

**Business Problem**

You have been contracted to build a system that will allow the Chicago Police Department to better deploy its scarce resources. By using five years of crime data, 2009 – 2013, you will need to build a system to better analyze crime data. Your system will include a program to select specific crime records from millions of crimes then create CSV records that you save in a file that can then be used in Microsoft Excel for further analysis.

Your COBOL program has to call a date conversion program, create a sequential data set that can be downloaded to a small computer where you can use Excel to do more analysis. Your program also has to work according to the specifications below and be **well-documented** according to our class documentation standards.

**Input, Processing, Output**

**Input -** Your program named, **LAB 9**, needs to read the following sequential data sets.

1. Read the five years of input data sequentially as one file. You can find all of the metadata about these datasets in ISPF 3.4.

**SHARE.CHICAGO.CRIME09**

**SHARE.CHICAGO.CRIME10**

**SHARE.CHICAGO.CRIME11**

**SHARE.CHICAGO.CRIME12**

**SHARE.CHICAGO.CRIME13**

1. The CRIME-RECORD record layout should be included in your FD section and can be found in **SHARE.GET239.COBOL(CRIMEREC)** and looks like this:

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* READ ME: Do not change this record layout

\* Chicago City Crime record - Length 249

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

01 CC-CRIME-RECORD.

05 CC-CASE-NUMBER PIC X(8).

05 CC-DATE-TIME PIC X(15).

05 CC-ADDRESS PIC X(40).

05 CC-IUCR PIC X(4).

05 CC-PRIMARY-CRIME PIC X(30).

05 CC-CRIME-DESC PIC X(50).

05 CC-LOCATION PIC X(50).

05 CC-ARREST PIC X.

05 CC-DOMESTIC PIC X.

05 CC-BEAT PIC X(4).

05 CC-WARD PIC X(2).

05 CC-FBI-CODE PIC X(3).

05 CC-X-COORD PIC X(7).

05 CC-Y-COORD PIC X(7).

05 CC-YEAR PIC X(4).

05 CC-LAT PIC X(11).

05 CC-LONG PIC X(12).

\*\*\*\*\*\*\* End of Chicago City Crime Record \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Remember from Lab 5, the date and time lives in a PIC X(15) field and is very difficult to determine the time because the time “floats” in the field depending on the number of characters used by the date. To fix this problem you will use data time conversion program that will pass you the date and time as discrete fields.

For each record selected, you will need to dynamically call the date/time conversion program, **CONVDATE**, passing it **CC-DATE-TIME** using the following fields in working storage. CONVDATE will separate the date and the time in the following fields. You will need to copy the CONVDATE load module from SHARE.GET239.LOADLIB to your SUSnnnn.GET239.LOADLIB.

**a. In WORKING-STORAGE SECTION include these date/time work fields:**

\*\*\*\* CONVERTED DATE \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

05 WS-DATE-CONV.

10 WS-MONTH PIC XX.

10 WS-DAY PIC XX.

10 WS-YEAR PIC X(4).

05 WS-DATE-CONVR REDEFINES WS-DATE-CONV.

10 WS-MONTH9 PIC 99.

10 WS-DAY9 PIC 99.

10 WS-YEAR9 PIC 9(4).

\*\*\*\* CONVERTED TIME \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

05 WS-TIME-CONV.

10 WS-HOUR PIC XX.

10 WS-MIN PIC XX.

05 WS-TIME-CONVR REDEFINES WS-TIME-CONV.

10 WS-HOUR9 PIC 99.

10 WS-MIN9 PIC 99.

**b. and the called program’s name:**

\*\*\*\* CALLED PROGRAM \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

01 CONVERT-DATE PIC X(8) VALUE 'CONVDATE'.

**c. and the output record in CSV format needed by Excel. Use the layout CRIMECSV located in SHARE.GET239.COBOL**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\* THIS IS THE CSV RECORD FORMAT - A HEADING AND A DETAIL LINE

\*--- WRITE THIS ONCE --------------------------------------------

01 CRIME-HEADING.

05 PIC X(4) VALUE 'Year'.

05 PIC X VALUE ','.

05 PIC X(5) VALUE 'Month'.

05 PIC X VALUE ','.

05 PIC X(3) VALUE 'Day'.

05 PIC X VALUE ','.

05 PIC X(4) VALUE 'Hour'.

05 PIC X VALUE ','.

05 PIC X(4) VALUE 'IUCR'.

05 PIC X VALUE ','.

05 PIC X(13) VALUE 'Primary Crime'.

05 PIC X VALUE ','.

05 PIC X(10) VALUE 'Crime-Desc'.

05 PIC X VALUE ','.

05 PIC X(4) VALUE 'Ward'.

05 PIC X VALUE ','.

05 PIC X(7) VALUE 'Address'.

05 PIC X VALUE ','.

05 PIC X(6) VALUE 'Arrest'.

05 PIC X VALUE ','.

05 PIC X(20).

\*--- THIS WILL BE WRITTEN OUT MANY TIMES ------------------------

01 CRIME-DETAIL.

05 CD-YYYY PIC X(4).

05 PIC X VALUE ','.

05 CD-MM PIC X(2).

05 PIC X VALUE ','.

05 CD-DD PIC X(2).

05 PIC X VALUE ','.

05 CD-HH PIC X(2).

05 PIC X VALUE ','.

05 CD-IUCR PIC X(4).

05 PIC X VALUE ','.

05 CD-PRIM-CRIME PIC X(20).

05 PIC X VALUE ','.

05 CD-CRIME-DESC PIC X(20).

05 PIC X VALUE ','.

05 CD-WARD PIC X(4).

05 PIC X VALUE ','.

05 CD-ADDRESS PIC X(20).

05 PIC X VALUE ','.

05 CD-ARREST PIC X.

05 PIC X VALUE ','.

05 PIC X VALUE ' '.

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1. **Processing - in the PROCEDURE DIVISION**

**a. Select crimes that meet the following criteria:**

|  |  |  |
| --- | --- | --- |
| 610 | BURGLARY | FORCIBLE ENTRY |
| 620 | BURGLARY | UNLAWFUL ENTRY |
| 630 | BURGLARY | ATTEMPT FORCIBLE ENTRY |
| 650 | BURGLARY | HOME INVASION |

**Before creating the CSV output record convert the CC-ARREST from “T” and “F” to “Y” and “N” respectively.**

**b. Call the date conversion program after you select each crime record.**

\*\*\*\* CALL THE CONVERT DATE-TIME PROGRAM \*\*\*\*\*\*\*\*\*\*\*\*\*

CALL CONVERT-DATE USING CC-DATE-TIME

WS-DATE-CONVR

WS-TIME-CONVR.

**c. Output - Create CSV records and write them to your output CSV file as identified in the JCL in letter d below. Here is an example of the Excel spreadsheet.**



**d. Use this data definition (DD) in your execute JCL:**

**//CRIMECSV DD DSN=&SYSUID..GET239.CSV,**

**// DISP=(NEW,CATLG,DELETE),**

**// DCB=(DSORG=PS,RECFM=FB,LRECL=90),**

**// UNIT=SYSDA,**

**// SPACE=(TRK,200)**

**e.** **Create an output summary that reports the number of crime records read and the number of CSV records written to your output file.**

SUMMARY TOTALS \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Crime Records In : 1,750,659

Crime CSV Records Out : 120,275 **🡨 number of rows in your spreadsheet**

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**Deliverables**

To get full credit, you need to submit the following:

1. Source code listing of your LAB9 program
2. Listing of the JCL used to execute your program
3. Summary Report from the execution of your LAB9 program
4. EXCEL spreadsheet showing your LAB9 output file works
5. Answers to the following questions (10) attaching your output that supports each answer. **No output, credit!**
6. What time of day (use non-military time) has the most burglaries? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Attach output.

1. Which Ward has the most burglaries? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Attach output.

1. Of the four burglary categories which one had the most arrests? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Attach output.

1. Which year had the most burglaries? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Attach output.

1. Which year had the least burglaries? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Attach output.