# 1. Research the following historical figures, and note at least two major accomplishments each has contributed to the field of computer organization.

## a) Alan Turing

Alan Turing was a British mathematician who was instrumental in cracking the German Military Enigma Machine during World War II using a cryptography and one of the first general purpose digital computers, the Turing Machine.

## b) Seymour Cray

The “Father of Supercomputing”, Seymour Cray was the originator of the high performance computing industry. After the rise of the transistor (and fall of the vacuum tube), he pioneered the high speed, externally cooled, megaflop supercomputers at Control Data Corporation (CDC). His work helped push supercomputers from the Megaflops to the Gigaflops in terms of processing power.

## c) Grace Hopper

Grace Hopper was a US Naval Reserve member who helped program the Mark I computer during World War II. She continued working with computers after WWII, helping to develop the first true compiler for programming languages. This work lead into the development of the COBOL (Common Business Orientated Language) programming language.

## d) John von Neumann

John von Neumann was an American mathematician who pioneered work in game theory. He helped Robert Oppenheimer on the Manhattan Project.

His namesake (Von Neumann Architecture) is used for the computer architecture that utilized the single system bus between I/O, memory, and processing.

## e) Douglas Englebart

Douglas Engelbart was the original designers of the computer mouse. He spent most of his life trying to expand computer knowledge from the scientific community to the general populace. His work helped revolutionize the human-computer interface methodology.

## f) Charles Babbage

Charles Babbage was one of the originators of the true computer system. He is considered by some as the “Father of Computing.” He designed but never built computer systems due to lack of funding and government. His devices were later built and were one of the first computational engines that printed mathematical, astronomical, and actuarial tables.

# 2. Assume you have two computers C1 and C2 for which you wish to compare performance for two programs P1 and P2.  P1 runs in 11 seconds on C1 and P2 runs in 12 seconds on C1.  P1 runs in 1.2 seconds on C2 and P2 runs in 33 seconds on C2.  Determine which computer is faster for each program.  Show all work.

Time\_p1\_c1 = 11s

Time\_p2\_c1 = 12s

Time\_p1\_c2 = 1.2s

Time\_p2\_c2 = 33s

## P1

It takes less time to run the P1 on C2, so we shall calculate how much faster C2 is than C1 for P1.

Time\_p1\_c1 / time\_p1\_c2 = (11s)/(1.2s) = 9.167

C2 is 9.167 times faster than C1 for P1.

## P2

It takes much less time to run P2 on C1, so we will calculate how much faster C1 is than C2 for P2.

Time\_p2\_c2 / Time\_p2\_c1 = (33s)/(12s) = 2.75

C1 is 2.75 times faster than C2 for P2

# 3. Assume you are given the following Java method prototype: int wordCount(char [] cArray).  This method should determine the number of words in an array of characters.  Note that the parameter to the method is a character array and not a string.  You may not use any string methods within the body of the wordCount method.  You may assume that the words within the character array are delimited only by spaces.

Int wordCount(Char[] cArray) {

Int wordCount =0;

If (cArray.length == 0) {

Return wordCount;

}

For (int I = 0; I < cArray.lenght; i++) {

If I > 0 {

If (c == ‘ ‘) {

wordCount += 1;

}

}

}

Return wordCount;

}