For z/OS Batch

Medicare Severity Diagnosis Related Groups (MS-DRG) Software

Software Installation Guide

3

Preface

THIS MANUAL CONTAINS the information needed to use the Medicare Severity Diagnosis Related Groups (MS-DRG) Software (the grouper), version 26.0 in a mainframe environment. Two interface versions to the MS-DRG software are supplied. One, the standard version, assumes that the operating system is z/OS Batch. The second is re-entrant and uses no macros and so can be used in a variety of operating system environments, although it requires additional parameters from the calling program.

This manual provides technical personnel with the detail necessary to install, debug, and support the MS-DRG software. The first four chapters describe installing, testing, and running the grouper. Chapter 5 provides detailed information on the logic of the executor and the construction of the tables. An appendix provides grouping results for the test database.

Users already familiar with the MS-DRG software are encouraged to read this manual to ensure that installation, testing, and production runs perform without incident. If you have never used the software, we strongly recommend that you read the manual thoroughly to become familiar with it before installation.

The manual assumes that you are familiar with:

◆ IBM Basic Assembler Language (BAL)

◆ IBM MVS Job Control Language

◆ The ICD-9-CM coding scheme from a computer standpoint (e.g., diagnosis codes are 5-character alphanumerics that are left-justified in an 8-byte field and blank-filled).

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Chapter 1

Introduction

THIS MANUAL PROVIDES TECHNICAL PERSONNEL with the detail necessary to install and understand the Medicare Severity Diagnosis Related Groups (MS-DRG) Software (the grouper) so they can install, interface with, and support it.

The MS-DRG software may be implemented either as a set of subroutines to be called from a program written in Assembler or a higher level language (e.g., COBOL) or as a utility program with all parameters passed through a job's SYSIN input stream.

Volume serial numbers on the sample JCL should be replaced with the volume serial number of the transfer tape received by your facility. This number is clearly indicated on the outside of the tape you received.

For example purposes, the required datasets are copied to disk and cataloged under the Userid, GROUPER.

Grouper tables Minimally, the grouper consists of four programs. One of the programs consists of tables which contain information for all valid diagnoses, procedures, and DRGs. The diagnosis and procedure tables were prepared from the CPHA ICD-9-CM codes and abbreviated description tape (December 1979 revision) and the additional codes documented in the Federal Registers detailing final grouper changes for versions 4.0 through 26.0. Plain text (EBCDIC) versions of the tables embedded in the programs are supplied as well.

Data format requirements   The grouper executor is contained in four Basic Assembler Language (BAL) programs. The data formats required by the executor are shown in table 1–1.

If these data requirements are met, the grouper may be implemented by using a utility program (see chapter 3). Whenever these requirements are not met, the grouper must be implemented as a subroutine to a higher level language program that re-codes the information as necessary (see chapter 4).

Table 1–1.   Required data formats

Name	Length in bytes	Description
Diagnosis	8	First 7 bytes represent the diagnosis code. Left-justified, blank-filled, up to 25 accepted. The eighth byte represents the POA indicator. Y - Yes, present at the time of inpatient admission N - No, not present at the time of inpatient admission U - Insufficient documentation to determine if present on admission W - Clinically unable to determine if present at time of admission 1 - Exempt from POA reporting
Procedure	7	Left-justified, blank-filled, up to 25 accepted
Age	3	0 (zero) through 124, right-justified
Sex	1	1 or 2 (1-male, 2-female)
Discharge Status	2	UB92 01-Home, Self-Care 02-Short Term Hosp 03-SNF 04-ICF 05-Canc/Child hosp 06-Home Health Service 07-Against Medical Advice 20-Died 30-Still A Patient 43-FedHospital 50-Hospice-Home 51-Hospice-Medical Facility 61-Swing Bed 62-Rehab facility/rehab unit 63-Long term care hospital 64-Nursing facility - Medicaid certified 65-Psych hosp/unit 66-Critical Access Hospital 70-Oth institution

Table 1–1.   Required data formats

Name	Length in bytes	Description
POA logic	1	Present On Admission (POA) logic indicator. X - Exempt from POA reporting Z - Requires POA reporting
Admit Date	8	Format = YYYYMMDD (for use with future POA logic)
Discharge Date	8	Format = YYYYMMDD (for use with future POA logic)
Procedure Dates	200	Date of each procedure code Format = YYYYMMDD (for use with future POA logic)

Information returned by the grouper

The information returned by the grouper is shown in tables 1–2 through 1–7.

The field DRG listed below represents the 3-digit MS-DRG number used by the Centers for Medicare and Medicaid Services (CMS) for DRG payment purposes. The 3-byte "initial DRG" field in the ancillary buffer represents the DRG prior to the application of the HAC logic. The ancillary buffer also contains 4-byte initial and final DRG numbers. These 4-byte DRG numbers are for statistical purposes only. Each 3-digit DRG concept is split on MCC, CC, and non-CC to create the 4-digit DRG.

For example, as a 3-digit DRG, Non-specific CVA & precerebral occulsion w/o infarction is split into 067 (w MCC) and 068 (w/o MCC). As a 4-digit DRG, Non-specific CVA & precerebral occulsion is split into 0671 (w MCC), 0672 (w CC), and 0673 (w/o CC/MCC). There are also "initial" and "final" flags in the diagnosis flag buffer.

Table 1–2.   Information returned by the MS-DRG software

Name	Length in bytes	Description
RTC	2	Grouper return code (see table 1–3 for more info) 00-Record grouped 01-Diagnosis code cannot be used as principal dx 02-Record does not meet criteria for any DRG in the MDC that is indicated by principal dx 03-Invalid age 04-Invalid sex 05-Invalid discharge status 06-Illogical principal diagnosis 07-Invalid principal diagnosis 09-POA logic Indicator = Z and at least one HAC POA is invalid or missing 10-POA logic Indicator is invalid or missing and at least one HAC POA is N or U 11-POA logic Indicator is invalid or missing and at least one HAC POA is invalid or missing 12-POA Logic Indicator = Z and at least one HAC POA =1 13-POA Logic Indicator is invalid or missing and at least one HAC POA = 1 14-POA Logic Indicator = Z and there are multiple HACs that have different HAC POA values that are not Y, W, N, U 15-POA Logic Indicator is invalid or missing and there are multiple HACs that have different HAC POA values that are not Y or W

Table 1–2.   Information returned by the MS-DRG software

Name	Length in bytes	Description
Final MDC	2	Major Diagnostic Category number (00 - 25) assigned to patient record
Final DRG	4	Diagnosis Related Group number (0001 - 0 999) assigned to patient record (after HAC logic is applied)
GRFLGS	5	See table 1–4
DXFLGS	150	See table 1–5
PRFLGS	175	See table 1–6

Grouper return code   The grouper return code (RTC) indicates whether or not the grouping process was successful for a given record. Table 1–3 describes the values for the Return Code.

Table 1–3.   Return code descriptions

Return code	Description
1	The first listed diagnosis is a valid code but it can not be used as principal diagnosis. An example of this situation would be any one of the "E" codes, which are not indicative of the MDC into which this patient should be classified.
2	This code occurs when all of the DRG criteria for the MDC have been examined and the record does not match any of them. For example, there is some clinical inaccuracy on the record, such as a male sex code with a principal diagnosis that maps to a female MDC.
3, 4 and 5	These codes occur only for those DRGs that are part of grouping criteria (i.e., the grouper does not perform an automatic edit check of age, sex, and discharge status).
6	The principal diagnosis is considered illogical, meaning that it is unlikely that there would be an occurrence. For example, diagnosis code 76509 (extreme immat 2500+g) is flagged as an illogical diagnosis whenever it is coded as the principal diagnosis.
7	The code used as principal diagnosis is not a valid ICD-9-CM code.
9 - 15	These codes occur when there is at least one HAC on the record and there is an issue with either the POA logic indicator or the POA values assigned to the HAC.

Flags returned by the grouper The information returned by the grouper regarding DRGs, diagnoses, and procedures.

Table 1–4. Grouper flags returned by the MS-DRG software

Position	Description
1 and 2	Number of unique Hospital Acquired Conditions (HAC) met
3	Final CC/MCC impact on DRG assignment: 0 = DRG assigned is not based on the presence of a CC or MCC 1 = DRG assigned is based on presence of MCC 2 = DRG assigned is based on presence of CC
4	Initial CC/MCC impact on DRG assignment: 0 = DRG assigned is not based on the presence of a CC or MCC 1 = DRG assigned is based on presence of MCC 2 = DRG assigned is based on presence of CC
5	HAC Status 0 = HAC Not Evaluated 1 = HAC Evaluated - No Codes on HAC Lists 2 = HAC Evaluated- Codes on HAC Lists but no demotions 3 = HAC Evaluated- with demotion but DRG does not change 4 = HAC Evaluated - with demotion and DRG changes

Table 1–5.   Diagnosis flags returned by the grouper

Position	Description (6 characters per diagnosis)
1	0 = Diagnosis invalid 1 = Diagnosis valid
2	Diagnosis affects DRG 0 = Diagnosis not used to assign DRG 1 = Diagnosis affected the initial DRG only 2 = Diagnosis affected the final DRG only 3 = Diagnosis affected both initial and final DRG
3	CC/MCC Categorization 0 = Diagnosis is not considered a Major CC or CC for this patient 1 = Diagnosis is a Major CC for both initial and final DRG 2 = Diagnosis is a CC for both initial and final DRG 3 = Diagnosis is a MCC for initial DRG and a Non-CC for final DRG 4 = Diagnosis is a CC for initial DRG and a Non-CC for final DRG
4 and 5	Hospital Acquired Condition (HAC) assignment criteria 00 = Not an HAC 01 = Foreign Object Retained After Surgery 02 = Air Embolism 03 = Blood Incompatibility 04 = Pressure Ulcers 05 = Falls and Trauma 06 = Catheter Associated UTI 07 = Vascular Catheter-Associated Infection 08 = Infection after CABG 09 = Manifestations of poor glycemic control 10 = DVT/PE after knee or hip replacement 11 = Infection after bariatric surgery 12 = Infection after certain orthopedic procedures of spine, shoulder and elbow
6	Hospital Acquired Condition (HAC)/ Present on admission (POA) Status 0 = Not HAC, POA not evaluated or non-exempt hospital HAC with recognized POA 1 = HAC, POA is not recognized or exempt hospital

Table 1–6.   Procedure flags returned by the grouper

Position	Description (7 characters per procedure)
1	0 = Procedure invalid 1 = Procedure valid
2	Procedure affects DRG 0 = Procedure did not affect DRG assignment 1 = Procedure affected the final DRG assignment only 2 = Procedure affected the initial DRG assignment only 3 = Procedure affected both initial and final DRG assignment
3	0= Procedure is not an OR procedure 1 = Procedure is an OR procedure
4 and 5	Hospital Acquired Condition (HAC) assignment criteria 08 = Infection after CABG 10 = DVT/PE after knee or hip replacement 11 = Infection after bariatric surgery 12 = Infection after certain orthopedic procedures of spine, shoulder and elbow
6	Not used
7	Not used

Ancillary buffer   The version number identifies the version of the grouper that is running. This field was formerly used to help the 3M HIS support staff and has been maintained for the user's convenience.

Table 1–7.   Additional flag information

Length in bytes	Description
5	1 byte reserved space (zero-filled) followed by 4-byte final DRG (after HAC logic applied)
1	Final DRG Medical/Surgical Indicator 0 = RTC is non-zero 1 = Medical DRG 2 = Surgical DRG
4	1 byte reserved space (zero-filled) followed by 3-byte initial DRG (prior to HAC logic)
5	1 byte reserved space (zero-filled) followed by 4-byte initial DRG (prior to HAC logic)
1	Initial DRG Medical/Surgical indicator 0 = RTC is non-zero 1 = Medical DRG 2 = Surgical DRG
8	Version ID returned by the grouper (PPPVVVUU) PPP = 001 (MS-DRG) VVV = 260 (Grouper version 26.0) UU = 00 (update 00)

Chapter 2

Installing the MS-DRG Software

Contents

Installing the MS-DRG Software

INSTALLING THE MEDICARE SEVERITY Diagnosis Related Groups (MS-DRG) Software (the grouper) consists of three steps:

1. Copying the grouper object library to disk

2. Copying the test database to disk

3. Link-editing the Assembler subroutines and testing the grouper

The first two steps are discussed in this chapter.

Step 3, the procedure for link-editing and testing the programs, depends on the way in which the grouper is implemented at your installation. Chapter 3 explains how to use the grouper utility and contains JCL for using it to run the test database. Chapter 4 shows how to link-edit the grouper programs for use as subroutines for a higher-level language. Two COBOL programs using the test database are included on the tape, and the JCL for using them to test the installation is included in chapter 4.

The layout of the system tape is shown in table 2–1.

Table 2–1.   MS-DRG system tape contents

File	File name	LRECL	BLKSIZE	Description
1	OBJLIB	80	27920	Object library
2	TESTDB	960	27840	Test database
3	SRCLIB	80	27920	Source library
4	MDCDSC	80	27920	MDC titles
5	DRGDSC3	80	27920	DRG titles (3-digit)
6	DRGDSC4	85	27965	DRG titles (4-digit)
7	EBC.DXTAB	112	27888	EBCDIC DXTAB
8	EBC.SGTAB	207	27945	EBCDIC SGTAB
9	EBC.DRGTAB	504	27720	EBCDIC DRGTAB
10	EBC.CCPAIRS	9	27990	EBCDIC CC exclusion pairs
3480 cartridge, No label				

Copying the grouper program object library to disk

The system tape includes a program object library containing six programs, as listed in table 2–2.

Table 2–2.   Object library contents

D260CN	The main control program (standard interface)
D260GR	The grouper program
D260LB	The grouper support library
D260RT	The grouper tables
D260CA	The main control program (alternate interface)
D260UT	The grouper utility interface

The first four programs (D260CN, D260GR, D260LB, D260RT) comprise the main grouper executor using the standard interface. Substitute D260CA for D260CN (that is, use D260CA, D260GR, D260LB, and D260RT) to compile the main grouper executor using the alternate (re-entrant, macro-free) interface. D260UT is a utility program that can serve as an interface if your input data meets specific criteria. Chapter 3 discusses this program. Figure 2–1 shows the JCL necessary to copy the object library to disk.

```
// EXEC PGM=IEBUPDTE, PARM=NEW
//SYSPRINT DD DUMMY
//SYSIN DD DSN=OBJLIB, UNIT=TAPE,
//VOL=(, RETAIN, SER=GRPXFR),
//LABEL=(1, NL), DISP=OLD,
//DCB=(RECFM=FB, LRECL=80, BLKSIZE=27920)
//SYSUT2 DD DSN=GROUPER.OBJLIB, UNIT=DISK,
//DISP=(NEW, CATLG, DELETE),
//DCB=(LRECL=80, BLKSIZE=27920, RECFM=FB),
//SPACE=(CYL, (4, 1, 5), RLSE)
```

Figure 2–1.   Sample JCL for copying grouper object library to disk

All of the programs contained on the system tape were written in IBM Basic Assembler. There may be some reprogramming involved for those installations that do not have IBM equipment. The source code for each of the programs is provided on the system tape (see table 2–1).

Copying the test database to disk

A test database has been provided on the system tape. The database consists of 5,380 records, all of which were grouped before being copied to tape. This file should be used as a test of the installed grouper.

There are three ways in which the installation can be tested, and you can use any of them. The first is to run the COBOL test program, COBTEST, which is included in the source library and documented in chapter 4. The second is to run the utility program D260UT, which is documented in chapter 3 and for which the grouping results are provided in appendix A. The third is to run the COBOL test program ALTTEST, which is included in the source library and documented in Chapter 4, and which tests the alternate interface.

Figure 2–2 shows the JCL for copying the test database to disk.

```
// EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=A
//SYSIN DD DUMMY
//SYSUT1 DD DSN=TESTDB,UNIT=TAPE,
//VOL=(,RETAIN,SER=GRPXFR),
//LABEL=(2,NL),DISP=OLD,
//DCB=(RECFM=FB,LRECL=960,BLKSIZE=27840)
//SYSUT2 DD DSN=GROUPER.TEST.DATA,UNIT=DISK,
//DISP=(NEW,CATLG,DELETE),
//DCB=(LRECL=960,BLKSIZE=27840,RECFM=FB),
//SPACE=(CYL,(7,1),RLSE)
```

Figure 2–2.   Sample JCL for copying grouper test database to disk

Table 2–3 provides a record description for the test database.

Table 2–3.   Record layout for grouper test database

Field	Location	Name	Description
1	1-3	AGE	Age on admission, in years
2	4-4	SEX	Gender
3	5-6	DSP	Discharge status (disposition)
4	7-7	POALOG	POA logic indicator
5	8-15	ADATE	Admission date (YYYYMMDD)
6	16-23	DDATE	Discharge date (YYYYMMDD)
7	24-223	DX1-25	Diagnosis codes (DX1=Principal)
32	224-398	PROC1-25	Procedure codes

Table 2–3.   Record layout for grouper test database   *(continued)*

Field	Location	Name	Description
57	399-598	PRDATES (1-25)	Procedure dates (YYYYMMDD)
82	599-600	RTC	Return code from the grouper
83	601-602	MDC	MDC number returned by the grouper
84	603-606	DRG	DRG number returned by the grouper
85	607-611	GRFLGS	Output grouper flags
86	612-761	DXFLGS	Output diagnosis flags (25x6)
111	762-936	PRFLGS	Output procedure flags (25x7)
136	937-960	BUFF	Output ancillary buffer

➤   ***Note:*** *All diagnoses are left-justified in the first five characters of an eight-character field, with each diagnosis' POA indicator occupying the eighth character of the field. Procedures are left-justified in seven-character fields. Unused characters in the diagnosis and procedure fields must be blank.*

Additional datasets on the transfer tape

There are several datasets included on the transfer tape that are not needed for the grouping process but may be useful to grouper users.

File 3 contains the source library for all the grouper programs, tables, and the COBOL test programs. The library contains 8 members, as listed in table 2–4.

Table 2–4.   Source library contents

D260CN	The main control program (standard interface)
D260GR	The grouper program
D260LB	The support library
D260RT	The grouper tables
D260UT	The grouper utility interface program
D260CA	The main control program (alternate interface)
COBTEST	The COBOL test interface program (standard interface)
ALTTEST	The COBOL test interface program (alternate interface)

Figure 2–3 shows the JCL necessary to copy the source library to disk.

```
// EXEC PGM=IEBUPDTE,PARM=NEW
//SYSPRINT DD DUMMY
//SYSIN DD DSN=SRCLIB,UNIT=TAPE,
//VOL=(,RETAIN,SER=GRPXFR),
//LABEL=(3,NL),DISP=OLD,
//DCB=(RECFM=FB,LRECL=80,BLKSIZE=27920
//SYSUT2 DD DSN=GROUPER.SRCLIB,UNIT=DISK,
//DISP=(NEW,CATLG,DELETE),
//DCB=(LRECL=80,BLKSIZE=27920,RECFM=FB),
//SPACE=(CYL,(7,1,11),RLSE)
```

Figure 2–3.   Sample JCL for copying grouper source library to disk

Comments are also included in the source programs, D260CN and D260UT, describing the modifications needed to convert the programs to VSE.

File 4 contains the English titles for the MDCs, file 5 contains the English titles for the 3-digit DRGs, and file 6 contains English titles for the 4-digit DRGs. Tables 2–5, 2–6, and 2–7 contain the record layouts for these datasets.

Table 2–5.   Record layout for MDCDSC (File 4)

Column	Description
1-2	MDC number
3-3	Comma (,)
4-80	MDC title

Table 2–6.   Record layout for DRGDSC3 (File 5)

Column	Description
1-3	DRG number
4-4	Comma (,)
5-7	Constant 'MDC'
8-8	Blank
9-10	MDC number
11-11	'M' (medical) or 'P' (surgical)
12-12	Comma (,)
13-80	DRG title

Table 2–7.   Record layout for DRGDSC4 (File 6)

Column	Description
1-4	DRG number
5-5	Comma (,)
6-85	DRG title

MS-DRG V26.0 EBCDIC tables

The tables that drive the grouper are expressed in Extended Binary Coded Decimal Interchange Code (EBCDIC) as four files:

Diagnosis table. Contains one row per ICD-9-CM diagnosis, with diagnosis attributes.

Procedure table. Contains one row per ICD-9-CM procedure, with procedure attributes.

DRG table. Contains grouper logic and DRG assignment by MDC.

Exclusion table. Contains lists of secondary diagnoses that are not considered a CC or MCC when in the presence of certain principal diagnoses.

In the layouts in this section, each field is identified by its position (first column is position 1) and length in a table row. Criteria fields (length 1) are one when the criteria are met and zero otherwise.

Files 7 though 10 contain the diagnosis, procedure, DRG, and CC exclusion EBCDIC tables. Sample JCL for downloading the EBCDIC tables is shown in figure 2–4 on page 2.21.

Diagnosis table   File 7, shown in table 2–8, contains the MS-DRG EBCDIC diagnosis table.

Table 2–8.   Diagnosis table

Name	Pos	Len	Description
Diagnosis	1	5	ICD-9-CM diagnosis
Sex	6	1	1=Male only 2=Female only 0=Both
Index	7	5	Index number used in exclusion table
MDC	12	2	MDC when principal dx
DxCat	14	2	Diagnosis category when principal dx
HAC_GRP	16	2	HAC Group Number
CC_group	18	4	CC exclusion group (0=no exclusions 1=self only)
acutecns	22	1	Acute complex CNS
ami	23	1	AMI
brstmal	24	1	Breast malignancy
chfami	25	1	AMI and heart failure
compapp	26	1	Appendectomy with complications
curvmalig	27	1	Curvature of spine or malignancy
curvoth	28	1	Spinal fusion except cervical
delcomp	29	1	Vaginal delivery with complications
diabetes	30	1	Diabetes
dxcc	31	1	CC unless excluded
dxcc01	32	1	CC unless excluded list 01
dxcc02	33	1	CC unless excluded list 02
dxcc03	34	1	CC unless excluded list 03
dxcc04	35	1	CC unless excluded list 04
dxcc05	36	1	CC unless excluded list 05
dxcc06	37	1	CC unless excluded list 06
dxcc07	38	1	CC unless excluded list 07
dxcc08	39	1	CC unless excluded list 08
dxcc09	40	1	CC unless excluded list 09
dxcc10	41	1	CC unless excluded list 10

Table 2–8.   Diagnosis table *(continued)*

Name	Pos	Len	Description
dxcc11	42	1	CC unless excluded list 11
dxcc12	43	1	CC unless excluded list 12
dxcc13	44	1	CC unless excluded list 13
dxcc14	45	1	CC unless excluded list 14
dxcc15	46	1	CC unless excluded list 15
dxcc16	47	1	CC unless excluded list 16
dxcc17	48	1	CC unless excluded list 17
dxcc18	49	1	CC unless excluded list 18
dxcc19	50	1	CC unless excluded list 19
dxcc20	51	1	CC unless excluded list 20
dxccm	52	1	Major CC unless excluded
dxccm01	53	1	Major CC unless excluded list 01
dxccm02	54	1	Major CC unless excluded list 02
dxccm03	55	1	Major CC unless excluded list 03
dxccm04	56	1	Major CC unless excluded list 04
dxccm05	57	1	Major CC unless excluded list 05
dxccm06	58	1	Major CC unless excluded list 06
dxccm07	59	1	Major CC unless excluded list 07
dxccm08	60	1	Major CC unless excluded list 08
dxccm09	61	1	Major CC unless excluded list 09
dxccm10	62	1	Major CC unless excluded list 10
dxccm11	63	1	Major CC unless excluded list 11
dxccm12	64	1	Major CC unless excluded list 12
dxccm13	65	1	Major CC unless excluded list 13
dxccm14	66	1	Major CC unless excluded list 14
dxccm15	67	1	Major CC unless excluded list 15
dxccm16	68	1	Major CC unless excluded list 16
dxccm17	69	1	Major CC unless excluded list 17
dxccm18	70	1	Major CC unless excluded list 18
dxccm19	71	1	Major CC unless excluded list 19
dxccm20	72	1	Major CC unless excluded list 20
ecode	73	1	E-code
extburn	74	1	Extensive 3rd degree burns
extimm	75	1	Extreme immaturity or RDS
fullburn	76	1	Full thickness burn
hac06_sdx	77	1	SDX on record for HAC 06
hac11_pdx	78	1	PDX required for HAC 11
hemorrhage	79	1	PDX hemorrhage

Table 2–8.   Diagnosis table *(continued)*

Name	Pos	Len	Description
hiv	80	1	HIV
hivmaj	81	1	HIV major
hivsig	82	1	Significant HIV related condition
illogical	83	1	Ungroupable
incident	84	1	Normal newborn
infection	85	1	Infection
inhalinj	86	1	Inhalation injury
lorl	87	1	Lymphoma or leukemia
mccalive	88	1	Is MCC only if discharged alive
mcomp	89	1	Other antepartum with complication
nbmaj	90	1	New born with major problems
nomouthlp	91	1	Except face, mouth and neck
nonextburn	92	1	Non-extensive burns
nonmalig	93	1	Uterine and adnexa for non-malignancy
ovadmal	94	1	Ovarian and adnexal malignancy
postop	95	1	postop
preterm	96	1	Prematurity
procoma	97	1	Traumatic stupor and coma
renaldiab	98	1	Other kidney & urinary tract procedures
renalfail	99	1	Renal failure
s492	100	1	Acute leukemia
skinulc	101	1	Skin ulcers
stabdom	102	1	Significant trauma - abdomen
stchest	103	1	Significant trauma - chest and respiratory
sthead	104	1	Significant trauma - head, face and neck
stkidney	105	1	Significant trauma - kidney
stlolimb	106	1	Significant trauma - lower limb
stpel	107	1	Significant trauma - spine / pelvis
strauma	108	1	Trauma
stroke	109	1	Acute ischemic stroke
stuplimb	110	1	Significant trauma - upper limb
sturin	111	1	Significant trauma - urinary system
uaothmal	112	1	Non-ovarian & non-adnexal malignancy

Procedure table File 8, shown in table 2–9, contains the MS-DRG EBCDIC procedure table.

Table 2–9. Procedure table

Name	Pos	Len	Description
Proc	1	4	ICD-9-CM procedure code
abdom	5	1	Rectal resection
aicd	6	1	AICD lead and generator procedures
amp18	7	1	Amputation of musculoskeletal system
ampul	8	1	Amputation of upper limb and toe
amputat	9	1	Amputation except limb and toe
anal	10	1	Anal procedures
antfuse	11	1	Anterior spinal fusion
aorta	12	1	Abdominal aorta
append	13	1	Appendectomy
apt	14	1	Adrenal and pituitary
arterial	15	1	PTCA
arthrosc	16	1	Arthroscopy
awdsg	17	1	Amputation due to metabolic disorders
backneck	18	1	Back and neck procs
biop18	19	1	Biopsies
bladur	20	1	Minor bowel procs
bmt	21	1	Bone marrow transplant
bowel	22	1	Bowel procedures
breastext	23	1	Mastectomy
bypass	24	1	Coronary bypass
cardthor	25	1	Other cardiothoracic repairs
cbdexpl	26	1	Common duct exploration
cervfuse	27	1	Cervical fusion
chestcl	28	1	Other respiratory procs
chestopn	29	1	Major chest procs
cochimpl	30	1	Cochlear implant
comp468	31	1	Extensive O.R. procedure except minor vaginal
comp476	32	1	Prostatic O.R. procedure
comp477	33	1	Non-extensive O.R. procedure except minor vaginal
cran	34	1	Craniotomy
cranface	35	1	Cranial or facial procedures
csect	36	1	C-section
d197	37	1	Cholecystomy except by laparoscope

Table 2–9.   Procedure table *(continued)*

Name	Pos	Len	Description
d468	38	1	Extensive O.R. procedure
d476	39	1	Prostatic proc unrelated to PDX
d477	40	1	Non-extensive proc unrelated to pdx
d484	41	1	Craniotomy for multiple significant trauma
d485	42	1	Limb, hip and femur for multiple significant trauma
d486	43	1	Other procs for multiple significant trauma
d491	44	1	Major joint and limb reattachment
d493	45	1	Laparoscopic cholecystomy
dc16	46	1	Abortion with D&C
defib	47	1	Cardiac defibrillator
defibgen	48	1	Cardiac defib implant
device1	49	1	Cardiac device 1
device2	50	1	Cardiac device 2
device3	51	1	Cardiac device 3
device4	52	1	Cardiac device 4
device5	53	1	Cardiac device 5
device6	54	1	Cardiac device 6
discdevice	55	1	Insertion of spinal disc devices
ecmo	56	1	ECMO
endograft	57	1	Endovascular implantation of graft in thoracic aorta
esoph	58	1	Stomach, esoph and duodenal procs
exp12	59	1	Hepatobiliary procs
femhip	60	1	Fix hip and femur procs
foot	61	1	Foot and toe procedures
freeskin	62	1	Skin grafts
fusion	63	1	Dorsal & lumbar fusion procs
gbbd	64	1	Biliary tract
graft	65	1	Skin graft
hac08_proc	66	1	CABG needed for HAC 08
hac10_proc	67	1	Procedures needed for HAC 10
hac11_proc	68	1	Procedures needed for HAC 11
hac12_proc	69	1	Procedures needed for HAC 12
hand	70	1	Hand procedures
hand22	71	1	Hand procedures
headneck	72	1	Other major head and neck procs

Table 2–9.   Procedure table *(continued)*

Name	Pos	Len	Description
heartsys	73	1	Heart assist transplant
heartxp	74	1	Heart transplant
hernia	75	1	Hernia procs expect inguinal or femoral
impgen	76	1	Implant cardiodefib generator
implead	77	1	Implant cardiodefib leads
impsys	78	1	Implant external heart assist system
ingfem	79	1	Inguinal, femoral and umbilical procs
intracran	80	1	Intracranial vascular procedures
intxp	81	1	Transplant of intestine
kidneyxp	82	1	Kidney transplant
knee	83	1	Knee procedures
kuret	84	1	Kidney, ureter and major bladder procs
lapint	85	1	Laparoscopy and tubal interruption
laryng	86	1	Laryngectomy
lead1	87	1	Cardiac lead 1
lead2	88	1	Cardiac lead 2
lead3	89	1	Cardiac lead 3
lead4	90	1	Cardiac lead 4
lead5	91	1	Cardiac lead 5
lead6	92	1	Cardiac lead 6
leadleft	93	1	Lead venous system
liverxp	94	1	Liver transplant
locexc	95	1	Local excision of musculoskeletal
lungxp	96	1	Lung transplant
lysis	97	1	Peritoneal adhesiolysis
maj04	98	1	Major OR procs for lymphoma and leukemia
majblad	99	1	Major bladder
minbow	100	1	Minor bowel procs
mse	101	1	Major shoulder and elbow
multjoint	102	1	Multiple joint procs of lower extremity
mvr	103	1	Major cardiovascular
mwth	104	1	Thumb, joint and wrist procedures
neurogen	105	1	Insertion or replacement of neurostimulator pulse generator
NORarternor	106	1	NOR cardiac mapping
NORcardcath	107	1	NOR cardiac valve w/cardiac catheterization

Table 2–9. Procedure table *(continued)*

Name	Pos	Len	Description
NORcarstent	108	1	Percutaneous insertion of carotid artery stent(s)
NORcathnor	109	1	NOR cardiac cath
NORchemoimp	110	1	NOR chemo agent implant
NORdrugstent	111	1	NOR drug-eluting stent
NOReswl	112	1	NOR extracorporeal shockwave litrotripsy
NORfuse9plus	113	1	Fusion or refusion of 9 or more vertebrae
NORhighdose	114	1	NOR high dose chemo agent
NORislets	115	1	Other NOR kidney & urinary tract procedures
NORmvge96h	116	1	At least 96 hours on mechanical ventilator
NORmvlt96h	117	1	Less than 96 hours on mechanical ventilator
NORnorminor	118	1	NOR for lymphoma and non-acure leukemia
NORnoroth02	119	1	NOR radiosurgery
NORnorpercut	120	1	NOR percutaneous cardiovascular
NORnorperi	121	1	NOR peripheral and carnial nerve
NORnorskin	122	1	NOR skin
NORrehab	123	1	NOR rehab and detox therapy
NORstent	124	1	NOR stent
NORstent4plus	125	1	Procedure on 4 or more vessels or insertion of 4 or more stents
NORtemptrach	126	1	NOR temporary tracheostomy
NORthrombo	127	1	Thrombolytic agent
NORvascdev	128	1	NOR vascular access device
obesity	129	1	Obesity procedure
oral	130	1	Mouth procedures
orbit	131	1	Orbital procs
or_indic	132	1	Operating Room procedure
oth02	133	1	Other endocrine and metabolic procs
oth03	134	1	Other blood and blood forming organs
oth08	135	1	Other ear, nose, mouth and throat
oth09	136	1	Other circulatory system
oth11	137	1	Other digestive system
oth12	138	1	Other hepabiliary procs
oth13	139	1	Other kidney and urinary tract

Table 2–9.   Procedure table *(continued)*

Name	Pos	Len	Description
oth14	140	1	Other male reproductive system
oth15	141	1	Other female reproductive system
oth16	142	1	Vaginal delivery except sterilization
oth17	143	1	Other skin, breast and sucut tissue
oth18	144	1	Other musculoskeletal procs
oth22	145	1	Other injuries
othbt	146	1	Other biliary tract procedures
othexoc	147	1	Other extraocular procs
othhf	148	1	Hip and femur
othinoc	149	1	Other intraocular procs
othlleg	150	1	Lower extremity
othtrach	151	1	Other tracheostomy
pacegen	152	1	Pacemaker generator
pacerepl	153	1	Cardiac pacemaker & defib device replacement
pacesys	154	1	Pacemaker system
pancby	155	1	Pancreas shunt
pancxp	156	1	Pancreas transplant
pelvevis	157	1	Pelvic evisceration
pelvic	158	1	Major male pelvis procs
penis	159	1	Penis procs
perangio	160	1	Percutaneous angioplasty or atherectomy of precerebral (extracranial) vessel(s)
percut	161	1	PTCA or coronary atherectomy
perilead	162	1	Implantation or replacement of peripheral neurostimulator
perinerv	163	1	Peripheral nerve disorders
postfuse	164	1	Posterior spinal fusion
pros	165	1	Prostate procs
ptca	166	1	PTCA
pulsegen	167	1	Insertion or replacement of dual array neurostimulator pulse generator
radioimp	168	1	Radioactive element implant
recon	169	1	Female reconstructive procs
remsys	170	1	Remove external heart assist system
repgen	171	1	Replacement cardiodefib generator
replacex	172	1	Major joint replacement or reattachment of lower extremity
replead	173	1	Replacement cardiodefib leads

Table 2–9.   Procedure table *(continued)*

Name	Pos	Len	Description
reppulgen	174	1	Replacement pacemaker device
revision	175	1	Revision of hip or knee replacement
salivary	176	1	Salivary gland procs
sensor	177	1	Imp/rep impl sensor lead
septal	178	1	Percutaneous cardiovascular procedures
sgraft02	179	1	Skin graft due to metabolic disorders
sgraft20	180	1	Skin graft
sinus	181	1	Sinus & mastoid procs
skgrft	182	1	Skin graft
softiss	183	1	Soft tissue procs
spinal	184	1	Spinal procs
spinallead	185	1	Implantation or replacement of spinal neurostimulator
splenect	186	1	Splenectomy
steril	187	1	Sterilization and/or D&C procs
stimlead	188	1	Implantation of intracranial neurostimulator
subcue	189	1	Imp/rep subcutaneous card dev
subtot	190	1	Subtotal mastectomy
testic	191	1	Testes procs
thorac	192	1	Other cardiothorasic
thyroid	193	1	Thyroid, parathyroid and thyroglossal
totchol	194	1	Cholecystomy
turp	195	1	Transureth prostatectomy
tusurg	196	1	Transurethral procedures
ua	197	1	Uterine and adnexa
upextrem	198	1	Upper extremity
urethra	199	1	Urethral & transurethral procs
vagcerv	200	1	Vaginal, cervix and vulva procs
valve	201	1	cardiac valve procs
vascular	202	1	Other vascular procs
veinstrip	203	1	Vein ligation & strip
vshunt	204	1	Ventricular shunt
wndebrid	205	1	Wound debridements
xcranvasc	206	1	Extracranial vascular procedures

DRG table   File 9, shown in table 2–10, contains the MS-DRG table.

Table 2–10.   DRG table

Name	Pos	Len	Description
MDC	1	2	Major Diagnostic Category
Seqno	3	3	Sequence number within MDC
DRG	6	3	DRG if row assigns one; zero otherwise
DxCat	9	2	Diagnosis Category if row requires one; zero otherwise
NewMDC	11	2	New MDC if row reroutes; zero otherwise.
MedSurg	13	1	1=Medical DRG 2=Surgical DRG 0 otherwise.D263
GRC	14	1	Grouper return code.
ALIVE	15	1	Discharged alive
AMA	16	1	Left against medical advise
ANYCOMB	17	1	At least 2 different procedures among procedure criteria listed
ANYDX	18	1	Any diagnosis
DIEDXFR	19	1	Died or transfer to ACF
FEMALE	20	1	Female
INVDSTAT	21	1	Invalid discharge status
INVPDX	22	1	Invalid PDX
INVSEX	23	1	Invalid sex
LDPAIR	24	1	Lead-device pair
MALE	25	1	Male reproductive procedures
MULTST	26	1	Multiple significant trauma
ONLYDX	27	1	Only diagnosis from the following list
ORindic	28	1	OR procedure(s) on record
pdx mask	29	91	Principal dx criteria. See dx table positions 22 to end. Add 7.
sdx mask	120	91	Secondary dx criteria. See dx table positions 22 to end. Add 98.
adx mask	211	91	Any dx criteria. See dx table positions 22 to end. Add 189.
proc mask	302	202	Procedure criteria. See proc table positions 5 to end. Add 297.

Exclusion table   File 10, shown in table 2–11, contains the MS-DRG exclusions table.

Table 2–11.   Exclusion table

Name	Pos	Len	Description
Group	1	4	Exclusion group from dx table
Index	5	5	Diagnosis index

Figure 2–4 on the following page shows the JCL needed to download the MS-DRG 26.0 EBCDIC files from the cartridge.

```
//JOB CARD FOR YOUR INSTALLATION
//* ***********************************************
//* UNLOAD MS V26.0 DIAGNOSES EBCDIC TABLE    *
//* ***********************************************
//DXEBC    EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=*
//SYSIN    DD DUMMY
//SYSUT1   DD UNIT=TAPE,VOL=(,RETAIN,SER=VVVVVV),
//    LABEL=(7,NL),DISP=(OLD,PASS),
//    DCB=(LRECL=112,BLKSIZE=27888,RECFM=FB)
//SYSUT2   DD UNIT=DISK,DISP=(NEW,CATLG,DELETE),
//    DSN=GROUPER.DXEBCDIC,
//    DCB=(LRECL=112,BLKSIZE=27888,RECFM=FB),
//    SPACE=(CYL,(3,1),RLSE)
/*
//* ***********************************************
//* UNLOAD MS V26.0 PROCEDURES EBCDIC TABLE    *
//* ***********************************************
//SGEBC    EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=*
//SYSIN    DD DUMMY
//SYSUT1   DD UNIT=TAPE,VOL=(,RETAIN,SER=VVVVVV),
//    LABEL=(8,NL),DISP=(OLD,PASS),
//    DCB=(LRECL=207,BLKSIZE=27945,RECFM=FB)
//SYSUT2   DD UNIT=DISK,DISP=(NEW,CATLG,DELETE),
//    DSN=GROUPER.SGEBCDIC,
//    DCB=(LRECL=207,BLKSIZE=27945,RECFM=FB),
//    SPACE=(CYL,(2,1),RLSE)
/*
//* ***********************************************
//* UNLOAD MS V26.0 DRG EBCDIC TABLE *
//* ***********************************************
//DGEBC    EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=*
//SYSIN    DD DUMMY
//SYSUT1   DD UNIT=TAPE,VOL=(,RETAIN,SER=VVVVVV),
//    LABEL=(9,NL),DISP=(OLD,PASS),
//    DCB=(LRECL=504,BLKSIZE=27720,RECFM=FB)
//SYSUT2   DD UNIT=DISK,DISP=(NEW,CATLG,DELETE),
//    DSN=GROUPER.DGEBCDIC,27720
//    DCB=(LRECL=504,BLKSIZE=27720,RECFM=FB),
//    SPACE=(CYL,(2,1),RLSE)
/*
//* ***********************************************
//* UNLOAD MS V26.0 CC EBCDIC TABLE   *
//* ***********************************************
//CCEBC    EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=*
//SYSIN    DD DUMMY
//SYSUT1   DD UNIT=TAPE,VOL=(,RETAIN,SER=VVVVVV),
//    LABEL=(10,NL),DISP=OLD,
//    DCB=(LRECL=9,BLKSIZE=27990,RECFM=FB)
//SYSUT2   DD UNIT=DISK,DISP=(NEW,CATLG,DELETE),
//    DSN=GROUPER.CCEBCDIC,
//    DCB=(LRECL=9,BLKSIZE=27990,RECFM=FB),
//    SPACE=(TRK,(6,1),RLSE)
/*
```

Figure 2–4.   Sample JCL for downloading the EBCDIC tables

Chapter 3

Using and testing the grouper utility

Contents

Using and testing the grouper utility

INSTALLATIONS WITH DATA THAT CONFORMS to the grouper requirements provided in chapter 1 (see table 1-1) and whose output record length does not exceed 2992 bytes, may implement the grouper as a utility program that receives all information pertaining to the input record layout from the job's SYSIN stream. To use the grouper utility, you must have copied file 1 (the grouper object library) from the system tape to disk (see chapter 2).

Link-editing the grouper utility

The JCL for creating a load module for the grouper utility is shown in figure 3–1.

```
//JOB CARD FOR YOUR INSTALLATION
//* ******************************************************
//* THIS JOB CREATES A GROUPER UTILITY LOAD MODULE   *
//* ******************************************************
//LKED    EXEC  PGM=HEWL, PARM='LIST, MAP, AMODE=31, RMODE=ANY',
//    REGION=1024K
//SYSLMOD  DD  DSN=GROUPER. UTIL. LOAD, DISP=OLD
//SYSUT1   DD  UNIT=DISK, SPACE=(CYL, (1, 1))
//SYSPRINT DD  SYSOUT=*
//OBJECT   DD  DSN=GROUPER. OBJLIB, DISP=OLD
//SYSLIN DD *
  INCLUDE OBJECT(D26OUT, D26OCN, D26OGR, D26OLB, D26ORT)
  ENTRY D26OUT
  NAME D26OUT
/*
```

Figure 3–1.   Sample JCL for creating the grouper utility load module

Using the grouper utility

As previously mentioned, the grouper utility receives all information pertaining to the input and output record layouts from the job's SYSIN stream. When using the grouper utility, you must provide 16 SYSIN control statements shown in table 3–1. These statements must be present in the order shown. Each control statement consists of a 3-character keyword followed by at least one 4-digit field, right-justified and zero-filled, indicating the starting position of the variable.

Table 3–1. Control statements required by the grouper utility

Control statement	Keyword	Identifies the starting position(s) of...
1	DDX	Each 8-byte diagnosis code
2	SRG	Each 7-byte procedure code
3	AGE	The age field
4	SEX	The sex field
5	DSP	The discharge status field
6	POA	Present on admission logic
7	ADT	Admission date
8	DDT	Discharge date
9	SDT	Procedure dates
10	RTC	The grouper return code
11	MDC	The MDC number returned by the grouper
12	DRG	The DRG number returned by the grouper
13	GFL	Grouper flags
14	DFL	Diagnosis flags
15	SFL	Procedure flags
16	BUF	Grouper buffer

Control statement examples

The following examples of the control statements use the 960-byte record from the test database as input. The first 598 bytes contain the data that must be passed to the grouper, and the next 362 bytes contain the information filled in by the previous grouper. The output record is 362 bytes larger, with those 362 bytes containing the data returned by the new grouper when you run the test.

The discharge diagnosis control statement (DDX)

The DDX control statement specifies the starting position of each discharge diagnosis code in the patient record to be used in the grouping process. Blanks must be inserted between each position specified. The grouper assumes that the first specified

diagnosis is the principal discharge diagnosis. You may specify up to 24 secondary diagnoses to be considered in the grouping process so there may be at most 25 diagnosis positions specified on the control statement. For example, the DDX control statement shown below indicates that the principal diagnosis started at position 24 and that there were 24 secondary diagnoses to be used by the grouper, which began at position 32.

The grouper assumes that each diagnosis code specified is left-justified in a 8-byte field. All codes must be blank-filled. Zero-filled codes are not allowed. The 8th byte in each field is the POA indicator.

```
Column      12345678901234567890123456789012345678901234567890123456789012345678901234567890
Contents    DDX 0024 0032 0040 0048 0056 0064 0072 0080 0088 0096 0104 0112 0120 0128 0136 *
            DDX 0144 0152 0160 0168 0176 0184 0192 0200 0208 0216
```

When there are more than 15 diagnoses, an asterisk (*) must be placed in column 80 as shown in the example above.

The procedure control statement (SRG)

The SRG control statement specifies the starting position of each procedure code in the patient record to be used in the grouping process. As with the diagnosis control statement, you specify each starting position as a 4-digit number. Blanks must be inserted between each position specified. You may provide up to 25 procedures for use by the grouper. For example, the SRG control statement shown below indicates that there were 25 procedure codes to be used in the grouping process, with the first procedure beginning at position 224, the second procedure beginning at position 231, and so on.

The grouper assumes that each procedure code specified is left-justified in a 7-byte field. Short codes must be blank-filled. Zero-filled codes are not allowed.

```
Column      12345678901234567890123456789012345678901234567890123456789012345678901234567890
Contents    SRG 0224 0231 0238 0245 0252 0259 0266 0273 0280 0287 0294 0301 0308 0315 0322 *
            SRG 0329 0336 0343 0350 0357 0364 0371 0378 0385 0392
```

When there are more than 15 procedures, an asterisk (*) must be placed in column 80 as shown in the example above.

The age control statement (AGE)	The AGE control statement specifies the starting position of the field containing the patient age. Only ages between 0 and 124 are considered valid for grouping. The age field is assumed to be three bytes in length, containing right-justified numerics, and may be either zero- or blank-filled. For example, the AGE control statement displayed below indicates that the 3-byte age field appears on the patient record starting at position 1.

```
Column    123456789
Contents  AGE 0001
```

The sex control statement (SEX)	The SEX control statement specifies the starting position of the field containing the patient's sex. The grouper assumes that the sex field is one byte in length, containing the values 0 through 2 (unknown/male/female respectively). The test database SEX control statement is:

```
Column    123456789
Contents  SEX 0004
```

The discharge status control statement (DSP)	The DSP control statement specifies the position of the discharge status on the patient's record. The grouper assumes this is a 2-byte, right-justified field, with values as specified in table 1-1. Short codes (i.e., codes with fewer than two digits) may be either blank- or zero-filled. The test database DSP control statement is:

```
Column    123456789
Contents  DSP 0005
```

The present on admission control statement (POA)	The POA control statement specifies the starting position of the field containing the Present on Admission logic flag. The grouper assumes the POA flag is one byte in length, containing the values specified in table 1-1. The test database control statement is:

```
Column    1234567890
Contents  POA 0007
```

The admission date control statement (ADT)	The ADT control statement specifies the starting position of the field containing the patient's admission date. The grouper assumes the admission date is 8 bytes in length, formatted as YYYYMMDD. The test database control statement is:

```
Column    1234567890
Contents  ADT 0008
```

The discharge date control statement (DDT)	The DDT control statement specifies the starting position of the field containing the patient's discharge date. The grouper assumes the discharge date is 8 bytes in length, formatted as YYYYMMDD. The test database control statement is:

```
Column    1234567890
Contents  DDT 0016
```

The procedure dates control statement (SDT)	The SDT control statement specifies the starting position of a 200-byte buffer containing the date of each procedure coded on the patient record. The grouper assumes each procedure date is 8 bytes in length, formatted as YYYYMMDD. The test database control statement is:

```
Column    1234567890
Contents  SDT 0399
```

Grouper output control statements	It is important to note that none of the data returned by the grouper needs be written to the output record, although pre-sumably you would want at least DRG and MDC numbers and the grouper return code (RTC). Regardless of whether you choose to output the data or not, a control statement with an output position must be supplied for each of the elements spec-ified below (RTC, MDC, DRG, GFL, DFL, SFL, BUF).

You must ensure that the storage for all fields returned by the grouper can be contained on the output record. The utility pro-gram determines the output record length from the JCL DCB specifications for the output dataset. If the position specified is beyond the end of the output record but within the maximum record length allowed, the field is dropped when the output record is written.

The return code control statement (RTC)	The RTC control statement specifies the location of a 2-byte field, which is used to store the grouper return code. The test database return code control statement is:

```
Column    123456789
Contents  RTC 0961
```

The MDC control statement (MDC)	The MDC control statement specifies the starting position for the storage of the MDC number returned by the grouper. The MDC number is a 2-byte, right-justified numeric value. The test data-base MDC control statement is:

```
Column    123456789
Contents  MDC 0963
```

The DRG control statement (DRG)

The DRG control statement specifies where on the output record the grouper should store the DRG number. The DRG number returned by the grouper is a 4-byte, right-justified numeric value. The test database DRG control statement is:

```
Column    123456789
Contents  DRG 0965
```

The grouper flags control statement (GFL)

The GFL control statement specifies the starting position of the grouper flags. The grouper assumes this field to be 5 bytes in length. The test database control statement is:

```
Column    1234567890
Contents  GFL 0969
```

The diagnosis flags control statement (DFL)

The DFL control statement specifies the starting position of the diagnosis flags. The grouper assumes this field to be 150 bytes in length. There are 6 diagnosis flags for each diagnosis on the record, up to a total of 25 diagnosis codes. The test database control statement is:

```
Column    1234567890
Contents  DFL 0974
```

The procedure flags control statement (SFL)

The SFL control statement specifies the starting position of the procedure flags. The grouper assumes this field to be 175 bytes in length. There are 7 procedure flags for each procedure on the record, up to a total of 25 procedure codes. The test database control statement is:

```
Column    1234567890
Contents  SFL 1124
```

The buffer control statement (BUF)

The BUF control statement specifies the starting position of the buffer of additional DRG information. The grouper assumes this field to be 24 bytes in length. The test database control statement is:

```
Column    1234567890
Contents  BUF 1299
```

Running the grouper utility program

Table 3–2 shows the ABENDs (abnormal end of jobs) possible from the grouper utility program.

Table 3–2.   ABEND codes

Code	Description
80A	Insufficient region size
001	Control statements missing or out of order
002	Non numeric data in position field on control statement
003	Missing control statement
004	Unsuccessful open of input database
005	Unsuccessful open of output database
006	Continuation character (*) found with less than 15 codes

The JCL for executing the grouper utility program is shown in figure 3–2.

```
//GO   EXEC  PGM=D26OUT
//STEPLIB  DD   DSN=GROUPER.UTIL.LOAD,DISP=SHR
//IN   DD   DSN=GROUPER.TEST.DATA,DISP=SHR
//OUT   DD   DSN=GROUPER.OUTTEST.DATA,
//     DISP=(NEW,CATLG,DELETE),UNIT=SYSDA,
//     DCB=(LRECL=1322,BLKSIZE=27762,RECFM=FB),
//     SPACE=(CYL,(10,1),RLSE)
//SYSPRINT DD  SYSOUT=*,DCB=(RECFM=FA,BLKSIZE=133,BUFNO=1)
//SYSIN    DD   *
DDX 0024 0032 0040 0048 0056 0064 0072 0080 0088 0096 0104 0112 0120 0128 0136 *
DDX 0144 0152 0160 0168 0176 0184 0192 0200 0208 0216
SRG 0224 0231 0238 0245 0252 0259 0266 0273 0280 0287 0294 0301 0308 0315 0322 *
SRG 0329 0336 0343 0350 0357 0364 0371 0378 0385 0392
AGE 0001
SEX 0004
DSP 0005
POA 0007
ADT 0008
DDT 0016
SDT 0399
RTC 0961
MDC 0963
DRG 0965
GFL 0969
DFL 0974
SFL 1124
BUF 1299
```

Figure 3–2.   Sample JCL for grouping test database

➤   *The SYSIN control statements must not contain line numbers, as the entire 80 bytes is considered input. Failure to do this causes User ABEND 001.*

Chapter 4

Using the grouper with higher-level languages

Contents

Chapter 4

Using the grouper with higher-level languages

THE GROUPER EXECUTOR MAY BE IMPLEMENTED as a sub-routine to be called from Assembler or a higher-level language program. This chapter shows how this may be done for a COBOL programming environment. To create the subroutines, you must have copied file 1 (the grouper objlib) from the system tape to disk (see chapter 2).

General strategy for COBOL driving program

A typical COBOL grouping utility might operate as follows:

- Opens the input and output datasets
- Reads records from the input dataset
- Reformats and recodes the input data to a form acceptable to the grouper
- Calls the grouper
- Stores the grouper return information on the output record
- Writes a new dataset containing the original data and the grouping information

A COBOL program (COBTEST) using the sample database is included on the installation tape. Sample JCL for running this program is shown in figure 4–1.

```
//JOB CARD FOR YOUR INSTALLATION
//* *********************************************************
//* SAMPLE JCL FOR GROUPING TEST DATABASE IN THE COBOL     *
//* ENVIRONMENT.        *
//*      *
//* BOTH OBJECT AND LOAD MODULES ARE TEMPORARY.   *
//* *********************************************************
//COBUCLG PROC
//*    COBOL FOR MVS COMPILE AND LE370 LINK
//COB     EXEC  PGM=IGYCRCTL, PARM=' RENT, NODYNAM'
//STEPLIB  DD   DSN=IGY.V2R2MO.SIGYCOMP, DISP=SHR
//SYSLIB   DD   DSN=GROUPER.SRCLIB, DISP=SHR
//SYSPRINT DD   SYSOUT=*
//SYSIN    DD   DSN=GROUPER.SRCLIB(COBTEST), DISP=SHR
//SYSUT1   DD   UNIT=DISK, SPACE=(CYL, (1,1))
//SYSUT2   DD   UNIT=DISK, SPACE=(CYL, (1,1))
//SYSUT3   DD   UNIT=DISK, SPACE=(CYL, (1,1))
//SYSUT4   DD   UNIT=DISK, SPACE=(CYL, (1,1))
//SYSUT5   DD   UNIT=DISK, SPACE=(CYL, (1,1))
//SYSUT6   DD   UNIT=DISK, SPACE=(CYL, (1,1))
//SYSUT7   DD   UNIT=DISK, SPACE=(CYL, (1,1))
//SYSLIN   DD   DSN=&&LOADSET, UNIT=DISK, DISP=(MOD, PASS),
//     SPACE=(TRK, (3,3)), DCB=BLKSIZE=800
//*
//LKED    EXEC  PGM=IEWL, PARM=' LIST, MAP, AMODE=31, RMODE=ANY',
//     COND=(5, LT, COB)
//SYSLIB   DD   DSN=CEE.SCEELKED, DISP=SHR
//SYSLMOD  DD   DSN=&&GOSET(GO), DISP=(, PASS), UNIT=DISK,
//     SPACE=(CYL, (5,1,5))
//SYSUT1   DD   UNIT=DISK, SPACE=(CYL, (1,1))
//SYSPRINT DD   SYSOUT=*
//SYSLIN   DD   DSN=&&LOADSET, DISP=(OLD, DELETE)
//     DD   DDNAME=SYSIN
//OBJECT   DD   DSN=GROUPER.OBJLIB, DISP=OLD
//*
//GO  EXEC  PGM=COBTEST, COND=((5, LT, COB), (5, LT, LKED))
//STEPLIB  DD DISP=SHR, DSN=CEE.SCEERUN
//     DD DISP=SHR, DSN=&&GOSET
//SYSPRINT DD SYSOUT=*
//INFILE   DD DSN=GROUPER.TEST.DATA, DISP=SHR
//     PEND
//*
//PROG1    EXEC COBUCLG, PROD=DRG260
//LKED.SYSIN DD *
  INCLUDE OBJECT(D260CN, D260GR, D260LB, D260RT)
  ENTRY COBTEST
  NAME COBTEST
/*
```

Figure 4–1.   Sample JCL for grouping test database in the COBOL environment

Input to the grouper subroutines

The grouper control program (D260CN) assumes that general purpose register 1 is pointing to a list of addresses with the structure shown in table 4–1.

Table 4–1.   MS-DRG software address list

Offset	Fullword pointer to...
0	The buffer containing the ICD-9-CM diagnosis codes for the record to be grouped. The first code is assumed to be principal diagnosis.
4	4-byte binary (PIC 9(8) COMP) field indicating the number of diagnoses contained in the buffer discussed above. This can be the actual number of codes in the buffer, or the maximum number of codes that the buffer can hold. This number cannot be less than 1 nor greater than 25. If greater than 25, the software uses only the first 25 fields in the buffer and ignores the rest.
8	The buffer containing the procedure codes for the record to be grouped.
12	4-byte binary (PIC 9(8) COMP) field indicating the number of procedures present. This field has the same rules as for diagnoses, except that it may be zero.
16	3-byte numeric field containing the patient's age in years.
20	1-byte numeric field containing the patient's sex.
24	2-byte numeric field containing the patient's discharge status.
28	1-byte numeric field containing the POA logic indicator
32	8-byte numeric field containing the patient's admission date (YYYYMMDD)
36	8-byte numeric containing the patient's discharge date (YYYYMMDD)
40	200-byte buffer containing the dates of the procedure codes. The buffer can hold up to a maximum of 25 dates, 8-bytes each (YYYYMMDD).
44	2-byte numeric field to hold the grouper return code.
48	2-byte numeric field to hold the MDC number.
52	4-byte numeric field to hold the DRG number.
56	5-byte field to hold the grouper flags.
60	150-byte field to hold the diagnosis flags.
64	175-byte field to hold the procedure flags.
68	24-byte field to hold the buffer of additional DRG information.

➤ *Note:* COBOL applications programmers need not concern themselves with implementing this structure since COBOL automatically creates it when a CALL USING statement is issued.

You must ensure that each diagnosis code is left-justified in a 8-byte field and that all of the diagnoses are in contiguous locations in the buffer whose address is in the first pointer described above. Empty fields may be interspersed throughout the buffer. A detailed discussion of the way in which fields in the buffer are processed is located at the end of this chapter.

Similarly, each procedure code must be left-justified in a 7-byte field, and all of the procedure codes must be in contiguous locations in the buffer whose address is in the third pointer described above.

Each diagnosis and procedure code must be blank-filled if it is shorter than the maximum field length. *Zero filling is not allowed.*

The patient's age must be right-justified in a 3-byte field. Valid ages for grouping are between 0 and 124. The age may be either zero- or blank-filled.

The patient's sex must be contained in a 1-byte field, in the range 0 through 2 (Unknown/Male/Female, respectively).

The discharge status must be contained in a 2-byte field which is coded according to the conventions shown in table 1-1. The code must be right-justified and may be either zero- or blank-filled.

Output from the grouper subroutines

On return from the grouper executor, the DRG, MDC, return code, and the grouper, diagnosis, and procedure flags fields are filled in, along with the buffer of additional DRG information. The DRG and MDC numbers are right-justified. The grouper return code is filled in according to the conventions detailed in chapter 1.

Using the alternate interface

The alternate grouper control program, (D260CA) operates the same as the standard grouper control program (D260CN) except that it does not contain any macros and is written to be re-entrant, so it should run in a wider variety of mainframe environments. Whereas the standard interface uses GETMAIN to obtain a 20,000 byte work area, the alternate interface requires that the calling program provide the work area. It must do so by providing two additional addresses in the list pointed to by general register 1 (see table 4–1.)

Table 4–2 gives the additional work area parameters required by the alternate interface.

Table 4–2. Work area parameters

Offset	Full word pointer to...
72	A buffer of at least 20,000 bytes.
76	4-byte binary (PIC 9(8) comp) field containing the actual length in bytes of the work area. The value of this field should not be less than 20,000 bytes, though larger values are acceptable.

To use the alternate interface, substitute D260CA for D260CN and provide these two extra parameters. See the COBOL program ALTTEST, provided in the source library, for an example of how to set up a work area and pass it to D260CA.

Assembler programmers should note that the length of the work area is *not* given in the full word at the offset 76 from R1 but rather a *pointer* to the full word containing the length is given at offset 76.

Sample JCL for running ALTTEST may be created by modifying the JCL shown in figure 4–1. To modify the JCL, change all occurrences of COBTEST to ALTTEST and change D260CN to D260CA.

Executor processing of the diagnosis and procedure buffers

The way in which the grouper retrieves diagnosis and procedure codes for processing is to loop through the related buffers using the counts addressed by the second and fourth pointers. If any diagnosis or procedure field is all zeroes or all blanks, then that field is considered empty and the code is flagged as invalid and is ignored. Codes are saved in an internal work area that is subsequently used for construction of the record mask (see chapter 5). Because processing is done this way, it is possible to pass a buffer that contains both valid and empty fields.

For example, assume there is a record containing a maximum of five diagnosis codes, three of which are coded for this abstract. The number of diagnoses passed would be five, and the buffer could look like any of the following:

```
3310    Y40210  Y5601    N
3310    Y       40210   Y5601    N
3310    Y00000  40210   Y5601    N00000
```

The principal diagnoses must be in the first field of the buffer. If the field is empty or invalid, the record is assigned DRG 999 (ungroupable) with a return code of 7 (invalid principal diagnosis).

Chapter 5

The MS-DRG grouper executor

Contents

The MS-DRG grouper executor

TO USE THE INFORMATION IN THIS CHAPTER, you should have:

◆   A working knowledge of IBM Basic Assembler Language

◆   At least a rudimentary understanding of the underlying logic on which all DRG decisions are based

◆   Access to the *Medicare Severity Diagnosis Related Groups Definitions Manual*, which explains the principles on which all decisions are made

The executor essentially makes its decisions by comparing indicators for each DRG within an MDC. Indicators are set by the elements found on the patient record. These sets of indicators are referred to as masks. The content of the masks are listed in the EBCDIC tables in chapter 2.

The tables are represented as hexadecimal constants in the module D260RT and are present in memory when the grouper is loaded for execution. All table lookups are in-memory binary searches.

The executor begins its basic task by creating masks that are indicative of the conditions found on the patient record. These are called the record masks.

Once the record masks have been constructed, the corresponding DRG masks for the MDC indicated by the principal diagnosis are compared to them, until a match is found or the DRG masks for the MDC are exhausted.

Because the internal format of the grouper tables is optimized in D260RT for fast lookups and is therefore difficult to read, the four principal tables included in D260RT are provided as flat EBCDIC files on the distribution tape. See chapter 2 for table layout details.

Construction of the record mask

The following list describes how the executor constructs the record masks.

1. Sex is tested for validity (1-2).
   — An error indicator is turned on if sex is out of that range.
   — If not, the appropriate indicator is set in the record mask.

2. Discharge status is tested for validity (01-07, 20, 30, 43, 50, 51, 61-66, 70)
   — An error indicator is turned on if discharge status is out of range.
   — Otherwise, the appropriate indicators are set in the record mask.

3. The first listed diagnosis (assumed principal) is looked up in the Diagnosis Table.
   — If no entry is found, the record is assigned DRG 999, RTC 7 and no further processing occurs.
   — If an entry is found, but the MDC number is 0, the record is assigned DRG 999, RTC 7 and no further processing occurs.
   — Otherwise, the MDC and DXCAT are saved and the indicators for this diagnosis code are moved to the mask where principal diagnosis indicators are positioned.

4. All secondary diagnoses are looked up in the Diagnosis Table and their bit indicators "OR'd" together in the mask reserved for secondary diagnosis indicators. Additionally, if any of the secondaries is a complication or comorbidity, the CC exclusion subroutine is called to determine if the CC flag in the record mask should be set. A complete discussion of the CC exclusion subroutine appears on page 5.7 later in this chapter.

   Any secondary diagnosis for which there is no Diagnosis Table entry does not cause an error, but is instead ignored. MDC and DXCAT numbers are of no importance for secondaries.

5. Once all diagnoses have been processed, the indicators for principal and secondary are "OR'd" together in yet another indicator section mask for ALLDX criteria.

6. All procedure codes are looked up in Procedure Table and their bit indicators "OR'd" together in the mask reserved for procedure indicators. As with secondary diagnoses, invalid procedure codes do not generate errors, but are ignored.

DRG determination

Once the record masks have been constructed, the executor loops through the DRG masks for the MDC indicated by the principal diagnosis, comparing them with the record masks.

1. The comparison is done by moving the record mask to a work area and ANDing it with the current DRG mask.

2. The result of the ANDed work mask is then compared with the DRG mask.
   — If the results are identical, the associated DRG number is assigned and the processing to find and return the diagnosis and procedure flags is executed.
   — Otherwise, looping continues until a match is found or the DRG list is exhausted, at which time DRG 999 is assigned.

The rest of this section discusses some special conditions in the grouper logic.

Testing for the ONLY surgery condition

When the DRG mask indicates that ONLY specific surgeries can be present, the executor loops through the saved O.R. surgeries from the record, making decisions as follows:

1. The O.R. portion of the DRG mask is moved to a work area.

2. The work mask is ANDed with the mask of the saved O.R. surgery.
   — If the result of the ANDing is zero, this indicates that the surgery found on the record is other than the ONLY surgery allowed. The executor ceases looping and gets the next DRG mask.
   — Otherwise, the process continues until all saved O.R. surgeries have been tested.

Testing for the ONLY DX condition

The testing for this condition is virtually identical to that done for the ONLY surgery condition, except that the comparison is done on saved diagnoses against the ALLDX portion of the DRG mask.

Testing for the OWISE condition

This condition exists for DRGs 794, 963-965 and 997. This is essentially the "fall through" DRG for the MDC and is assigned when no other DRG criteria have been met. The "anydx" bit in the DRG mask is turned on, leaving a mask with only that bit on, thereby guaranteeing a match.

Testing for the ANYCOMB condition

This condition exists only for DRG 461-462 in MDC 8. The test is done by comparing all coded O.R. procedures with the procedure portion of the DRG mask and adding one to an accumulator for each procedure that has a matching mask. If the resulting count is less than two, this record does not meet the "anycomb" condition, and the next DRG mask is retrieved.

CC exclusion subroutine

A large subset of the diagnosis codes are flagged as complication/comorbidity codes (CC) or major complication/comorbidity codes (MCC). Many of these codes are not really CC/MCC codes at all times because there are many conditions for which the secondary diagnosis is a natural side effect of the principal diagnosis. The CC/MCC exclusion table is organized to reflect a direct relationship between a principal diagnosis and selected secondaries.

Because the ICD-9-CM codes are non-contiguous and do not lend themselves well to defining ranges of codes, an index number is associated with each diagnosis and the CC/MCC exclusion table is constructed entirely from those index numbers.

To determine whether a secondary should be considered a CC/MCC, the executor accesses the CC/MCC table, using the principal diagnosis CC/MCC exclusion category as the key each time a secondary flagged as CC/MCC is encountered.

— If no entry is found for the exclusion category, that means that there are no exclusions and the secondary is considered a CC/MCC code.

— If an entry is found, then the secondary is excluded as a CC/MCC.

Testing for the OTHOR condition

This test is similar in logic to the test for the ONLY conditions, except that it tests for procedures in addition to the O.R. criteria in the DRG mask. When the DRG mask indicates that other O.R. procedures must be present, the executor loops through the O.R. procedures from the record, making decisions as follows:

1. The O.R. portion of the DRG mask is moved to a work area.

2. The work mask is ANDed with the mask of the saved O.R. procedure.

— If the result of the ANDing is zero, this indicates that the procedure is other than the specific procedure required (e.g., T&A) and therefore satisfies the other O.R. criteria. When that occurs, looping ceases and processing continues for the DRG.

— Otherwise, the loop continues until a procedure satisfies the other condition. If all saved procedures are exhausted without finding one that satisfies the other condition, then processing for that DRG is ended.

Testing for illogical principal diagnosis

When a DRG has been matched, and the DRG number is 999, the cause is an illogical principal diagnosis. To indicate this, the return code is changed to 6.

Testing for multiple significant trauma

The principal diagnosis is tested to see if it is a trauma code. If it is, processing continues to test for multiple significant trauma. Otherwise, no further trauma testing is done.

To qualify as multiple significant trauma, two significant trauma codes from *different* body sites must be present. The diagnosis mask contains special trauma indicators, with each body site trauma represented by a different flag.

The mask of the first diagnosis (either principal or secondary) that is flagged as a significant trauma is saved. The mask of each subsequent diagnosis that is also flagged is compared with the initial saved mask. If they are not the same, the record is flagged as a multiple significant trauma episode. If they are the same, the next diagnosis is tested until the multiple condition is satisfied or the diagnoses are exhausted.

Finding codes that affect Initial DRG assignment

After the DRG has been determined, the grouper executor analyzes the saved diagnosis and procedure masks, comparing them against the masks which were used to determine MDC and DRG. Codes which were necessary for the determination of the MDC/DRG are flagged with an "affect flag."

Final DRG

If no Hospital Acquired Conditions (HACs) are found on the record, then the initial DRG becomes the final DRG. Otherwise, the record is re-grouped demoting the HAC secondary diagnosis which may or may not change the DRG assignment based on what DRG it was initially assigned to, and/or the presence of other codes that are CCs or MCCs.

Executor ABEND codes

There is one ABEND (abnormal end of job) code that can be generated by the executor, standard version only.

Table 5–1.   ABEND codes generated by the executor–standard version

Code	Description
108	Not able to GETMAIN a work area of sufficient size.

The alternate interface does not contain any ABEND macros.

Appendix A

Grouping results for the test database

Contents | **Grouping results for the test database   A.3**

Grouping results for the test database

THE FOLLOWING IS A PARTIAL LISTING OF THE OUTPUT
produced by the grouper utility program (D260UT). The pro-
gram's printout is a distribution of record counts by final DRG,
MDC, and return code (RTC), respectively. The test database
used a POA indicator of Z. There were no POAs assigned to the
diagnosis codes. The printout of counts from your test run may
differ in appearance from what is shown in the appendix, but
the content should be the same if the test is successful. Some
editing was done in order to fit the text into this manual.

The test, when performed by 3M HIS on an IBM H7060/H70,
used 192K of virtual storage, and took less than 1 CPU second.

```
COUNTS BY DRG
  1   3 |  51   0 | 101  25 | 151  10 | 201  10 | 251  15 | 301  11 | 351   3 |
  2   7 |  52   5 | 102   0 | 152   0 | 202  13 | 252   4 | 302   0 | 352  25 |
  3  10 |  53   5 | 103  11 | 153  50 | 203  17 | 253  15 | 303  20 | 353   0 |
  4  10 |  54   3 | 104   0 | 154   2 | 204  19 | 254  11 | 304   0 | 354   8 |
  5   5 |  55  17 | 105   0 | 155   6 | 205   2 | 255   0 | 305  10 | 355  12 |
  6   5 |  56   2 | 106   0 | 156  17 | 206  16 | 256   5 | 306   3 | 356   4 |
  7  10 |  57   8 | 107   0 | 157   1 | 207  10 | 257   5 | 307  27 | 357   9 |
  8  10 |  58   0 | 108   0 | 158   6 | 208  10 | 258   0 | 308   3 | 358   8 |
  9  10 |  59   2 | 109   0 | 159  23 | 209   0 | 259  10 | 309   4 | 359   0 |
 10  10 |  60   8 | 110   0 | 160   0 | 210   0 | 260   1 | 310  13 | 360   0 |
 11   0 |  61   0 | 111   0 | 161   0 | 211   0 | 261   3 | 311  10 | 361   0 |
 12   0 |  62   0 | 112   0 | 162   0 | 212   0 | 262   6 | 312  19 | 362   0 |
 13  10 |  63  10 | 113   3 | 163   2 | 213   0 | 263  10 | 313  10 | 363   0 |
 14   0 |  64   2 | 114   5 | 164   4 | 214   0 | 264  10 | 314   3 | 364   0 |
 15   0 |  65   5 | 115  20 | 165   1 | 215  10 | 265   1 | 315   5 | 365   0 |
 16   0 |  66   3 | 116   7 | 166   4 | 216   4 | 266   0 | 316  12 | 366   0 |
 17   0 |  67   1 | 117  33 | 167   8 | 217   6 | 267   0 | 317   0 | 367   0 |
 18   0 |  68   9 | 118   0 | 168  10 | 218   0 | 268   0 | 318   0 | 368   0 |
 19   0 |  69  10 | 119   0 | 169   0 | 219   4 | 269   0 | 319   0 | 369   8 |
 20   4 |  70   1 | 120   0 | 170   0 | 220   5 | 270   0 | 320   0 | 370   2 |
 21   3 |  71   8 | 121   1 | 171   0 | 221   1 | 271   0 | 321   0 | 371   0 |
 22   3 |  72  11 | 122   9 | 172   0 | 222  10 | 272   0 | 322   0 | 372   6 |
 23   9 |  73   1 | 123  10 | 173   0 | 223   0 | 273   0 | 323   0 | 373   4 |
 24   1 |  74  19 | 124   1 | 174   0 | 224   2 | 274   0 | 324   0 | 374   2 |
 25   2 |  75   6 | 125  38 | 175   3 | 225   8 | 275   0 | 325   0 | 375   8 |
 26   9 |  76   4 | 126   0 | 176   7 | 226   3 | 276   0 | 326  17 | 376  13 |
 27  10 |  77   5 | 127   0 | 177   4 | 227   7 | 277   0 | 327   5 | 377   0 |
 28   1 |  78   3 | 128   0 | 178  10 | 228   2 | 278   0 | 328  16 | 378   9 |
 29   8 |  79   1 | 129   7 | 179  15 | 229   3 | 279   0 | 329  13 | 379  11 |
 30  10 |  80   2 | 130   3 | 180   2 | 230   5 | 280   3 | 330   5 | 380   0 |
 31   4 |  81   8 | 131   4 | 181   6 | 231   5 | 281   5 | 331  12 | 381   5 |
 32  10 |  82   1 | 132  12 | 182   3 | 232   5 | 282  12 | 332   2 | 382   5 |
 33  13 |  83   1 | 133   9 | 183   1 | 233   4 | 283   6 | 333   2 | 383   0 |
 34   0 |  84   4 | 134  89 | 184   5 | 234  16 | 284   4 | 334  10 | 384  20 |
 35   0 |  85   2 | 135   0 | 185  11 | 235   5 | 285   0 | 335   2 | 385   1 |
 36   9 |  86   3 | 136  11 | 186   1 | 236  15 | 286   1 | 336   7 | 386   6 |
 37   1 |  87  20 | 137   7 | 187   4 | 237   6 | 287  19 | 337  12 | 387   3 |
 38  10 |  88   1 | 138   8 | 188  12 | 238  14 | 288   4 | 338   4 | 388   2 |
 39   9 |  89   6 | 139  16 | 189  10 | 239   3 | 289   2 | 339   4 | 389   9 |
 40   1 |  90  19 | 140   0 | 190   2 | 240   7 | 290   4 | 340  12 | 390   9 |
 41   6 |  91   5 | 141   0 | 191   6 | 241   0 | 291   3 | 341   0 | 391   0 |
 42  22 |  92   5 | 142   0 | 192   2 | 242   3 | 292   4 | 342   4 | 392  30 |
 43   0 |  93  10 | 143   0 | 193   1 | 243   4 | 293   3 | 343  16 | 393   1 |
 44   0 |  94   6 | 144   0 | 194  11 | 244  10 | 294   4 | 344   0 | 394   9 |
 45   0 |  95   0 | 145   0 | 195  18 | 245   2 | 295   6 | 345   7 | 395  20 |
 46   0 |  96   3 | 146   2 | 196   3 | 246   1 | 296   5 | 346  13 | 396   0 |
 47   0 |  97   6 | 147   5 | 197   5 | 247  19 | 297   1 | 347   2 | 397   0 |
 48   0 |  98   0 | 148   3 | 198  12 | 248   2 | 298   4 | 348   4 | 398   0 |
 49   0 |  99   4 | 149  10 | 199   2 | 249  10 | 299   1 | 349  14 | 399   0 |
 50   0 | 100   4 | 150   0 | 200   4 | 250   3 | 300   8 | 350   2 | 400   0 |
```

COUNTS BY DRG

DRG	n	DRG	n	DRG	n	DRG	n	DRG	n	DRG	n	DRG	n	DRG	n
401	0	451	0	501	11	551	0	601	8	651	0	701	0	751	0
402	0	452	0	502	8	552	10	602	0	652	10	702	0	752	0
403	0	453	0	503	0	553	0	603	30	653	0	703	0	753	0
404	0	454	4	504	2	554	32	604	2	654	0	704	0	754	1
405	4	455	6	505	8	555	0	605	25	655	10	705	0	755	7
406	7	456	0	506	4	556	10	606	1	656	1	706	0	756	12
407	9	457	4	507	2	557	1	607	20	657	7	707	10	757	0
408	2	458	6	508	4	558	9	608	0	658	2	708	10	758	5
409	6	459	0	509	9	559	0	609	0	659	1	709	4	759	5
410	12	460	20	510	0	560	0	610	0	660	8	710	6	760	2
411	3	461	0	511	4	561	9	611	0	661	11	711	10	761	8
412	6	462	10	512	9	562	1	612	0	662	0	712	20	762	0
413	11	463	1	513	2	563	52	613	0	663	5	713	6	763	0
414	2	464	5	514	13	564	0	614	4	664	15	714	15	764	0
415	9	465	3	515	2	565	1	615	6	665	1	715	6	765	8
416	9	466	0	516	5	566	9	616	3	666	7	716	4	766	12
417	1	467	6	517	11	567	0	617	4	667	12	717	4	767	10
418	4	468	4	518	0	568	0	618	2	668	1	718	6	768	10
419	15	469	1	519	0	569	0	619	0	669	4	719	0	769	10
420	8	470	9	520	0	570	0	620	1	670	15	720	0	770	10
421	7	471	1	521	0	571	0	621	9	671	6	721	0	771	0
422	5	472	4	522	0	572	0	622	3	672	24	722	0	772	0
423	8	473	15	523	0	573	2	623	5	673	1	723	10	773	0
424	2	474	1	524	0	574	10	624	2	674	4	724	10	774	10
425	0	475	4	525	0	575	8	625	1	675	4	725	2	775	10
426	0	476	5	526	0	576	0	626	4	676	0	726	18	776	10
427	0	477	1	527	0	577	7	627	25	677	0	727	0	777	10
428	0	478	3	528	0	578	10	628	4	678	0	728	29	778	10
429	0	479	6	529	0	579	2	629	8	679	0	729	0	779	10
430	0	480	1	530	0	580	16	630	8	680	0	730	20	780	10
431	0	481	7	531	0	581	38	631	0	681	0	731	0	781	10
432	6	482	19	532	0	582	6	632	0	682	3	732	0	782	10
433	3	483	3	533	1	583	11	633	0	683	6	733	0	783	0
434	1	484	6	534	7	584	4	634	0	684	1	734	1	784	0
435	2	485	0	535	0	585	17	635	0	685	10	735	9	785	0
436	6	486	7	536	8	586	0	636	0	686	3	736	2	786	0
437	2	487	13	537	1	587	0	637	4	687	4	737	3	787	0
438	3	488	2	538	9	588	0	638	8	688	13	738	5	788	0
439	7	489	8	539	0	589	0	639	8	689	3	739	0	789	10
440	0	490	5	540	3	590	0	640	0	690	27	740	7	790	10
441	1	491	11	541	7	591	0	641	30	691	0	741	13	791	9
442	11	492	0	542	2	592	2	642	10	692	0	742	6	792	11
443	8	493	4	543	4	593	5	643	2	693	1	743	14	793	10
444	2	494	24	544	4	594	3	644	5	694	19	744	10	794	10
445	5	495	2	545	1	595	1	645	7	695	0	745	30	795	10
446	13	496	6	546	8	596	11	646	0	696	13	746	2	796	0
447	0	497	12	547	12	597	1	647	0	697	30	747	6	797	0
448	0	498	1	548	2	598	9	648	0	698	1	748	10	798	0
449	0	499	9	549	2	599	10	649	0	699	9	749	5	799	2
450	0	500	1	550	6	600	2	650	0	700	18	750	5	800	8

COUNTS BY DRG

801	10	826	2	851	0	876	9	901	1	926	0	951	10	976	3
802	0	827	8	852	0	877	0	902	5	927	2	952	0	977	8
803	3	828	10	853	2	878	0	903	4	928	7	953	0	978	0
804	7	829	3	854	8	879	0	904	3	929	9	954	0	979	0
805	0	830	7	855	0	880	10	905	7	930	0	955	1	980	0
806	0	831	0	856	1	881	10	906	10	931	0	956	1	981	3
807	0	832	0	857	2	882	10	907	7	932	0	957	0	982	0
808	0	833	0	858	6	883	10	908	3	933	4	958	3	983	6
809	5	834	3	859	0	884	10	909	10	934	15	959	4	984	2
810	3	835	2	860	0	885	10	910	0	935	18	960	0	985	3
811	2	836	15	861	0	886	10	911	0	936	0	961	0	986	5
812	18	837	0	862	1	887	10	912	0	937	0	962	0	987	1
813	10	838	4	863	9	888	0	913	2	938	0	963	1	988	5
814	1	839	6	864	0	889	0	914	27	939	0	964	1	989	4
815	6	840	1	865	0	890	0	915	1	940	4	965	2	990	0
816	13	841	8	866	12	891	0	916	19	941	6	966	0	991	0
817	0	842	11	867	2	892	0	917	6	942	0	967	0	992	0
818	0	843	2	868	4	893	0	918	24	943	0	968	0	993	0
819	0	844	8	869	4	894	10	919	1	944	0	969	9	994	0
820	3	845	30	870	11	895	11	920	7	945	9	970	1	995	0
821	7	846	0	871	6	896	0	921	12	946	1	971	0	996	0
822	10	847	7	872	13	897	19	922	2	947	1	972	0	997	0
823	3	848	3	873	0	898	0	923	16	948	12	973	0	998	10
824	6	849	10	874	0	899	0	924	0	949	9	974	3	999	233
825	11	850	0	875	0	900	0	925	0	950	8	975	4		

COUNTS BY MDC

0	233
1	448
2	127
3	314
4	306
5	574
6	438
7	208
8	567
9	261
10	185
11	310
12	191
13	169
14	160
15	70
16	91
17	193
18	82
19	89
20	40
21	168
22	55

```
   23      60
   24      13
   25      28

COUNTS BY RTC
    0    5147
    1       0
    2       0
    3       0
    4       0
    5       1
    6       0
    7      92
    8       0
    9     140
   10       0
   11       0
   12       0
   13       0
   14       0
   15       0

TOTAL RECORDS PROCESSED      5380
```

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