CS112: Computing Laboratory

Assignment :- 11 Date: 29/04/2020

For proper indentation and commenting in the code: 10 marks

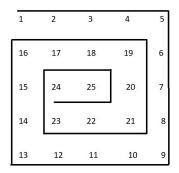
For below questions: 10+10+10+10 = 40 marks

Total marks: 40 + 10 = 50 marks

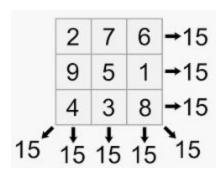
Basic Information:

- **1. Spiral matrix:** A spiral matrix is n*n square matrix formed by placing the number 1,2,3....n² in spiral form starting from the leftmost column and topmost row.
- **2. Magic matrix:** A square matrix is magic matrix if all the elements in it are distinct and the sum of elements in row, column and diagonal are equal.
 - The elements of magic matrix are 1,2,3...n² and each number can occur in the matrix only once.
 - The sum of elements of every row, column, and diagonal are equal. The sum is always equal to $n(n^2+1)/2$.

Example of Spiral Matrix:



Example of Magic Matrix:



Questions

1. WAP to accept 10 records with the structure:

```
struct {
  char *name;
  int *age;
  float salary;
}
```

Display the records before sorting and after sorting. Note that sorting is performed based on primary key "name" (dictionary order) and secondary key "age".

Example: (Raam, 24), (Ram, 26), (Ram, 28), (Sham, 22).

- 2. WAP to generate random matrix (the elements of matrix should be generated randomly in between 1 to 100) of 5*5 using pointer. Check whether the generated matrix is magic matrix or not?
- 3. WAP which uses only pointers and generates a magic matrix of 5*5.
- **4.** WAP which uses only pointers and generates a spiral matrix of 7*7.

Instructions to follow:

- 1. Implement all the above programs and give the file names as follows:
 - a. Name of program file: question_1.c
 - b. Name of output file: output 1.out
 - c. Run with few sample inputs and mention the details: execution_1.txt

 *** Note that the format of details in execution_1.txt would be:

Run1: Input: 4 Output: 567

Run 2: Input: 19 Output: 5678

- 2) Create a zip file which includes all the above files naming it<Student_EmailID>.zip and upload the zip file through google form:
 - 3) Deadline of submission :- 7 PM 30/04/2020 (sharp).
 - 4) Feel free to contact your respective TA for any query.