Name: Antarin Ghosal

Ha5.1:

```c
/*Author : Antarin Ghosal
Program : WAP to swap first element with last, second element with second last and
 so on, stored in an array.*/


#include<stdio.h>

int main(){
    int s[]={1,2,3,4,5},temp,i,n=5;

    for(i=0;i<5/2;i++){
        temp=s[i];
        s[i]=s[n-i-1];
        s[n-i-1]=temp;
    }

    for(i=0;i<5;i++){
        printf("%d ",s[i]);
    }

    return 0;
}
```

```
5 4 3 2 1
```

Ha5.2

```c
/*Author : Antarin Ghosal
Program : WAP to find out the second largest element stored in an array of 20
 integers.*/


#include<stdio.h>

int main(){
    int s[]={1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,18,19,20};
    int i,max,max2,n=20;

    for(i=0;i<20;i++){
        if(s[i]>s[i+1]){
            max=i-1;
```

```
        }
        else if (s[i+1]>s[i]){
            max=i;
        }
    }

    s[max]=0;

    for(i=0;i<20;i++){
        if(s[i]>s[i+1]){
            max2=i-1;
        }
        else if (s[i+1]>s[i]){
            max2=i;
        }
    }

    printf("The second largest element : %d",s[max2-2]);

    return 0;
}
```

```
The second largest element : 19
```

Ha 5.3

```
/*Author : Antarin Ghosal
Program : WAP to find the median of a list of numbers.*/


#include<stdio.h>

int main(){
    int a[]={1,2,3,4,5,6,7},n=6,median;

    if ( n % 2 == 0)
        median = (a[n/2] + a[n/2+1])/2.0 ;
    else
    median = a[n/2 + 1];

    printf("%d ",median);

    return 0;
}
```

4

Ha5.4

```c
/*Author : Antarin Ghosal
Program : WAP to find the standard deviation of a list of numbers.*/


#include<stdio.h>
#include<math.h>

int main(){
int i;
    float data[10];
    printf("Enter 10 elements: ");
    for (i = 0; i < 10; ++i)
        scanf("%f", &data[i]);

    float sum = 0.0, mean, SD = 0.0;

    for (i = 0; i < 10; ++i) {
        sum += data[i];
    }
    mean = sum / 10;
    for (i = 0; i < 10; ++i) {
        SD += pow(data[i] - mean, 2);
    }
    printf("\nStandard Deviation = %.6f", sqrt(SD / 10));

    return 0;
}
```

```
Enter 10 elements: 1
2
3
4
5
6
7
8
9
10

Standard Deviation = 2.872281
```

La5.1

```c
/*Author : Antarin Ghosal
Program : WAP to input 10 integers into an array of size 10. Print all elements.*/


#include<stdio.h>

int main(){
    int i,arr[10];

    for(i=0;i<10;i++){
        printf("Enter the %d number : ",i+1);
        scanf("%d",&arr[i]);
    }

    printf("\n");


    for(i=0;i<10;i++){
        printf("The Entered number is %d \n",arr[i]);
    }

    return 0;
}
```

```
Enter the 1 number : 1
Enter the 2 number : 2
Enter the 3 number : 3
Enter the 4 number : 4
Enter the 5 number : 5
Enter the 6 number : 6
Enter the 7 number : 7
Enter the 8 number : 8
Enter the 9 number : 9
Enter the 10 number : 10

The Entered number is 1
The Entered number is 2
The Entered number is 3
The Entered number is 4
The Entered number is 5
The Entered number is 6
The Entered number is 7
The Entered number is 8
The Entered number is 9
The Entered number is 10
```

```
Enter the 1 number : 10
Enter the 2 number : 20
Enter the 3 number : 30
Enter the 4 number : 40
Enter the 5 number : 40
Enter the 6 number : 40
Enter the 7 number : 50
Enter the 8 number : 40
Enter the 9 number : 40
Enter the 10 number : 50

The Entered number is 10
The Entered number is 20
The Entered number is 30
The Entered number is 40
The Entered number is 40
The Entered number is 40
The Entered number is 50
The Entered number is 40
The Entered number is 40
The Entered number is 50
```

La 5.2

```c
/*Author : Antarin Ghosal
Program : WAP to store max. 100 numbers into an array. Print all the elements
that are three digit even integers..*/


#include<stdio.h>

int main(){
    int arr[100],n,i;
    printf("Enter the amount of numbers we want to input : ");
    scanf("%d",&n);

    for(i=0;i<n;i++){
        printf("Enter a number : ");
        scanf("%d",&arr[i]);
    }

    printf("\n");

    for(i=0;i<n;i++){
        printf("The Entered value was : %d \n",arr[i]);
    }

    printf("\n");

    printf("The EVEN integers are as follows : \n");
    for(i=0;i<=n;i++){
        if ((arr[i]<=999 && arr[i]>=100) && arr[i]%2==0){
            printf("%d\n",arr[i]);
        }
    }

    return 0;
}
```

```
Enter the amount of numbers we want to input : 5
Enter a number : 101
Enter a number : 102
Enter a number : 103
Enter a number : 104
Enter a number : 105

The Entered value was : 101
The Entered value was : 102
The Entered value was : 103
The Entered value was : 104
The Entered value was : 105

The EVEN integers are as follows :
102
104
```

```
Enter the amount of numbers we want to input : 3
Enter a number : 1002
Enter a number : 102
Enter a number : 106

The Entered value was : 1002
The Entered value was : 102
The Entered value was : 106

The EVEN integers are as follows :
102
106
```

La 5.3

```c
/*Author : Antarin Ghosal
Program : WAP to find out the largest even integer stored in the array of n
integers. n is the user input.*/


#include<stdio.h>

int main(){
    int n[100],i,num,j,largest;

    printf("Enter the amount of numbers we want to input : ");
    scanf("%d",&num);

    for(i=0;i<num;i++){
        printf("Enter a number : ");
        scanf("%d",&n[i]);
```

```
    }

    largest = n[0];
    for(i=0;i<num;i++){
        if (n[i]%2==0 && n[i]>largest){
                    largest=n[i];
            }
    }

    printf("The largest number is : %d",largest);

    return 0;
}
```

```
Enter the amount of numbers we want to input : 5
Enter a number : 102
Enter a number : 103
Enter a number : 104
Enter a number : 105
Enter a number : 106
The largest number is : 106
```

```
Enter the amount of numbers we want to input : 3
Enter a number : 1002
Enter a number : 102
Enter a number : 103
The largest number is : 1002
```

La 5.4

```
/*Author : Antarin Ghosal
Program : WAP to swap the pair of elements starting from beginning.*/


#include<stdio.h>

int main()
{
    int arr[100],n,i;
    int temp;

    printf("Enter total number of elements: ");
    scanf("%d",&n);

    //value of n must be even
    if(n%2 !=0)
    {
        printf("Total number of elements should be EVEN.");
```

```
        return 1;
    }
    //read array elements
    printf("Enter array elements:\n");
    for(i=0;i < n;i++)
    {
        printf("Enter element %d:",i+1);
        scanf("%d",&arr[i]);
    }
    //swap adjacent elements
    for(i=0;i < n;i+=2)
    {
        temp    = arr[i];
        arr[i]  = arr[i+1];
        arr[i+1]= temp;
    }

    printf("\nArray elements after swapping adjacent elements:\n");
    for(i=0;i < n;i++)
    {
        printf("%d\n",arr[i]);
    }
    return 0;
}
```

```
Enter total number of elements: 5
Total number of elements should be EVEN.
```

```
Enter total number of elements: 6
Enter array elements:
Enter element 1:1
Enter element 2:2
Enter element 3:3
Enter element 4:4
Enter element 5:5
Enter element 6:6

Array elements after swapping adjacent elements:
2
1
4
3
6
5
```

La 5.5

```c
/*Author : Antarin Ghosal
Program : WAP to arrange the numbers stored in the array so that it will display
 first all odd numbers,then even numbers.*/


#include<stdio.h>

int main(){
    int i,n,s[]={1,2,3,4,5,6,7,8,9,10};


    for(i=0;i<10;i++){
        if (s[i]%2==0)
            printf(" Even %d \n",s[i]);
    }

    for(i=0;i<10;i++){
        if (s[i]%2==1)
            printf(" Odd %d \n",s[i]);
    }


    return 0;
}
```

```
Even 2
Even 4
Even 6
Even 8
Even 10
Odd 1
Odd 3
Odd 5
Odd 7
Odd 9
```

La 5.6

```c
/*Author : Antarin Ghosal
Program : WAP to display the array elements in reverse order.*/


#include<stdio.h>

int main(){
    int s[]={1,2,3,4,5};

    for(int i=4;i>=0;i--){
```

```
        printf("%d ",s[i]);
    }
    return 0;
}
```

```
5 4 3 2 1
```

La52.1

```
/*Author : Antarin Ghosal
Program : WAP to print fibonacci series using arrays.*/


#include<stdio.h>

int main(){
    int arr[30],n,i;
    printf("Enter the number of elements we want to print : ");
    scanf("%d",&n);

    if (n>30){
        printf("Too many numbers !!");
        return 0;
    }

    printf("The Requested Elements are : \n0 \n1 \n");

    arr[0]=0;
    arr[1]=1;
    for(i=2;i<n;i++){
        arr[i]=arr[i-1]+arr[i-2];
        printf("%d\n",arr[i]);
    }

    return 0;
}
```

```
Enter the number of elements we want to print : 10
The Requested Elements are :
0
1
1
2
3
5
8
13
21
34
```

```
Enter the number of elements we want to print : 5
The Requested Elements are :
0
1
1
2
3
```

La52.2

```c
/*Author : Antarin Ghosal
Program : WAP to find first and second largest in an array.*/


#include<stdio.h>

int main(){
    int i,j,arr[30],n,large1,large2;
    printf("Enter the amount of numbers we want to enter : ");
    scanf("%d",&n);

    if (n>30){
        printf("Too many numbers !!");
        return 0;
    }

    printf("Enter the numbers : \n");
    for(i=0;i<n;i++){
        scanf("%d",&arr[i]);
    }

    large1=arr[0];
    for(i=1;i<n;i++){
        if(arr[i]>large1)
        {
            large1=arr[i];
```

```
            j=i;
        }
    }

    arr[j]=0;

    large2=arr[0];
    for(i=1;i<n;i++){
        if(arr[i]>large2)
            large2=arr[i];
    }

    printf("The first largest value is : %d\n",large1);
    printf("The second largest value is : %d\n",large2);

    return 0;
}
```

```
Enter the amount of numbers we want to enter : 10
Enter the numbers :
1
2
3
4
5
6
7
8
9
10
The first largest value is : 10
The second largest value is : 9
```

```
Enter the amount of numbers we want to enter : 5
Enter the numbers :
20
30
20
40
10
The first largest value is : 40
The second largest value is : 30
```

La 52.3

```c
/*Author : Antarin Ghosal
Program : WAP to perform linear search on a array for a search key.*/


#include<stdio.h>

int main(){
    int i,j,arr[30],n,key;
    printf("Enter the amount of numbers we want to enter : ");
    scanf("%d",&n);

    printf("Enter the numbers : \n");
    for(i=0;i<n;i++){
        scanf("%d",&arr[i]);
    }

    printf("\nEnter the number you want to find : ");
    scanf("%d",&key);

    for(i=0;i<n;i++){
        if(arr[i]==key){
            printf("The number %d is found at index %d",key,i);
        }
    }

    return 0;
}
```

```
Enter the amount of numbers we want to enter : 10
Enter the numbers :
1
2
3
4
5
6
7
8
9
10

Enter the number you want to find : 5
The number 5 is found at index 4
```

```
Enter the amount of numbers we want to enter : 5
Enter the numbers :
100
2
3
10
30

Enter the number you want to find : 100
The number 100 is found at index 0
```

La 52.4

```c
/*Author : Antarin Ghosal
Program : WAP to perform binary search on a array for a search key.*/


#include<stdio.h>

int main(){
    int i,j,arr[30],n,key,temp;
    printf("Enter the amount of numbers we want to enter : ");
    scanf("%d",&n);

    printf("Enter the numbers : \n");
    for(i=0;i<n;i++){
        scanf("%d",&arr[i]);
    }

    printf("\nEnter the number you want to find : ");
    scanf("%d",&key);

    temp=n/2;

    if (key <= arr[temp]){
        for(i=temp;i>=0;i--){
            if(key==arr[i])
            printf("The number %d is found at index %d\n",key,i);
        }
    }

    else if (key > arr[temp]) {
        for (i=temp;i<n;i++){
            if(key==arr[i])
            printf("The number %d is found at index %d\n",key,i);
        }
    }

    return 0;
```

```
}
```

```
Enter the amount of numbers we want to enter : 10
Enter the numbers :
1
2
3
4
5
6
7
8
9
10

Enter the number you want to find : 5
The number 5 is found at index 4
```

```
Enter the amount of numbers we want to enter : 5
Enter the numbers :
100
2
3
10
30

Enter the number you want to find : 100
The number 100 is found at index 0
```

La 52.5

```c
/*Author : Antarin Ghosal
Program : WAP to print odd and even numbers in a array.*/


#include<stdio.h>

int main(){
    int n,arr[30],i,j;
    printf("Enter the amount of numbers we want to enter : ");
    scanf("%d",&n);

    printf("Enter the numbers : \n");
    for(i=0;i<n;i++){
        scanf("%d",&arr[i]);
    }
```

```c
    printf("\nAll EVEN numbers are as follows : \n");
    for(i=0;i<n;i++){
        if(arr[i]%2==0){
            printf("\n%d",arr[i]);
        }
    }

    printf("\n\nAll ODD numbers are as follows : \n");
    for(i=0;i<n;i++){
        if(arr[i]%2==1){
            printf("\n%d",arr[i]);
        }
    }

    return 0;
}
```

```
Enter the amount of numbers we want to enter : 10
Enter the numbers :
1
2
3
4
5
6
7
8
9
10

All EVEN numbers are as follows :

2
4
6
8
10

All ODD numbers are as follows :

1
3
5
7
9
```

```
Enter the amount of numbers we want to enter : 5
Enter the numbers :
1
2
4
5
6

All EVEN numbers are as follows :

2
4
6

All ODD numbers are as follows :

1
5
```

Ha 5.6

```c
/*Author : Antarin Ghosal
Program :WAP to find out the sum of the secondary diagonal elements of a matrix.*/


#include<stdio.h>

int main(){
    int arr1[3][3]={{1,2,3},{4,5,6},{7,8,9}},i,j,sum=0;

    for(i=0;i<3;i++){
            sum+=arr1[i][3-i-1];
    }

    printf("%d",sum);

    return 0;
}
```

```
15
```

Ha 5.7

```c
/*Author : Antarin Ghosal
Program : WAP to check whether a given matrix is symmetric or not.*/


#include<stdio.h>

int main(){
    int arr1[10][10],i,j,m,n,arr2[10][10],flag;

    printf("Enter the number of rows : ");
    scanf("%d",&m);

    printf("Enter the number of coloumns : ");
    scanf("%d",&n);

    //takes input
    for(i=0;i<m;i++){
        for(j=0;j<n;j++){
            printf("Enter the [%d][%d] element : ",i,j);
            scanf("%d",&arr1[i][j]);
        }
    }

    //finds transpose
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            arr2[j][i]=arr1[i][j];
        }
    }

    //checks for symmetric
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            if(arr1[i][j]==arr2[i][j])
                flag=1;
            else flag=0;
        }
    }

    if(flag==1){
        printf("The given matrix is Symmetric !!");
    }
    else{
        printf("The given matrix is NOT symmetric.");
    }

    return 0;
}
```

```
Enter the number of rows : 3
Enter the number of coloumns : 3
Enter the [0][0] element : 1
Enter the [0][1] element : 2
Enter the [0][2] element : 3
Enter the [1][0] element : 4
Enter the [1][1] element : 5
Enter the [1][2] element : 6
Enter the [2][0] element : 7
Enter the [2][1] element : 8
Enter the [2][2] element : 9
The given matrix is NOT symmetric.
```

```
Enter the number of rows : 2
Enter the number of coloumns : 2
Enter the [0][0] element : 1
Enter the [0][1] element : 2
Enter the [1][0] element : 2
Enter the [1][1] element : 1
The given matrix is Symmetric !!
```

Ha 5.8

```c
/*Author : Antarin Ghosal
Program : WAP to check whether a given matrix is orthogonal or not.*/


#include<stdio.h>

int main(){
    int arr1[10][10],i,j,m,n,arr2[10][10],mularr[10][10],iarr[10][10],flag;

    printf("Enter the number of rows : ");
    scanf("%d",&m);

    printf("Enter the number of coloumns : ");
    scanf("%d",&n);

    //creating identity matrix
    for(i=0;i<m;i++){
        for(j=0;j<n;j++){
            if(i==j)
                iarr[i][i]=1;
            else iarr[i][j]=0;
        }
    }


    //takes input
    for(i=0;i<m;i++){
        for(j=0;j<n;j++){
            printf("Enter the [%d][%d] element : ",i,j);
            scanf("%d",&arr1[i][j]);
        }
    }

    //finds transpose
```

```
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            arr2[i][j]=arr1[j][i];
        }
    }

    //multiplying A and At.
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            mularr[i][j]=arr1[j][i]*arr2[i][j];
        }
    }

    //checking if A*At=I or not
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            if(mularr[i][j]==iarr[i][j])
                flag=0;
            else flag=1;
        }
    }

    if(flag==1){
        printf("The given matrix is Orthogonal !!");
    }
    else{
        printf("The given matrix is NOT orthogonal.");
    }

    return 0;
}
```

```
Enter the number of rows : 3
Enter the number of coloumns : 3
Enter the [0][0] element : 1
Enter the [0][1] element : 23
Enter the [0][2] element : 24
Enter the [1][0] element : 25
Enter the [1][1] element : 6
Enter the [1][2] element : 7
Enter the [2][0] element : 8
Enter the [2][1] element : 9
Enter the [2][2] element : 10
The given matrix is Orthogonal !!
```

```
Enter the number of rows : 2
Enter the number of coloumns : 2
Enter the [0][0] element : 1
Enter the [0][1] element : 2
Enter the [1][0] element : 3
Enter the [1][1] element : 3
The given matrix is Orthogonal !!
```

La 5.7

```c
/*Author : Antarin Ghosal
Program : WAP to find out the sum of the elements stored in a matrix.*/


#include<stdio.h>

int main(){
    int i,j,arr[3][3]={1,2,3,4,5,6,7,8,9},sum=0;

    for (i=0;i<3;i++){
        for (j=0;j<3;j++){
            sum+=arr[i][j];
        }
    }

    printf("%d",sum);

    return 0;
}
```

```
45
```

La 5.8

```c
/*Author : Antarin Ghosal
Program : WAP to find out the transpose of a given matrix.*/


#include<stdio.h>

int main(){
    int i,j,arr2[3][3];
    int arr1[3][3]={{1,2,3},{4,5,6},{7,8,9}};

    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            arr2[i][j]=arr1[j][i];
        }
    }

    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            printf("%d ",arr2[i][j]);
        }
        printf("\n");
    }
    return 0;
}
```

```
1 4 7
2 5 8
3 6 9
```

Sa 6.5

```c
/*Author : Antarin Ghosal
Program : WAP to add two matrices and display it.*/


#include<stdio.h>

int main(){
    int arr1[3][3]={{1,2,3},{4,5,6},{7,8,9}};
    int arr2[3][3]={{9,8,7},{6,5,4},{3,2,1}};
    int sumarr[3][3],i,j;

    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            sumarr[i][j]=arr1[i][j]+arr2[i][j];
        }
    }

    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            printf("%d ",sumarr[i][j]);
        }
    printf("\n");
    }

    return 0;
}
```

```
10 10 10
10 10 10
10 10 10
```

Sa 6.6

```c
/*Author: Antarin Ghosal
Program: WAP to multiply two matrices and display it.*/
```

```c
#include<stdio.h>
int main()
{
    int r,c,a[100][100],b[100][100],d[100][100];
    int i,j,k,sum,e;
    printf("Enter the number of rows:");
    scanf("%d",&r);
    printf("\nEnter the number of columns:");
    scanf("%d",&c);


    for(i=0;i<r;i++){
        for(j=0;j<c;j++){
            printf("\nEnter a[%d][%d]:",i,j);
            scanf("%d",&a[i][j]);
        }
    }

    for(i=0;i<r;i++){
        for(j=0;j<c;j++){
            printf("\nEnter b[%d][%d]:",i,j);
            scanf("%d",&b[i][j]);
        }
    }

    for(i=0;i<r;i++){
        for(j=0;j<c;j++)
        {
            sum=0;
            e=1;
            for(k=0;k<c;k++)
            {
                e=a[i][k]*b[k][j];
                printf("%d",e);
                sum+=e;
            }
            d[i][j]=sum;
            sum=0;
        }
    }

    printf("\nThe multiplication of the two matrix is:\n");

    for(i=0;i<r;i++){
        for(j=0;j<c;j++){
            printf("%d  ",d[i][j]);
        }
        printf("\n");
    }


    return 0;
}
```

```
The multiplication of the two matrix is:
84  90  96
201  216  231
318  342  366
```

```
The multiplication of the two matrix is:
9  12
9  12
```

Sa 6.7

```c
/*Author : Antarin Ghosal
Program : WAP to find the Trace(sum of the diagonal element) of a given mxn matrix.*/


#include<stdio.h>

int main(){
int arr1[3][3]={{1,2,3},{4,5,6},{7,8,9}},i,j,sum=0;

    for(i=0;i<3;i++){
            sum+=arr1[i][i];
    }

    printf("%d",sum);

    return 0;
}
```

```
15
```

Ha 7.1

```c
/*
Name : Antarin ghosal
program : HA7.1 WAP to capitalize first character of each word of a string entered through
keyboard.
*/
```

```c
#include <stdio.h>
#include<string.h>
#include<ctype.h>
int main()
    {
    char str[30];int len=0,i;
    printf("Enter the string: ");
    scanf("%[^\n]s",str);
    len=strlen(str);
    char str2[len];
    str2[0]=toupper(str[0]);
    for(i=1;i<len;i++)
        if(str[i-1]==' ')
            str2[i]=toupper(str[i]);
        else
            str2[i]=str[i];

    printf("%s",str2);
        return 0;
    }
```

```
Enter the string: Hello world
Hello World
```

```
Enter the string: Antarin
Antarin
```

Ha 7.2

```c
/*
Name : Antarin ghosal
HA7.2 WAP to take a sentence as input and reverse every word of the sentence.
*/

#include<stdio.h>
#include<string.h>
#include<ctype.h>
int main()
{
int i,j=0;
char str[100];
//input
    printf("Enter the sstring: ");
    scanf("%[^\n]s",str);
    sprintf(str,"%s ",str);
    int k=0,len=strlen(str);
while(str[i]!='\0')
{
    if(str[i]==32)
    {
```

```
        for(j=i-1;j>=k;j--)
            printf("%c",str[j]);
            printf(" ");
            k=i+1;
    }
    i++;
}

return 0;
}
```

```
Enter the sstring: Antarin ghosal
niratnA lasohg
```

```
Enter the sstring: Hello world
olleH dlrow
```

Ha 7.3

```
/*
Name : Antarin ghosal
HA7.3 WAP to print a given string in an alphabetical order
*/

#include<stdio.h>
#include<string.h>
#include<ctype.h>
int main()
{
int i,j;
char str[10];
//input
    printf("Enter the sstring: ");
    scanf("%[^\n]s",str);
    int len=strlen(str);

//cal and out
    for(i=65;i<=90;i++)
    for(j=0;j<len;j++)
        if(toupper(str[j])==(char)i)
            printf("%c",(char)i);

return 0;
}
```

```
Enter the sstring: hello world
EHLLLOORW
```

```
Enter the sstring: Antarin ghosal
AAGHINNRT
```

La 7.1

```c
/*
Name : Antarin ghosal
LA7.1 WAP to extract the last character of each word of a given string.
*/

#include <stdio.h>
#include<string.h>
#include<ctype.h>
int main()
    {
    char str[100],str2[100];int len=0,i;
    printf("Enter the sstring: ");
    scanf("%[^\n]s",str);
    sprintf(str,"%s ",str);
    len=strlen(str);

    for(i=0;i<len;i++)
        if(str[i]==' ')
            printf("%c ",str[i-1]);

    return 0;
    }
```

```
Enter the sstring: Antarin Ghosal
n l
```

```
Enter the sstring: Hello world
o d
```

La 7.2

```c
/*
Name : Antarin ghosal
LA7.2 Write a program to concatenate two strings without using any library function.
*/

#include <stdio.h>
#include<string.h>
#include<ctype.h>
int main()
    {
    char str[100];
    char str2[100];
```

```
    char buffer[200];
    printf("Enter 1st string: ");
    gets(str);
    printf("Enter 2nd string: ");
    gets(str2);
    sprintf(buffer,"%s %s",str,str2);
    printf("CONCATENATED STRING: %s",buffer);
    return 0;
    }
```

```
Enter 1st string: Antarin
Enter 2nd string: Ghosal
CONCATENATED STRING: Antarin Ghosal
```

```
Enter 1st string: Hello
Enter 2nd string: world
CONCATENATED STRING: Hello world
```

La 7.3

```
/*
Name : Antarin ghosal
LA7.3 WAP to check whether a string entered through keyboard is palindrome or not.
*/

#include <stdio.h>
#include<string.h>
#include<ctype.h>
int main()
    {
    char str[100],str2[100];int len=0,i;
    printf("Enter the sstring: ");
    scanf("%[^\n]s",str);

    len=strlen(str);
    int r=len-1;

    for(i=0;i<len;i++)
        str2[i]=str[r--];

    short int flag=0;
    for(i=0;i<len;i++)
        if(str[i]!=str2[i])
            flag=1;

    if(flag==1)
        printf("%s is not palindrome",str);
    else
        printf("%s is palindrome",str);
    return 0;
```

```
    }
```

```
Enter the sstring: Antarin ghosal
Antarin ghosal is not palindrome
```

```
Enter the sstring: madam
madam is palindrome
```

La 7.4

```c
/*
Name : Antarin ghosal
LA7.4 Write a program to count the number of characters, alphabets, tabs, newlines, words,
vowels, consonants present in a in a string.
*/

#include <stdio.h>
#include<string.h>
#include<ctype.h>
int main()
{

  char str[150];
  int vowels=0, consonant=0, digit=0, space=0,i;

  vowels = consonant = digit = space = 0;

  printf("Enter a str of string: ");
  fgets(str, sizeof(str), stdin);

  for (i=0;str[i]!='\0';i++)
  {
    str[i]=tolower(str[i]);

    if(str[i]=='a'||str[i]=='e'||str[i]=='i'||str[i]=='o'||str[i]=='u')
        vowels++;
    else if((str[i]>='a'&&str[i]<='z'))
        consonant++;
    else if(str[i]>='0'&&str[i]<='9')
        digit++;
    else if(str[i]==' ')
        space++;
  }
  printf("Vowels: %d", vowels);
  printf("\nConsonants: %d", consonant);
  printf("\nDigits: %d", digit);
  printf("\nWhite spaces: %d", space);

  return 0;
```

```
}
```

```
Enter a str of string: Antarin
Vowels: 3
Consonants: 4
Digits: 0
White spaces: 0
```

```
Enter a str of string: Hello world
Vowels: 3
Consonants: 7
Digits: 0
White spaces: 1
```

Sa 7.1

```c
/*
Name : Antarin ghosal
SA7.1 WAP to find the length of a string with/without using library function for getting
length of the string.
*/

#include <stdio.h>
#include<string.h>
#include<ctype.h>
int main()
    {
    char str[100];
    int len=0,i,sp=0;
    scanf("%[^\n]s",str);
    for(i=0;i<100;i++)
        if(str[i]!='\0')
        {
            if(str[i]!=' ')
            len+=1;
            if(str[i]==' ')
            sp+=1;
        }
        else
            break;
    printf("String: %s\n",str);
    printf("Lenght without white space: %d\n",len);
    printf("Lenght with white space: %d",(len+sp));
    return 0;
    }
```

```
Antarin Ghosal
String: Antarin Ghosal
Lenght without white space: 13
Lenght with white space: 14
```

```
Hello world
String: Hello world
Lenght without white space: 10
Lenght with white space: 11
```

Sa 7.2

```c
/*
Name : Antarin ghosal
SA7.2 WAP to copy one string into other with/without using a library function for copy
operation.
*/

#include <stdio.h>
#include<string.h>
#include<ctype.h>
int main()
    {
    char str[100];
    char str2[100];
    printf("Enter THE string: ");
    scanf("%[^\n]s",str);
    int i;
//  sprintf(str2,"%s",str);
//  strcpy(str2,str)
    for(i=0;i<strlen(str);i++)
        str2[i]=str[i];
        str2[strlen(str)]='\0';

    printf("COPIED STRING:    %s",str2);

    return 0;
    }
```

```
Enter THE string: Hello world
COPIED STRING:    Hello world
```

```
Enter THE string: Antarin ghosal
COPIED STRING:    Antarin ghosal
```

Sa 7.3

```c
/*
Name : Antarin ghosal
SA7.3 WAP to compare two strings without using library function for comparison operation.
*/
```

```c
#include <stdio.h>
#include<string.h>
#include<ctype.h>
int main()
    {
    int i=0;
    char str1[100];
    char str2[100];
    printf("Enter 1st string: ");
    gets(str1);
    printf("Enter 2nd string: ");
    gets(str2);

    while(str1[i]!='\0'&&str2[i]!='\0')
        {
            if(str1[i]==str2[i])
            {
                i++;
                continue;
            }
            else
                break;
        }
    printf("%d",str1[i]-str2[i]);
    return 0;
    }
```

```
Enter 1st string: Antarin
Enter 2nd string: Ghosal
-6
```

```
Enter 1st string: Hello
Enter 2nd string: world
-47
```

Sa 7.4

```c
/*
Name : Antarin ghosal
SA7.4 WAP to find the reverse of a string with/without using library function.
*/

#include <stdio.h>
#include<string.h>
#include<ctype.h>
int main()
    {
    char str[100];int len=0,i;
    printf("Enter the sstring: ");
```

```
    scanf("%[^\n]s",str);

    len=strlen(str);
    int r=len-1;
    char str2[len];
    for(i=0;i<len,r>=0;i++)
        str2[i]=str[r--];

    printf("STRING: %s",str);
    printf("\nREVERSE: %s",str2);
    return 0;
    }
```

```
Enter the sstring: Antarin Ghosal
STRING: Antarin Ghosal
REVERSE: lasohG niratnA
```

```
Enter the sstring: Hello world
STRING: Hello world
REVERSE: dlrow olle»
```

Ha 7.5

```
/*
Name : Antarin ghosal
HA7.5 WAP to replace all occurrences of a substring in a given string with a new one.
*/

#include<stdio.h>
#include<string.h>
int main()
{
    char str[100],str1[100],str2[100];
    int k,ch,b,j;

    printf("ENTER THE STRING:");
    scanf("%[^\n]s",str);

    printf("ENTER THE SUBSTRING TO REPLACE:");
    scanf(" %[^\n]s",str1);

    printf("ENTER THE SUBSTRING TO REPLACE WITH:");
    scanf(" %[^\n]s",str2);

    int len=strlen(str),len1=strlen(str1),len2=strlen(str2),i=0;

    while(str[i]!='\0')
    {
        b=0;
        if(str[i]==str1[0])
```

```
            {
                k=0,ch=0,b=0;
                for(j=i;j<i+len1;j++)
                    if(str1[k++]==str[j])
                        ch++;
                if(ch==len1)
                    b=1;
            }
        if(b==1)
            {
                printf("%s",str2);
                i=i+(len1-1);
            }
        else
            printf("%c",str[i]);
            i=i+1;
    }
    return 0;
}
```

```
ENTER THE STRING:hello world
ENTER THE SUBSTRING TO REPLACE:ell
ENTER THE SUBSTRING TO REPLACE WITH:aaa
haaao world
```

```
ENTER THE STRING:Antarin ghosal
ENTER THE SUBSTRING TO REPLACE:ghosal
ENTER THE SUBSTRING TO REPLACE WITH:antarin
Antarin antarin
```

Ha 7.4

```
/*
Name : Antarin ghosal
HA7.4 WAP to sort a list of names/strings alphabetically.
*/

#include<stdio.h>
#include<string.h>
int main()
{
   int i,j,n;
   char str[100][100],temp[100];


   printf("Enter number of names :\n");
   scanf("%d",&n);
```

```
   printf("Enter names in any order:\n");


   for(i=0;i<n;i++)
   {
      scanf("%s",str[i]);
   }

   for(i=0;i<n;i++)
   {
      for(j=i+1;j<n;j++)
     {
         if(strcmp(str[i],str[j])>0)
       {
            strcpy(temp,str[i]);
            strcpy(str[i],str[j]);
            strcpy(str[j],temp);
         }
      }
   }

   printf("\nThe sorted order of names are:\n");
   for(i=0;i<n;i++)
   {
      printf("%s\n",str[i]);
   }
   return 0;
}
```

```
Enter number of names :
2
Enter names in any order:
anto
antarin

The sorted order of names are:
antarin
anto
```

```
Enter number of names :
3
Enter names in any order:
jayas
rajesh
antarin

The sorted order of names are:
antarin
jayas
rajesh
```

La 7.5

```
/*
Name : Antarin ghosal
```

```c
/*LA7.5 WAP to reads a sentence and prints frequency of each of the vowels and total count
of Consonants.
*/

#include<stdio.h>
#include<string.h>
#include<ctype.h>
int main()
{
int i,vc=0,c=0;char ch;
char str[100];

    printf("Enter the sstring: ");
    scanf("%[^\n]s",str);
    int len=strlen(str);
    for(i=0;i<len;i++)
    {
        if(str[i]=='a'||str[i]=='e'||str[i]=='i'||str[i]=='o'||str[i]=='u'||str[i]=='A'||s
tr[i]=='E'||str[i]=='I'||str[i]=='O'||str[i]=='U')
            vc++;
        else if(isalpha(str[i]))
            c+=1;
        else
            continue;
    }


    printf("NUMBER OF VOWEL: %d\n",vc);
    printf("NUMBER OF CONSUNENT: %d",c);


return 0;
}
```

```
Enter the sstring: hello
NUMBER OF VOWEL: 2
NUMBER OF CONSUNENT: 3
```

```
Enter the sstring: antarin
NUMBER OF VOWEL: 3
NUMBER OF CONSUNENT: 4
```

La 7.6

```c
/*
Name : Antarin ghosal
LA7.6 WAP to replace all occurrences of a character in a string with the previous 3rd
character if any of the character.
*/

#include<stdio.h>
#include<string.h>
int main()
```

```c
{
char ch;
char str[10];
int i;
    printf("Enter the sstring: ");
    scanf("%[^\n]s",str);
    int len=strlen(str);
    printf("%s",str);


    for(i=0;i<len;i++)
    {
        ch=tolower(str[i])-3;

        if(ch<97)
            ch=ch+26;


        if(isalpha(str[i]))
            str[i]=ch;
    }

    printf("\n%s",str);



return 0;
}

//reverse is on the string
```

```
Enter the sstring: antarin
antarin
xkqxofk
```

```
Enter the sstring: hello
hello
ebiil
```

La 7.7

```c
/*
Name : Antarin ghosal
LA7.7 Develop a user defined function and test them in the main program for the following
standard function:
int MatchAny(char s1[], char s2[]) :It takes two string arguments and it returns  1 if s2
is substring of s1, returns 0 if both s1 and s2 are equal strings,
 otherwise, returns -1. Do not use the standard library functions.

*/
```

```c
#include<stdio.h>
#include<string.h>
int main()
{
    char str[100],str1[100],str2[100];
    int k,ch,b=0,j;

    printf("ENTER THE STRING(s1):");
    scanf("%[^\n]s",str);

    printf("ENTER THE SUBSTRING:(s2):");
    scanf(" %[^\n]s",str1);

    int len=strlen(str),len1=strlen(str1),i=0;

    if(len!=len1)
    {
        while(str[i]!='\0')
        {
        b=0;
        if(str[i]==str1[0])
                {
                    k=0,ch=0,b=0;
                    for(j=i;j<i+len1;j++)
                        if(str1[k++]==str[j])
                            ch++;
                    if(ch==len1)
                        b=1;
                }
            i=i+1;
        }
    if(b==1)
        printf("1");
    else
        printf("-1");
    }



    else if(len==len1)
    {
        for(i=0;i<len;i++)
            if(str[i]!=str1[i])
                b=1;
        if(b=1)
            printf("0");
        else
            printf("-1");
    }
    else
        printf("-1");

    return 0;
}
```

```
ENTER THE STRING(s1):antarin
ENTER THE SUBSTRING:(s2):ghosal
-1
```

```
ENTER THE STRING(s1):hell
ENTER THE SUBSTRING:(s2):hello
-1
```

Sa 7.5

```c
/*
Name : Antarin ghosal
SA7.5 WAP to extract the first character of each word of a given string  (Achromatic string).
*/

#include<stdio.h>
#include<string.h>
int main()
{
    char ch;
    char str[10];
    int i;

    printf("Enter the string: ");
    scanf("%[^\n]s",str);
    int len=strlen(str);

    printf("%c ",str[0]);

    for(i=1;i<len;i++)
        if(str[i]==' ')
            printf("%c ",str[i+1]);




return 0;
}
```

```
Enter the string: antarin
a
```

```
Enter the string: Hello
H
```

Sa 7.6

```c
/*
Name : Antarin ghosal
SA7.6 WAP to extract a substring of a given string.
*/

#include<stdio.h>
#include<string.h>
int main()
{
    char ch;
    char str[10];
    int i,p1,s;

    printf("Enter the string: ");
    scanf("%[^\n]s",str);
    int len=strlen(str);

    printf("enter the staring postion: ");
    scanf("%d",&p1);
    printf("enter the size of the substring:");
    scanf("%d",&s);

    printf("subString: ");
    for(i=p1-1;i<(p1+s)-1;i++)
        printf("%c",str[i]);




return 0;
}
```

```
Enter the string: Hello world
enter the staring postion: 2
enter the size of the substring:4
subString: ello
```

```
Enter the string: antarin ghosal
enter the staring postion: 2
enter the size of the substring:
subString: ntar
```

Sa 7.8

```c
/*
Name : Antarin ghosal
SA7.8 WAP to replace all occurrences of a character in a given string with a new
character.
```

```c
*/

#include<stdio.h>
#include<string.h>
int main()
{
    char ch,ch2;
    char str[10];
    int i,p1,s;

    printf("Enter the string: ");
    scanf("%[^\n]s",str);
    int len=strlen(str);

    printf("CHAR TO REPLACE:");
    scanf(" %c",&ch);
    printf("REPLACE WITH: ");
    scanf(" %c",&ch2);

    printf("NEW STRING:  ");
    for(i=0;i<len;i++)
        if(str[i]==ch)
            str[i]=ch2;

    printf("%s",str);




return 0;
}
```

```
Enter the string: antarin
CHAR TO REPLACE:a
REPLACE WITH: d
NEW STRING:  dntdrin
```

```
Enter the string: hello
CHAR TO REPLACE:l
REPLACE WITH: a
NEW STRING:  heaao
```

Ha 7.1

```c
/*
Antarin Ghosal
HA7.1 WAP to test whether a number num (num is entered through keyboard) is a number in
 the Fibonacci sequence or not.
*/
```

```c
int fibo(int x)
{
    int a=-1,b=1,c=a+b,flag=0;
    while(c<=x)
    {
        if(c==x)
            flag=1;
        a=b;
        b=c;
        c=a+b;
    }

    return flag;
}

int main()
{
    int num;
    printf("Enter a number: ");
    scanf(" %d",&num);

    if(fibo(num))
        printf("%d comes in fibonaci series",num);
    else
        printf("IT DOES NOT COMES IN FIBONACCI SERIES");
    return 0;

}
```

```
Enter a number: 72
IT DOES NOT COMES IN FIBONACCI SERIES
```

```
Enter a number: 5
5 comes in fibonaci series
```

Ha 7.2

```c
/*
Antarin Ghosal
HA7.2 WAP to compute the power series (e to the power x).
ex=1+x+x^2/2!+x^3/3!+x^4/4!+...
*/

#include<stdio.h>

int POWER(int x,int y)
{
    int pow=1,i;
    for(i=1;i<=y;i++)
```

```
        pow*=x;

    return pow;
}

int fact(int x)
{
    int i,fact=1;
    for(i=1;i<=x;i++)
        fact*=i;
        return fact;
}

int main()
{
    int x,term=1;
    float sum=1.0;
    printf("ENTER THE VALUE OF X: ");
    scanf("%d",&x);
    while(term<x)
    {
        sum+=(float)POWER(x,term)/fact(term);
        term++;
    }
    printf("sum of the series: %0.2f",sum);
}
```

```
ENTER THE VALUE OF X: 5
sum of the series: 65.38
```

```
ENTER THE VALUE OF X: 10
sum of the series: 10086.57
```

Ha 7.3

```
/*
Antarin Ghosal
HA7.3 WAP to find the LCM of two numbers a and b by using a suitable function (say LCM)
for this.
*/

#include<stdio.h>

int LCM(int a,int b)
{
    int i,lcm;
        for(i=1;i<=(a<b?a:b);i++)
            if(a%i==0&&b%i==0)
```

```
                lcm=i;
    return lcm;
}

int main()
{
    int x,y;
    printf("ENTER the value of A and B : ");
        scanf("%d %d",&x,&y);
    printf("LCM of %d and %d is %d",x,y,LCM(x,y));

    return 0;

}
```

```
ENTER the value of A and B : 10 20
LCM of 10 and 20 is 10
```

```
ENTER the value of A and B : 10 3
LCM of 10 and 3 is 1
```

Ha 7.4

```
/*
Antarin Ghosal
HA7.4 WAP to find out the sum of n elements of an integer array a[] by using recursion.
*/

#include<stdio.h>

void sumOfArray(int a[],int n,int sum)
{
    if(n>=0)
    {
        sum+=(a[n]);
    sumOfArray(a,n-1,sum);
    }
    else
    printf("Sum:%d",sum);
}


int main()
{
    int i,n,sum=0;
    printf("ENTER NUMBER OF ARRay elements: ");
    scanf("%d",&n);
    int a[n];
    printf("Enter array elements:\n");
    for(i=0;i<n;i++)
```

```
        scanf("%d",&a[i]);
        sumOfArray(a,n-1,sum);
    return 0;

}
```

```
ENTER NUMBER OF ARRay elements:
Enter array elements:
1
2
3
4
5
Sum:15
```

```
ENTER NUMBER OF ARRay elements: 3
Enter array elements:
7
8
9
Sum:24
```

Ha 7.5

```
/*
Antarin Ghosal
HA7.5 WAP by designing a recursive function to calculate the sum of all even digits of
any given integer.
*/

#include<stdio.h>

void sumEd(int num,int sum)
{
    if(num!=0)
    {
        if((num%10)%2==0)
            sum+=num%10;
        sumEd(num/10,sum);
    }
    else
    printf("SUM OF EVEN DIGIT:%d ",sum);
    return;
}

int main()
{
    int n,sum=0;
    printf("ENter the number: ");
    scanf("%d",&n);
    sumEd(n,sum);
    return 0;
}
```

```
ENter the number: 72
SUM OF EVEN DIGIT:2
```

```
ENter the number: 272
SUM OF EVEN DIGIT:4
```

La 7.1

```c
/*
Antarin Ghosal
LA7.1 WAP to swap the values of two variables by using a suitable user defined function
(say SWAP) for it.
*/

#include<stdio.h>

void SWAP(int x,int y)
{
    x=x+y;
    y=x-y;
    x=x-y;
    printf("value of a:%d b:%d After swap\n ",x,y);
}

int main()
{
    int a,b;
    printf("Enter the value of a and b: ");
    scanf("%d %d",&a,&b);
    printf("Value of a:%d b:%d before swap\n",a,b);
    SWAP(a,b);
    return 0;
}
```

```
Enter the value of a and b: 10 20
Value of a:10 b:20 before swap
value of a:20 b:10 After swap
```

```
Enter the value of a and b: 30 40
Value of a:30 b:40 before swap
value of a:40 b:30 After swap
```

La 7.2

```c
/*
```

```c
/*
Antarin Ghosal
LA7.2 WAP to find out ncr factor by using a user defined function for factorial (say
fact).
*/

#include<stdio.h>

int fact(int x)
{
    int i,fact=1;
    for(i=1;i<=x;i++)
        fact*=i;
        return fact;
}


int main()
{
    int n,r;
    printf("Enter the value of n and r: ");
    scanf("%d %d",&n,&r);
    int nCr=fact(n)/(fact(r)*fact(n-r));
    printf("\nnCr:%d",nCr);
    return 0;
}
```

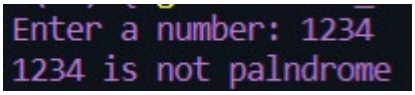
```
Enter the value of n and r: 10 3

nCr:120
```

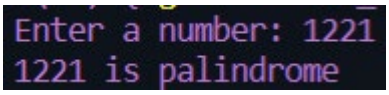
```
Enter the value of n and r: 30 3

nCr:4
```

La 7.3

```c
/*
Antarin Ghosal
LA7.3 WAP to test whether a number n is palindrome number or not.
*/

#include<stdio.h>

int pali(int x)
{
    int rem,rev,temp;
    temp=x;
    while(x!=0)
    {
        rem=x%10;
        rev=rev*10+rem;
```

```
        x=x/10;
    }
    if(rev==temp)
        return 1;
    else
        return 0;
}

int main()
{

    int n;
    printf("Enter a number: ");
    scanf("%d",&n);
    if(pali(n))
        printf("%d is palindrome",n);
    else
        printf("%d is not palndrome",n);

    return 0;
}
```

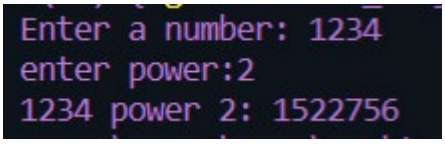


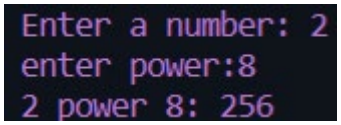


La 7.4

```
/*
Antarin Ghosal
LA7.4 WAP to calculate x^y by writing a function(say POWER) for it.
*/

#include<stdio.h>

int POWER(int x,int y)
{
    int pow=1,i;
    for(i=1;i<=y;i++)
        pow*=x;

    return pow;
}

int main()
```

```
{

    int n,m;
    printf("Enter a number: ");
    scanf("%d",&n);
    printf("enter power:");
    scanf("%d",&m);
    printf("%d power %d: %d",n,m,POWER(n,m));


    return 0;
}
```





La 7.5

```
/*
Antarin Ghosal
LA7.5 WAP to generate all the prime numbers between 1 and n by using a user defined
function (say isPRIME) to be used for prime number testing, where n is a value supplied by
the user.
*/

#include<stdio.h>

int isPrime(int x)
{
    int flag=0,i;
    for(i=2;i<x;i++)
        if(x%i==0)
            flag=1;
    if(flag==1)
        return 0;
    else
        return 1;
}

int main()
{

    int n,i;
    printf("Enter the value of n: ");
```

```
    scanf("%d",&n);
    for(i=1;i<=n;i++)
        if(isPrime(i))
            printf("%d  ",i);
    return 0;
}
```

```
Enter the value of n: 10
1  2  3  5  7
```

```
Enter the value of n: 20
1  2  3  5  7  11  13  17  19
```

La 7.6

```
/*
Antarin Ghosal
LA7.6 A Fibonacci sequence is defined as follows: the first and second terms in the
sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the
 sequence (Fi=Fi-1+Fi-2). WAP to generate the first n terms of the sequence by writing a
 suitable user defined function (say fib) to be used to get nth term Fibonacci value.
*/

#include<stdio.h>

int fib(int x)
{
    int a=-1,b=1,c=a+b,i;
    for(i=1;i<=x;i++)
        {
            a=b;
            b=c;
            c=a+b;
        }
    return c;
}

int main()
{
    int n,i;
    printf("Enter the value of n: ");
    scanf("%d",&n);
    for(i=1;i<=n;i++)
        printf("%d ",fib(i));
    return 0;
}
```

```
Enter the value of n: 10
1 1 2 3 5 8 13 21 34 55
```

```
Enter the value of n: 15
1 1 2 3 5 8 13 21 34 55 89 144 233 377 610
```

La 7.7

```c
/*
Antarin Ghosal
LA7.7 WAP to compute the cosine series using function.
cos(x)=1-x^2/2!+x^4/4!-x^6/6!+ 
*/

#include<stdio.h>

int POWER(int x,int y)
{
    int pow=1,i;
    for(i=1;i<=y;i++)
        pow*=x;

    return pow;
}

int fact(int x)
{
    int i,fact=1;
    for(i=1;i<=x;i++)
        fact*=i;
        return fact;
}

int main()
{
    float sum=1.0;
    int term=1,y=2,n,x;
    printf("Enter the value of N: ");
    scanf("%d",&n);
    printf("enter the value of x: ");
    scanf("%d",&x);
    while(term<n)
    {
        if(term%2!=0)
            sum-=(float)POWER(x,y)/fact(y);
        else
            sum+=(float)POWER(x,y)/fact(y);

        y=y+2;
        term=term+1;
```

```
    }

    printf("SUM OF THE SERIES: %0.2f",sum);
    return 0;
}
```

```
Enter the value of N: 10
enter the value of x: 10
SUM OF THE SERIES: 1067.91
```

```
Enter the value of N: 10
enter the value of x: 2
SUM OF THE SERIES: -0.42
```

La 7.8

```
/*
Antarin Ghosal
LA7.8 WAP to count number of digits of a positive integer n by using recursion.
*/

#include<stdio.h>

void COUNT(int num,int count)
{
    if(num<0)
    {
        printf("the number is not postive");
        return;
    }
    if(num!=0)
    {
            count+=1;
        COUNT(num/10,count);
    }
    else
    printf("NUMBER OF DIGIT: :%d ",count);
    return;
}

int main()
{
    int n,count=0;
    printf("ENter the number: ");
    scanf("%d",&n);
    COUNT(n,count);
    return 0;
}
```

```
ENter the number: 10
NUMBER OF DIGIT: :2
```

```
ENter the number: 12345
NUMBER OF DIGIT: :5
```

La 8.1

```c
/*
Antarin Ghosal
LA8.1 WAP to add two numbers using call by reference.
*/


#include <stdio.h>

int add(int *a,int *b,int *c){
    *c=*a+*b;}
int main ()
    {
    int x,y,s=0;
    printf("ENter the Value of x and y: ");
    scanf("%d %d",&x,&y);
    add(&x,&y,&s);
    printf("SUM:%d",s);
   return 0;
}
```

```
ENter the Value of x and y: 10 20
SUM:30
```

```
ENter the Value of x and y: 30 4
SUM:70
```

La 8.2

```c
/*
Antarin Ghosal
LA8.2 WAP to compute the sum of all elements in an array using pointer.
*/
#include <stdio.h>

int main ()
    {
    int N,i,sum=0;
    printf("Enter number of element in the array:");
    scanf("%d",&N);
    int arr[N];
```

```
    for(i=0;i<N;i++)
    {
        printf("ENter arr element [%d]: ",i);
        scanf("%d",&arr[i]);
    }
    int *p=&arr[0];
    for(i=0;i<N;i++)
    {
        sum+=*p;
        p=p+1;
    }
    printf("sum of the array: %d",sum);
   return 0;
}
```

```
Enter number of element in the array:10
ENter arr element [0]: 1
ENter arr element [1]: 2
ENter arr element [2]: 3
ENter arr element [3]: 4
ENter arr element [4]: 5
ENter arr element [5]: 6
ENter arr element [6]: 7
ENter arr element [7]: 8
ENter arr element [8]: 9
ENter arr element [9]: 10
sum of the array: 55
```

```
Enter number of element in the array:3
ENter arr element [0]: 10
ENter arr element [1]: 20
ENter arr element [2]: 30
sum of the array: 60
```

La 8.3

```
/*
Antarin Ghosal
LA8.3 WAP to display values in reverse order from an integer array using pointer.
*/
#include <stdio.h>

int main ()
    {
    int N,i,sum=0;
```

```
    printf("Enter number of element in the array:");
    scanf("%d",&N);
    int arr[N];
    for(i=0;i<N;i++)
    {
        printf("ENter arr element [%d]: ",i);
        scanf("%d",&arr[i]);
    }
    int *p=&arr[N-1];
    for(i=N-1;i>=0;i--)
    {
        printf("%d\t",*p);
        p=p-1;
    }
   return 0;
}
```

```
Enter number of element in the array:5
ENter arr element [0]: 1
ENter arr element [1]: 2
ENter arr element [2]: 3
ENter arr element [3]: 4
ENter arr element [4]: 5
5 4 3 2 1
```

```
Enter number of element in the array:3
ENter arr element [0]: 10
ENter arr element [1]: 20
ENter arr element [2]: 30
30 20 10
```

La 8.4

```
/*
Antarin Ghosal
LA8.4 WAP to swap three numbers in cyclic order using Call by Reference. In other words, WAP that
takes three variable (a, b, c) in as separate parameters and rotates the values stored so that
value a goes to be, b, to c and c to a.
*/


#include <stdio.h>

cyclic(int *i,int *j,int *k)
{
```

```
        int temp=*j;
        *j=*i;
        *i=*k;
        *k=temp;
}
int main ()
    {
    int a,b,c;
    printf("Enter the value of a b and c: ");
    scanf("%d %d %d",&a,&b,&c);
    printf("VAlue before cyclic swap A:%d\tB:%d\tC:%d\n",a,b,c);
    cyclic(&a,&b,&c);
    printf("VAlue after cyclic swap A:%d\tB:%d\tC:%d",a,b,c);
   return 0;
}
```

```
Enter the value of a b and c: 10 20 30
VAlue before cyclic swap A:10   B:20    C:30
VAlue after cyclic swap A:30    B:10    C:20
```

```
Enter the value of a b and c: 1 2 3
VAlue before cyclic swap A:1    B:2     C:3
VAlue after cyclic swap A:3     B:1     C:2
```

Sa 8.1

```
/*
Antarin Ghosal
SA8.1 WAP to create, initialize, assign and access a pointer variable.
*/


#include <stdio.h>

int main ()
    {
    int a=5;
    int *p1;
    p1=&a;

    printf("%d ",*p1);

   return 0;
}
```

5

Sa 8.2

```c
/*
Antarin Ghosal
SA8.2 WAP to print size of different types of pointer variables.
*/


#include <stdio.h>

int main ()
    {

        printf("\nsize of int pointer: %d",sizeof(int*));
        printf("\nsize of char pointer: %d",sizeof(char*));
        printf("\nsize of float pointer: %d",sizeof(float*));
        printf("\nsize of double pointer: %d",sizeof(double*));
   return 0;
}
```

```
size of int pointer: 8
size of char pointer: 8
size of float pointer: 8
size of double pointer: 8
```

Sa 8.3

```c
/*
Antarin Ghosal
SA8.3 WAP to add two numbers using pointers.
*/


#include <stdio.h>

int main ()
    {
    int a=5,*p1=&a;
    int b=6,*p2=&b;
```

```
    int c= *p1+*p2;
    printf("SUM: %d",c);

   return 0;
}
```

```
SUM: 11
```

Sa 8.4

```
/*
Antarin Ghosal
SA8.4 WAP to swap two numbers using call by reference.
*/


#include <stdio.h>

int swap(int *a,int *b)
{
    int temp=*b;
    *b=*a;
    *a=temp;
}
int main ()
    {
    int x,y;
    printf("ENter the Value of x and y: ");
    scanf("%d %d",&x,&y);

    printf("Before swaping :\na:%d\tb:%d\n",x,y);

    swap(&x,&y);

    printf("After swaping :\na:%d\tb:%d\n",x,y);
   return 0;
}
```

```
ENter the Value of x and y: 10 20
Before swaping :
a:10    b:20
After swaping :
a:20    b:10
```

```
ENter the Value of x and y: 20 40
Before swaping :
a:20    b:40
After swaping :
a:40    b:20
```

La 9.5

```c
/*Author : Antarin Ghosal
Program : WAP to sort an array using Pointer.*/


#include<stdio.h>

void bubblesort();

int main(){
    int arr[6]={6,3,7,1,9,2};

    bubblesort(arr,6);

    return 0;
}

void bubblesort(int *p,int n){
    int i,j,temp;
    for(i=1;i<n;i++){
        for(j=0;j<n-i;j++){
            if(*(p+j)<*(p+j+1)){
                temp=*(p+j);
                *(p+j)=*(p+j+1);
                *(p+j+1)=temp;
            }
        }
    }

    printf("The sorted array is : ");
    for(i=0;i<6;i++){
        printf("%d,",p[i]);
    }
}
```

```
The sorted array is : 9,7,6,3,2,1,
```

La 9.6

```c
/*Author : Antarin Ghosal
Program : WAP to count vowels and consonants in a string using pointer.*/

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

int main(){
    char s[100];
    char *p;
    int vow=0,consts=0;

    printf("\nEnter a string : ");
    gets(s);

    p=s;

    while(*p!='\0'){
        if(*p=='A'||*p=='E'||*p=='I'||*p=='O'||*p=='U'||*p=='a'||*p=='e'||*p=='i'||*p=='o'
||*p=='u'){
            vow++;
        }
        else{
            if(*p!=' '){
                consts++;
            }
        }
    p++;
    }

    printf("The number of vowels Present are : %d",vow);
    printf(" And consonants are : %d",consts);

    return 0;
}
```

```
Enter a string : Antarin
The number of vowels Present are : 3 And consonants are : 4
```

```
Enter a string : Hello world
The number of vowels Present are : 3 And consonants are : 7
```

La 9.7

```c
/*Author : Antarin Ghosal
Program : WAP to print a string in reverse using a pointer.*/


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

int main(){
    char s[]="Hello world";
    int i,l;

    l=strlen(s);

    printf("The reversed string is : ");
    for(i=l;i>=0;i--){
        printf("%c",*(s+i));
    }

    return 0;
}
```

```
The reversed string is : dlrow olleH
```

La 9.8

```c
/*Author : Antarin Ghosal
Program : WAP to find the largest element stored in an array of n elements by using
dynamic memory
allocation*/


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

int main(){
    int n,*a,i,s=0,max;

    printf("Enter the number of elements : ");
    scanf("%d",&n);

    a=(int *)malloc(n*sizeof(int));
```

```
    if(a==NULL){
        printf("Unsuccessful !!");
        exit(0);
    }

    printf("Enter the array Elements : ");
    for(i=0;i<n;i++){
        scanf("%d",&a[i]);
    }

    for(i=0;i<n;i++){
        if(a[i]>a[i-1]){
            max=a[i];
        }
        else max=a[i-1];
    }

    printf("The largest element is : %d",max);

    return 0;
}
```

```
Enter the number of elements : 5
Enter the array Elements : 1
2
3
5
The largest element is : 5
```

```
Enter the number of elements : 3
Enter the array Elements : 1
4
2
The largest element is : 4
```

La 9.9

```
/*Author : Antarin Ghosal
Program : WAP to bubble sort array elements declared dynamically using call by reference.*/


#include<stdio.h>

void bubblesort();

int main(){
    int arr[6]={6,3,7,1,9,2};

    bubblesort(arr,6);

    return 0;
}

void bubblesort(int *p,int n){
    int i,j,temp;
    for(i=1;i<n;i++){
        for(j=0;j<n-i;j++){
```

```
            if(*(p+j)<*(p+j+1)){
                temp=*(p+j);
                *(p+j)=*(p+j+1);
                *(p+j+1)=temp;
            }
        }
    }

    printf("The sorted array is : ");
    for(i=0;i<6;i++){
        printf("%d,",p[i]);
    }
}
```

```
The sorted array is : 9,7,6,3,2,1,
```

Sa 9.5

```
/*Author : Antarin Ghosal
Program : WAP to print a string using pointer.*/


#include<stdio.h>

int main(){
    char str[100];
    char *p;
    printf("\nEnter a string : ");
    gets(str);

    p = str;

    printf("\nEntered string is : ");
    while(*p!='\0')
        printf("%c",*p++);

    return 0;
}
```

```
Enter a string : hello

Entered string is : hello
```

```
Enter a string : antarin

Entered string is : antarin
```

Sa 9.6

```
/*Author : Antarin Ghosal
Program : WAP to count vowels in a string using pointer.*/
```

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

int main(){
    char s[100];
    char *p;
    int vow=0;

    printf("\nEnter a string : ");
    gets(s);

    p=s;

    while(*p!='\0'){
        if(*p=='A'||*p=='E'||*p=='I'||*p=='O'||*p=='U'||*p=='a'||*p=='e'||*p=='i'||*p=='o'||*p=='u'){
            vow++;
        }
    p++;
    }

    printf("The number of vowels Present are : %d",vow);

    return 0;
}
```

```
Enter a string : antarin
The number of vowels Present are : 3
```

```
Enter a string : Hello world
The number of vowels Present are : 3
```

Sa 9.7

```c
/*Author : Antarin Ghosal
Program : WAP to store n elements in an array using dynamic memory allocation and print the elements
using pointer.*/


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

int main(){
    int n,*a,i,s=0;

    printf("Enter the number of elements : ");
    scanf("%d",&n);

    a=(int *)malloc(n*sizeof(int));

    if(a==NULL){
        printf("Unsuccessful !!");
        exit(0);
    }

    printf("Enter the array Elements : ");
    for(i=0;i<n;i++){
        scanf("%d",&a[i]);
    }
```

```
    return 0;
}

int bubble
```

```
Enter the number of elements : 5
Enter the array Elements : 1
2
3
4
5

Entered string is : 12345
```

```
Enter the number of elements : 3
Enter the array Elements : 1
2
3

Entered string is : 123
```

Ha 9.2

```c
#include<stdio.h>
#include<stdlib.h>
int main()
{
    int n,*a,i,max,*b,N;
    int k=0;
    printf("enter number of elment of the array: ");
    scanf("%d",&n);
    a=(int*)malloc(n*sizeof(int));
    b=(int*)malloc(n*sizeof(int));

    printf("Enter the cyclic switch: ");
    scanf("%d",&N);
    if(a==NULL)
    {
        printf("MEMORY ALLOCATION UNSUCCESFULL");
        exit(0);
    }
    else
    {
        printf("\ENTER THE ARRAY ELEMENT ONE by one\n:");
        for(i=0;i<n;i++)
        {
            printf("Enter element number [%d]: ",i+1);
            scanf("%d",(a+i));
        }
    k=N;
    for(i=0;i<n-N;i++)
        *(b+i)=*(a+k++);
    k=0;
    for(i=n-N;i<n;i++)
        *(b+i)=*(a+k++);

    printf("AFTER LEFT CYCLIC SWITCH OF VALUE %d\n",N);

    for(i=0;i<n;i++)
        printf("%d\t",*(b+i));

    }


    return 0;
}
```

```
enter number of elment of the array: 5
Enter the cyclic switch: 1
TER THE ARRAY ELEMENT ONE by one
:Enter elemrnt number [1]: 1
Enter elemrnt number [2]: 2
Enter elemrnt number [3]: 3
Enter elemrnt number [4]: 4
Enter elemrnt number [5]: 5
AFTER LEFT CYCLIC SWITCH OF VALUE 1
2       3       4       5       1
```

```
enter number of elment of the array: 3
Enter the cyclic switch: 2
TER THE ARRAY ELEMENT ONE by one
:Enter element number [1]: 1
Enter element number [2]: 2
Enter element number [3]: 3
AFTER LEFT CYCLIC SWITCH OF VALUE 2
3       1       2
```

Ha 9.3

```c
#include<stdio.h>
#include<string.h>
#include <ctype.h>
int main()
{
    int n;char ch[100],*str=ch;
    int vc=0,c=0,i;
    printf("Enter the string:");
    scanf("%[^\n]s",ch);

    for(i=0;i<strlen(ch);i++)
    {
        if(*(str+i)=='A'||*(str+i)=='E'||*(str+i)=='I'||*(str+i)=='O'||*(str+i)=='U'||*(str+i)=='a'||*(str+i)=='e'||*(str+i)=='i'||*(str+i)=='o'||*(str+i)=='u')
            vc++;
        else if(isalpha(*(str+i)))
                c++;
    }
    printf("VOWEL: %d\n",vc);
    printf("CONSONANT: %d\n",c);

return 0;
}
```

```
Enter the string:antarin
VOWEL: 3
CONSONANT: 4
```

```
Enter the string:Hello world
VOWEL: 3
CONSONANT: 7
```

Ha 9.4

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

void swap(char *x, char *y)
{
    char temp;
    temp = *x;
    *x = *y;
    *y = temp;
}
void permute(char *a, int l, int r)
{
int i;
if (l==r)
    printf("%s\n",a);
else
{
    for(i=l;i<=r;i++)
    {
        swap((a+l),(a+i));
        permute(a,l+1, r);
        swap((a+l),(a+i));
    }
}
}

int main()
{
    char str[100];
    printf("Enter the string:");
    scanf("%[^\n]s",str);
    int n = strlen(str);
    permute(str, 0, n-1);
    return 0;
}
```

```
Enter the string:hel
hel
hle
ehl
elh
leh
lhe
```

```
Enter the string:123
123
132
213
231
321
312
```

Ha 9.5

```c
#include <stdio.h>
#include <string.h>
void swap(char* str)
{

    char c=0;
    int length=0,i=0;
    length = strlen(str);

    if (length % 2 == 0)
    {
        for(i=0;i<length;i+=2)
        {
            c=str[i];
            str[i]=str[i+1];
            str[i+1] =c;
        }
        printf("%s\n", str);
    }
    else {

        printf("NA\n");
    }
}

int main()
{
    char str[100];
    printf("Enter the string:");
    scanf("%[^\n]s",str);

    swap(str);

    return 0;
}
```

```
Enter the string:he
eh
```

```
Enter the string:an
na
```

Ha 9.6

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


void main()
{
    char str[100], sub[100];
    int count=0,count1=0;

    int i,j,l,l1,l2;

    printf("Enter a string : ");
```

```
    scanf("%[^\n]s", str);

    l1=strlen(str);

    printf("\nEnter a substring : ");
    scanf(" %[^\n]s", sub);

    l2=strlen(sub);

    for(i=0;i<l1;)
    {
        j=0;
        count=0;
        while((str[i]==sub[j]))
        {
            count++;
            i++;
            j++;
        }
        if(count==l2)
        {
            count1++;
            count=0;
        }
        else
            i++;
    }
    printf("%s occurs %d times in %s", sub, count1, str);
}
```

```
Enter a string : hello

Enter a substring : ell
ell occurs 1 times in hello
```

```
Enter a string : antarin

Enter a substring : a
a occurs 2 times in antarin
```

Ha 10.1

```
/*
Name: Antarin ghosal
WAP to create a new data type DATE with the help of structure and typedef. Write the
following user defined functions for the date manipulations.
a) To return next date
b) To return next month.
c) To return next year.
d) to add few days in a date.
e) To add few months in a date.
f) To add few years in a date.
g) To return month name from a date.
h) To display date in various format such as DD-MM-YYYY, DD.MM.YY etc.*/
#include<stdio.h>
typedef struct date
{
    int day;
```

```
    int month;
    int year;
}d;
int main()
{
    d date;
    int n,x;
    printf("Enter Date :~");
    scanf("%i %i %i",&date.day,&date.month,&date.year);
    printf("Enter Command Number For Function:~\n");
    printf("1 for Next Day\n");
    printf("2 for Next Month\n");
    printf("3 for Next Year\n");
    printf("4 for Add Date\n");
    printf("5 for Add Month\n");
    printf("6 for Add Year\n");
    printf("7 for Different Styles\n");
    printf("Enetr Function key:~");
    scanf("%i",&n);
    switch (n)
    {
    case 1:
        printf("Next Date Is %i/%i/%i",date.day+1,date.month,date.year);
        break;
    case 2:
        printf("Next Month Is %i",date.month+1);
        break;
    case 3:
        printf("Next Year Is %i",date.year+1);
        break;
    case 4:
        printf("Enter Date To Add:~");
        scanf("%i",&x);
        printf("Resultant Date Is %i",date.year+x);
        break;
    case 5:
        printf("Enter Month To Add:~");
        scanf("%i",&x);
        printf("Resultant Month Is %i",date.month+x);
        break;
    case 6:
        printf("Enter Year To Add:~");
        scanf("%i",&x);
        printf("Resultant Year Is %i",date.year+x);
        break;
    case 7:
        printf("Date Is %i/%i/%i\n",date.day+1,date.month,date.year);
        printf("Date Is %i.%i.%i\n",date.day+1,date.month,date.year);
        printf("Date Is %i-%i-%i\n",date.day+1,date.month,date.year);
        break;
    default:
        printf("Please Enter Valid Number");
        break;
    }
```

```
}
```

```
Enter Date :~10 1 21
Enter Command Number For Function:~
1 for Next Day
2 for Next Month
3 for Next Year
4 for Add Date
5 for Add Date
6 for Add Date
7 for Different Styles
Enetr Function key:~2
Next Month Is 2
```

```
Enter Date :~10 1 12
Enter Command Number For Function:~
1 for Next Day
2 for Next Month
3 for Next Year
4 for Add Date
5 for Add Month
6 for Add Year
7 for Different Styles
Enetr Function key:~4
Enter Date To Add:~1 3 22
Resultant Date Is 13
```

Ha 10.2

```c
/*
Name: Antarin ghosal
HA10.2 WAP to calulate the difference between two time periods. Times are given in hr, min
and sec.
*/

#include<stdio.h>

struct time{
    int second,min,hr;
}t1,t2,D;


int main()
{
    printf("Time1:\n");
    printf("ENTER TIME:hr:");
    scanf("%d",&t1.hr);
    printf("min:");
    scanf("%d",&t1.min);
    printf("Sec:");
```

```c
    scanf("%d",&t1.second);

    printf("Time2:\n");
    printf("ENTER TIME:hr:");
    scanf("%d",&t2.hr);
    printf("min:");
    scanf("%d",&t2.min);
    printf("Sec:");
    scanf("%d",&t2.second);

    //DIFRENCE

    D.hr=t1.hr-t2.hr;
    D.min=t1.min-t2.min;
    D.second=t1.second-t2.second;

    while(D.second<0)
    {
        D.second=60+D.second;
        D.min=D.min-1;
    }
    while(D.min<0)
    {
        D.min+=60;
        D.hr=-1;
    }

    printf("TIME DIFFRENCE:%d:%d:%d",D.hr,D.min,D.second);
    return 0;
}
```

```
Time1:
ENTER TIME:hr:2
min:26
Sec:50
Time2:
ENTER TIME:hr:1
min:26
Sec:40
TIME DIFFRENCE:1:0:10
```

```
Time1:
ENTER TIME:hr:10
min:20
Sec:40
Time2:
ENTER TIME:hr:1
min:26
Sec:40
TIME DIFFRENCE:-1:54:0
```

Ha 10.3

```c
/*
Name: Antarin ghosal
HA10.3 WAP to extract individual bytes from an unsigned int using union.
*/

#include<stdio.h>
union tagname
```

```
{
    unsigned int a;
    unsigned char s[4];
}object;

int main()
{
    char i; //for loop counter

    printf("ENter an integer number: ");
    scanf("%d",&object.a);

    printf("Integer number: %ld, hex: %X\n",object.a,object.a);

    printf("Indivisual bytes: ");
    for(i=3;i>=0;i--)
        printf("%02X ",object.s[i]);

    printf("\n");
    return 0;
}
```

```
Enter an integer number: 4
Integer number: 4, hex: 4
Indivisual bytes: 00 00 00 04
```

```
Enter an integer number: 10
Integer number: 10, hex: A
Indivisual bytes: 00 00 00 0A
```

La 10.1

```
/*Author : Antarin Ghosal
Program : WAP to store n student's information (i.e. student's roll no, name, gender,
marks in 5 subjects
etc) of an educational institute and display all the data with total marks of each
student, using
array of structure. If full mark of each subject is considered as 100 and pass mark as 40,
then
display the list of students failed in a particular subject.
*/



#include<stdio.h>

struct student
{
    int roll;
    char name[30];
    char gender;
    int marks1;
    int marks2;
```

```
    int marks3;
    int marks4;
    int marks5;
}
stu[5]={
    {1,"Ramesh",'M',74,68,70,76,80},
    {2,"Suresh",'M',89,90,86,74,83},
    {3,"Kamli",'F',78,36,78,80,62},
    {4,"Ananya",'F',58,93,32,78,80},
    {5,"Kamlesh",'M',89,64,80,28,90},
};



int main(){

    printf("The Student details of individual student are : \n");
    for(int i=0;i<5;i++){
        printf("\t  %d  \t  %s  \t  %c  \t  %d  \t  %d  \t  %d  \t  %d  \t  %d  \t\n",stu[
i].roll,stu[i].name,stu[i].gender,stu[i].marks1,stu[i].marks2,stu[i].marks3,stu[i].marks4,
stu[i].marks5);
    }

    return 0;
}
```

```
The Student details of individual student are :
          1       Ramesh          M       74      68      70      76      80
          2       Suresh          M       89      90      86      74      83
          3       Kamli           F       78      36      78      80      62
          4       Ananya          F       58      93      32      78      80
          5       Kamlesh         M       89      64      80      28      90
```

La 10.2

```
/*
Name: Antarin ghosal
LA10.2 WAP to add two distances (in km-meter) using structures.
*/

#include<stdio.h>
struct dis
{
    int km;
    int m;
```

```c
};

int main()
{
    struct dis d1,d2,sum;

    printf("Enter distance1:KM:");
    scanf("%d",&d1.km);
    printf("M:");
    scanf("%d",&d1.m);


    printf("Enter distance2:KM:");
    scanf("%d",&d2.km);
    printf("M:");
    scanf("%d",&d2.m);

    sum.km=d1.km+d2.km;
    sum.m=d1.m+d2.m;

    if(sum.m>1000)
        {
            int temp=sum.m/1000;
            sum.km=sum.km+temp;
            sum.m=sum.m%1000;
        }

    printf("Total distance: %dkm %dm",sum.km,sum.m);


    return 0;
```

```
Enter distance1:KM:10
M:20
Enter distance2:KM:30
M:
20
Total distance: 40km 40m
```

```
Enter distance1:KM:5
M:10
Enter distance2:KM:8
M:10
Total distance: 13km 20m
```

La 10.3

```c
#include<stdio.h>
struct Time
{
    int h;
    int m;
    int s;
};

int main()
```

```c
{
    struct Time T1,T2,S;

    printf("\nEnter time 1\n");
    printf("Hour:");
    scanf("%d",&T1.h);
    printf("MINUTE:");
    scanf("%d",&T1.m);
    printf("SECOUND:");
    scanf("%d",&T1.s);


    printf("\nEnter time 2\n");
    printf("Hour:");
    scanf("%d",&T2.h);
    printf("MINUTE:");
    scanf("%d",&T2.m);
    printf("SECOUND:");
    scanf("%d",&T2.s);

    S.h=T1.h+T2.h;
    S.m=T1.m+T2.m;
    S.s=T1.s+T2.s;


    while(S.s>60)
    {
        S.s-=60;
        S.m+=1;
    }

    while(S.m>60)
    {
        S.m-=60;
        S.h+=1;
    }
printf("\nT1 : %d:%d:%d",T1.h,T1.m,T1.s);
printf("\nT2 : %d:%d:%d",T2.h,T2.m,T2.s);
printf("\nADDED TIME: %d:%d:%d",S.h,S.m,S.s);

    return 0;
}
```

```
Enter time 1
Hour:10
MINUTE:20
SECOUND:30

Enter time 2
Hour:10
MINUTE:20
SECOUND:20

T1 : 10:20:30
T2 : 10:20:20
ADDED TIME: 20:40:50
```

```
Enter time 1
Hour:20
MINUTE:30
SECOUND:40

Enter time 2
Hour:20
MINUTE:30
SECOUND:40

T1 : 20:30:40
T2 : 20:30:40
ADDED TIME: 41:1:20
```

La 10.4

```c
#include<stdio.h>
struct info
{
    char name[20];
    char Gender;
    char designaton[25];
    char depatment[25];
    float BP;
    float GP;
};

int main()
{

    printf("Enter number of employee: ");
    int n,i;
    scanf("%d",&n);
    struct info employe[n];

    printf("\n\t\tEnter information of the employee\n");
    float HR,DA;
    for(i=0;i<n;i++)
        {
            printf("\t\t\t\tEMPLOYE %d\n\n",i+1);
            printf("ENter name: ");
            scanf(" %[^\n]s",&employe[i].name);
            printf("Enter Gender: ");
            scanf(" %c",&employe[i].Gender);
            printf("Enter DEGIGNATION: ");
            scanf(" %[^\n]s",&employe[i].designaton);
            printf("Enter DEPARTMENT: ");
            scanf(" %[^\n]s",&employe[i].depatment);
```

```
            printf("ENTER BP(basic pay): ");
            scanf("%f",&employe[i].BP);
            HR=(float)25*employe[i].BP/100;
            DA=(float)75*employe[i].BP/100;

            employe[i].GP=employe[i].BP+HR+DA;
        }

        //DISPLAY
        printf("\n %10s\t %10s\t %10s\t %10s\t %10s\t
%10s\n","NAME","GENDER","DESIGNATION","DEPARTMANT","BP","GP");

        for(i=0;i<n;i++)
        printf("\n %10s\t %10c\t %10s\t %10s\t %10.2f\t
%10.2f\n",employe[i].name,employe[i].Gender,employe[i].designaton,employe[i].depatment,emp
loye[i].BP,employe[i].GP);


    return 0;
}
```

```
              Enter information of the employee
                            EMPLOYE 1

 ENter name: Antarin
 Enter Gender: M
 Enter DEGIGNATION: manager
 Enter DEPARTMENT: It
 ENTER BP(basic pay): 1000000
                            EMPLOYE 2

 ENter name: Kolluri
 Enter Gender: M
 Enter DEGIGNATION: Ceo
 Enter DEPARTMENT: IT
 ENTER BP(basic pay): 5000000

       NAME         GENDER      DESIGNATION     DEPARTMANT             BP             GP

    Antarin              M         manager             It      1000000.00      2000000.00

    Kolluri              M             Ceo             IT      5000000.00      10000000.00
```

La 10.5

```
/*
Name: Antarin ghosal
WAP to declare an union named as ABC having three members a, b and c as character, integer
and double respectively. Assign user entered values to these members respectively one by
one
and display these values immediately. Again assign these user entered values to a, b, c
one by
one all together and display these values at last. Find the difference.*/
#include<stdio.h>
union ABC
{
```

```
    char a;
    int b;
    double c;
}ob;
int main()
{
    int n;
    char s;
    double x;
    printf("Enter Value Of int:~");
    scanf("%i",&n);
    printf("Enter Charater Value:~\n");
    scanf("\n%c",&s);
    printf("Enter Double Value:~\n");
    scanf("%ld",&x);
    ob.a = s;
    printf("Current Value In %u Is %c After Adding a Value\n",&ob,ob.a);
    ob.b = n;
    printf("Current Value In %u Is %i After Adding b Value\n",&ob,ob.b);
    ob.c = x;
    printf("Current Value In %u Is %i After Adding b Value\n",&ob,ob.c);
    ob.a = s;
    ob.b = n;
    ob.c = x;
    printf("Current Value In %u Is %c After Adding All Values\n",&ob,ob.a);
    printf("Current Value In %u Is %i After Adding All Values\n",&ob,ob.b);
    printf("Current Value In %u Is %ld After Adding All Values",&ob,ob.c);
}
```

```
Enter Value Of int:~2
Enter Charater Value:~
a
Enter Double Value:~
2.3
Current Value In 2565951552 Is a After Adding a Value
Current Value In 2565951552 Is 2 After Adding b Value
Current Value In 2565951552 Is 2 After Adding b Value
Current Value In 2565951552 Is ☻ After Adding All Values
Current Value In 2565951552 Is 2 After Adding All Values
Current Value In 2565951552 Is 2 After Adding All Values
```

Sa 10.1

```
/*
Name: Antarin ghosal
SA10.1 WAP to store one student's information (i.e. student's roll no, name, gender,
marks etc) of an
```

```c
educational institute and display all the data, using structure.
24/05/2022
*/
#include<stdio.h>
#include<string.h>
struct stdinf
{
    char name[20];
    int roll;
    char gender;
    int marks;
};

int main()
{
    struct stdinf std1={"Antarin",2106096,'M',100};
    printf("Name:%s\nRoll:%d\nGender:%c\nMarks:%d",std1.name,std1.roll,std1.gender,std1.ma
rks);
    return 0;
}
```

```
Name:Antarin
Roll:2106069
Gender:M
Marks:100
```

Sa 10.2

```c
/*
Name: Antarin ghosal
SA10.2 WAP to store n student's information (i.e. student's roll no, name, gender, marks
etc) of an
educational institute and display all the data, using array of structure.
24/05/2022
*/
#include<stdio.h>
#include<string.h>
struct stdinf
{
    char name[20];
    int roll;
    char gender;
    int marks;
};

int main()
{
```

```c
    int n,i;
    printf("Enter the value of n:(total number of student)");
    scanf("%d",&n);
    struct stdinf std[n];
    //input
    for(i=0;i<n;i++)
        {
            printf("\n-------for student %d---------",i+1);
            printf("\nEnter name: ");
            scanf("%s",&std[i].name);
            printf("\nEnter roll: ");
            scanf("%d",&std[i].roll);
            printf("\nEnter gender: ");
            scanf(" %c",&std[i].gender);
            printf("\nEnter marks: ");
            scanf("%d",&std[i].marks);
        }
    //display
    printf("\n\nSno.\tName\tRoll\tGender\tmarks\n");
    for(i=0;i<n;i++)
        printf("%d\t%s\t%d\t%c\t%d\n",i+1,std[i].name,std[i].roll,std[i].gender,std[i].mar
ks);

    return 0;

}
```

```
Enter the value of n:(total number of student)2

-------for student 1---------
Enter name: Antarin

Enter roll: 2106096

Enter gender: M

Enter marks: 100

-------for student 2---------
Enter name: Ayush

Enter roll: 2106137

Enter gender: M

Enter marks: 100


Sno.    Name    Roll    Gender  marks
1       Antarin 2106096 M       100
2       Ayush   2106137 M       100
```

Sa 10.4

```c
/*
Name: Antarin ghosal
WAP to add two complex numbers by passing structure to a function
24/05/2022
*/
#include <stdio.h>
typedef struct complex
{
    float real;
    float imag;
} complex;
complex add(complex n1, complex n2)
{
    complex temp;
    temp.real = n1.real + n2.real;
    temp.imag = n1.imag + n2.imag;
    return (temp);
}
int main() {
    complex n1, n2, result;
    printf("For 1st complex number \n");
```

```c
    printf("Enter the real then imaginary parts: ");
    scanf("%f %f", &n1.real, &n1.imag);

    printf("\nFor 2nd complex number \n");
    printf("Enter the real then imaginary parts: ");
    scanf("%f %f", &n2.real, &n2.imag);

    result = add(n1, n2);

    printf("Sum = %.1f + %.1fi", result.real, result.imag);
    return 0;
}
```

```
For 1st complex number
Enter the real then imaginary parts: 10 5

For 2nd complex number
Enter the real then imaginary parts: 5 10
Sum = 15.0 + 15.0i
```

```
For 1st complex number
Enter the real then imaginary parts: 12 1

For 2nd complex number
Enter the real then imaginary parts: 19
3
Sum = 31.0 + 4.0i
```

Sa 10.5

```c
/*
Name: Antarin ghosal
WAP to store n books data such as title, author, pulication, price etc using structures
with
dynamically memory allocation. Display all the books information of a particular author.*/
#include<stdio.h>
#include<string.h>
#define SIZE 20
struct bookdetail
{
    char name[20];
    char author[20];
    int pages;
    float price;
};
```

```c
void output(struct bookdetail v[],int n)
{
    int i,t=1;
    for(i=0;i<n;i++,t++)
    {
        printf("\n");
        printf("Book No.%d\n",t);
        printf("\t\tBook %d Name is=%s \n",t,v[i].name);
        printf("\t\tBook %d Author is=%s \n",t,v[i].author);
        printf("\t\tBook %d Pages is=%d \n",t,v[i].pages);
        printf("\t\tBook %d Price is=%f \n",t,v[i].price);
        printf("\n");
    }
}
void main()
{
    struct bookdetail b[SIZE];
    int num,i;
    printf("Enter the Numbers of Books:");
    scanf("%d",&num);
    printf("\n");
    for(i=0;i<num;i++)
    {
        printf("\t=:Book %d Detail:=\n",i+1);
        printf("\nEnter the Book Name:\n");
        scanf("%s",b[i].name);
        printf("Enter the Author of Book:\n");
        scanf("%s",b[i].author);
        printf("Enter the Pages of Book:\n");
        scanf("%d",&b[i].pages);
        printf("Enter the Price of Book:\n");
        scanf("%f",&b[i].price);
    }
    output(b,num);
}
```

```
Enter the Numbers of Books:2

        =:Book 1 Detail:=

Enter the Book Name:
alaska
Enter the Author of Book:
james
Enter the Pages of Book:
270
Enter the Price of Book:

100
        =:Book 2 Detail:=

Enter the Book Name:
look
Enter the Author of Book:
james
Enter the Pages of Book:
240
Enter the Price of Book:
200

Book No.1
                Book 1 Name is=alaska
                Book 1 Author is=james
                Book 1 Pages is=270
                Book 1 Price is=100.000000


Book No.2
                Book 2 Name is=look
                Book 2 Author is=james
                Book 2 Pages is=240
                Book 2 Price is=200.000000
```

Sa 10.6

```c
/*
Name: Antarin ghosal
WAP to read item details used in party and calculate all expenses, divide expenses in all
friends equally.*/
#include <stdio.h>
```

```c
#define MAX 50
//structure definition
typedef struct item_details
{
    char itemName[30];
    int quantity;
    float price;
    float totalAmount;
}item;
int main()
{
    item thing[MAX];
    int i,choice;
    int count=0;
    float expenses=0.0f;
    i=0;
    //infinite loop
    do{
        printf("Enter item details [%2d]:\n",i+1);
        printf("Item:  ");
        fgets(thing[i].itemName,30,stdin);
        printf("Price? ");
        scanf("%f",&thing[i].price);
        printf("Quantity:  ");
        scanf("%d",&thing[i].quantity);
        thing[i].totalAmount=(float)thing[i].quantity*thing[i].price;
        expenses += thing[i].totalAmount;
        i++;
        count++;
        printf("\nWant to more items (press 1): ");
        scanf("%d",&choice);
        getchar();
    }while(choice==1);
    //print all items
    printf("All details are:\n");
    for(i=0; i<count; i++)
    {
        printf("%-30s\t %.2f \t %3d \n %.2f\n",thing[i].itemName, thing[i].price,
thing[i].quantity, thing[i].totalAmount);
    }
    printf("#### Total expense: %.2f\n",expenses);
    printf("Want to divide in friends (press 1 for yes): ");
    scanf("%d",&choice);
    if(choice==1)
    {
        printf("How many friends? ");
        scanf("%d",&i);
        printf("Each friend will have to pay: %.2f\n",(expenses/(float)i));
    }
    printf("~Thanks for using me... Enjoy your party!!!~\n");
    return 0;
}
```

```
Enter item details [ 1]:
Item?  book
Price? 100
Quantity?  10

Want to more items (press 1): 1
Enter item details [ 2]:
Item?  games
Price? 10
Quantity?  2

Want to more items (press 1):
2
All details are:
book
                                100.00          10
 1000.00
games
                                10.00     2
 20.00
#### Total expense: 1020.00
Want to divide in friends (press 1 for yes): 1
How many friends? 2
Each friend will have to pay: 510.00
~Thanks for using me... Enjoy your party!!!~
```

Sa 10.7

```c
/*
Name: Antarin ghosal
WAP to declare an union named as ABC having two members a as character and b as
integer . Assign ‘A’ to a, 1088 to b respectively through an union variable ob one by one
and
display these these values immediately. Now assign these values to a, b through ob all
together and display these values at last. Find the difference.*/
#include<stdio.h>
union Ob
{
    char a;
    int b;
}ob;
int main()
{
    int n;
    char s;
```

```c
    printf("Enter Value Of int:~");
    scanf("%i",&n);
    printf("Enter Charater Value:~");
    scanf("%c",&s);
    ob.a = s;
    printf("Current Value In %u Is %c After Adding a Value\n",&ob,ob.a);
    ob.b = n;
    printf("Current Value In %u Is %i After Adding b Value\n",&ob,ob.b);
    ob.a = s;
    ob.b = n;
    printf("Current Value In %u Is %c After Adding Both Values\n",&ob,ob.a);
    printf("Current Value In %u Is %i After Adding Both Value",&ob,ob.b);
}
```

```
Enter Value Of int:~4
Enter Charater Value:~Current Value In 1891323968 Is
 After Adding a Value
Current Value In 1891323968 Is 4 After Adding b Value
Current Value In 1891323968 Is ♦ After Adding Both Values
Current Value In 1891323968 Is 4 After Adding Both Value
```

```
Enter Value Of int:~1
Enter Charater Value:~Current Value In 3550236736 Is
 After Adding a Value
Current Value In 3550236736 Is 1 After Adding b Value
Current Value In 3550236736 Is ☺ After Adding Both Values
Current Value In 3550236736 Is 1 After Adding Both Value
```