**Palomar College**
**Computer Science &**
**Information Technology**
**CSCI 112 Programming Fundamentals I**
**Chapter 3 – HW - 3**

1. Describe the Data Requirements including: Constants, Inputs, and Outputs along with the algorithm for the following problem:
   Describe the problem inputs and outputs and write the algorithm for a program that computes an employee's gross salary given the hours worked and the hourly rate.

   Data Requirements
   Constants:
   hourly rate
   Input:
   hours worked ,
   Formulas:
   hourly rate * hours worked = gross salary
   Output:
   gross salary
   Initial Algorithm:

```
rate = 13.00/hr;      gross salary = 0;
hours worked = 0;
get hours worked X;
rate * X = gross salary;
Printf (" Gross Salary is ____ ");
```

2. Look up the following C Library Reference Guide:

   https://www.tutorialspoint.com/c_standard_library/index.htm

   The goal of this assignment is to get a quick glimpse of the various functions and library's available in C. Remember, we are learning fundamentals of computer science, not the entire C language, therefore the goal is to be aware of functions available to use. Look up the following functions and determine what they do. Write one line of code using the functions listed.

   Library – #include <stdio.h>
   Example –
   printf() – this function prints a line to the standard output (screen)
   int x = 10;
   printf("print a number of your choice %d\n",x);

```
#include <stdio.h>
#include <math.h>
int main() {
    Printf (" 12.0 ^ 12 = %lf \n", pow(12.0, 12));
}
```

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scanf()
```
int x=0;
scanf("%d", &x);
```

getchar()
```
char c;
c= getchar();
```

rand()
```
printf("%d\n", rand());
```

srand()
```
srand((unsigned) time(&t));
```

Library - #include <math.h>

pow()
```
printf("12.0 ^12 = %lf, pow(12.0, 12));
```

abs()
```
a = 1234
printf("abs value of %d is %lf \n", a, fabs(a));
```

sqrt()
```
printf(" square root of %lf is %lf \n", 4.0, sqrt(4.0));
```

3. What is a function prototype, function call, and function header?
How is a function prototype different than a function header?

function call is running the function in your program
function header is the name of your function
function prototype is defining the type of function

4. ~~Give~~ write the **function header** only for each of the following functions.
   a. Function areaTriangle takes two double arguments, base and height, and returns a double value.
   Example: double areaTriangle(double base, double height)

   b. Function max takes four integers, w, x, y, and z, and returns an integer.
   int Max(int w, int x, int y, int z)

   c. Function outputHeaders does not receive any arguments and does not return a value.
   void outputHeaders(void)

   d. Function getASCII takes a character argument, ch, and returns an int.
   int getASCII(char ch)

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5. Suppose that the function foo() has the following function header definition:

   int foo(int a, int b, int c)

   Which of the following statements are legal? Assume that i is of type int and x has a type double. int i
   double x

   a. i = foo(10, 20, 30);
      legal ✓
   b. x = foo(10, 20, 30);
      Illegal ✓
   c. i = foo(5.25, 3.45, 7.22);
      Illegal ✓
   d. x = foo(5.25, 3.45, 7.22);
      illegal ✓
   e. foo(10, 20, 30);
      legal ✓
   f. foo(10,20);
      illegal ✓

6. What are function preconditions and post conditions? Why are they important?

Pre conditions are for the compiler to know that they are functions and not to worry because they will be evaluated later. Post condition is what it will do after.