COMP 222 Computer Organization
Assignment #1—Performance Assessment

Objective:

To calculate the average CPI, total execution time, and MIPS of a sequence of instructions, given the number of instruction classes, the CPI and total count of each instruction type, and the clock rate (frequency) of a particular machine.

Inputs:

- Number of instructions classes (types)
- CPI each type of instruction
- Total count of each type of instruction (in millions)
- Clock rate of machine (MHz)

Output:

- Average CPI
- Total CPU processing time (msec)
- MIPS of the program

Specification:

The program calculates the output based on choosing from a menu of choices, where each choice calls the appropriate procedure, where the choices are:

1) Enter parameters
2) Calculate average CPI of a sequence of instructions
3) Calculate total execution time of a sequence of instructions
4) Calculate MIPS of a sequence of instructions
5) Quit

Notes:

- Make sure all calculations are displayed truncated to 2 decimal fractional places, using the format **"%.2f"** in the printf statements.
- Be sure that CPU time is measured in milliseconds (msec).
- To typecast an int **x** to a float **y**, use **y=(float)x or** simply **y=1.0*x**
- To create proper spacing, use "\t" to tab.
- Feel free to use the template "skeleton" code provided on Moodle for the assignment {beware: it will not compile correctly until modified appropriately}

What to turn in:

The source code as a single file named: **asmt1_*yourlastname*.c** uploaded to Moodle (http://moodle.csun.edu) by the deadline.

Be sure to name your file: **asmt1_*yourlastname*.c {**not **assignment1_yourlastname.c, assign.c, main.c**, or **my_ass.c**, or any other name}. Any deviation from the format for submission will result in an automatic -10% on the total grade. You can use any editor and/or compiler, but **make sure** your code compiles and executes under the gcc compiler—otherwise you will receive 0 points for compilation and execution.

Sample test run

```
% asmt1

Performance assessment:
-----------------------
1) Enter parameters
2) Calculate average CPI of a sequence of instructions
3) Calculate total execution time of a sequence of instructions
4) Calculate MIPS of a sequence of instructions
5) Quit

Enter selection: 1

Enter the number of instruction classes: 3
Enter the frequency of the machine (MHz): 200
Enter CPI of class 1: 1
Enter instruction count of class 1 (millions): 6
Enter CPI of class 2: 3
Enter instruction count of class 2 (millions): 4
Enter CPI of class 3: 5
Enter instruction count of class 3 (millions): 2

Performance assessment:
-----------------------
1) Enter parameters
2) Calculate average CPI of a sequence of instructions
3) Calculate total execution time of a sequence of instructions
4) Calculate MIPS of a sequence of instructions
5) Quit

Enter selection: 2
The average CPI of the sequence is: 2.33

Performance assessment:
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1) Enter parameters
2) Calculate average CPI of a sequence of instructions
3) Calculate total execution time of a sequence of instructions
4) Calculate MIPS of a sequence of instructions
5) Quit

Enter selection: 3
The total CPU time of the sequence is: 140.00 msec

Performance assessment:
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1) Enter parameters
2) Calculate average CPI of a sequence of instructions
3) Calculate total execution time of a sequence of instructions
4) Calculate MIPS of a sequence of instructions
5) Quit

Enter selection: 4
The total MIPS of the sequence is: 85.71

Performance assessment:
-----------------------
1) Enter parameters
2) Calculate average CPI of a sequence of instructions
3) Calculate total execution time of a sequence of instructions
4) Calculate MIPS of a sequence of instructions
5) Quit

Enter selection: 5
%
```