LAB MANUAL

SEMESTER- I

M.sc DEGREE PROGRAMME

Lab-I - Programming in C++ (502105)

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EX.NO	LIST OF PROGRAMS
1	Arithmetic operators
2	Logical operator
3	Size of variables
4	Simple interest and compound interest
5	Fahrenheit to Celsius
6	Gross salary of the employee
7	Student mark list
8	Eligibility for voting
9	Sorting in ascending order
10	Complementary DNA
11	Standard Genetic Code Table
12	Convert The DNA to RNA
13	Amino Acids
14	Finding Mismatch

EX.NO:1 ARITHMETIC OPERATOR

AIM:

Write a c program for addition, subtraction, multiplication, division, modulus using arithmetic operators.

ALGORITHM:

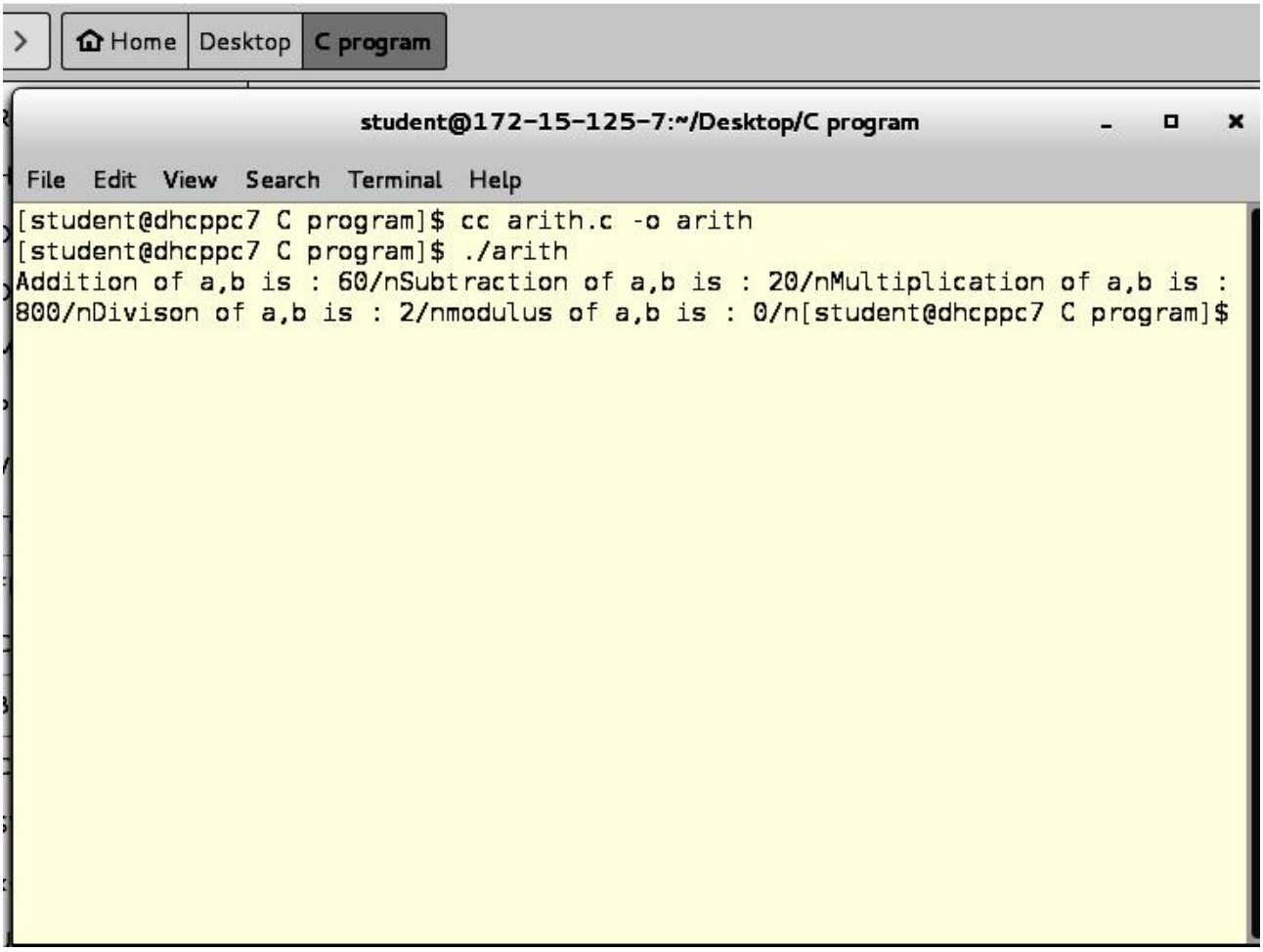
1. Start the program.

1. Declare the variable.
2. Declare the arithmetic operations.
3. Save the program with (.c).
4. Close the program.
5. Run the terminal and obtain the result.
6. Stop the program.

ARITHEMATIC OPERATIONS

```
#include <stdio.h>
 int main()
{
int a=40,b=20, add,sub,mul,div,mod;
add = a+b;
sub = a-b;
mul = a*b;
div = a/b;
mod = a%b;
printf("Addition of a, b is : %d\n", add);
printf("Subtraction of a, b is : %d\n", sub);
printf("Multiplication of a, b is : %d\n", mul);
printf("Division of a, b is : %d\n", div);
printf("Modulus of a, b is : %d\n", mod);
}
```

OUTPUT:



EX.NO:2 LOGICAL OPERATORS

AIM:

Write a c program for comparison of three numbers using logical operator

ALGORITHM:

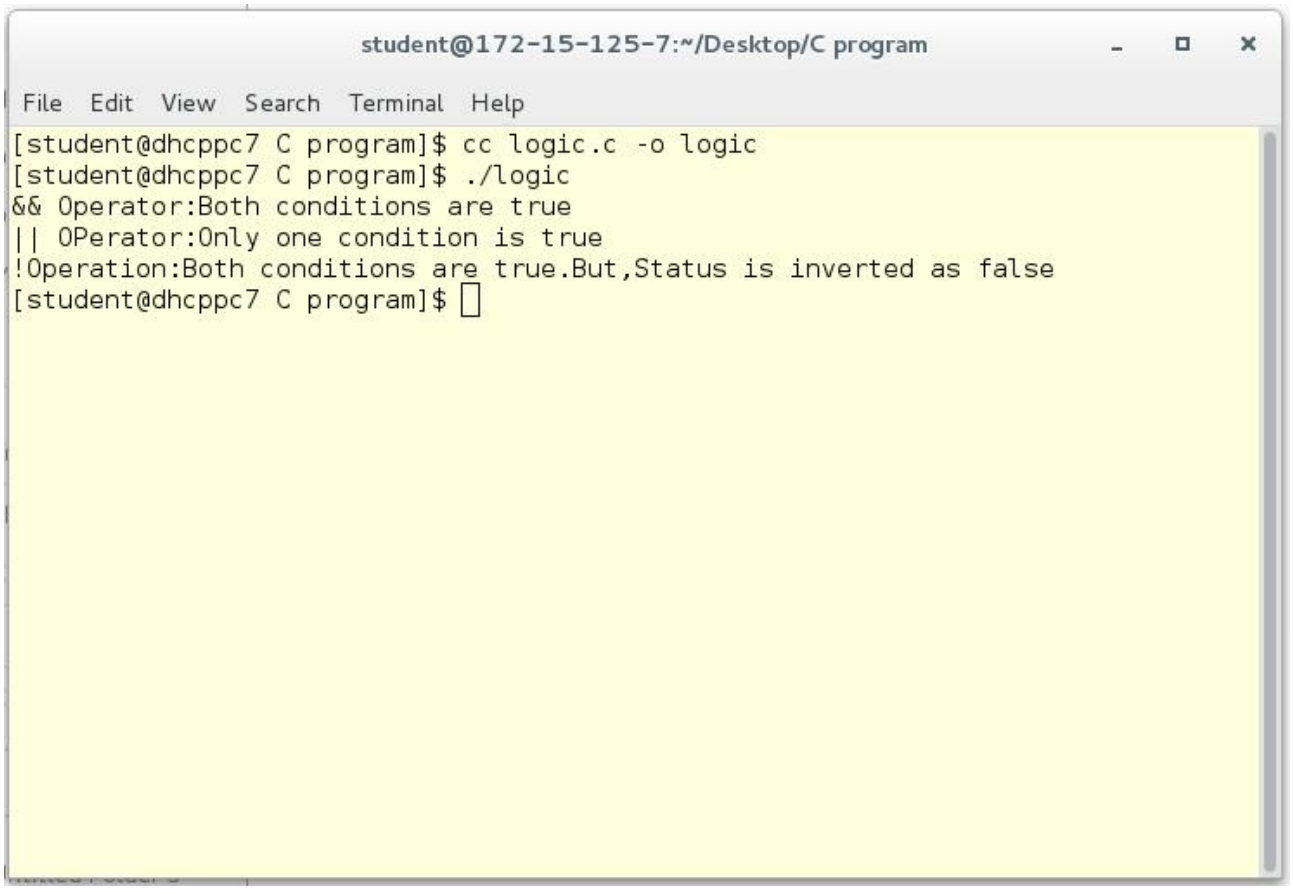
1. Start the program.
2. Declare the variable.
3. Declare the 3 numbers for the comparison of using logical operator.
4. Save the program with (.c).
5. Close the program.
6. Run the terminal and obtain the result.
7. Stop the program.

COMPARITION OF 3 NUMBERS USING LOGICAL OPERATERS (WITHOUT VALUE)

```
#include <stdio.h>
int main()
{
int m=40,n=20;
int o=20,p=30;
if (m>n && m !=0)
{
printf("&& Operator : Both conditions are true\n");
}
if (o>p || p!=20)
{
printf("|| Operator : Only one condition is true\n");
}
if (!(m>n && m !=0))
{
```

```
printf("! Operator : Both conditions are true\n");
}
else
{
printf("! Operator : Both conditions are true. " \
"But, status is inverted as false\n");
}
}
```

OUTPUT:



EX.NO:3 SIZES OF VARIABLES

AIM:

Write a c program for size of variables.

ALGORITHM:

1. Start the program.
2. Declare the variable.
3. Save the program with (.c).
4. Close the program.
5. Run the terminal and obtain the result.
6. Stop the program.

SIZE OF ( ) FUNCTION

```
#include <stdio.h>
#include <limits.h>
int main()
{
int a;
char b;
float c;
double d;
printf("storage size for int data type:%d\n",sizeof (a));
```

```
printf("storage size for char data type:%d\n",sizeof (b));
printf("storage size for float data type:%d\n",sizeof (c));
printf("storage size for double data type:%d\n",sizeof (d));
return 0;
}
```

OUTPUT

EX.NO:4 SIMPLE INTEREST AND COMPOUND INTEREST

AIM:

Write the c program for simple and compound interest.

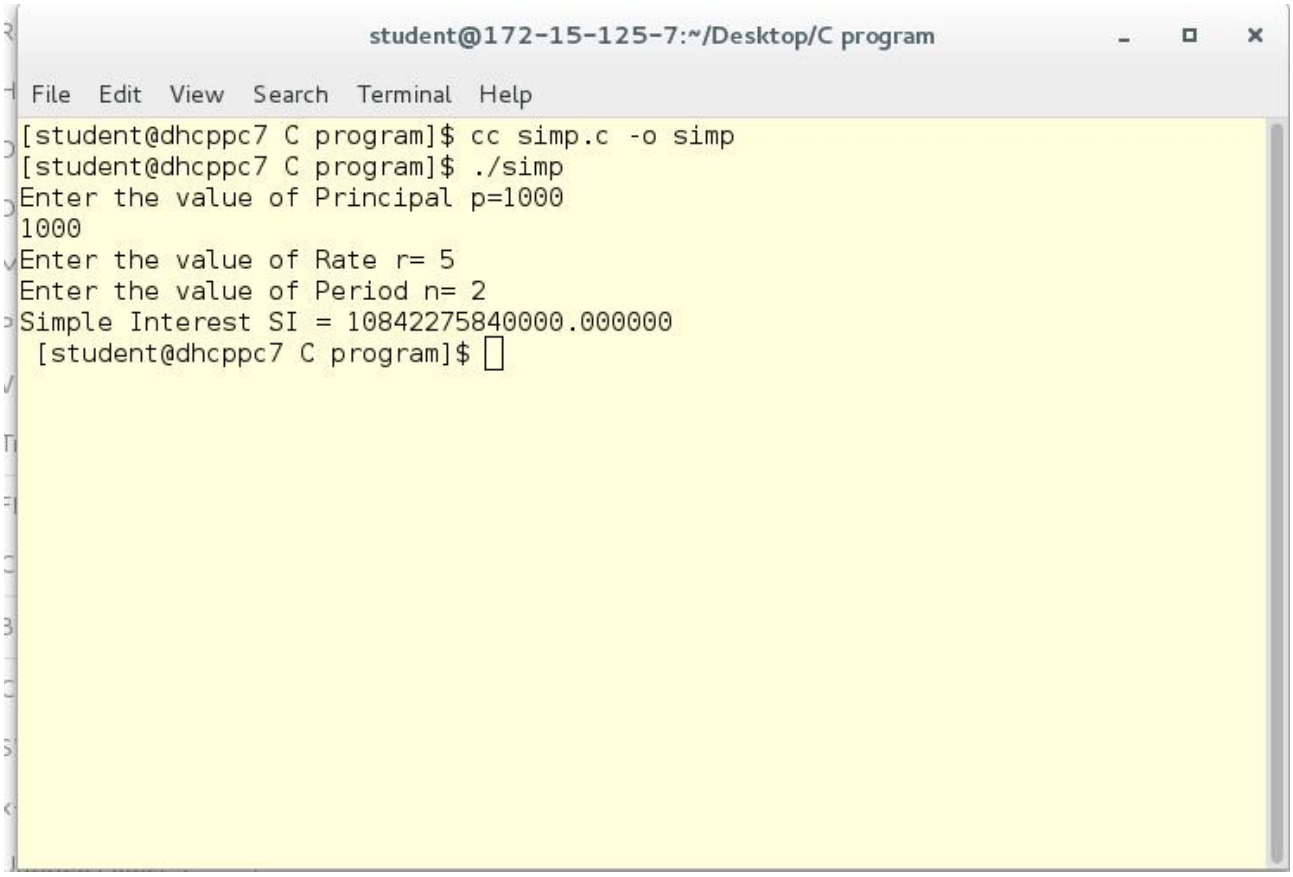
SIMPLE INTEREST

```
#include<stdio.h>
#include<math.h>
 int main()
{
 float p,r,SI;
  int n;
  printf("Enter the value of Principal p =");
  scanf("%f",&p);
  printf("Enter the value of Rate r = ");
  scanf("%f",&r);
  printf("Enter the value of Period n = ");
  scanf("%d \n",&n);
  SI = (p*r*n)/100;
  printf("Simple Interest SI=%f \n",SI);
}
```

COMPOUND INTEREST

```
#include <stdio.h>
int main()
{
float amount, rate, time, CI;
 printf("Enter principle (amount): ");
 scanf("%f", &amount);
 printf("Enter time: ");
 scanf("%f", &time);
 printf("Enter rate: ");
 scanf("%f", &rate);
 CI = amount * (((1 + rate / 100), time)-1);
 printf("Compound Interest = %f", CI); return 0; }
```

OUTPUT:



EX.NO:5 FAHRENHEIT TO CELSIUS

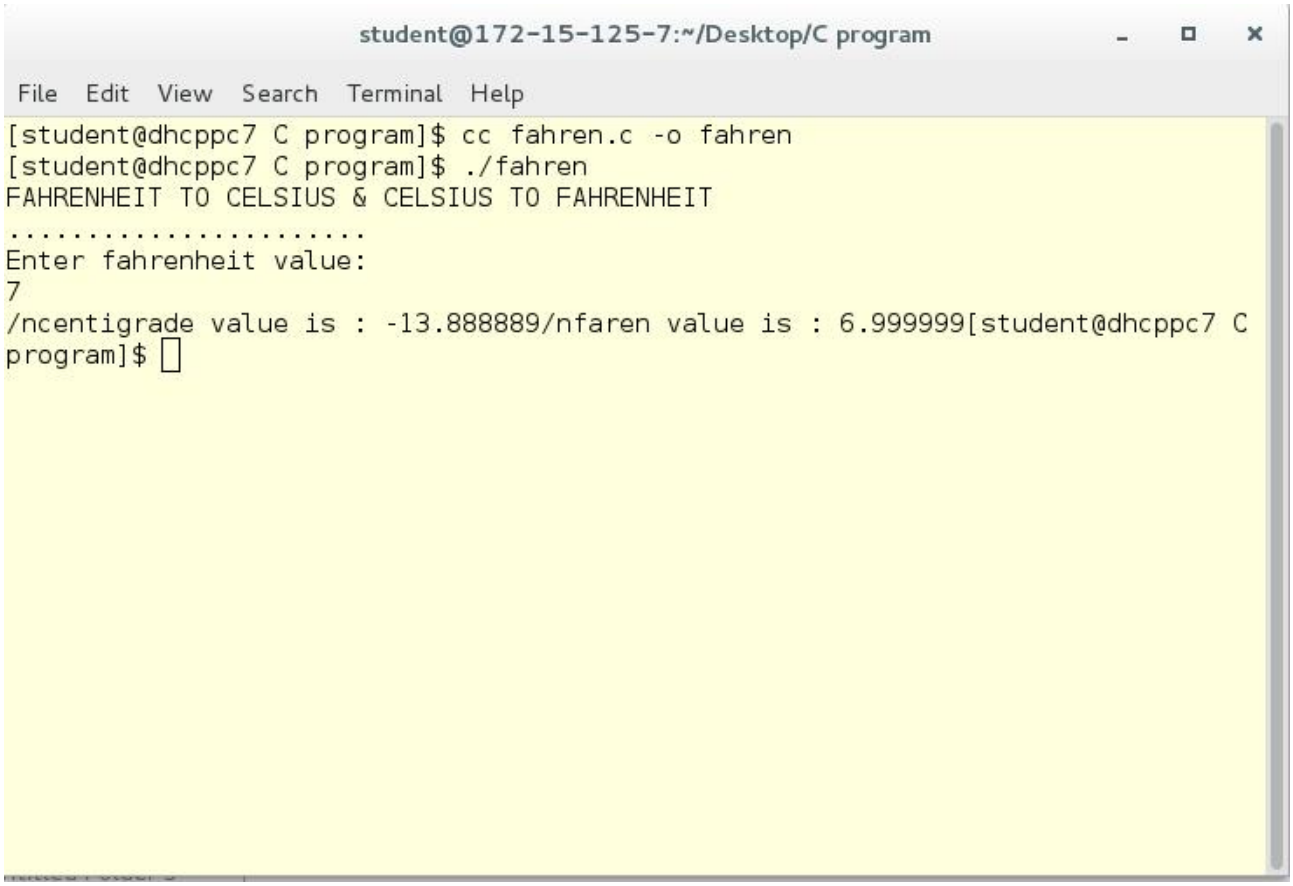
AIM:

To write a c program to find a Fahrenheit to Celsius.

Fahrenheit and celcius

```
#include<stdio.h>

int main()
{
float cent,faren;
printf("FAHRENHEIT TO CELSIUS & CELSIUS TO FAHRENHEIT\n");
printf("--------------------\n");
printf("Enter fahrenheit value:\n");
scanf("%f",&faren);
cent = 5.0/9.0*(faren - 32);
faren = ((9.0/5.0)*cent+32);
printf("\ncentigrade value is : %f",cent);
printf("\nfaren value is : %f",faren);
}
```

OUTPUT



EX.NO:6 GROSSPAY AND NETPAY

AIM:

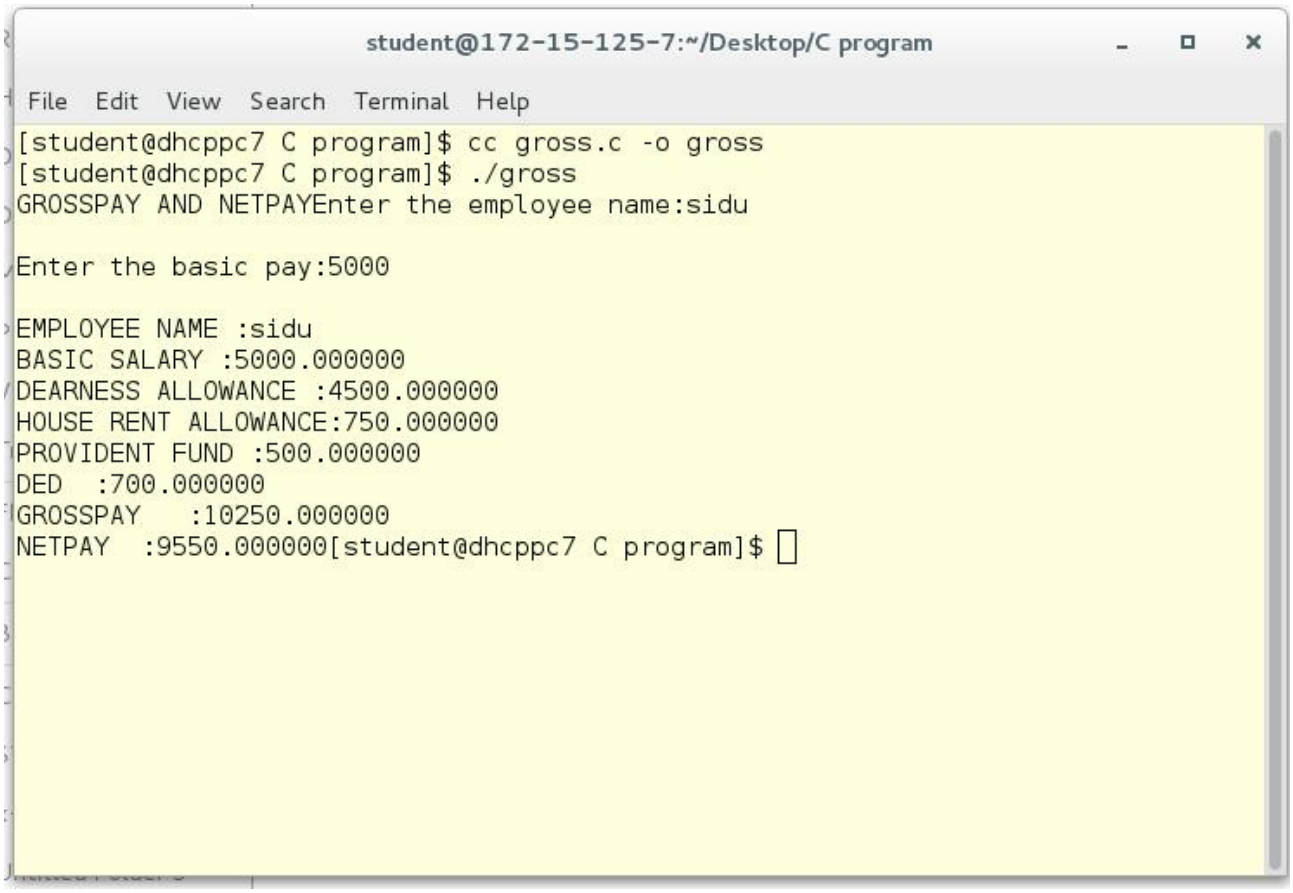
Write the c program for gross pay of the employee.

GROSSPAY AND NETPAY

#include<stdio.h>

```
int main()
{
char name[20];
float basic,da,hra,pf,ns,wc,gpay,npay,ded;
printf("GROSSPAY AND NETPAY");
printf("Enter the employee name:");
scanf("%s",&name);
printf("\nEnter the basic pay:");
scanf("%f",&basic);
if(basic>10)
{
hra=0.15*basic;
da=0.9*basic;
gpay=basic+da+hra;
pf=0.1*basic;
wc=200;
ded=pf+wc;
npay=gpay-ded;
printf("\nEMPLOYEE NAME :%s",name);
printf("\nBASIC SALARY :%f",basic);
printf("\nDEARNESS ALLOWANCE :%f",da);
printf("\nHOUSE RENT ALLOWANCE:%f",hra);
printf("\nPROVIDENT FUND :%f",pf);
printf("\nDED  :%f",ded);
printf("\nGROSSPAY   :%f",gpay);
printf("\nNETPAY  :%f",npay);
}
}
```

OUTPUT



EX.NO.7 STUDENT MARK LIST

AIM:

write a c program to find a student mark list.

ALGORITHM:

1. Start the program.

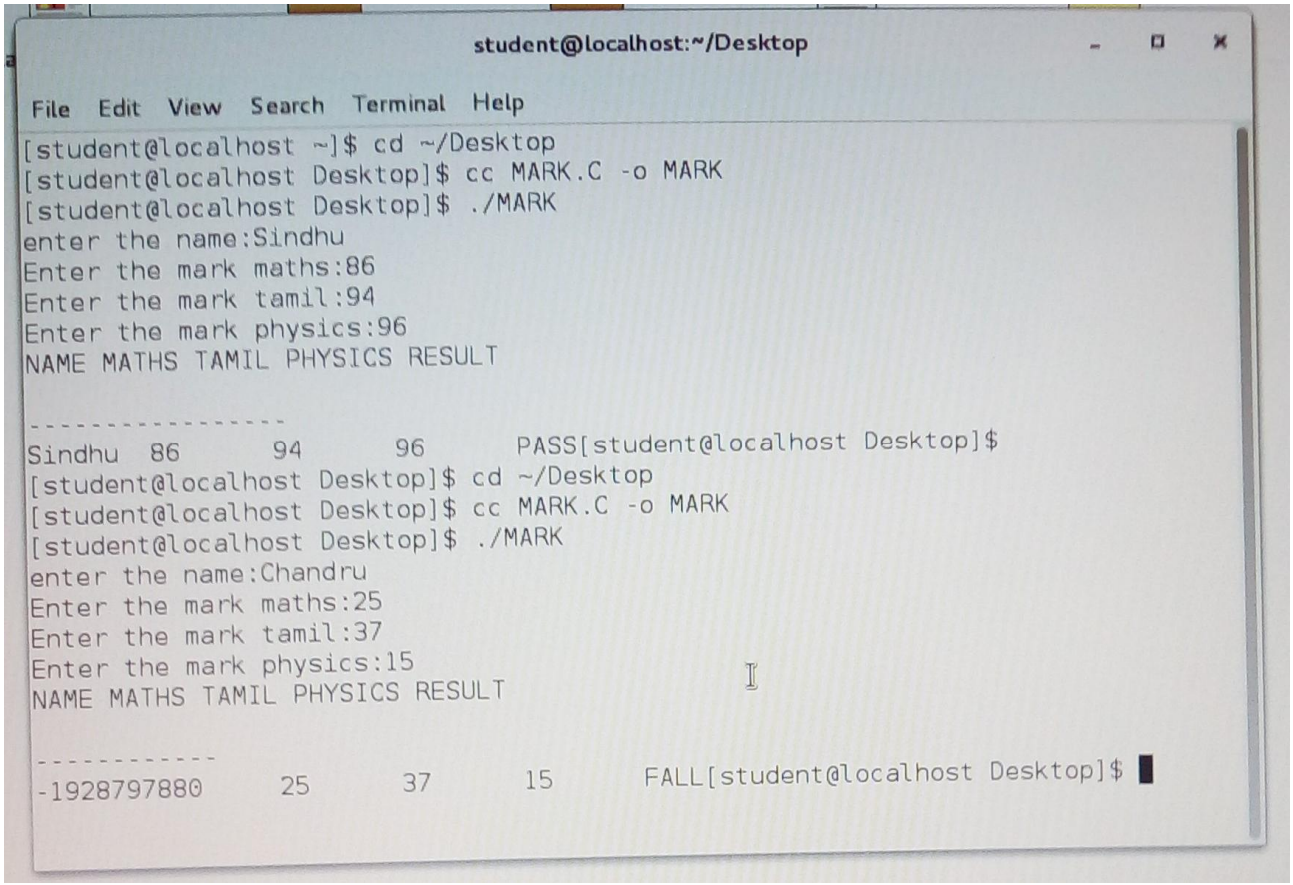
2. Declare the variable.
3. Save the program with (.c).
4. Close the program.
5. Run the terminal and obtain the result.
6. Stop the program.

Mark statement

```
#include<stdio.h>

int main()
{
int i,m1[10],m2[10],m3[10];
char name[20][30];
for(i=1;i<=3;i++);
{
printf("enter the name:");
scanf("%s",& name[i]);
printf("Enter the mark maths:");
scanf("%d",&m1[i]);
printf("Enter the mark tamil:");
scanf("%d",&m2[i]);
printf("Enter the mark physics:");
scanf("%d",&m3[i]);
}
printf("NAME MATHS TAMIL PHYSICS RESULT\n");
for(i=1;i<=3;i++);
{
if(m1[i]>40 && m2[i]>40 && m3[i]>40)
{
printf("\n-----------------\n");
printf("%s\t",name[i]);
printf("%d\t",m1[i]);
printf("%d\t",m2[i]);
printf("%d\t",m3[i]);
printf("PASS");
}
else
{
printf("\n------------\n");
printf("%d\t",name[i]);
printf("%d\t",m1[i]);
printf("%d\t",m2[i]);
printf("%d\t",m3[i]);
printf("FALL");
```

}
}
}

OUTPUT



EX.NO.8 ELIGIBLITY FOR VOTING

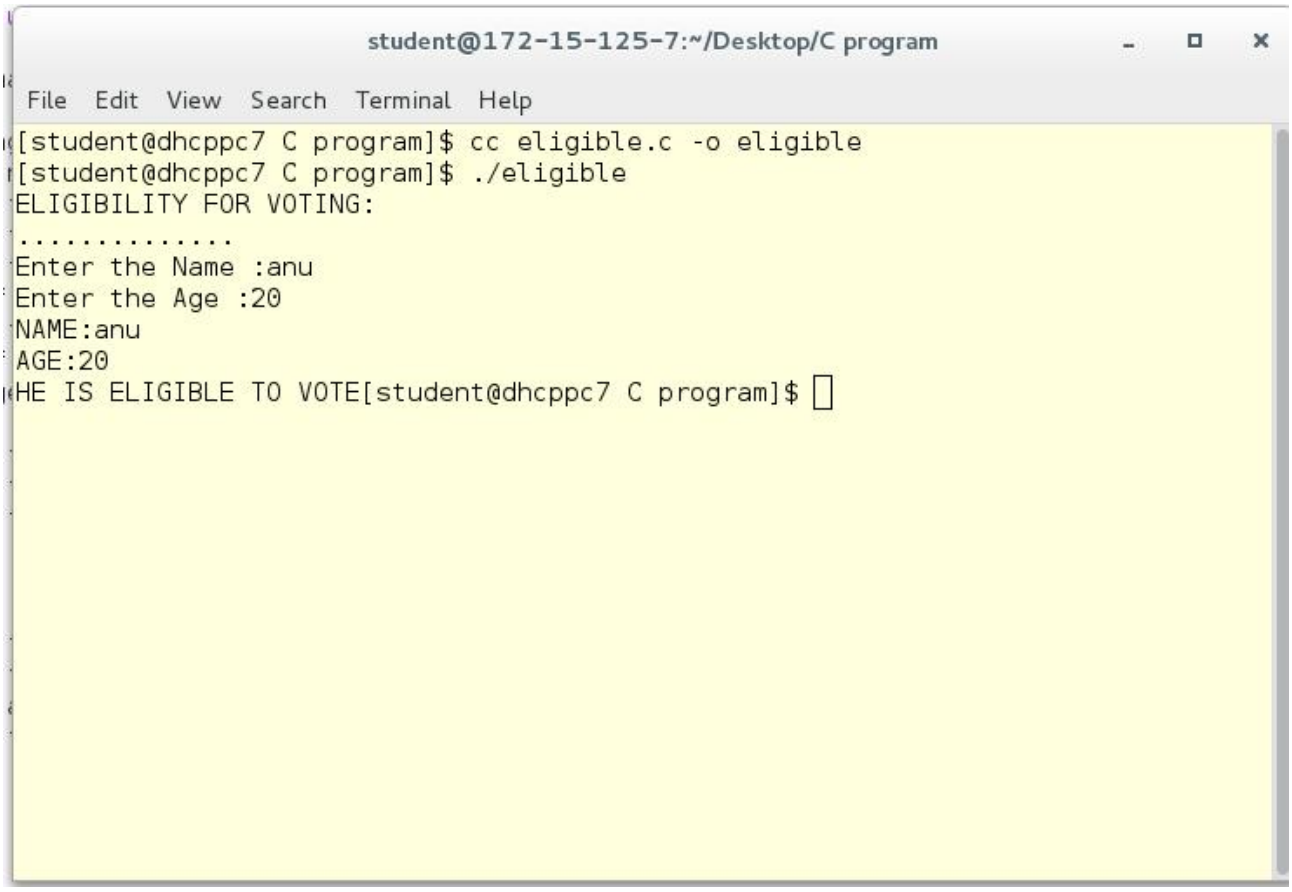
AIM:

To write a c program to find the eligibility for voting

Voting

```
#include<stdio.h>
int main()
{
int age,d;
char name[20];
printf("ELIGIBILITY FOR VOTING:\n");
printf("------------\n");
printf("Enter the Name:");
scanf("%s",&name);
printf("Enter the Age:");
scanf("%d",&age);
if(age>18)
{
printf("NAME:%s\n",name);
printf("AGE:%d\n",age);
printf("HE IS ELIGIBLE TO VOTE");
}
else
{
printf("NAME:%s\n",name);
printf("AGE:%d\n",age);
d=18-age;
printf("\n%d years has to be wait for voting",d);}
}
```

OUTPUT



EX.NO:9 SORTING IN ASCENDING ORDER

AIM:

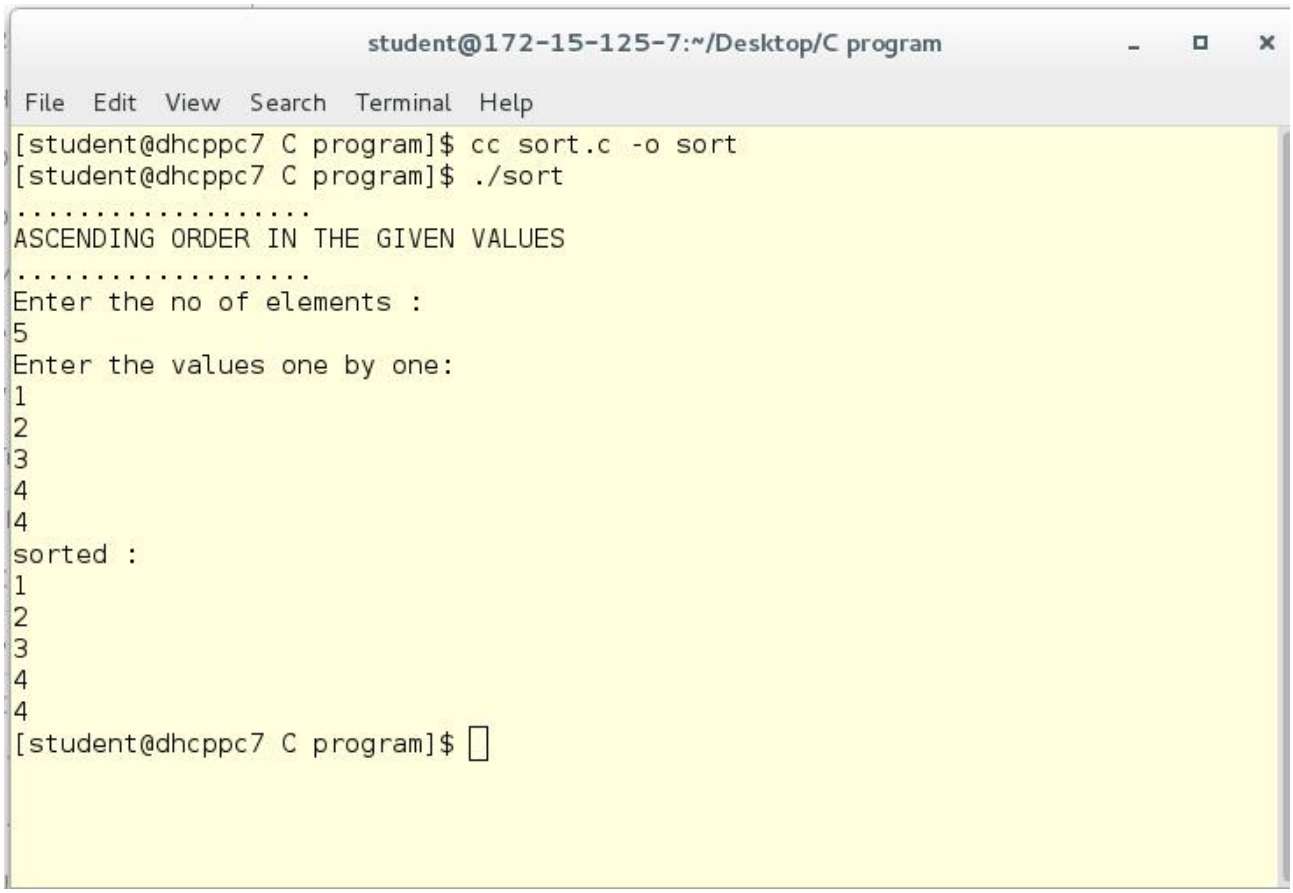
Write the c program for sorting in ascending order.

ASCENDING ORDER

```
#include<stdio.h>
int main()
{
int i,j,n,t=0;
```

```
int a[10];
printf("--------------------\n");
printf("ASCENDING ORDER IN THE VALUES\n");
printf("--------------------\n");
printf("enter the number of elements:\n");
scanf("%d",&n);
printf("Enter the values one by one:\n");
for(i=0;i<n;i++)
{
scanf("%d",&a[i]);
}
for(i=0;i<n;i++)
{
for(j=i+1;j<n;j++)
{
if(a[i]>=a[j])
{
t=a[i];
a[i]=a[j];
a[j]=t;
}
}
}
printf("sorted:\n");
for(i=0;i<n;i++)
{
printf("%d",a[i]);
printf("\n");
}
}
```

OUTPUT



EX.NO:10 COMPLEMENTARY DNA

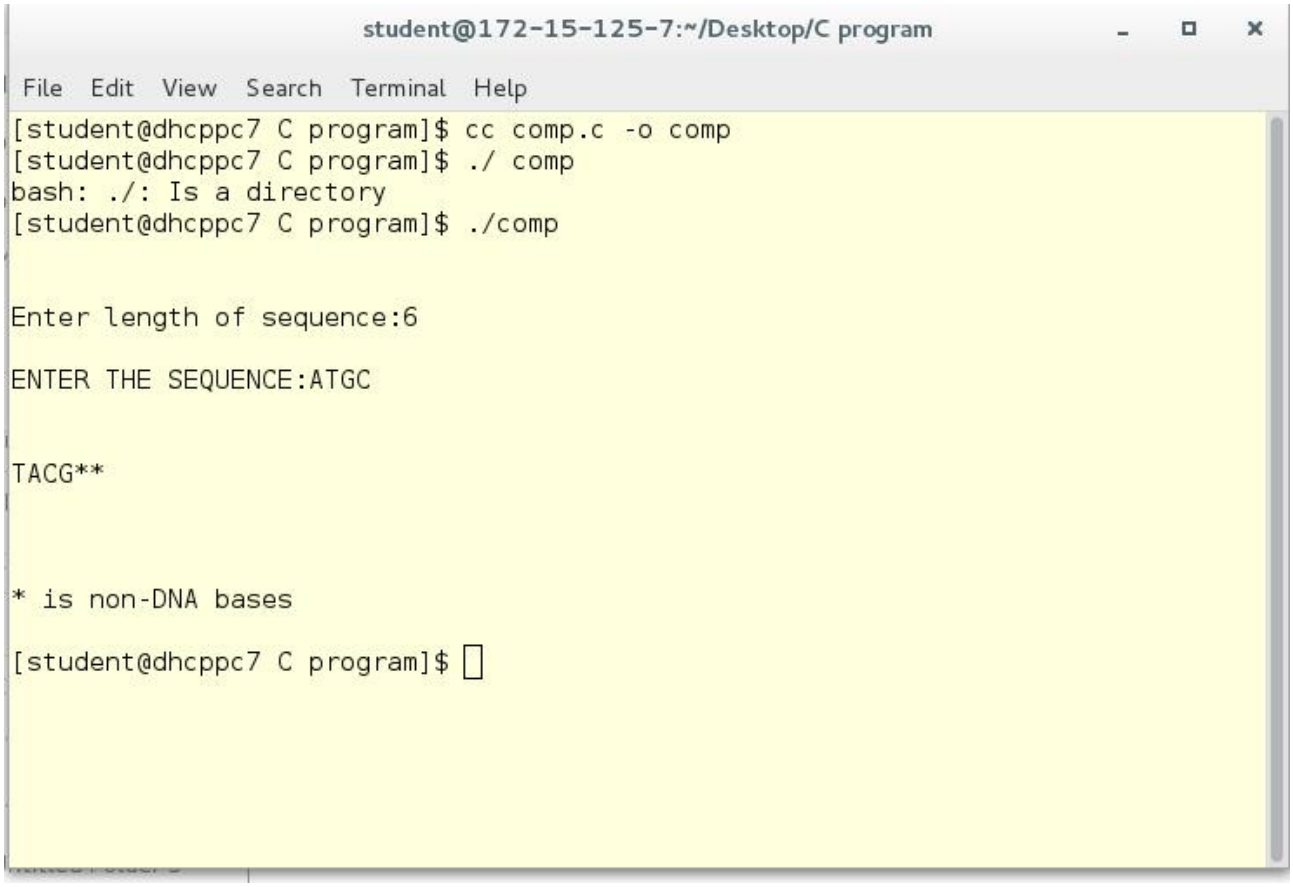
AIM:

Write a c program for complementary DNA sequence

COMPLEMENTARY DNA

```
#include<stdio.h>
main ()
{
int n;
printf("\n\nEnter length of sequence:");
scanf("%d",&n);
char seq[n], com[n];
int i;
printf("\nENTER THE SEQUENCE:");
scanf("%s",&seq);
for(i;i<n;i++)
{
if(seq[i]=='A')
com[i]='T';
else if(seq[i]=='T')
com[i]='A';
else if(seq[i]=='G')
com[i]='C';
else if(seq[i]=='C')
com[i]='G';
else if(seq[i]==' ')
com[i]='_';
else if(seq[i]!='T' && seq[i]!='A' && seq[i]!='G' && seq[i]!='C')
com[i]='*';
}
printf("\n\n%s\n\n",com);
printf("\n\n* is non-DNA bases\n\n");
}
```

OUTPUT



EX.NO:11 STANDARD GENETIC CODE TABLE

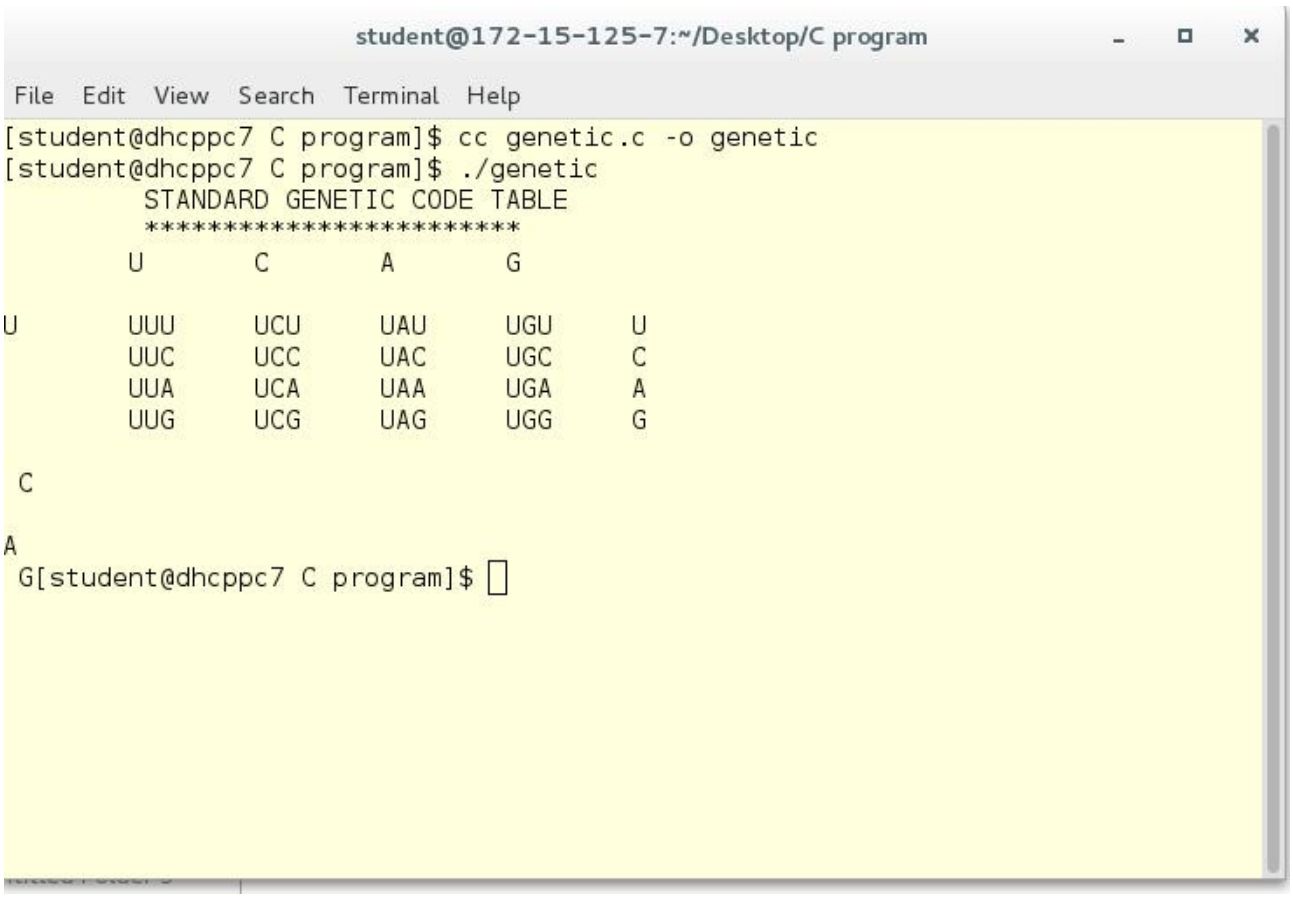
AIM:

Write a c program for Standard genetic code table

Standard genetic code table

```
#include<stdio.h>
int main()
{
char *text[20]={

        "UUU","UCU","UAU","UGU","U","UUC","UCC",
        "UAC","UGC","C","UUA","UCA","UAA","UGA","A",
        "UUG","UCG","UAG","UGG","G"};


char *text1[20]={

        "CUU","CCU","CAU","CGU","U","CUC","CCC",
        "CAC","CGC","C","CUA","CCA","CAA","CGG","A",
        "CUG","CCG","CAG","CGG","G"};


char *text2[20]={

        "AUU","ACU","AAU","AGU","U","AUC","ACC",
        "AAC","AGC","C","AUA","ACA","AAA","AGA","A",
        "AUG","ACG","AAG","AGG","G"};


char *text3[20]={

        "GUU","GCU","GAU","GGU","U","GUC","GCC",
        "GAC","GGC","C","GUA","GCA","GAA","GGA","A",
        "GUG","GCG","GAG","GGG","G"};
int i,j=0;
/*now,display them*/
printf("\t STANDARD GENETIC CODE TABLE\n");
printf("\t ********************** \n");
printf("\tU\tC\tA\tG\n");
printf("\nU");
while(j<19)
{
for(i=0;i<5;i++)
        {
        printf("\t%s",text[j]);
        j++;
        }
        printf("\n");
        }
```

OUTPUT:



EX.NO:12 CONVERT THE DNA TO RNA

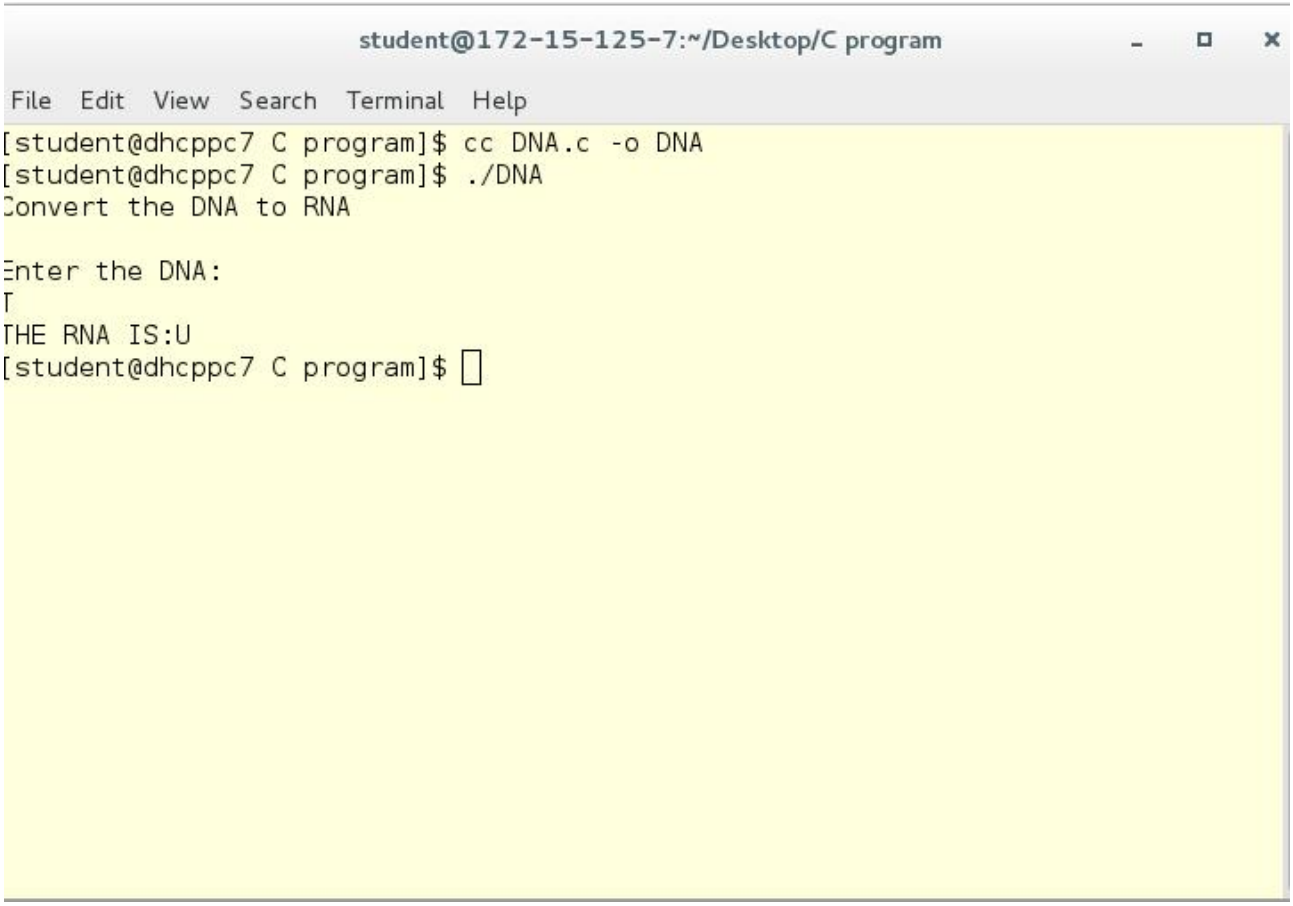
AIM:

Write A C Program for **Convert the DNA to RNA**

CONVERT THE DNA TO RNA

```
#include<stdio.h>
int main()
{
char s[50];
int i=0,n;
printf("Convert the DNA to RNA\n");
printf("\nEnter the DNA:\n");
scanf("%s",&s);
for(i=0;i<50;i++)
{
if(s[i]=='T')
{
s[i]='U';
}
}
printf("THE RNA IS:%s\n",s);
}
```

OUTPUT



EX.NO:13 AMINO ACIDS

AIM:

Write A C Program for Amino Acids

AMINO ACIDS

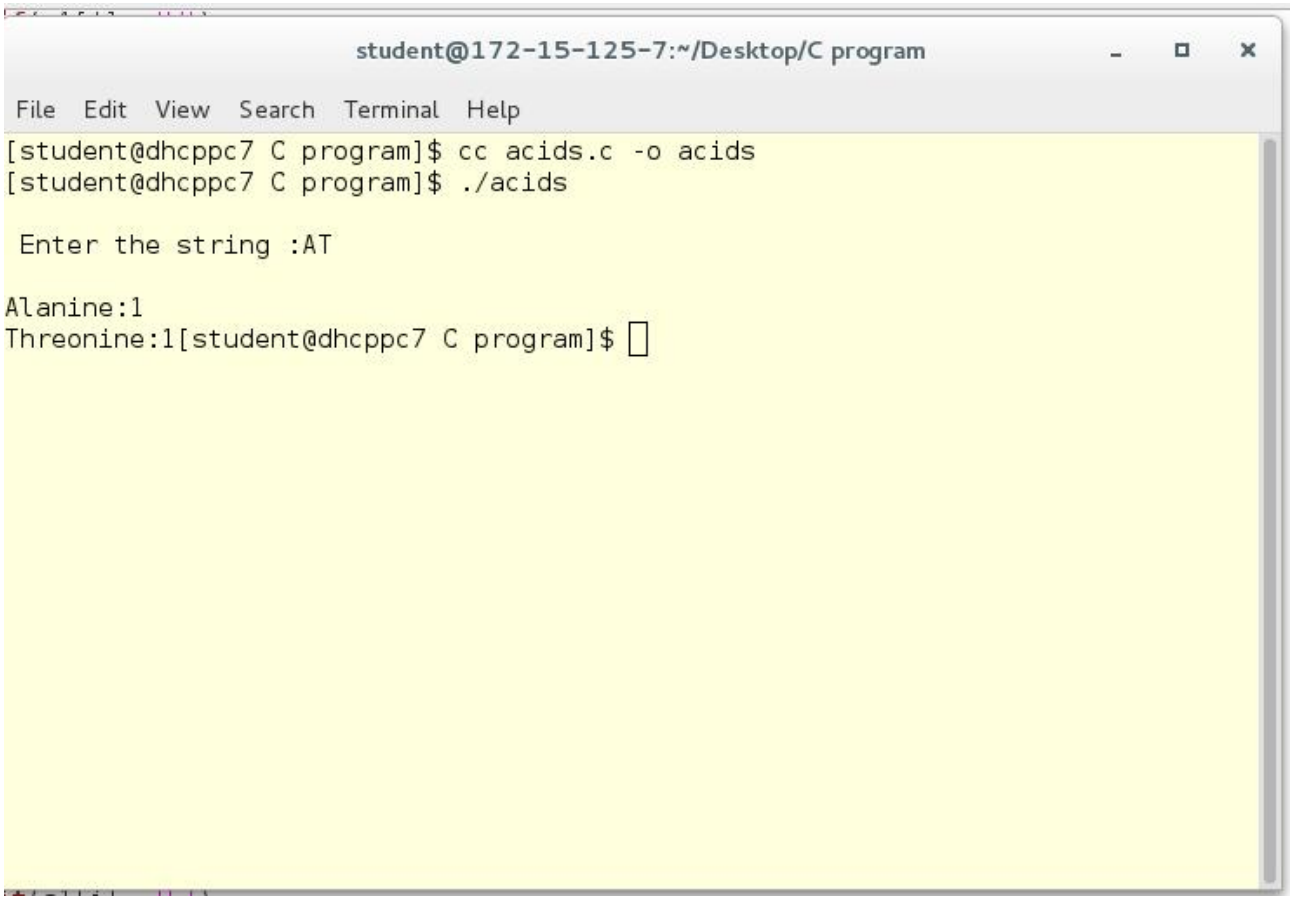
```
#include<stdio.h>
int main()
{
char s1[50];
int j=0,a=0,v=0,i=0,l=0,m=0,f=0,y=0,w=0,k=0,r=0,h=0,
d=0,s=0,t=0,e=0,n=0,q=0,c=0,g=0,p=0;
printf("\n Enter the string :");
scanf("%s",&s1);
while(s1[j]!='\0')
{
if(s1[j]=='A')
{
a=a+1;
}
else if(s1[j]=='V')
{
v=v+1;
}
else if(s1[j]=='I')
{
i=i+1;
}
else if(s1[j]=='L')
{
l=l+1;
}
else if(s1[j]=='M')
{
m=m+1;
}
else if(s1[j]=='F')
{
f=f+1;
}
else if(s1[ j ]=='Y')
{
y=y+1;
}
else if(s1[j]=='W')
{
w=w+1;
}
else if(s1[j]=='K')
```

```
{
k=k+1;
}
else if(s1[j]=='r')
{
r=r+1;
}
else if(s1[j]=='H')
{
h=h+1;
}
else if(s1[j]=='D')
{
d=d+1;
}
else if(s1['S'])
{
s=s+1;
}
else if(s1[j]=='T')
{
t=t+1;
}
else if(s1[j]=='E')
{
e=e+1;
}
else if(s1[j]=='N')
{
n=n+1;
}
else if(s1[j]=='Q')
{
q=q+1;
}
else if(s1[j]=='C')
{
c=c+1;
}
else if(s1[j]=='G')
{
g=g+1;
}
else if(s1[j]=='P')
{
```

```
p=p+1;
}
j=j+1;
}
if(a!=0)
{
printf("\nAlanine:%d",a);
}
if(v!=0)
{
printf("\nValine:%d",v);
}
if(i!=0)
{
printf("\nIsoleucine:%d",i);
}
if(l!=0)
{
printf("\nLeucine:%d",l);
}
if(m!=0)
{
printf("\nMethionine:%d",m);
}
if(f!=0)
{
printf("\nPhenylanine:%d",f);
}
if(y!=0)
{
printf("\nTyrosine:%d",y);
}
if(w!=0)
{
printf("\nTryptophan:%d",w);
}
if(k!=0)
{
printf("\nLysine:%d",k);
}
if(r!=0)
{
printf("\nArginine:%d",r);
}
if(h!=0)
```

```
{
printf("\nHistidine:%d",h);
}
if(d!=0)
{
printf("\nAspartate:%d",d);
}
if(s!=0)
{
printf("\nSerine:%d",s);
}
if(t!=0)
{
printf("\nThreonine:%d",t);
}
if(e!=0)
{
printf("\nGlutamate:%d",e);
}
if(n!=0)
{
printf("\nAsparagine:%d",n);
}
if(q!=0)
{
printf("\nGlutamine:%d",q);
}
if(c!=0)
{
printf("\nCysteine:%d",c);
}
if(g!=0)
{
printf("\nGlycine:%d",g);
}
if(p!=0)
{
printf("\nProline:%d",p);
}
}
```

OUTPUT



EX.NO:14 FINDING MISMATCH

AIM:

Write a C Program to find the finding mismatch sequence

FINDING MISMATCH

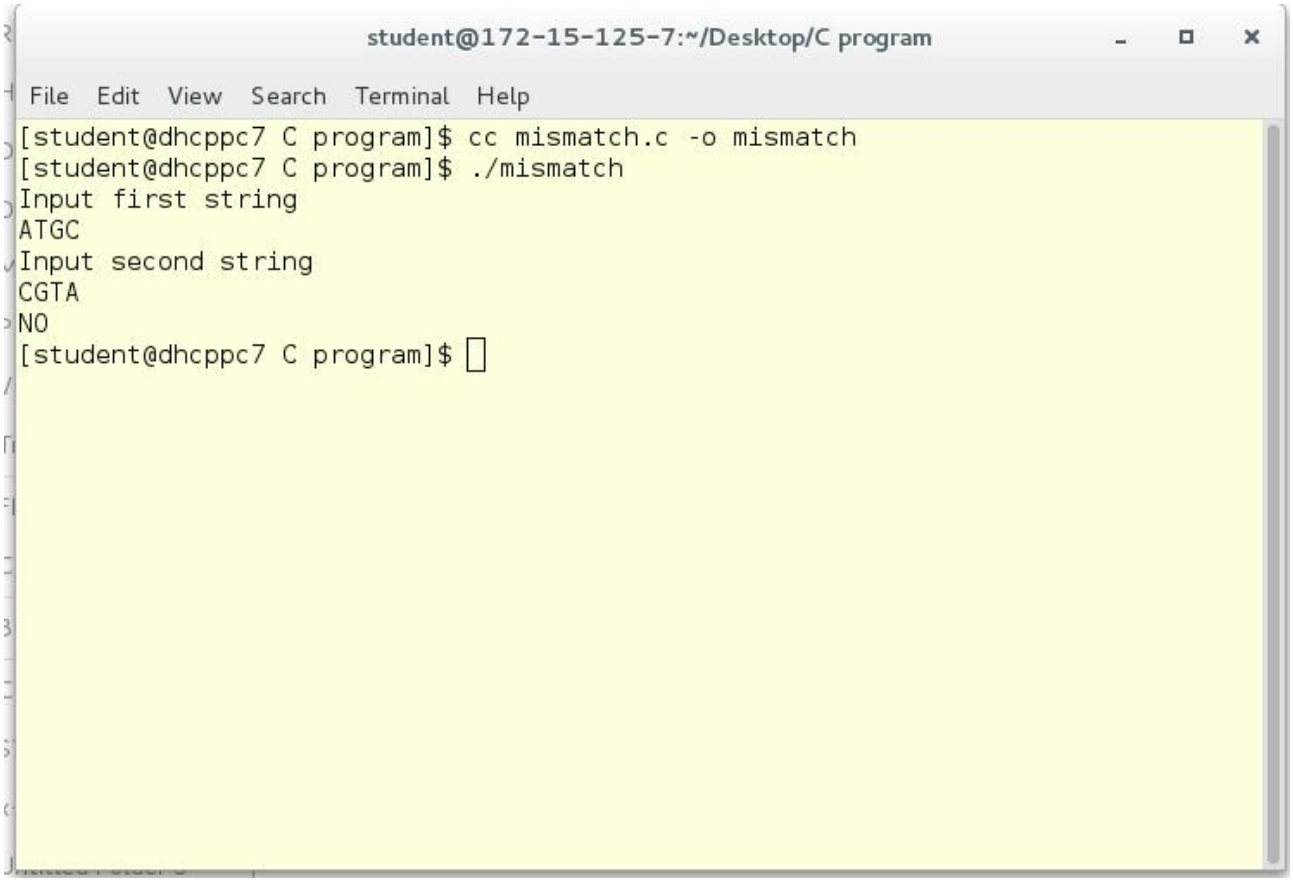
```
#include <stdio.h>
#include <string.h>
```

```
int main ()
 {
  int flag;
  char s1[1000], s2[1000];

  printf("Input first string\n");
  scanf("%s",&s1);

  printf("Input second string\n");
  scanf("%s",&s2);

  /** Passing smaller length string first */

  if (strlen(s1) < strlen(s2))
        flag = check_subsequence(s1, s2);
  else
        flag = check_subsequence(s2, s1);

  if (flag)
        printf("YES\n");
  else
        printf("NO\n");

  return 0;
}

int check_subsequence (char a[], char b[]) {
  int c, d;

  c = d = 0;

  while (a[c] != '\0') {
        while ((a[c] != b[d]) && b[d] != '\0') {
        d++;
```

```
        }
        if (b[d] == '\0')
        break;
        d++;
        c++;
  }
  if (a[c] == '\0')
        return 1;
  else
        return 0;
}
```

OUTPUT

I


student@172-15-125-7:~/Desktop/C program
File Edit View Search Terminal Help
[student@dhcppc7 C program]$ cc mismatch.c -o mismatch
[student@dhcppc7 C program]$ ./mismatch
Input first string
ATGC
Input second string
CGTA
NO
[student@dhcppc7 C program]$