**CSCI 360-1 Assignment 9 – Subprograms and Linkage Spring 2019**

**250 points**

This assignment adds major functionality to your Assignment 8 program. It will first add multi-page processing using a line counter register to count lines and, when the line counter reaches a certain number, new headers and an incremented page count are printed at the top of a new page and the line counter register is started over again. Secondly, it will add two subprograms to which you will need to pass parameters to have calculations done.

To start, copy your ASSIGN8 PDSE member and name the new PDSE member ASSIGN9. Rename the main CSECT PAYROLL. Don't forget to change the END statement PAYROLL too!

The input data set is:

DSN=KC02322.CSCI360.DATASP19(DATA9),DISP=SHR

Each record has the same format as before.

It is recommended that you first add the following functionality to what you wrote for your Assignment 8 program BEFORE breaking the program into subprograms described later:

* After printing the line with the employee count, total deductions, total bonuses, and total gross pay, double space and print an averages line as displayed in the example output. You will have to use the divide packed technique shown in class to round the averages to two decimal places.
* Add a packed decimal page counter variable that can hold up to 999 pages. Each page will display the page number in the upper right hand corner similar to this:

PAGE: 3

When you are ready to print a new header, add 1 to the packed decimal page counter variable and ED it into the first header before XPRNT of the header on the new page.

* Set aside a register to be used as a line counter. Set the line counter register to 99 to begin and it will "kick off" printing your report's first headers before printing the very first employee's detail line.

Hint: Check if it is time to print headers ***immediately*** before printing a detail line in your read loop. If it is, print them at the top of a new page. In the code that prints the headers, reset your line counter register to zero. Also, immediately after you XPRNT a detail line, add 1 to the line counter register.

* Make sure that your output looks as close to the example output as possible. The TA cannot take off points if yours matches the example.

Now that you have your report looking perfect and printing headers, the page count and 16 double-spaced detail lines per page, begin the transformations to the program described below:

* First, remove only the calculation of the employee pay from the main program and place the necessary instructions in an external program named CALCPAY. Pass a parameter list referencing the fields necessary to calculate the employee pay according to the following equation:

Employee Pay = Pay Rate \* Hours Worked – Deduction Amount + Bonus Amount

* In addition to the four fields read from the input record, you will need to pass a reference to an additional field that will hold the employee pay as calculated by the subprogram. Be sure that each field for which you send a reference is defined as a packed decimal field in the main program storage.
* Secondly, remove the calculation of the three averages from the main program and place the necessary instruction in a second external program named CALCAVGS. Pass a different parameter list to this subprogram referencing the fields necessary to calculate the three averages, i.e., number of employees, total deductions, total bonuses, total employee pay, and three additional fields to hold the calculated averages of the deductions, bonuses and employee pay. Once again, only pass references to packed decimal fields. This subprogram will be called once after the end of the loop.

By the way, changing your program into one with two external subprograms should NOT change the way the report looks!

Document your program completely according to Chapter 2 of the CSCI 360 Course Notes and submit your single .txt file on Blackboard as before.