**CS2400 Assignment1 CPU Performance**

1. A processor has three types of instructions A, B, and C, which require 1, 2 and 3 clock cycles respectively. The instruction flow that generated by the compiler of this processor for a given program contains 20 A-type, 20 B-type, and 60 C-type instructions.

What is the CPI (average cycle per instruction) of this processor to run such a program?

1. Suppose we have two implementations of the same instruction set architecture (ISA). Machine A and B use the same compiler. For a same given program:

Machine A has a clock cycle time of 40 ns. and a CPI of 1.0

Machine B has a clock cycle time of 10 ns. and a CPI of 2.0

Which machine is faster running this program, and by how much?

1. Let us consider computer A and computer B executing a given application. CPI\_A = CPI\_B. Computer B has a higher frequency (clock rate), ClockRate\_B= 2\* ClockRate\_A. Both computers have the same ISA, however B has a more efficient complier that generates only 50% instructions compared with A, for the same application.

To execute the given application, which machine is faster and by how much?