```
/*
Name            : Deepanshu Gupta
Section         : E
Roll Number     : 20
1. WAP to insert a substring into a string from a particular position.
*/

#include<stdio.h>
int main () {
   char a[50], b[50];
   int l1, l2, x, i;
   printf("\t\t\t******INPUT******\n");
   printf("Enter a string: ");
   gets(a);
   printf("Enter a substring: ");
   gets(b);
   printf("Enter the index: ");
   scanf("%d", &x);
   for (l1=0; a[l1]!='\0'; l1++);
   for (l2=0; b[l2]!='\0'; l2++);
   for (i=l1; i>=x; i--)
      a[i+l2]=a[i];
   for (i=0; i<l2; i++)
      a[i+x]=b[i];
   printf("\t\t\t*****OUTPUT*****\n");
   printf("New String = %s", a);
   return 0;
}
```

******INPUT******

Enter a string: Hell World

Enter a substring: o Computer

Enter the index: 4

*****OUTPUT*****

New String = Hello Computer World

```
/*
Name        : Deepanshu Gupta
Section     : E
Roll Number : 20
2. Write a c code that loops over the string and replace each character to the character immediately preceding it in the alphabet.
Example
Input String: HELLO
Output String: GDKKN
*/


#include<stdio.h>
int main () {
   char a[50];
   int l, i;
   printf("\t\t\t******INPUT******\n");
   printf("Enter a string: ");
   gets(a);
   for (l=0; a[l]!='\0'; l++);
   for (i=0; i<l; i++)
      a[i]=a[i]-1;
   printf("\t\t\t*****OUTPUT*****\n");
   printf("New String = %s", a);
   return 0;
}
```

******INPUT******

Enter a string: USE

*****OUTPUT*****

New String = TRD

/*

Name : Deepanshu Gupta

Section : E

Roll Number : 20

3. Write a program that takes your full name (First, middle and last) as input and displays the abbreviations of the first and middle names except the last name which is displayed as it is. For example, if your name is Aman Singh Rawat, then the output should be A.S.Rawat.

*/

```
#include<stdio.h>
int main() {
	char f[50], r[20];
	int i, j=0, a, k=0;
	printf("\t\t\t******INPUT******\n");
	printf("Enter name: ");
	gets(f);
	r[0]=f[0];
	for(i=0; f[i]!='\0'; i++) {
		if(f[i]==' ') {
			j++;
			if(j==1)
				r[1]='.', r[2]=f[i+1];
			else if(j==2){
				r[3]='.';
				for(a=i+1; f[a]!='\0'; a++){
					r[4+k]=f[a];
					k++;
				}
			}
		}
	}
```

```
        r[4+k]='\0';
        printf("\t\t\t*****OUTPUT*****\n");
        printf("Result: %s", r);
        return 0;
}
```

******INPUT******

Enter name: Deepanshu Kumar Gupta

*****OUTPUT*****

Result: D.K.Gupta

```
/*
Name          : Deepanshu Gupta
Section       : E
Roll Number   : 20
4. Write a program to check if the two strings entered by user are anagrams or not. Two words are Said to be anagrams if the letters of one word can be rearranged to form the other word.
For example, HEART and EARTH are anagrams of each other.
*/

#include<stdio.h>
int main () {
   char a[100], b[100];
   int i, j, count=0, l1, l2;
   printf("\t\t\t******INPUT******\n");
   printf("Enter first string: ");
   gets(a);
   printf("Enter second string: ");
   gets(b);
   for(l1=0; a[l1]!='\0'; l1++);
   for(l2=0; b[l2]!='\0'; l2++);
   printf("\t\t\t*****OUTPUT*****\n");
   if (l1==l2) {
      for(i=0; i<l1; i++){
         for(j=0; j<l1; j++) {
            if (a[i]>=a[j]){
               char temp=a[i];
               a[i]=a[j];
               a[j]=temp;
            }
            if (b[i]>=b[j]){
               char temp=b[i];
```

```
                b[i]=b[j];
                b[j]=temp;
            }
        }
    }
    for(i=0; i<l2; i++)
        if (a[i]==b[i]) count++;
    if (count==l1) printf("Both the strings are anagrams of each other.");
    else printf("Both the strings are not anagrams of each other.");
  }
  else printf("Both the strings are not anagrams of each other.");
  return 0;
}
```

******INPUT******

Enter first string: LISTEN

Enter second string: SILENT

*****OUTPUT*****

Both the strings are anagrams of each other.

******INPUT******

Enter first string: HEAD

Enter second string: DOWN

*****OUTPUT*****

Both the strings are not anagrams of each other.

```
/*
Name        : Deepanshu Gupta
Section     : E
Roll Number : 20
5. WAP using dynamic memory allocation to insert elements in an array and perform the following operation:
i. Searching of an element.
ii. Replace the searched elements with its cube and print the array
Note: make 2 different user defined function to perform the operation.
*/

#include<stdio.h>
#include<stdlib.h>
int search(int, int, int *);
void replace(int, int, int *);
int main() {
   int n, i, a, v;
   printf("\t\t\t******INPUT******\n");
   printf("Enter the length of an array: ");
   scanf("%d", &n);
   int *arr=(int*)malloc(n*sizeof(int));
   for (i=0; i<n; i++) {
      printf("Enter the element %d: ", i+1);
      scanf("%d", arr+i);
   }
   n=n+1;
   printf("Enter the element and index:\n");
   scanf("%d %d", &a, &v);
   for (i=n-1; i>=v-1; i--)
      *(arr+i)=*(arr+i-1);
   *(arr+v-1)=a;
   printf("Enter element to be search: ");
```

```
    scanf("%d", &a);
    int x=search(a, n, arr);
    printf("\t\t\t*****OUTPUT*****\n");
    if (x==0) printf("Element not found\n");
    else {
        printf("Element found at position = %d\n", x);
        replace(x, n, arr);
    }
    return 0;
}
int search(int a, int n, int* arr){
    int i, c=0;
    for (i=0; i<n; i++){
       if (*(arr+i)==a){
          c=i+1;
          break;
       }
    }
    return c;
}
void replace(int x, int n, int* arr){
    *(arr+x-1)=(*(arr+x-1) * *(arr+x-1) * *(arr+x-1));
    for (int i=0; i<n; i++)
       printf("%d\t", *(arr+i));
    printf("\n");
}
```

******INPUT******

Enter the length of an array: 5

Enter the element 1: 10

Enter the element 2: 20

Enter the element 3: 30

Enter the element 4: 40

Enter the element 5: 50

Enter the element and index:

100 2

Enter element to be search: 40

*****OUTPUT*****

Element found at position = 5

10 100 20 30 64000 50

******INPUT******

Enter the length of an array: 5

Enter the element 1: 1

Enter the element 2: 2

Enter the element 3: 3

Enter the element 4: 4

Enter the element 5: 5

Enter the element and index:

10 3

Enter element to be search: 20

*****OUTPUT*****

Element not found

```
/*
Name            : Deepanshu Gupta
Section         : E
Roll Number     : 20
6. WAP to reverse the digits of a number using pointer.
*/

#include<stdio.h>
int main() {
   int num, *p, rev, n=0, *r;
   p=&num, r=&n;
   printf("\t\t\t******INPUT******\n");
   printf("Enter number: ");
   scanf("%d", p);
   while(*p!=0){
      rev=*p%10;
      *r=*r*10 + rev;
      *p/=10;
   }
   printf("\t\t\t*****OUTPUT*****\n");
   printf("New number: %d", *r);
   return 0;
}
```

******INPUT******

Enter number: 12345

*****OUTPUT*****

New number: 54321

```
/*
Name        : Deepanshu Gupta
Section     : E
Roll Number : 20
7. WAP to add elements of two unequal size array into 3rd array using Dynamic Memory Allocation.
*/

#include<stdio.h>
#include<stdlib.h>
int main() {
   int *a, *b, *c, n1, n2, x, i;
   printf("\t\t\t******INPUT******\n");
   printf("Enter size of first array: ");
   scanf("%d", &n1);
   a=(int *)malloc(n1*sizeof(int));
   for(i=0; i<n1; i++) {
      printf("Enter element %d: ", i+1);
      scanf("%d", a+i);
   }
   printf("Enter size of second array: ");
   scanf("%d", &n2);
   b=(int *)malloc(n2*sizeof(int));
   for(i=0; i<n2; i++) {
      printf("Enter element %d: ", i+1);
      scanf("%d", b+i);
   }
   if (n1>n2) x=n1;
   else x=n2;
   c=(int *)malloc(x*sizeof(int));
   if (x==n1){
```

```
        for(i=0; i<x; i++){
            if (i<n2)
                *(c+i)=*(a+i)+*(b+i);
            else
                *(c+i)=*(a+i);
        }
    }
    else if (x==n2){
        for(i=0; i<x; i++){
            if (i<n1)
                *(c+i)=*(a+i)+*(b+i);
            else
                *(c+i)=*(b+i);
        }
    }
    printf("\t\t\t*****OUTPUT*****\n");
    printf("Result: \n");
    for(i=0; i<x; i++)
        printf("%d\t", *(c+i));
    return 0;
}
```

******INPUT******

Enter size of first array: 5

Enter element 1: 1

Enter element 2: 2

Enter element 3: 3

Enter element 4: 4

Enter element 5: 5

Enter size of second array: 3

Enter element 1: 6

Enter element 2: 7

Enter element 3: 8

*****OUTPUT*****

Result:

7 9 11 4 5

```
/*
Name          : Deepanshu Gupta
Section       : E
Roll Number   : 20
8. Define a structure to store the roll no., name, age (between 11 to 14) and address of students. Input and store records of more than 10 students. Write a function to print the names of all the students having age 14 and even roll number.
*/


#include<stdio.h>
void pnt(int, int, char[50]);
struct students {
   char name[50], add[200];
   int roll_no, age;
};
int main () {
   int n, i;
   printf("\t\t\t******INPUT******\n");
   printf("Enter no. of details to be entered: ");
   scanf("%d", &n);
   struct students s[n];
   for (i=0; i<n; i++) {
      printf("Student %d -\n", i+1);
      printf("Enter name: ");
      scanf("%s", s[i].name);
      printf("Enter roll number: ");
      scanf("%d", &s[i].roll_no);
      printf("Enter address: ");
      scanf("%s", s[i].add);
      do {
      printf("Enter age (must between 11 to 14): ");  scanf("%d", &s[i].age);
      } while (s[i].age<11 || s[i].age>14);
   }
```

```
    printf("\t\t\t*****OUTPUT*****\n");
    for(i=0; i<n; i++)
        pnt(s[i].age, s[i].roll_no, s[i].name);
    return 0;
}
void pnt(int a, int r, char s[50]){
    if(a==14 && r%2==0)
        printf("%s\n", s);
}
```

******INPUT******

Enter no. of details to be entered: 12

Student 1 -

Enter name: Raja

Enter roll number: 1

Enter address: UP

Enter age (must between 11 to 14): 10

Enter age (must between 11 to 14): 11

Student 2 -

Enter name: Ram

Enter roll number: 2

Enter address: Tamil Nadu

Enter age (must between 11 to 14): 14

Student 3 -

Enter name: Mohan

Enter roll number: 3

Enter address: Haryana

Enter age (must between 11 to 14): 15

Enter age (must between 11 to 14): 14

Student 4 -

Enter name: Roy

Enter roll number: 4

Enter address: Bihar

Enter age (must between 11 to 14): 14

Student 5 -

Enter name: Deepanshu

Enter roll number: 5

Enter address: Delhi

Enter age (must between 11 to 14): 14

Student 6 -

Enter name: Vaibhav

Enter roll number: 6

Enter address: Jharkhand

Enter age (must between 11 to 14): 12

Student 7 -

Enter name: Sumit

Enter roll number: 7

Enter address: UP

Enter age (must between 11 to 14): 13

Student 8 -

Enter name: Ashutosh

Enter roll number: 8

Enter address: Kerala

Enter age (must between 11 to 14): 14

Student 9 -

Enter name: Yuvraj

Enter roll number: 9

Enter address: Haryana

Enter age (must between 11 to 14): 12

Student 10 -

Enter name: Aalokik

Enter roll number: 10

Enter address: Delhi

Enter age (must between 11 to 14): 13

Student 11 -

Enter name: Rishabh

Enter roll number: 11

Enter address: Punjab

Enter age (must between 11 to 14): 14

Student 12 -

Enter name: Shivam

Enter roll number: 12

Enter address: Delhi

Enter age (must between 11 to 14): 14

*****OUTPUT*****

Ram

Roy

Ashutosh

Shivam

/*

Name : Deepanshu Gupta

Section : E

Roll Number : 20

9. Write a structure to store the names, salary and working hours per day (fixed at the time of joining) of 10 employees. Calculate the increased monthly salary depending on the working hours per day as given below. Print the name of all the employees along with their new salaries.

Hours of work per day 8 10 >=12

Increase in salary Rs.2500 Rs. 5000 Rs.7500

*/

```
#include<stdio.h>
struct employee {
   char name[50];
   int salary, work_h, new_salary;
};
int main () {
   struct employee s[10];
   printf("\t\t\t******INPUT******\n");
   for (int i=0; i<10; i++) {
      printf("Employee %d -\n", i+1);
      printf("Enter name: ");
      scanf("%s", s[i].name);
      printf("Enter salary: ");
      scanf("%d", &s[i].salary);
      printf("Enter working hours: ");
      scanf("%d", &s[i].work_h);
   }
   printf("\t\t\t*****OUTPUT*****\n");
   for(int i=0; i<10; i++) {
      if (s[i].work_h>=8 && s[i].work_h<10)
```

```
            s[i].new_salary=s[i].salary+2500;
        else if (s[i].work_h>=10 && s[i].work_h<12)
            s[i].new_salary=s[i].salary+5000;
        else if (s[i].work_h>=12)
            s[i].new_salary=s[i].salary+7500;
        else s[i].new_salary=s[i].salary;
        printf("%s\t%d\n", s[i].name, s[i].new_salary);
    }
    return 0;
}
```

******INPUT******

Employee 1 -

Enter name: Raja

Enter salary: 20000

Enter working hours: 7

Employee 2 -

Enter name: Ram

Enter salary: 25000

Enter working hours: 8

Employee 3 -

Enter name: Mohan

Enter salary: 27500

Enter working hours: 9

Employee 4 -

Enter name: Roy

Enter salary: 25000

Enter working hours: 10

Employee 5 -

Enter name: Vaibhav

Enter salary: 30000

Enter working hours: 11

Employee 6 -

Enter name: Sumit

Enter salary: 28000

Enter working hours: 12

Employee 7 -

Enter name: Ashutosh

Enter salary: 28500

Enter working hours: 8

Employee 8 -

Enter name: Shivam

Enter salary: 29000

Enter working hours: 15

Employee 9 -

Enter name: Deepanshu

Enter salary: 35000

Enter working hours: 12

Employee 10 -

Enter name: Yuvraj

Enter salary: 32000

Enter working hours: 14

*****OUTPUT*****

Raja 20000

Ram 27500

Mohan 30000

Roy 30000

Vaibhav 35000

Sumit 35500

Ashutosh 31000

Shivam 36500

Deepanshu 42500

Yuvraj 39500

```
/*
Name        : Deepanshu Gupta
Section     : E
Roll Number : 20
10. Write a program to read 20 integers in a file. Separate them into two different files
prime.txt and nonprime.txt such that all prime numbers are copied in prime.txt and
remaining numbers in nonprime.txt.
*/


#include<stdio.h>
int main() {
   int i, a;
   FILE *f=fopen("integers.txt", "r");
   FILE *p1=fopen("prime.txt", "w");
   FILE *np1=fopen("nonprime.txt", "w");
   if (f==NULL || p1==NULL || np1==NULL)
      printf("Files not open to write");
   else {
      printf("\t\t\t******OUTPUT******\n");
      for (i=0; i<20; i++) {
         int count=0;
         fscanf(f, "%d", &a);
         if (a==1) printf("1 is a composite number\n");
         else{
            for(int j=2; j<=a/2; j++){
               if (a%j==0) {
                  count=1;
                  break;
               }
            }
            if (count==0) fprintf(p1, "%d\n", a);
            else fprintf(np1, "%d\n", a);
```

```
            }
        }
        fclose(f), fclose(p1), fclose(np1);
    }
    FILE *p2=fopen("prime.txt", "r");
    FILE *np2=fopen("nonprime.txt", "r");
    if (p2==NULL || np2==NULL)
        printf("Files not open to read");
    else {
        printf("Prime Numbers ('prime.txt')-\n");
        while(fscanf(p2, "%d", &a)!=(-1))
            printf("%d\t", a);
        printf("\n");
        printf("Non-Prime Numbers ('nonprime.txt')-\n");
        while(fscanf(np2, "%d", &a)!=(-1))
            printf("%d\t", a);
        printf("\n");
        fclose(p2), fclose(np2);
    }
    return 0;
}
```

******INPUT******

1 2 3 4 5 6 7 8 9 10 11 12
13 14 15 16 17 18 19 20

*****OUTPUT*****

1 is a composite number

Prime Numbers ('prime.txt')-

2 3 5 7 11 13 17 19

Non-Prime Numbers ('nonprime.txt')-

4 6 8 9 10 12 14 15 16 18 20

```
/*
Name          : Deepanshu Gupta
Section       : E
Roll Number   : 20
11. Write a program to create a file with some contents. Display its contents. Also print all the positions of a given alphabet (user input) in the file.
*/
#include<stdio.h>
int main() {
   char c[500], x[3]; int count=0, i;
   FILE *f=fopen("data.txt","w");
   if (f==NULL) printf("File not opened");
   else {
      printf("\t\t\t******INPUT******\n");
      printf("Enter some content: "); scanf(" %[^\n]s", c);
      fputs(c, f); fclose(f);
   }
   FILE *p=fopen("data.txt","r");
   if (p==NULL) printf("File not opened");
   else {
      printf("Enter alphabet: "); scanf("%s", &x);
      printf("\t\t\t*****OUTPUT*****\n");
      printf("Content: %s\n", fgets(c, 500, p));
      printf("Positions = ");
      for (i=0; c[i]!='\0'; i++){
         if (c[i]==x[0]){
            count++;
            printf("%d\t", i+1);
         }
      } fclose(p);
   } return 0;
}
```

******INPUT******

Enter some content: Hello Computer World I am Deepanshu

Enter alphabet: o

*****OUTPUT*****

Content: Hello Computer World I am Deepanshu

Positions = 5 8 17

"""

Name : Deepanshu Gupta

Section : E

Roll Number : 20

12. Write a python program to print factorial of a number.

"""

```
print("\t\t\t******INPUT******")
num=int(input("Enter a number: "))
print("\t\t\t*****OUTPUT*****")
if num<0:
   print("Not possible")
elif num == 0:
   print("Factorial if ", 0, " is ", 1)
else:
   f=1
   for i in range(1, num+1):
      f=f*i
   print("The factorial of ",num," is ",f)
```

******INPUT******

Enter a number: 5

*****OUTPUT*****

The factorial of 5 is 120

"""

Name : Deepanshu Gupta

Section : E

Roll Number : 20

13. Write a program in Python. A library charges a fine for every book returned late. For First 5 days the fine is 50 paisa/day, for 6-10 days fine is one rupee/day and above 10 days fine is 5 Rupees/ per day. If you return the book after 30 days your membership will be cancelled. Write a program to accept the number of days the member is late to return the book and display the fine or the appropriate message.

"""

```
print("\t\t\t******INPUT******")
days=int(input("Enter number of days: "))
print("\t\t\t*****OUTPUT*****")
if days>0 and days<=5:
    print("Fine = Rs. ", 0.50*days)
elif days>5 and days<=10:
    print("Fine = Rs. ", days)
elif days>10 and days<=30:
    print("Fine = Rs. ", 5*days)
elif days>30:
    print("Your membership will be cancelled now and your fine is Rs. ", 5*days)
else:
    print("Days cannot be in negative")
```

******INPUT******

Enter number of days: -5

*****OUTPUT*****

Days cannot be in negative

******INPUT******

Enter number of days: 2

*****OUTPUT*****

Fine = Rs. 1.0

******INPUT******

Enter number of days: 8

*****OUTPUT*****

Fine = Rs. 8

******INPUT******

Enter number of days: 20

*****OUTPUT*****

Fine = Rs. 100

******INPUT******

Enter number of days: 45

*****OUTPUT*****

Your membership will be cancelled now and your fine is Rs. 225

"""

Name : Deepanshu Gupta

Section : E

Roll Number : 20

14. Take input of age of 3 people by user and determine oldest and youngest among them.

"""

```
print("\t\t\t******INPUT******")
n1=int(input("Enter age of person 1: "))
n2=int(input("Enter age of person 2: "))
n3=int(input("Enter age of person 3: "))
print("\t\t\t*****OUTPUT*****")
if n1>n2 and n1>n3:
    print("Person 1 is oldest")
elif n2>n3:
    print("Person 2 is oldest")
else:
    print("Person 3 is oldest")
if n1<n2 and n1<n3:
    print("Person 1 is youngest")
elif n2<n3:
    print("Person 2 is youngest")
else:
    print("Person 3 is youngest")
```

******INPUT******

Enter age of person 1: 20

Enter age of person 2: 23

Enter age of person 3: 22

*****OUTPUT*****

Person 2 is oldest

Person 1 is youngest

"""

Name : Deepanshu Gupta

Section : E

Roll Number : 20

15. A company decided to give bonus of 5% to employee if his/her year of service is more than 5 years. Ask user for their salary and year of service and print the net bonus amount.

"""

```
print("\t\t\t******INPUT******")
salary=int(input("Enter salary: "))
years=int(input("Enter number of years of service: "))
print("\t\t\t*****OUTPUT*****")
if years>5:
    net_bonus=salary+salary*0.05
else: net_bonus=salary
print("Net bonus amount = Rs. ", net_bonus)
```

******INPUT******

Enter salary: 20000

Enter number of years of service: 3

*****OUTPUT*****

Net bonus amount = Rs. 20000

******INPUT******

Enter salary: 25000

Enter number of years of service: 8

*****OUTPUT*****

Net bonus amount = Rs. 26250.0