Assignment10

1. [3 pts] List the three groups of a machine's instructions and give a specific example of instruction of each group.

Using the machine language in Appendix C of the textbook[1], answer the following questions.

2. [2 pts] For the following instructions, try to compute how many different instruction instances can each instruction pattern of the machine have.
   (a) Op-code = 2
   (b) Op-code = 4
   (c) Op-code = A
   (d) Op-code = C
3. [2 pts] Translate the following instruction from English into the machine language. (Answer in hexadecimal format)
   (a) STORE the bit pattern found in register *2* in the memory cell whose address is *10*.
   (b) JUMP to the instruction located in the memory cell at address *DE* if the bit pattern in register *C* is equal to the bit pattern in register number 0. Otherwise, continue with the normal sequence of execution.
4. [3 pts, 0.5 pts for each instruction] The purpose of the following program is to calculate the result of **1+3+5+7+9** and save it to the **register *1***, and eventually, the program will halt execution. Assume that the machine is started with its program counter containing ***A4***. Please fill in the blank.

[1] J.G.Brookshear, "Computer Science: An Overview," Addison-Wesley, 2011(11th Edition)

A4 2 0 _ _
A6 2 1 _ _
A8 2 2 0 1
AA 2 3 0 2
AC 2 4 0 0
AE 2 5 0 1
B0 5 1 _ _
B2 5 2 2 3
B4 5 4 _ _
B6 B 4 _ _
B8 _ _ _ _
BA C 0 0 0