C assignments – Set 1

1. An employee's basic salary is input through the keyboard. His dearness allowance is 40% of basic salary, and house rent allowance is 20% of basic salary. Write a program to calculate his gross salary.
2. A five digit number is entered through the keyboard. Write a program to obtain the reversed number and to determine whether the original and reversed numbers are equal or not.
3. Given the expression
   I = 2 + (y + 0.5x)
   Write a program, which will produce a table of values of I,y, and x where y varies from 1 to 6, and for each value of y, x varies from 5.5 to 12.5 in steps of 0.5(Use while loop).
4. Write a program that would take input from the key board, and do the following operations based on the input :
   Input : 0
   Operation : Just print "nothing to be done".
   Input : 1
   Operation : Read the next two integers and add them and print the result;
   Input : 2
   Operation : Read the next three integers and multiply them if all of them are less than 50. If any integer is above 50 print "invalid input".
   Input : 3
   Operation : Read the next integer and print whether it is divisible by 2.
   Input : 4
   Operation : Read the next two integer and print whether the first is divisible by second.
   Input : 5
   Operation : Read the inputs and add them together till the input number is more than 50. If the input is more than 50 print the sum.

   Input : 6
   Operation : Print the size of the following variable types int, short, long, double, and float.

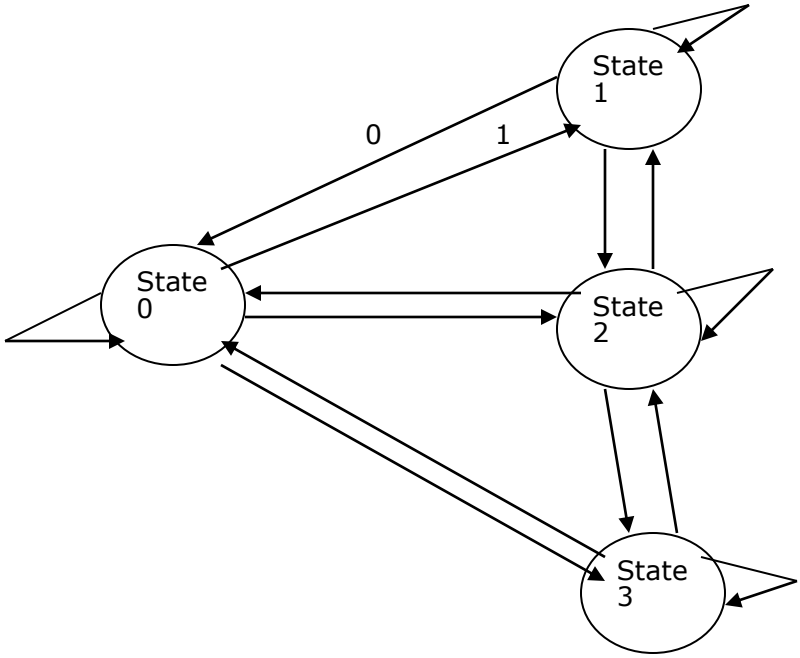
   Input : 100
   Operation : Exit the program.

   Input : Any other number
   Operation : Print "Invalid operation code"

   Do all the above operations in an infinite loop. Use (Switch statement)
5. Do the same thing using inputs from a file.
6. Write a function which receives 5 integers and returns the sum, average and the maximum of the numbers. Call this function from main and print the results from main.
7. Write a recursive function to obtain the first 25 numbers of a Fibonacci sequence. In a fibonacci sequence the sum of two successive terms gives the third term. Following are the first few terms of the Fibonacci sequence :
   1 1 2 3 5 8 13 21 34 55 89…Modify it to print the number of times the function is called, once for each invocation of the function.
8. Write a program to print out the size of char, int, short, long, float, double and long double.
9. Write macro definitions with arguments for calculation of area and perimeter of a triangle, a square and a circle. Store these macro definitions in a file called "areaperi.h". Include this file in your program, and call the macro definitions for calculating area and perimeter for different squares, triangles and circles.

C assignments – set 2

1. Implement the following state machine using switch statement. It should execute in a while loop till the input is number 1000, and take transition inputs from the keyboard. The program should print the current state and new state on each input. The valid inputs at any state would be the numbers of the states it can transition to.



2. Write a function to multiply two 3*3 matrices, by reading the inputs from a file and then print the result.
3. Write a program to count the number of 'e' in the following array of pointers to strings.

```
char *s[] = {

"We will teach you how to",
"Move a mountain",
"Level a building",
"Erase the past",
"Make a million",
"…all through C!"
};
```

4. Write a program and functions to manipulate (add and delete nodes) a linked list, storing an integer value at each node. The program should be able to input values from the keyboard with options for adding and deleting values. Whenever a value is added/deleted it should traverse the list and print all the values stored in the modified list.
5. Write a program and functions to manipulate a doubly linked list, storing an integer value at each node. The program should be able to input values from the keyboard with options for adding and deleting values. Whenever a value is added/deleted it should traverse the list and print all the values stored in the modified list.
6. Write a program and functions to manipulate a queue, storing an integer value at each node. Use 1. linked list 2. Array. The program should be able to input values from the keyboard with options for adding and deleting values. Whenever a value is added/deleted it should traverse the queue and print the values in the front and rear of the queue.
7. Write a program and functions to manipulate stack using linked list. The program should be able to push and pop, with input values from the keyboard with options

for pushing values and popping (one or more elements based on input). Whenever a value is pushed/popped, it should print the entire stack top to bottom.

8. Implement a hash table having 6 slots using modulo operator. Add functions to add, delete and search the hash table for any particular value.

9. Create a binary tree and write functions to traverse it in pre order and post order. Use the tree to arrange 1. a given set of numbers in ascending order. 2. Implement a binary search function to search the list formed in step 1.

10. Write the following declarations :
    - Write a pointer to array[15] of int.
    - Function pointer taking function pointer as parameter and returning int.
    - Array[4] of pointer to function returning pointer to array[5] of char.