

Assignment 6

Name: _____

Direction: Upload your typed solutions in a file named “assignment06.txt” to your Github account.

1. Consider two microprocessors having 8-bit and 16-bit wide external data buses, respectively. The two processors are identical otherwise and their bus cycles take just as long.
 - a. If all instructions and operands are two bytes long, by what factor do the maximum data transfer rates differ?
 - b. If half the instructions and operands are one byte long, by what factor do the maximum data transfer rates differ?
2. If a 32-bit microprocessor having 32-bit instructions which consists of a 1 byte opcode and the remainder is either an operand or the address of the operand,
 - a. what is the maximum directly addressable memory capacity (in bytes)?
 - b. how many bits are needed for the program counter and the instruction register?
3. Write an int C++ function named `DataBusTransfer()` that takes an ifstream reference parameter, ofstream reference parameter and an int parameter named *memory*, *cpu* and *width* respectively. Given that *memory* references a file that consisting of only of 1s and 0s and *width* is positive, the function writes a line of read characters from *memory* into *cpu* every time *width* number of characters are read from *memory* or when you reached the end of the file of *memory*. Afterwards, the function returns the number of lines it wrote in *cpu*.