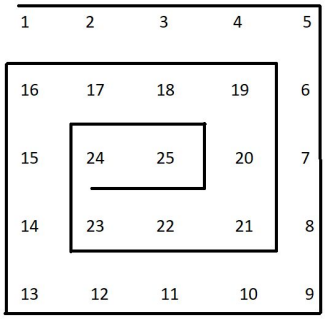
CS112: Computing Laboratory
Assignment :- 11
Date: 29/04/2020

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

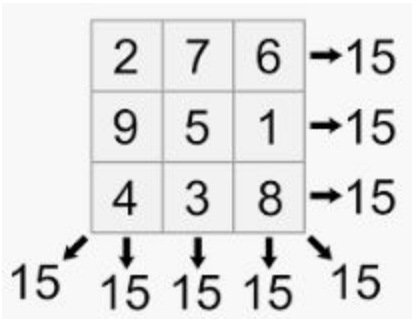
Basic Information:

1. **Spiral matrix:** A spiral matrix is n*n square matrix formed by placing the number 1,2,3….n^2 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…n^2 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: https://docs.google.com/forms/d/e/1FAIpQLSfyBOUIXVXbonFu5h_MuIt03Tw12LlHJ5oQmi9ovAR3Zat2gg/viewform?usp=sf_link

3) **Deadline of submission :- 7 PM 30/04/2020 (sharp).**

4) Feel free to contact your respective TA for any query.