Lab Assignment - 4 FM: 20

1. Write a C program to show the value of x after each of the following statements is performed: **[3]**
   I. x = fabs(7.5);
   II. x = floor(7.5);
   III. x = fabs(0.0);
   IV. x = ceil(0.0);
   V. x = fabs(-6.4);
   VI. x = ceil(-fabs(-8 + floor(-5.5)));

2. Write a C function, sub5 called from function main(). It takes an integer parameter and subtracts 5 from it and prints the updated value in function main(). **[2]**

3. A parking garage charges Rs.20 minimum fee to park for upto 3 hours and an additional Rs. 10 for each hour over 3 hours. The maximum charge for any given 24-hour period is Rs. 300. Assume that no car parks for longer than 24 hours at a time. Write a program that will calculate and print the parking charges for each of three customers who parked their cars in the garage yesterday. You should enter the hours parked for each customer. Your program should print the results in a tabular format, and should calculate and print the total of yesterday's receipts. The program should use a function **calculateCharges** to determine the charge of each customer as follows:

Car	Hours	Charge
1	x	y
2	a	b
…….		
Total	hour	amount

   [2]

4. Define a function called **hypotenuse** that calculates the length of the hypotenuse of a right angled triangle when the other two sides are given. The function should take two arguments of type float and return the hypotenuse as a float. **[2]**
   Formula: hypotenuse = $\sqrt{(a^2 + b^2)}$, where a, b are two sides.

5. Write a function that displays a solid square of asterisks whose side is specified as integer parameter side. **[2]**

6. Write a function **multiple** that determines for a pair of integers whether the second integer is multiple of the first. The function should take two integer arguments and return 1 if the second is multiple of the first, and 0 otherwise. Use this function in a program that inputs a series of pairs of integers. **[2]**

7. Write a program that accomplish the following: **[3]**
   I. Calculate the quotient when integer a is divided by integer b.

II. Calculate the remainder when integer a is divided by integer b.

III. Use the above functions (defined in I and II) to write a function that inputs an integer between 1 and 32767 and prints it as a series of digits with two spaces between each digit.
Example Input: 4562, Output: 4 5 6 2

8. Write a program that simulates coin tossing. For each toss of the coin the program should print Heads or Tails. Let the program toss the coin 100 times, and count the number of times each side of the coin appears. Print the results. The program should call a separate function **flip** that takes no arguments and returns 0 for tail and 1 for head. **[2]**

9. Write a program that plays the game of 'guess the number' as follows: **[2]**
Your program chooses the number to be guessed by selecting an integer in the range 1 to 1000. The program then types:
   - I have a number between 1 and 1000
   - Can you guess my number?
   - Please type your first guess.

   The player then types a first guess. The program responds with one of the following:

   - Excellent! You guessed the number!
     Would you like to play again (y or n)?
   - Too low try again.
   - Too high. Try again.

If the player's guess is incorrect, your program should loop until the player finally gets the number right. Your program should keep telling the player Too high or Too low to help the player guess correctly.