**Home Assignment – 1  
Due Date: 9/10 (Monday), end of day  
Total Points: 100 Points  
Name: --Insert your name here----**

***Please type your answers right below each of the questions.***

**Answer the following questions:** *(Note: questions 1 through 10 above are 3 points each = 30 points)*

1. Describe what are the functions of a CPU?
2. Describe the various logical components of a CPU along with functions each of these components performs.
3. Explain the difference between main memory and secondary storage devices
4. What is a memory address?
5. Explain the statement – “Different processor types have different machine languages”.
6. Explain the Java compilation process including the function of JVM.
7. How is the java compilation process different from a traditional programming language like C or C++?
8. Explain the concept of platform independence or portability
9. What is the relationship between a high-level language and a machine language?
10. What is Java bytecode?
11. Select the word from the following list that best matches each of the following phrases:

*Assembly, Compiler, IDE, Interpreter, Java, Low-level, Machine, High*

*(1 point each = 5 points)*

* 1. *A program written in this type of language can run directly on a computer*
  2. *Generally, each language instruction in this type of language corresponds to an equivalent machine language instruction*
  3. *Most programmers write their programs using this type of language*
  4. *This type of program translates code in one language to code in machine language*
  5. *This type of program interweaves the translation of code and the execution of the code*

1. How many bytes are in each of the following? (Make sure to show your calculations)  
   *(3 points each = 9 points)*
   1. 3 KB
   2. 2 MB
   3. 4 GB
2. How many bits are there in each of the following? (Make sure to show your calculations)  
   *(3 points each = 9 points)*
   1. 8 bytes
   2. 2 KB
   3. 4 MB
3. The music on a CD is created using a sampling rate of 44,000 measurements per second. Each measurement is stored as a number that represents a specific voltage level. Suppose each of these numbers requires two bytes of storage space. How many MB does it take to represent one hour or music? *( 7 points)*
4. If a language uses 240 unique letters and symbols, how many bits would be needed to store each character of a document? Why? *(7 points)*
5. If a CPU is rated at 1.5 GHz, how many instructions per second can the CPU execute? How much time does it take to execute one instruction? *(5 points)*
6. A RAM chip is organized as **X 8** memory, i.e. each unit contains 8 bits or a byte. There are 7 address pins on the chip. How many bytes does that memory chip contain? *(for clue read section 1.1.1 in the textbook)*  *(5 points)*
7. In HTML, a color can be coded I the following *hexadecimal* notation: *#rrggbb*, where  
   *rr* represents the amount of red in the color  
   *gg* represents the amount of green in the color  
   *bb* represents the amount of blue in the color  
     
   *rr, gg, bb* vary between 00 and FF in hexadecimal notation, i.e., 0 and 255 in decimal equivalent notation. Give the decimal values of the red, green, and blue values in the color #33AB12  
   *(5 points)*
8. Conversions: *(2 points each = 8 points)*
   1. Convert the decimal number 1257 into binary
   2. Convert the binary number 110001010010 in decimal
   3. Convert the binary number 1011011111010110011 into hexadecimal
   4. Convert the hexadecimal number D8F into binary.

**To turn in your assignment**

* Rename the Microsoft Word document name using the same file naming convention below
  + Home01-LnameFM
    - Home01 = assignment prefix
    - Lname = your last name
    - F = your first initial
    - M = your second initial
* Type in the answers to the questions in the assignment.
* **On Blackboard submit your Word document.**