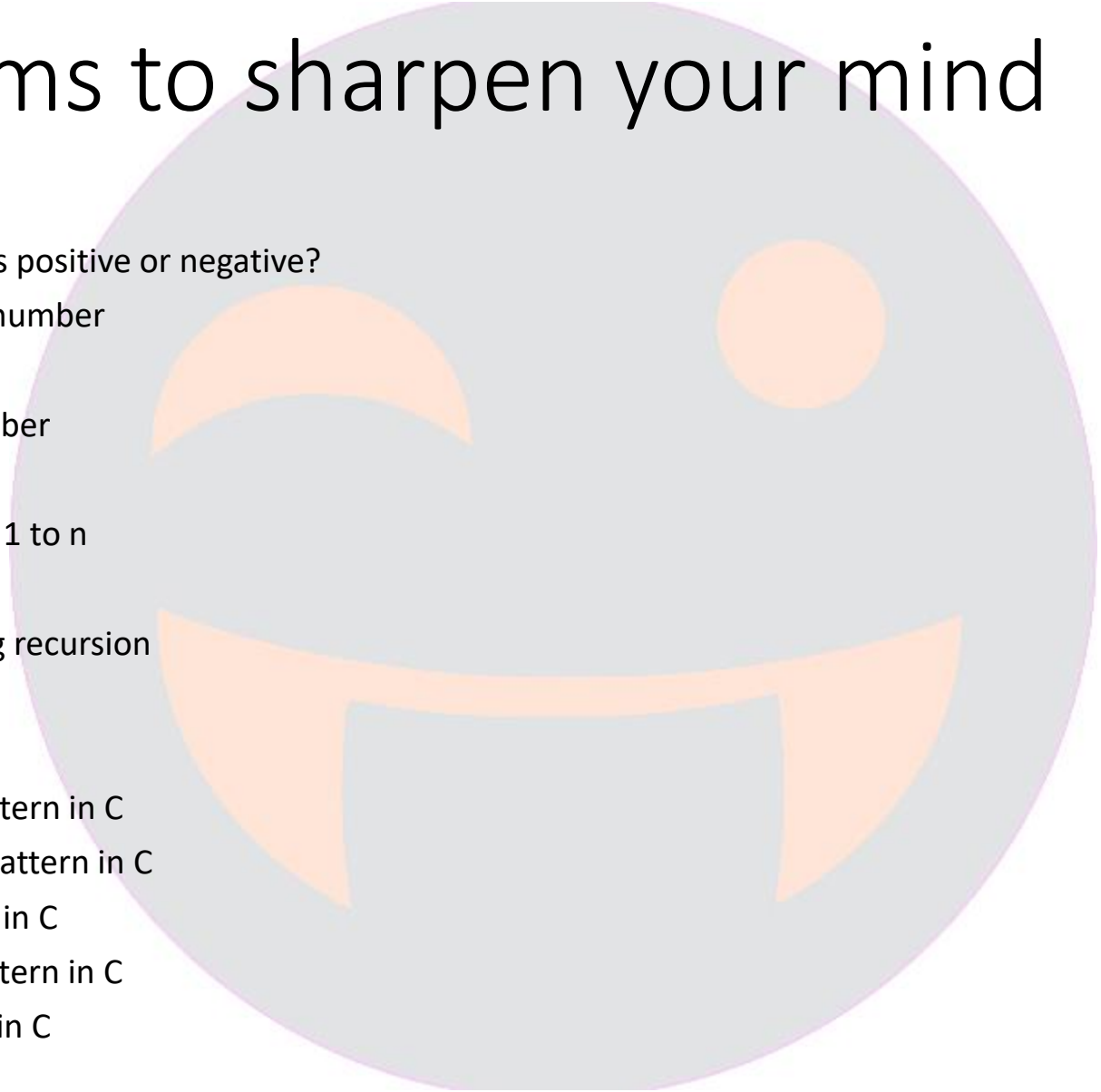
15 Simple programs

CHAPTER 30

SURESH TECHS

C PROGRAMMING COURSE

15 Programs to sharpen your mind



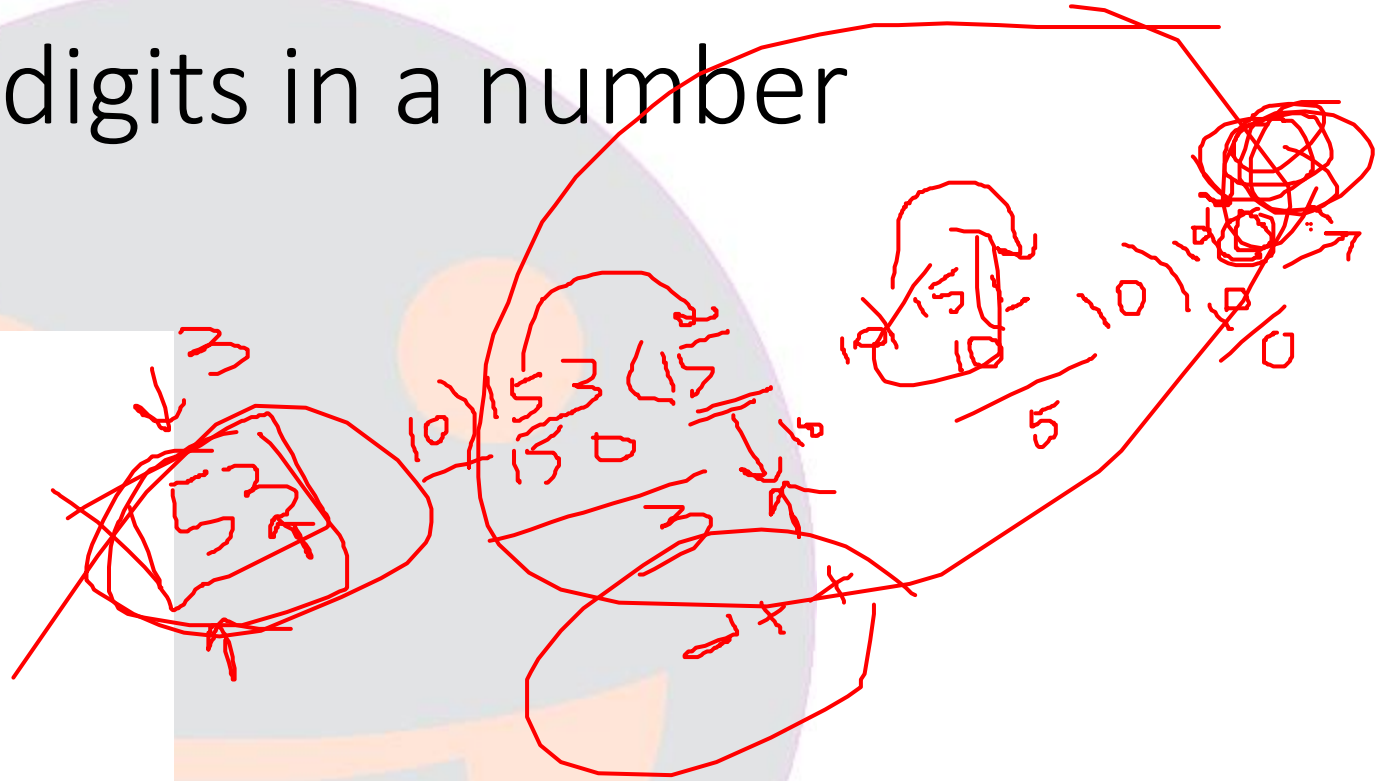
1. Check whether a number is positive or negative?
2. Find number of digits in a number
3. Reverse a number
4. Find sum of digits in a number
5. Print numbers from 0 to n
6. Find sum of numbers from 1 to n
7. Factorial of a number
8. Factorial of a number using recursion
9. Fibonacci
10. Fibonacci using recursion
11. Solid Rectangular Star Pattern in C
12. Hollow Rectangular star Pattern in C
13. Half Pyramid Star Pattern in C
14. Inverted Half Pyramid Pattern in C
15. Full Pyramid Star Pattern in C

1. Check whether a number is positive or negative?

```c
#include<stdio.h>
int main(){
    int n;
    printf("Enter a number: ");
    scanf("%d",&n);
    if(n>0){
        printf("Positive number");
    }else{
        printf("Negative number");
    }
    return 0;
}
```

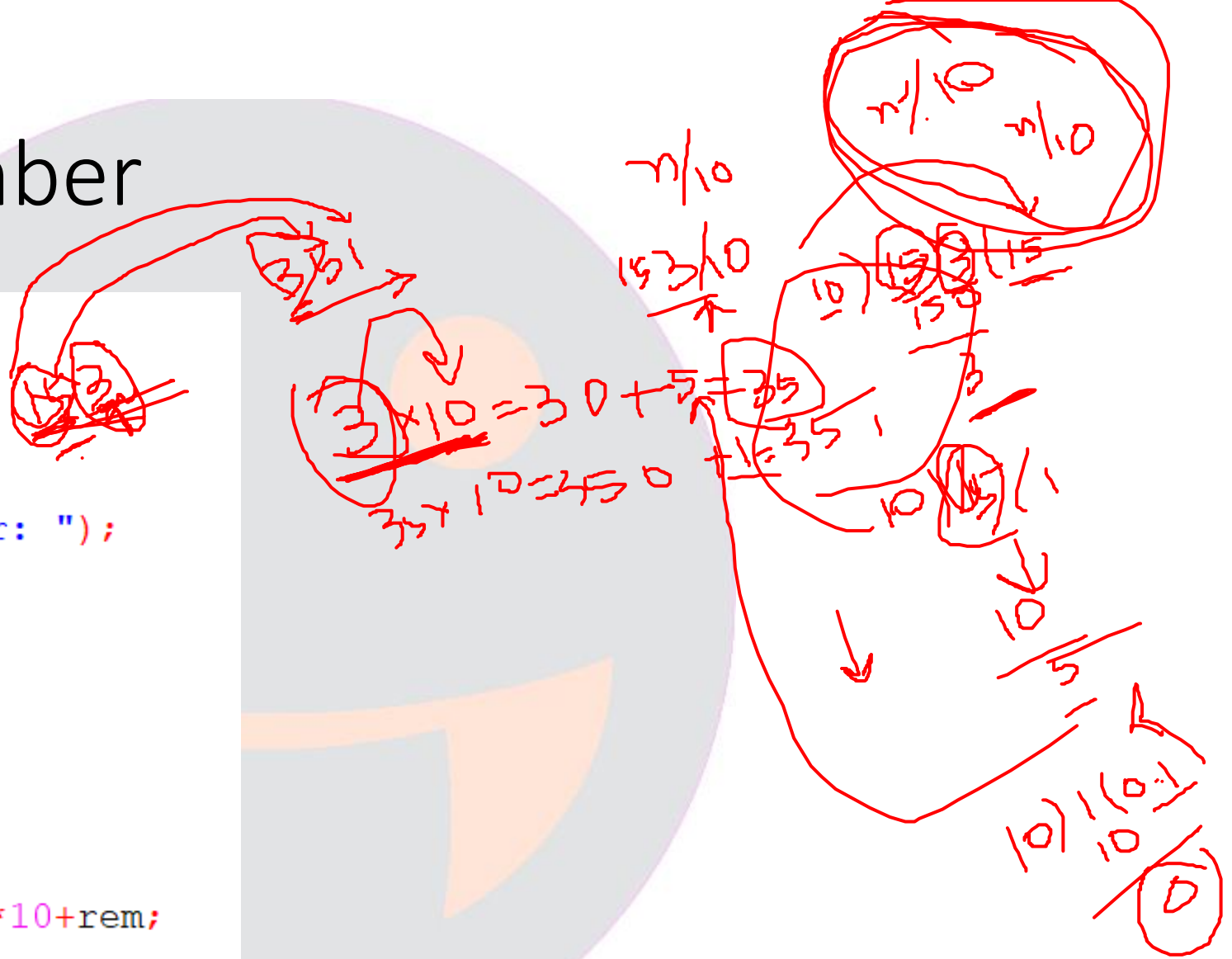
2. Find number of digits in a number

```c
#include<stdio.h>
int main(){
    //number of digits in a number
    int digits = 0;
    //388 - 38
    //38 - 3
    //3 - 0.3 //int ->0
    int n;
    printf("Enter a number: ");
    scanf("%d",&n);
    while(n!=0){
        n = n/10; //quotient
        digits++;
    }
    printf("Number of digits: %d",digits);
    return 0;
}
```

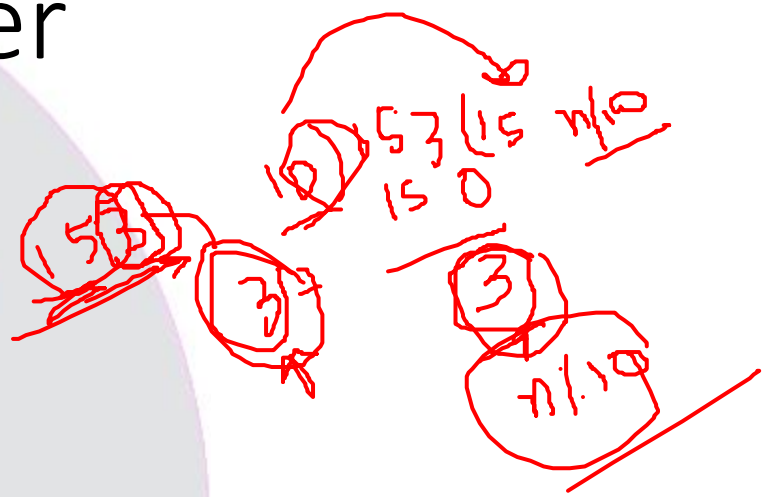


3. Reverse a number

```c
#include<stdio.h>
int main(){
    //Reverse a number
    int n;
    int rem;
    printf("Enter a number: ");
    scanf("%d",&n);
    //234 - 432
    //4 - reminder - 23
    //43 - 4*10+3 - 2
    //432 - 43*10+2
    int reverse = 0;
    while(n!=0){
        rem = n%10;
        reverse = reverse*10+rem;
        n = n/10;
    }
    printf("Reverse: %d",reverse);
    return 0;
}
```



4. Find sum of digits in a number




```c
#include<stdio.h>
int main(){
    //Sum of the digits in a number
    int n;
    int rem;
    int sum=0;
    printf("Enter a number: ");
    scanf("%d",&n);
    while(n>0){
        rem = n%10;
        sum = sum+rem;
        n = n/10;
    }
    printf("Sum: %d",sum);
    return 0;
}
```

5. Print numbers from 0 to n

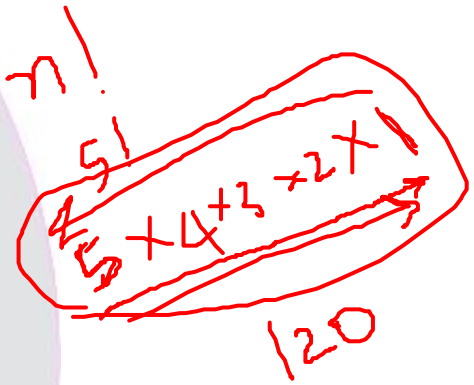
```c
#include<stdio.h>
int main(){
    //Print numbers from 0 to n
    int n;
    printf("Enter a number: ");
    scanf("%d",&n);
    for(int i=0;i<=n;i++){
        printf("%d\n",i);
    }
    return 0;
}
```

6. Find sum of numbers from 1 to n

```c
#include<stdio.h>
int main(){
    int n;
    printf("Enter a number: ");
    scanf("%d",&n);
    if(n<=0){
        printf("Please enter a number greater than 0");
    }else{
        int sum = 0;
        for(int i=1;i<=n;i++){
            sum = sum+i;
        }
        printf("Sum is: %d",sum);
    }
    return 0;
}
```

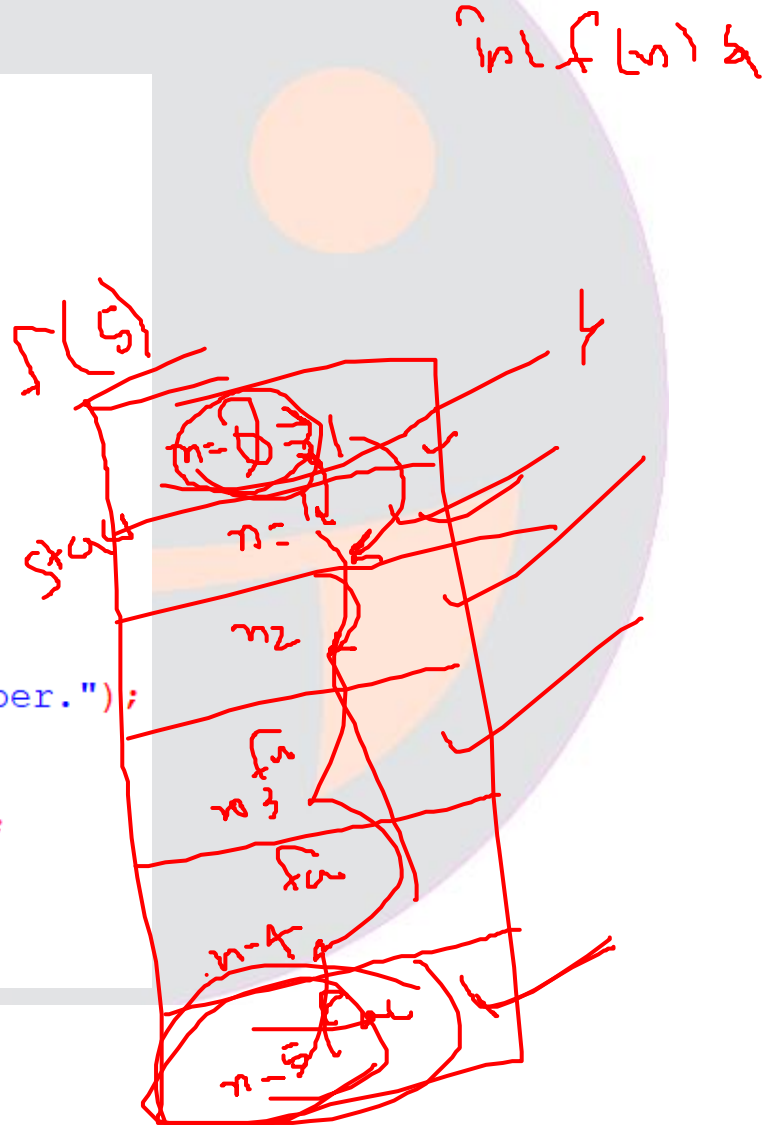
7. Factorial of a number

```c
#include<stdio.h>
int main(){
    int n;
    printf("Enter a number: ");
    scanf("%d",&n);
    int factorial=1;
    if(n<0){
        printf("Please enter positive number.");
    }else{
        //5=> 5*4*3*2*1
        for(int i=n;i>=1;i--){
            factorial = factorial*i;
        }
        printf("Factorial is: %d",factorial);
    }

    return 0;
}
```



8. Factorial of a number using recursion

```c
#include<stdio.h>
int factorial(int num){
    if(num==0){
        return 1;
    }else{
        return num*factorial(num-1);
    }
}

int main(){
    int n;
    printf("Enter a number: ");
    scanf("%d",&n);
    if(n<0){
        printf("Please enter positive number.");
    }else{
        int result = factorial(n);
        printf("Factorial is: %d",result);
    }
    return 0;
}
```



9. Fibonacci series

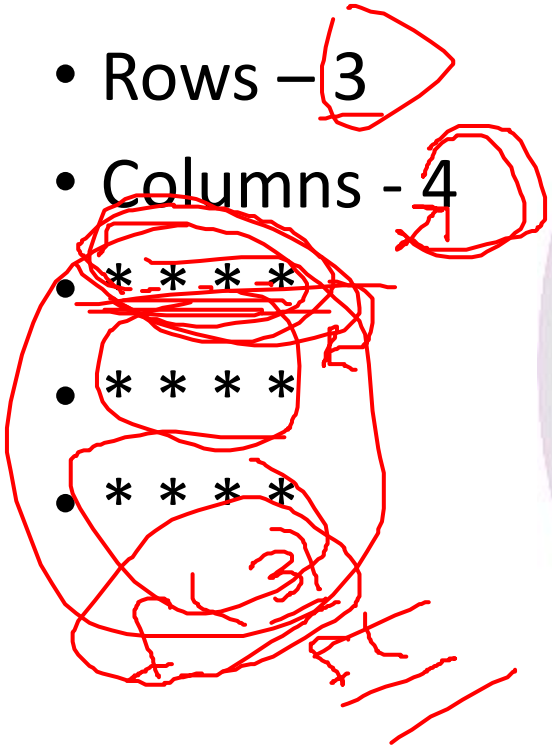
```c
#include<stdio.h>
int main(){
    //Fibonacci(8)
    //0 1 1 2 3 5 8 11
    int num1 = 0;
    int num2 = 1;
    int n;
    scanf("%d",&n);
    printf("%d\t%d\t",num1,num2);
    for(int i = 2;i<n;i++){
        int sum = num1+num2;
        printf("%d\t",sum);
        num1 = num2;
        num2 = sum;
    }
    return 0;
}
```

10. Fibonacci using recursion

```c
#include<stdio.h>
int fibonacci(int n){
    if(n==0) return 0;
    else if(n==1) return 1;
    else return fibonacci(n-1)+fibonacci(n-2);
}
int main(){
    //Fibonacci(8)
    //0 1 1 2 3 5 8 11
    int n;
    scanf("%d",&n);
    for(int i = 0;i<n;i++){
        int sum = fibonacci(i);
        printf("%d\t",sum);
    }
    return 0;
}
```

11. Solid Rectangular Star Pattern in C

- Rows – 3
- Columns - 4

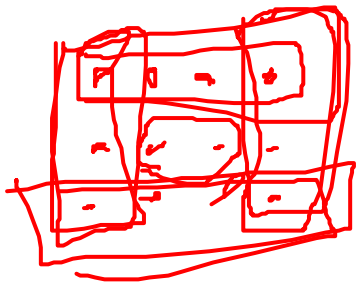


```
* * * *
* * * *
* * * *
```

```c
#include<stdio.h>
int main(){
    //Solid rectangular pattern
    //Rows 3, Columns 2
    int rows, cols;
    printf("Enter number of rows: ");
    scanf("%d",&rows);
    printf("Enter number of cols: ");
    scanf("%d",&cols);
    for(int i=0;i<rows;i++){
        for(int j=0;j<cols;j++){
            printf("*\t");
        }
        printf("\n");
    }

    return 0;
}
```

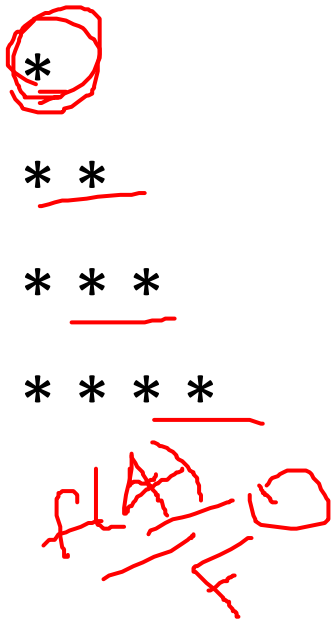
12. Hollow Rectangular Star Pattern in C

- Rows – 3
- Columns - 4
- * * * *
- * *
- * * * *



```c
#include<stdio.h>
int main(){
    //Hollow rectangular pattern
    //Rows 3, Columns 2
    //first row, first column, last row, last column
    int rows, cols;
    printf("Enter number of rows: ");
    scanf("%d",&rows);
    printf("Enter number of cols: ");
    scanf("%d",&cols);
    for(int i=0;i<rows;i++){
            for(int j=0;j<cols;j++){
                if(i==0||i==rows-1||j==0||j==cols-1){
                    printf("*");
                }else{
                    printf(" ");
                }
            }
        printf("\n");
    }

    return 0;
}
```

13. Half Pyramid Star Pattern in C




```c
#include<stdio.h>
int main(){
    //Half pyramid pattern
    //Rows 3
    //*
    //**
    //***
    int rows;
    printf("Enter number of rows: ");
    scanf("%d",&rows);
    for(int i=0;i<rows;i++){
            for(int j=0;j<=i;j++){
                printf("*");
            }
            printf("\n");
    }
    return 0;
}
```

14. Inverted Half Pyramid Pattern in C

```
* * * *
* * *
* *
*
```

```c
#include<stdio.h>
int main(){
    //Inverted Half pyramid pattern
    //Rows 3
    //***
    //**
    //*
    int rows;
    printf("Enter number of rows: ");
    scanf("%d",&rows);
    for(int i=0;i<rows;i++){
            for(int j=0;j<rows-i;j++){
                printf("*");
            }
            printf("\n");
    }
    return 0;
}
```

15. Full Pyramid Star Pattern in C (3)


```c
#include<stdio.h>
int main(){
    int n=5;
    int spaces=n;
    for(int i=1;i<=5;i++){
        for(int j=1;j<=spaces-1;j++){
            printf(" ");
        }
        for(int k=1;k<=2*i-1;k++){
            printf("*");
        }
        spaces--;
        printf("\n");
    }
    return 0;
}
```

What next?

- Arrays