

Assignment 6: Multiplication and Division
125 points

Write an Assembler program to calculate payroll for a business. Each employee has an hourly pay rate, a number of hours worked in the pay period, a deduction amount for any lunches eaten in the company cafeteria during the pay period, and, if earned, a bonus amount. Of course, each employee has a name and employee identification number.

A .txt document named 360 Assign 6 Starter Program.txt is provided for you to begin this assignment. Copy it into IDz and save as a new member of your ASSIGNS PDSE named ASSIGN6 to begin this assignment. Be sure to enter your KC-ID in the upper left hand corner and put your first initial, a period, and your last name in between the tick marks in the first line, the JOB card.

The first thing the executable code provided does is load register 10 with the federal tax rate percentage and load register 11 with the state tax rate percentage. These two registers will be used in your arithmetic so do not accidentally overwrite them or they will be irretrievable.

Input

For your information, the input data set as provided in the Start Program is connected to the JCL with this statement:

```
//FT05F001 DD DSN=KC02322.CSCI360.DATASP24(DATA6),DISP=SHR
```

Each of the input records contains, from left to right across the 80-byte record, the following data about a single employee: employee name, employee id number, hourly pay rate, number of hours worked in the pay period, deduction amount, and bonus amount, with the three dollar amounts rounded to the whole dollar. Remember to use MVC to move character data (even though it is numeric, you may consider the employee id number character data – people do not do arithmetic with ID numbers...usually).

Calculations

Your program must calculate each employee's gross pay amount using the following formula:

$$\text{gross pay amount} = \text{hourly pay rate} * \text{number of hours worked} - \text{deduction amount} + \text{bonus amount}$$

And then calculate each employee's net pay amount using the following formula:

$$\begin{aligned} \text{net pay amount} = & \text{gross pay amount} - \\ & (\text{gross pay amount} * \text{current federal withholding percentage} / 100) - \\ & (\text{gross pay amount} * \text{current state withholding percentage} / 100) \end{aligned}$$

Note: When doing division, disregard the remainder and use only the quotient of the division. Working with decimal points will be included in a future assignment.

Be VERY smart about your register usage

(continued)

Output

For each record, print out (using XPRNT) the employee's id number, employee name, hourly pay rate, number of hours worked, gross pay amount, federal withholding amount, state withholding amount and, finally, net pay amount, that you calculated across one output line, double spaced.

For guidance, see the exact output document named:

360 Assign 6 Exact Output.txt

Important Notes

Here is the data in the PDSE member named DATA6:

WOLFGANG AMADEUS MOZART	12345	15	80	25	500
RICHARD STRAUSS	23456	19	80	00	010
AMY BEACH	22132	10	80	31	200
DAME ETHEL SMYTHE	65465	22	80	15	900
PETER ILYICH TCHAIKOVSKY	44560	23	28	34	070
ANTON BRUCKNER	99870	22	80	21	000
LUDWIG VAN BEETHOVEN	13345	15	80	25	500
JOHANNES BRAHMS	24456	19	80	00	010
BELA BARTOK	22532	10	80	31	200
MAX REGER	11465	22	80	15	900
SAMUEL BARBER	13360	23	28	34	070
GIUSEPPE VERDI	99873	22	80	21	000
JOHANN SEBASTIAN BACH	12342	15	80	25	500
JOSEPH HAYDN	23452	19	80	00	010
GEORG FRIEDRICH HANDEL	22131	10	80	31	200
EDWARD ELGAR	65411	22	80	15	900
NIKOLAI RIMSKY-KORSAKOV	44378	23	28	34	070
CLAUDE DEBUSSY	99855	22	80	21	000
ANTONIN DVORAK	13346	15	80	25	500
THOMAS TALLIS	24457	19	80	00	010
RALPH VAUGHAN WILLIAMS	22538	10	80	31	200
RICHARD WAGNER	11477	22	80	15	900
FREDERIC CHOPIN	17777	23	28	34	070
JOAN TOWER	99211	22	80	21	000

Note that employee ID begins in column 26 and the first numeric value for calculating pay begins in column 32 of each input record.

(Note that you can use a label followed by a plus sign and an integer value in any instruction that requires a D(X,B) or D(B) type address to represent a displacement from the address of the label. For example: RECORD+25 refers to the 26th byte of the RECORD and RECORD+31 refers to the 32nd byte of the RECORD.)

You may use registers 2 through 11, inclusive. No registers need be cleared before processing begins.

After you MVC both the employee ID and name to the print line, here is a bit of a start of the calculations to give you an idea of how to proceed. You will need to use registers 2 through 5 very judiciously.

```
XDECI 2,RECORD+31  GET PAY RATE
XDECO 2,OPAYRATE   DISPLAY PAY RATE
```

```
*      XDECI 3,0(1)      GET HOURS
      XDECO 3,0HOURS     DISPLAY HOURS
*
      MR      2,2        PAY RATE * HOURS (PRODUCT IN R3)
*
      XDECI 2,0(1)      GET DEDUCTIONS
      SR      3,2        SUBTRACT FROM PAY
      XDECI 2,0(1)      GET BONUS
      AR      3,2        ADD TO PAY
*
      XDECO 3,0GROSS     DISPLAY GROSS PAY AMT
*
```

From this point on, you will need to calculate federal withholding, display it, then calculate state withholding and display it. After this, subtract those two amounts from the gross pay amount and display it (net pay). You ARE allowed to use a single fullword of storage to perhaps save the gross pay amount but you should be able to do everything without it.

Other

Fully document your program as instructed in the **CSCI 360 Coding and Documentation Guidelines** soon to be found in Blackboard's Course Documents.

Be sure you are using the structured read loop as taught to you in class.

Be sure that your ENTIRE output is included in the .txt file BEFORE you submit it for grading. If any or all of it is missing, you will earn a 0 on the assignment.

Submit the .txt output from Marist on Blackboard as before.