**CSCI 360 Assignment 7 – Introduction to Packed Decimal Summer 2021**

**(75 points)**

This program is a rather simple introduction to packed decimal and packed decimal arithmetic.

First, copy the following Assembler program into a new member of your ASSIGNS PDSE named ASSIGN7.

Be sure the program is surrounded by the correct JCL:

PRINT NOGEN

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\* CSCI 360 ASSIGNMENT 7 SUMMER 2021 \*

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PAYROLL CSECT

\*

\* STANDARD ENTRY LINKAGE ESTABLISHING R12 AS BASE REGISTER

\*

STM 14,12,12(13) SAVE REGS IN CALLER'S SAVE AREA

LR 12,15 COPY CSECT ADDR INTO R12

USING PAYROLL,12 ESTABLISH R12 AS THE BASE REG

LA 14,REGSAVE R14 POINTS TO THIS CSECT'S SAVE AREA

ST 14,8(,13) STORE ADDR OF THIS CSECT'S SAVE AREA

ST 13,4(,14) STORE ADDR OF CALLER'S SAVE AREA

LR 13,14 POINT R13 AT THIS CSECT'S SAVE AREA

\*

\*

\* *Here is where you will write your program.*

\*

\*

\* STANDARD EXIT LINKAGE WITH RC OF 0 RETURNED IN R15

\*

SR 15,15 R15 = RETURN CODE OF 0

L 13,4(,13) POINT R13 TO CALLER'S SAVE AREA

L 14,12(,13) RESTORE REGISTER 14

LM 0,12,20(13) RESTORE R0 THRU R12

\*

BR 14 RETURN TO CALLER

\*

LTORG

\*

\* THE FOLLOWING TWO LINES PUTS A LABEL ON YOUR STORAGE ON A

\* 32-BYTE BOUNDARY SO THAT YOU CAN FIND IT EASILY IN A DUMP

\*

ORG PAYROLL+((\*-PAYROLL+31)/32)\*32

DC C'\* PROGRAM STORAGE FOR PAYROLL \*\*'

\*

REGSAVE DS 18F PROGRAM'S REGISTER SAVE AREA

\*

\* *Here is where your storage will be defined.*

\*

END PAYROLL

You will write your source code in between the lines of standard entry and exit linkage code. Of course, you can add variables and other storage declarations immediately following the LTORG provided but place them above the 18-fullword caller's register storage area.

Secondly, change the input data member to:

//FT05F001 DD DSN=KC02322.CSCI360.DATASU21(DATA7),DISP=SHR

To assist you, here is the data in the DATA7 member:

WOLFGANG AMADEUS MOZART 1234515802550

RICHARD STRAUSS 2345619800001

AMY BEACH 2213210803120

DAME ETHEL SMYTHE 6546522801590

PETER ILYICH TCHAIKOVSKY 4456023283407

ANTON BRUCKNER 9987022802100

LUDWIG VAN BEETHOVEN 1334515802550

JOHANNES BRAHMS 2445619800001

BELA BARTOK 2253210803120

MAX REGER 1146522801590

SAMUEL BARBER 1336023283407

GIUSEPPE VERDI 9987322802100

JOHANN SEBASTIAN BACH 1234215802550

JOSEPH HAYDN 2345219800001

GEORG FRIEDRICH HANDEL 2213110803120

NIKOLAI RIMSKY-KORSAKOV 4437823283407

EDWARD ELGAR 6541122801590

CLAUDE DEBUSSY 9985522802100

ANTONIN DVORAK 1334615802550

THOMAS TALLIS 2445719800001

RALPH VAUGHAN WILLIAMS 2253810803120

RICHARD WAGNER 1147722801590

FREDERIC CHOPIN 1777723283407

JOAN TOWER 9921122802100

Each of the above input records has the following layout:

|  |  |  |  |
| --- | --- | --- | --- |
| **Data Field** | **Data Type** | **Columns** | **Max. Value** |
| Employee Name | Alphanumeric | 1-25 |  |
| Employee ID | Alphanumeric | 26-30 |  |
| Hourly Pay Rate | Zoned Decimal | 31-34 | $99.99 (two implied decimal places) |
| Hours Worked | Zoned Decimal | 35-38 | 99.99 (two implied decimal places) |
| Unused |  | 39-80 |  |

As before, read the employee records one at a time using a standard read loop and printing a detail line for each employee so that your output looks like that provided to you in the Assignment 7 folder on Blackboard.

For each employee, move their name to the print line and move their ID to the print line. Make sure your read loop works at this point before moving on.

Next, using only packed decimal instructions, PACK and ED the Hourly Pay Rate into the print line showing the decimal point. Do the same for the Hours Worked.

Finally, calculate the gross pay amount using MP, round it to two decimal places and ED it into the print line showing the decimal point.

The only packed decimal instructions you will need are: PACK, ED, ZAP, MP and SRP.

***You will no longer need to use XDECI or XDECO. DO NOT use them!***

Name your detail line you print for each employee DETAIL and place the following two lines at the top of your read loop:

MVI DETAIL+1,C' '

MVC DETAIL+2(131),DETAIL+1

These two lines set all but the very first byte – the carriage control character – of your 133-byte detail line to spaces to prepare for the next employee information.

Submit your ASSIGN7.txt file on Blackboard as before.