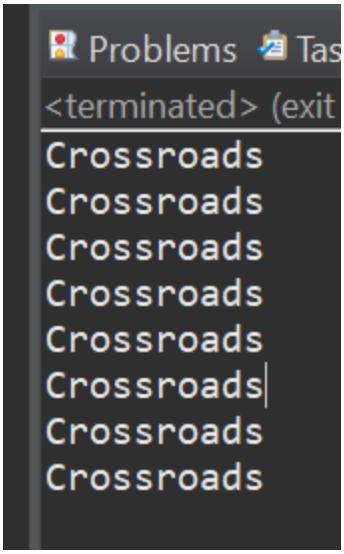
Week 0: Extra Assignments

1. Read the word “Crossroads” from the user and Print the word “Crossroads” Less Than 8 times without using any loop or goto statement.

```
#include <stdio.h>
void printName(char* name,int count)
{
   printf("%s\n",name);
   count++;
   if(count<8)
      printName(name,count);
}
int main()
{
   char name[50];
   setbuf(stdout,NULL);
    printf("Enter the name\n");
    gets(name);
   printName(name,0);
   return 0;
}
```



2. Write a Program for pattern shown below

```
    1
   1 1
  1 2 1
 1 2 3 1
1 2 3 4 1
1 2 3 4 5 1
```

Code of the program & screenshot of the output.

3. Write a program to compare two strings without using string functions.

```
#include <stdio.h>
#include <stdlib.h>
int main(void) {
    char f[30],s[30];
    int i,flag=0;
    setbuf(stdout,NULL);
    printf("Enter first and second  string\n");
```

```
    scanf("%s%s",f,s);
    for(i=0;f[i]!='\0'&&s[i]!='\0';i++){
        if(f[i]!=s[i]){
            flag=1;
            break;
        }
    }
        if(flag==0){
            printf("It is same\n");
        }else{
            printf("it is not same\n");
        }

    return EXIT_SUCCESS;
}
```

```
Enter first and second  string
crossroads
sps
it is not same
```

4. Write a menu driven program to perform following Operations without using Library functions.

    1. STRING LENGTH
    2. STRING CONCATENATION
    3. STRING REVERSE

    A. The program should not end until the user exits the program by giving an input to the program to exit. The menu Should contain an option to exit.
    B. The program should Contain 4 Functions Excluding main():

a. STRINGLENGTH()
b. STRINGCONCATENATION()
c. STRINGREVERSE()
d. EXIT()

```
#include <stdio.h>
#include <stdlib.h>

void length(char str[100]);
void concat(char str[100]);
void reverse(char str[100]);
int main(void) {
    int choice;
    char str[100];
    setbuf(stdout,NULL);
        printf("\nEnter the string\n");
            scanf("%s",str);
    while(choice!=4){
        printf("\nEnter the choice >>> 1.String Length 2.String Concatinaton
    3.String Reverse  4.Exit\n");
        scanf("%d",&choice);

        switch(choice) {
        case 1:
            length(str);
            break;
        case 2:
             concat(str);
            break;
```

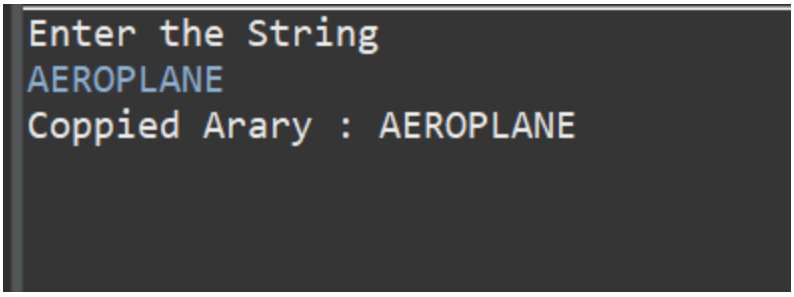
```
                case 3:
                        reverse(str);
                        break;
                case 4:
                        exit (EXIT_SUCCESS);
                }
        }
        return EXIT_SUCCESS;
}
void length(char str[100]) {

        int length=0;

        for(int i=0;str[i]!='\0';i++)
        {
                length++;
        }
printf("   Length : %d\n",length);



}

void concat(char str[100]) {
        char final[50];
        int i;
printf("Enter the second string\n");
scanf("%s",final);
for( i=0;str[i]!='\0';i++);
```

```
for(int j=0;final[j]!='\0';j++)
{

   str[i]=final[j];
   i++;
}
str[i]='\0';
printf("\nAfter concatenation : %s\n", str);
}
void reverse(char str[100]) {
     int len=0;

               for(int i=0;str[i]!='\0';i++)
               {
                         len++;
               }
               printf("\nAfter reverse :");
for(int j=len-1;j>=0;j--){
     printf("%c",str[j]);
}

}
```

```
Enter the string
crossroads

Enter the choice >>> 1.String Length 2.String Concatinaton  3.String Reverse  4.Exit
1
   Length : 10

Enter the choice >>> 1.String Length 2.String Concatinaton  3.String Reverse  4.Exit
2
Enter the second string
sps

After concatenation : crossroadssps

Enter the choice >>> 1.String Length 2.String Concatinaton  3.String Reverse  4.Exit
3

After reverse :spssdaorssorc
Enter the choice >>> 1.String Length 2.String Concatinaton  3.String Reverse  4.Exit
```

5. Write a Program to copy one string to another without using String Functions?

```
#include <stdio.h>
#include <stdlib.h>
int main(void) {
    char r[20],c[20];
    int i;
    setbuf(stdout,NULL);
    printf("Enter the String\n");
    scanf("%s",r);
    for(i=0;r[i]!='\0';i++){
                    c[i]=r[i];
            }
            printf("Coppied Arary : %s",c);

    return EXIT_SUCCESS;
}
```



6. Read some Malayalam Movie Names from User And Sort it?

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

int main(void) {
    int i,lim,j;
    char str[50][50];
    char temp[20];
    setbuf(stdout,NULL);
  printf("how many movie name \n");
  scanf("%d",&lim);
  printf("Enter the movie names\n");
  for(i=0;i<=lim;i++){
    gets(str[i]);
  }
  for(i=0;i<=lim;i++)
     for(j=i+1;j<=lim;j++){
       if(strcmp(str[i],str[j])>0){
          strcpy(temp,str[i]);
          strcpy(str[i],str[j]);
          strcpy(str[j],temp);
```

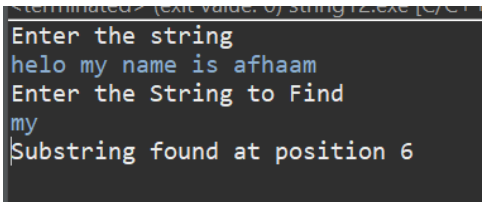
```
        }
      }
    printf("Order of Sorted Strings:\n");
    for(i=0;i<=lim;i++){
      puts(str[i]);
    }
     return 0;

}
```

```
<terminated> (exit value: 0) movie.exe [
how many movie name
5
Enter the movie names
Achan
Big B
Daddy cool
Home
Trafiic
Order of Sorted Strings:

Achan
Big B
Daddy cool
Home
Trafiic
```

7. Write a program to read the string “India is my country” from the user and find the position of the word “is”?

```
#include <stdio.h>
#include <string.h>

int main()
{
  char str[50],sbstr[20];
  int i,j,l;
```

```
    setbuf(stdout,NULL);
      printf("Enter the string \n");
      gets(str);
      printf("Enter the String to Find\n");
      gets(sbstr);
    for (l = 0; sbstr[l] != '\0'; l++);

    for (i = 0, j = 0; str[i] != '\0' && sbstr[j] != '\0'; i++)
    {
       if (str[i] == sbstr[j])
       {
          j++;
       }
       else
       {
          j = 0;
       }
    }

    if (j == l)
    {
       printf("Substring found at position %d", i - j + 1);
    }
    else
    {
       printf("Substring not found");
    }
    return 0;
}
```



8. Read random numbers [22,87,178,34,10,45,22,89,31] from users and sort numbers in descending Order?

```
#include <stdio.h>
#include <string.h>
int main()
{
   int limit,arr[50],j,i;
   setbuf(stdout,NULL);
    printf("How many numbers to sort\n");
    scanf("%d",&limit);
    printf("Enter the values\n");
    for( i=0;i<limit;i++)
    {
            scanf("%d",&arr[i]);
    }
    for(i=0;i<limit-1;i++){
            for(j=i+1;j<limit;j++){
                    if(arr[i]<arr[j]){
                            int temp =arr[i];
                            arr[i]=arr[j];
                            arr[j]=temp;
                    }
            }
    }
```

```
    printf("After sorting  ");
    for(i=0;i<limit;i++){
            printf("%d ",arr[i]);
    }
   return 0;
}
```

```
How many numbers to sort
8
Enter the values
45 34 67 34 56 125 34 34 23
After sorting  125 67 56 45 34 34 34 34
```

9. Read a character from the user and find the ASCII code of that character?

```
#include <stdio.h>
#include <stdlib.h>

int main(void) {
    char str;
    setbuf(stdout,NULL);
    printf("Enter the character\n");
    scanf("%c",&str);
    printf("Ascii value of %c is %d",str,str);
    return EXIT_SUCCESS;
}
```

```
Enter the character
h
Ascii value of h is 104
```

10. Write a program to print the following pattern

```
    A
   A B A
  A B C B A
 A B C D C B A
```

Code of the program & screenshot of the output.

11. Read some numbers from the user and find the repeating numbers?

Eg:

Input : 2 9 4 6 9 4

Output : 9 4

```
#include <stdio.h>
#include <stdlib.h>

int main(void) {
    int limit,i,arr[50],j;
    setbuf(stdout,NULL);
    printf("Enter the limit\n");
    scanf("%d",&limit);
    printf("Enter the values \n");
    for ( i = 0; i < limit; i++) {
            scanf("%d",&arr[i]);
    }
    printf("repeated numbers  : ");
    for ( i = 0; i < limit-1; i++){
            for(j=i+1;j<limit;j++)
            {
```

```
                    if(arr[i]==arr[j]){
                        printf(" %d",arr[i]);
                    }
                }
            }
    return EXIT_SUCCESS;
}
```

```
Enter the limit
7
Enter the values
4
3
4
6
7
8
7
repeated numbers  :  4 7
```

12. Read a line of text from the user , Find the number of Alphabets, Digits and Special characters?

Eg,

Input	: hello, Welcome to District B-13
Output	:-
	Number of Alphabets in the string is : 23
	Number of Digits in the string is : 2
	Number of Special characters in the string is : 7

```
#include <stdio.h>
#include <stdlib.h>
#include <ctype.h>

int main(void) {
    char arr[100];
```

```
    int alpha=0,digit=0,spec=0;
    setbuf(stdout,NULL);
    printf("Enter the the string\n");
    gets(arr);

    for(int i=0;arr[i]!='\0';i++){
        if(((arr[i]>='a')&&(arr[i]<='z'))||((arr[i]>='A')&&(arr[i]<='Z'))){
            alpha++;
        }else if(((arr[i]>='0')&&(arr[i]<='9'))){
            digit++;
        }else if(arr[i]!=' '){
            spec++;
        }
    }
    printf("Number of Alphabets in the string is : %d\n Number of Digits in the string
    is :%d\nNumber of special charcaters in the string is :%d ",alpha,digit,spec);

    return EXIT_SUCCESS;
}
```

```
Enter the the string
HI,Its me Afhaam@007^
Number of Alphabets in the string is : 13
 Number of Digits in the string is :3
Number of special charcaters in the string is :3
```

13. Read random numbers from the user, find the maximum number in the list of numbers?
    a. Use at least one function
    b. The function should return a value to main function

```
#include <stdio.h>
#include <string.h>
int* sort(int*arr,int limit){
    int i,j;
    for(i=0;i<limit-1;i++){
                for(j=i+1;j<limit;j++){
                        if(arr[i]<arr[j]){
                                int temp =arr[i];
                                arr[i]=arr[j];
                                arr[j]=temp;
                        }
                }
        }
    return arr;
}
int main()
{
   int limit,arr[50],i;
   setbuf(stdout,NULL);
    printf("How many numbers \n");
    scanf("%d",&limit);
    printf("Enter the values\n");
    for( i=0;i<limit;i++)
    {
            scanf("%d",&arr[i]);
    }
int *large = sort(arr,limit);
    printf("Largest Element  is %d ", large[0]);
```

```
    return 0;
}
```

```
How many numbers
7
Enter the values
77 65 43 23 23 4 54
Largest Element  is 77
```

14. Read a random number (n) from the user and Generate n^{th} Fibonacci
    a. Must use Recursion

```
#include <stdio.h>
#include <stdlib.h>

int fib(int n) {
  if(n == 0){
    return 0;
  } else if(n == 1) {
    return 1;
  } else {
    return (fib(n-1) + fib(n-2));
  }
}

int main() {
  int i,num;
  setbuf(stdout,NULL);
  printf("Enter the number  : ");
  scanf("%d",&num);
  printf("fibbonacci of %d: " , num);
```

```
  for(i = 0;i<num;i++) {
    printf("%d ",fib(i));
  }
}
```

```
Enter the number  : 8
fibbonacci of 8: 0 1 1 2 3 5 8 13
```

15. Write a program to print following pattern

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

Code of the program & screenshot of the output.

16. It's your first day at school. Your teacher asked the students to meet every other student in the class and to introduce themselves. The teacher asked them to do handshakes when they meet each other.

    If there are n number of students in the class then find the total number of handshakes made by the students.

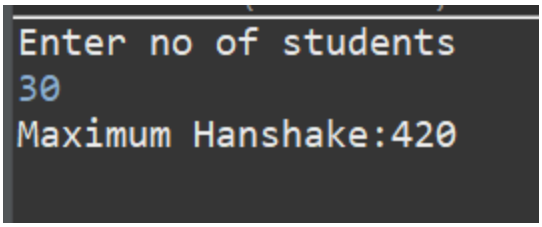
Program to find the maximum number of handshakes is discussed here. Given a positive integer n, find out the total number of handshakes possible.

Eg,

Input : 15 // Total Number of students

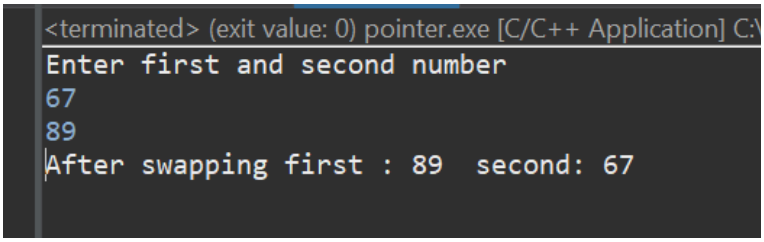
Output :105 //Maximum Number of Handshakes

```
#include <stdio.h>
#include <stdlib.h>

int main(void) {
    int std;
    setbuf(stdout,NULL);
printf("Enter no of students\n");
scanf("%d",&std);

printf("Maximum Hanshake:%d",std*((std-1)/2));
    return EXIT_SUCCESS;
}
```



17. Read two numbers from the user and swap those two numbers using Pointer.

```
#include <stdio.h>


int main()
{
    int a,b,temp;
    int *ptr1,*ptr2;
   setbuf(stdout,NULL);
    printf("Enter first and second number\n");
   scanf("%d%d",&a,&b);
   ptr1=&a;
   ptr2=&b;
   temp=*ptr1;
   *ptr1=*ptr2;
   *ptr2=temp;
   printf("After swapping first : %d  second: %d",a,b);
   return 0;
}
```



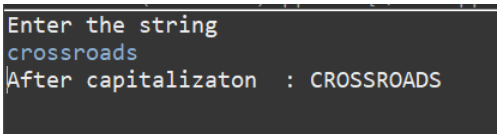
18. Convert the lowercase characters in a word into uppercase

Eg,

Input : Hello

Output : HELLO

```
#include <stdio.h>
#include <stdlib.h>
#include <ctype.h>
int main(void) {
    char str[100];
    setbuf(stdout,NULL);
    printf("Enter the string\n");
    gets(str);
    printf("After capitalizaton  : ");
    for(int i=0;str[i]!='\0';i++){
     putchar(toupper(str[i]));
    }
    return EXIT_SUCCESS;
}
```

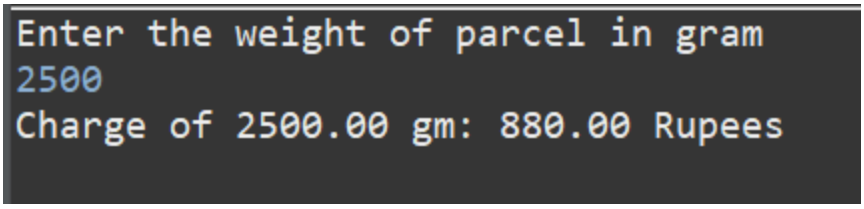


19. Write a program to calculate the charge for parcel:

    If the weight of the parcel is less than 500gm or equal to 500gm then the parcel charge will be Rs. 200, Otherwise there is an additional charge of Rs.170 per each extra 500gm

```
#include <stdio.h>
#include <stdlib.h>
```

```
int main(void) {
    float weigh,ch;
    float extra;
    setbuf(stdout,NULL);
    printf("Enter the weight of parcel in gram\n");
    scanf("%f",&weigh);
    if(weigh<=500){
            ch=200;
    }else if(weigh>=1000||weigh<1000){
            extra=(weigh-500)/500;
            ch=200+(extra*170);
    }
    printf("Charge of %.2f gm: %.2f Rupees" ,weigh,ch);
    return EXIT_SUCCESS;
}
```



20. Write a program to perform the following calculation:
    a. Matrix addition
    b. Matrix multiplication
    c. Matrix subtraction
    d. Matrix transpose

- Program should be a menu driven program.
- Program should have Functions with arguments and Return Value.

- List Functions:
  - matrix_addition()
  - matrix_multiplication()
  - matrix_subtraction()
  - matrix_transpose()
  - exit()
- Do not exit the program until the user enters the input to exit the program.

```
package matrix;

import java.util.Scanner;

public class Matrix {
    int[][] arr1=new int[50][50];
    int[][] arr2=new int[50][50];
    int row,col;
    Scanner b= new Scanner (System.in);
public static void main(String[] args) {
    Matrix obj = new Matrix();
    Scanner sc=new Scanner(System.in);
    int choice;
    do {
    System.out.println("Enter the choice--->> 1.Addition  2.Multiplication
    3.Substraction  4.Transpose  5.Exit");
    choice=sc.nextInt();

        switch (choice) {
        case 1:
```

```
                    obj.matrix_addition();
                    break;
            case 2:
                    obj.matrix_multiplication();
                    break;
            case 3:
                    obj.matrix_substraction();
                    break;
            case 4:
                    obj.matrix_Transpose();
                    break;

            case 5:
                    return;
            }
    }while(choice!=5);

}
void matrix_addition(){
    this.getArray();
    int[][] sum=new int[50][50];
    System.out.println("The sum is : \n");
    for(int i=0;i<this.row;i++) {
            for(int j=0;j<this.col;j++) {
                    sum[i][j]=this.arr1[i][j]+this.arr2[i][j];
            }
            }
    this.displayArray(sum);
}
```

```
void matrix_substraction() {
    this.getArray();
    int[][] sub=new int[50][50];
    System.out.println("The substraction is : \n");
    for(int i=0;i<this.row;i++) {
            for(int j=0;j<this.col;j++) {

                sub[i][j]=this.arr1[i][j]-this.arr2[i][j];
            }
    }
    this.displayArray(sub);
}
void matrix_multiplication(){
    int[][] mul=new int[50][50];
    int i,j,sum = 0,row1,col1;
    System.out.println("Enter the row and column first matrix\n");
    this.row=b.nextInt();
    this.col=b.nextInt();
    System.out.println("Enter the row and column second matrix\n");
     row1=b.nextInt();
    col1=b.nextInt();
    if(this.col!=row1) {
            System.out.println("first array row not matching to second array column");

    }else {
            System.out.println("Enter the values of first array\n");
            for( i=0;i<this.row;i++) {
                    for( j=0;j<this.col;j++) {
                            this.arr1[i][j]=b.nextInt();
```

```
                }
        }

        System.out.println("Enter the values of second array\n");
        for( i=0;i<row1;i++) {
                for(j=0;j<col1;j++) {
                        this.arr2[i][j]=b.nextInt();
                }

        }

        for( i=0;i<this.row;i++) {
                for(j=0;j<col1;j++) {
                        for(int m=0;m<row1;m++) {
                                sum = sum + this.arr1[i][m]*this.arr2[m][j];
                        }

                        mul[i][j]=sum;
                        sum=0;
                }

        }

        this.displayArray(mul);

    }
}
void matrix_Transpose() {
    int[][] arr=new int[50][50];
```

```
        int[][] tpose=new int[50][50];
        System.out.println("Enter the row and column\n");
        this.row=b.nextInt();
        this.col=b.nextInt();
        System.out.println("Enter the values first array\n");
        for(int i=0;i<this.row;i++) {
                for(int j=0;j<this.col;j++) {
                        arr[i][j]=b.nextInt();
                }
                }
        for(int i=0;i<this.row;i++) {
                for(int j=0;j<this.col;j++) {
                        tpose[i][j]=arr[j][i];
                }
                }
        System.out.println("Transpose of");
        this.displayArray(arr);
        System.out.println(" << is >>> ");
        this.displayArray(tpose);
}
//function to get array
void getArray() {



        System.out.println("Enter the row and column\n");
        this.row=b.nextInt();
        this.col=b.nextInt();
        System.out.println("Enter the values first array\n");
        for(int i=0;i<this.row;i++) {
```

```
                for(int j=0;j<this.col;j++) {
                        this.arr1[i][j]=b.nextInt();
                }
                }
        System.out.println("Enter the values second array\n");
        for(int i=0;i<this.row;i++) {
                for(int j=0;j<this.col;j++) {
                        this.arr2[i][j]=b.nextInt();
                }
                }
        }
    void displayArray(int[][] array) {
    for(int i=0;i<this.row;i++) {
        for(int j=0;j<this.col;j++) {
                System.out.print("  "+array[i][j]);
        }
        System.out.println();
    }
    }


    }
```

```
Enter the choice--->>
 1.Addition
 2.Multiplication
 3.Substraction
 4.Transpose
 5.Exit
2
Enter the row and column first matrix

3
2
Enter the row and column second matrix

2
3
Enter the values of first array

3 2 4 1 2 3
Enter the values of second array

2 3 1 4 2 3
Product

  14  13
  12  14
  16  12
Enter the choice--->>
 1.Addition
 2.Multiplication
 3.Substraction
 4.Transpose
 5.Exit
5
```