

Programming Lab-1

Assignment 1

Prn number:-21510120

Batch:-S7

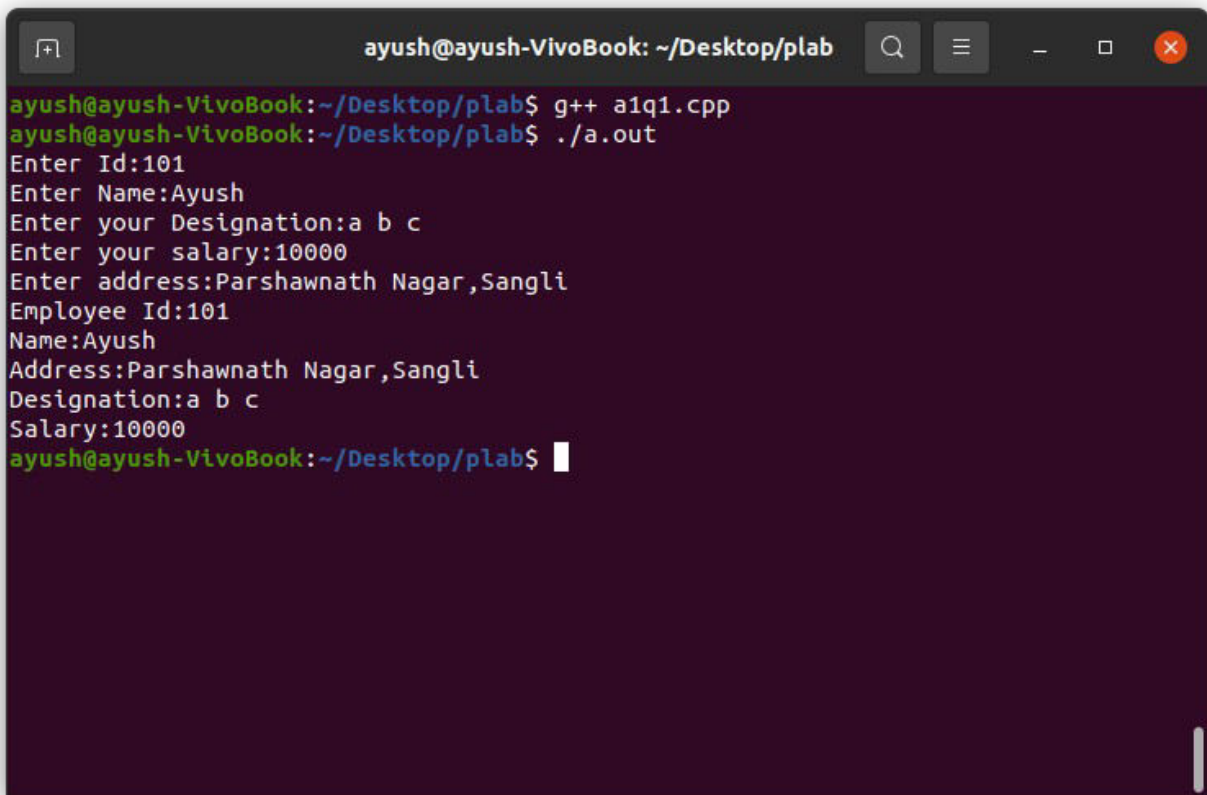
Roll number:-113

Q1.

Program:-

```
1 #include<iostream>
2 using namespace std;
3 class employee
4 {
5     public:
6     string name,address,des;
7     int id,salary;
8     void inp(int i,string n,string a,string d,int s)
9     {
10         name=n;
11         id=i;
12         address=a;
13         des=d;
14         salary=s;
15     }
16     void out()
17     {
18         cout<<"Employee Id:"<<id<<"\nName:"<<name<<"\nAddress:"<<address<<endl;
19         cout<<"Designation:"<<des<<"\nSalary:"<<salary<<endl;
20     }
21 };
22 int main()
23 {
24     employee e1;
25     string name,address,des;
26     int id,salary;
27     cout<<"Enter Id:";
28     cin>>id;
29     cout<<"Enter Name:";
30     cin>>name;
31     cout<<"Enter your Designation:";
32     getline(cin>>ws,des);
33     cout<<"Enter your salary:";
34     cin>>salary;
35     cout<<"Enter address:";
36     getline(cin>>ws,address);
37     e1.inp(id,name,address,des,salary);
38     e1.out();
39     return 0;
40 }
```

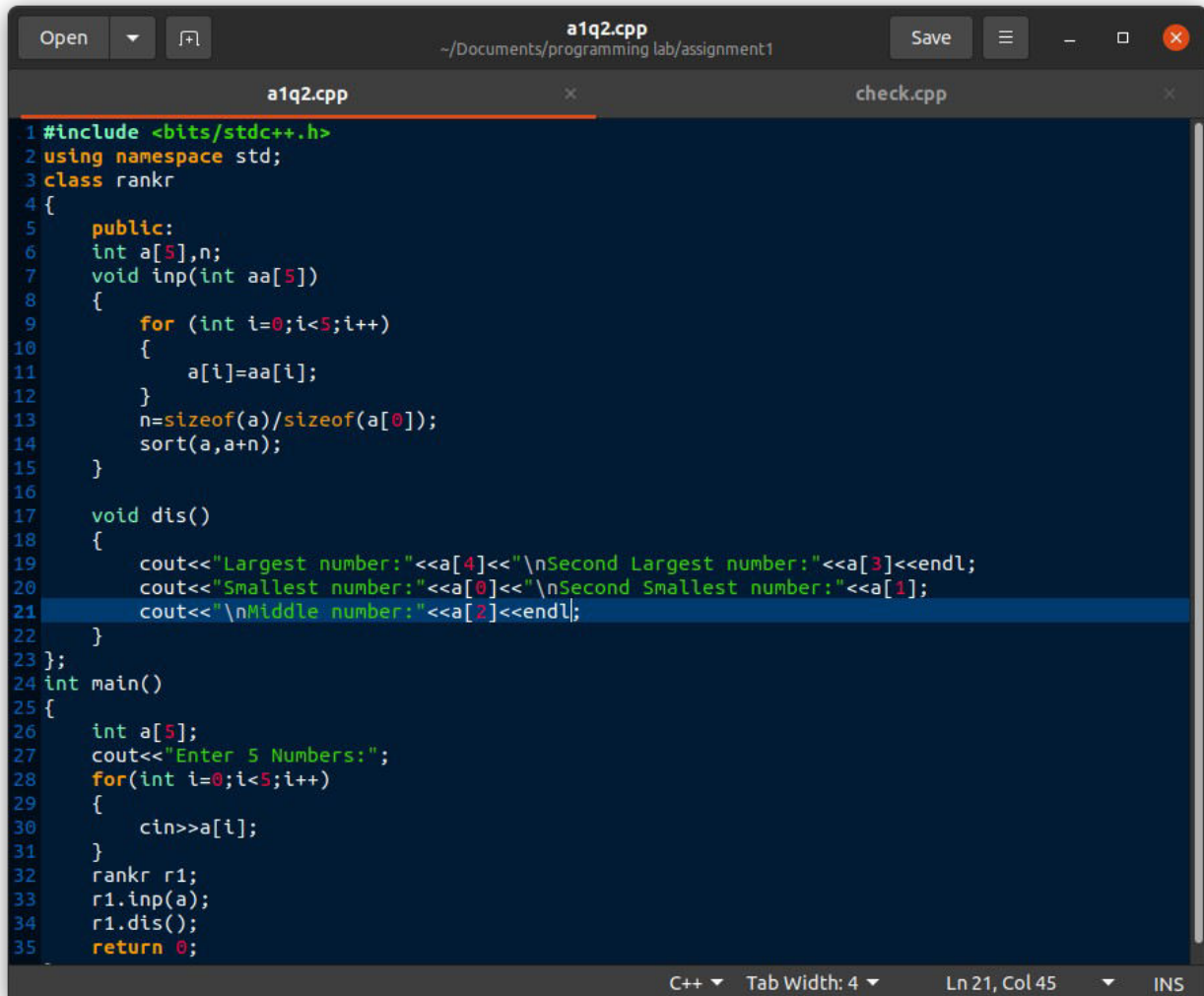
Output:-

A terminal window with a dark purple background and a title bar. The title bar contains the text 'ayush@ayush-VivoBook: ~/Desktop/plab' and standard window control icons (search, menu, zoom, close). The terminal shows the execution of a C++ program. The user enters several inputs: '101' for ID, 'Ayush' for Name, 'a b c' for Designation, '10000' for salary, and 'Parshawnath Nagar,Sangli' for address. The program then prints out the entered data in a structured format.

```
ayush@ayush-VivoBook:~/Desktop/plab$ g++ a1q1.cpp
ayush@ayush-VivoBook:~/Desktop/plab$ ./a.out
Enter Id:101
Enter Name:Ayush
Enter your Designation:a b c
Enter your salary:10000
Enter address:Parshawnath Nagar,Sangli
Employee Id:101
Name:Ayush
Address:Parshawnath Nagar,Sangli
Designation:a b c
Salary:10000
ayush@ayush-VivoBook:~/Desktop/plab$
```

Q2.

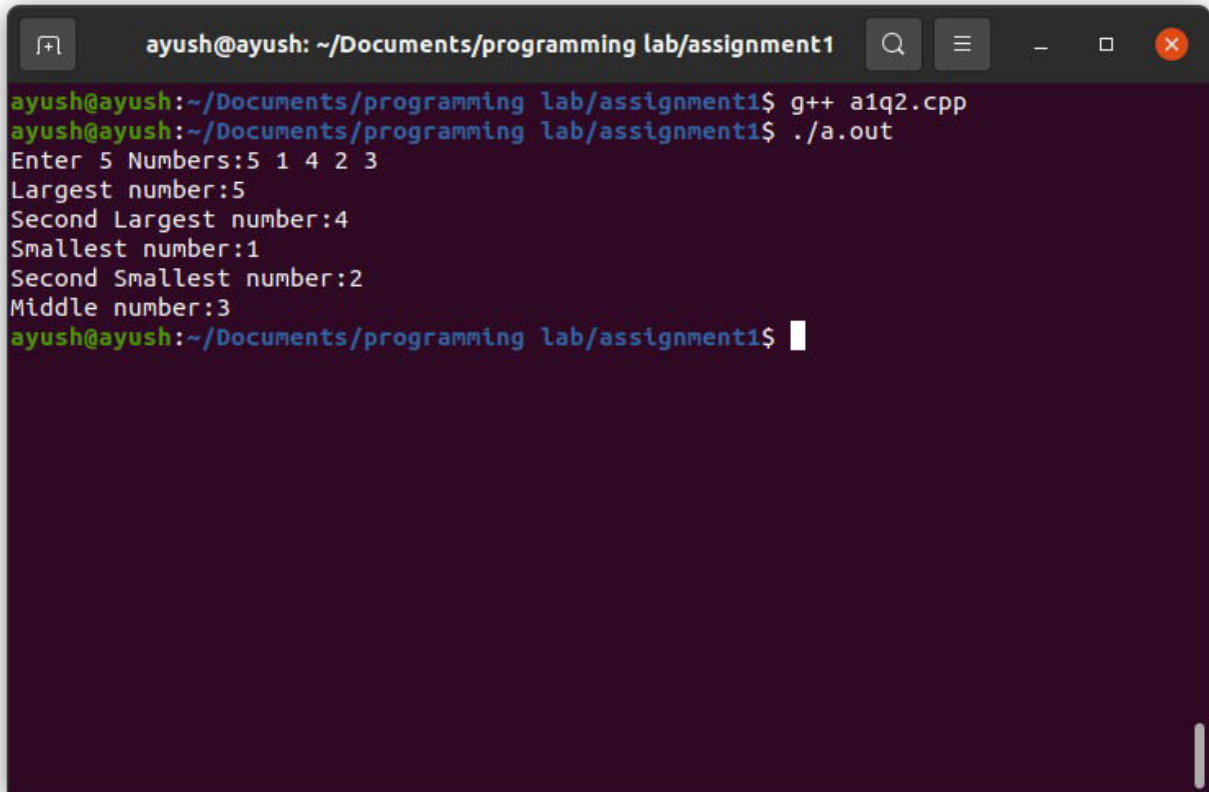
Program:-



```
1 #include <bits/stdc++.h>
2 using namespace std;
3 class rankr
4 {
5     public:
6     int a[5],n;
7     void inp(int aa[5])
8     {
9         for (int i=0;i<5;i++)
10         {
11             a[i]=aa[i];
12         }
13         n=sizeof(a)/sizeof(a[0]);
14         sort(a,a+n);
15     }
16
17     void dis()
18     {
19         cout<<"Largest number:"<<a[4]<<"\nSecond Largest number:"<<a[3]<<endl;
20         cout<<"Smallest number:"<<a[0]<<"\nSecond Smallest number:"<<a[1];
21         cout<<"\nMiddle number:"<<a[2]<<endl;
22     }
23 };
24 int main()
25 {
26     int a[5];
27     cout<<"Enter 5 Numbers:";
28     for(int i=0;i<5;i++)
29     {
30         cin>>a[i];
31     }
32     rankr r1;
33     r1.inp(a);
34     r1.dis();
35     return 0;
```

The screenshot shows a C++ IDE with two tabs: 'a1q2.cpp' and 'check.cpp'. The 'a1q2.cpp' tab is active, displaying the code. The code defines a class 'rankr' with an array 'a' of size 5 and an integer 'n'. It has two methods: 'inp' to take input and 'dis' to display the largest, second largest, smallest, and second smallest numbers. The 'main' function creates an array 'a', prompts the user to enter 5 numbers, and uses the 'rankr' class to process the input.

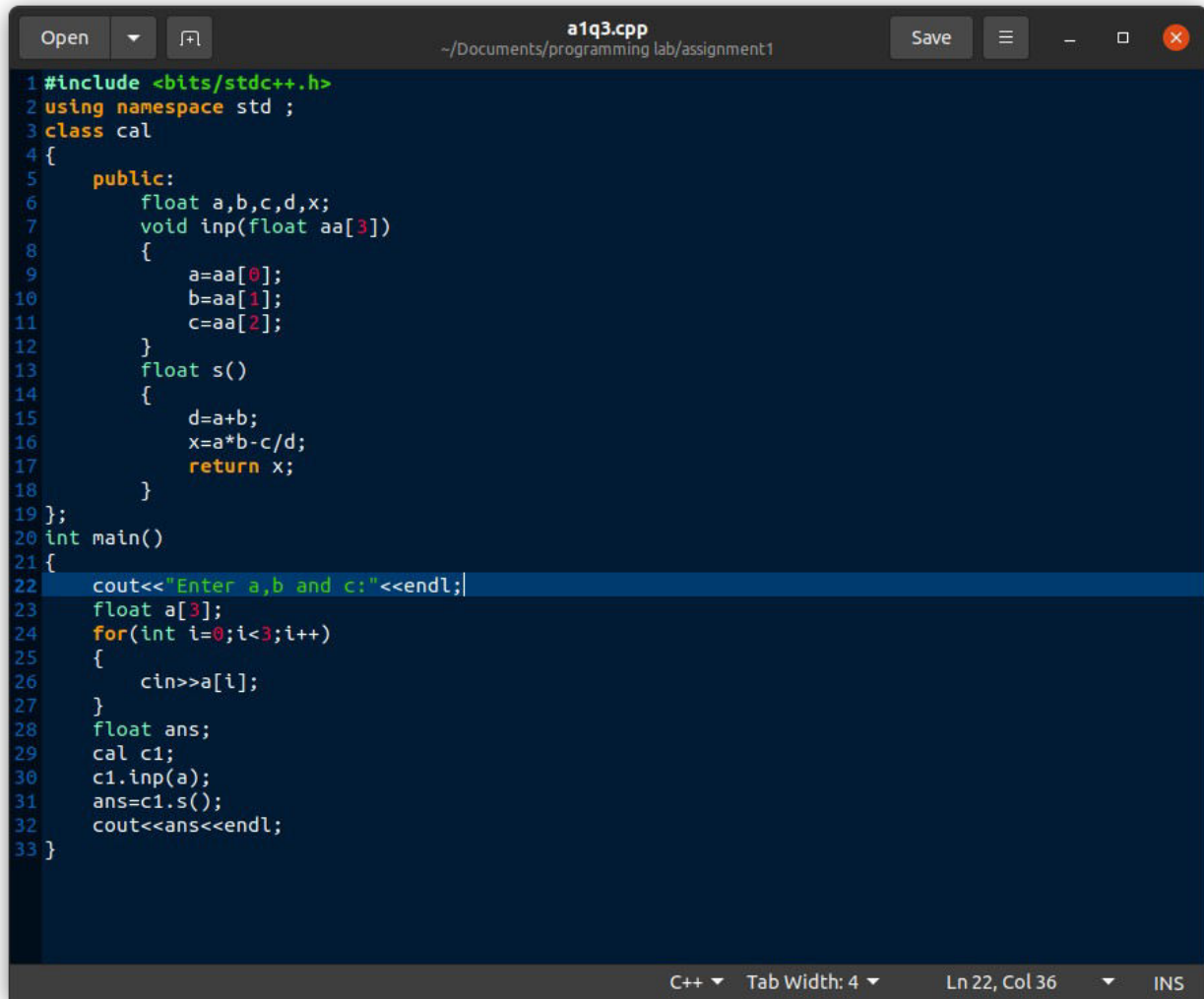
Output:-



```
ayush@ayush: ~/Documents/programming lab/assignment1
ayush@ayush:~/Documents/programming lab/assignment1$ g++ a1q2.cpp
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
Enter 5 Numbers:5 1 4 2 3
Largest number:5
Second Largest number:4
Smallest number:1
Second Smallest number:2
Middle number:3
ayush@ayush:~/Documents/programming lab/assignment1$
```

Q3.

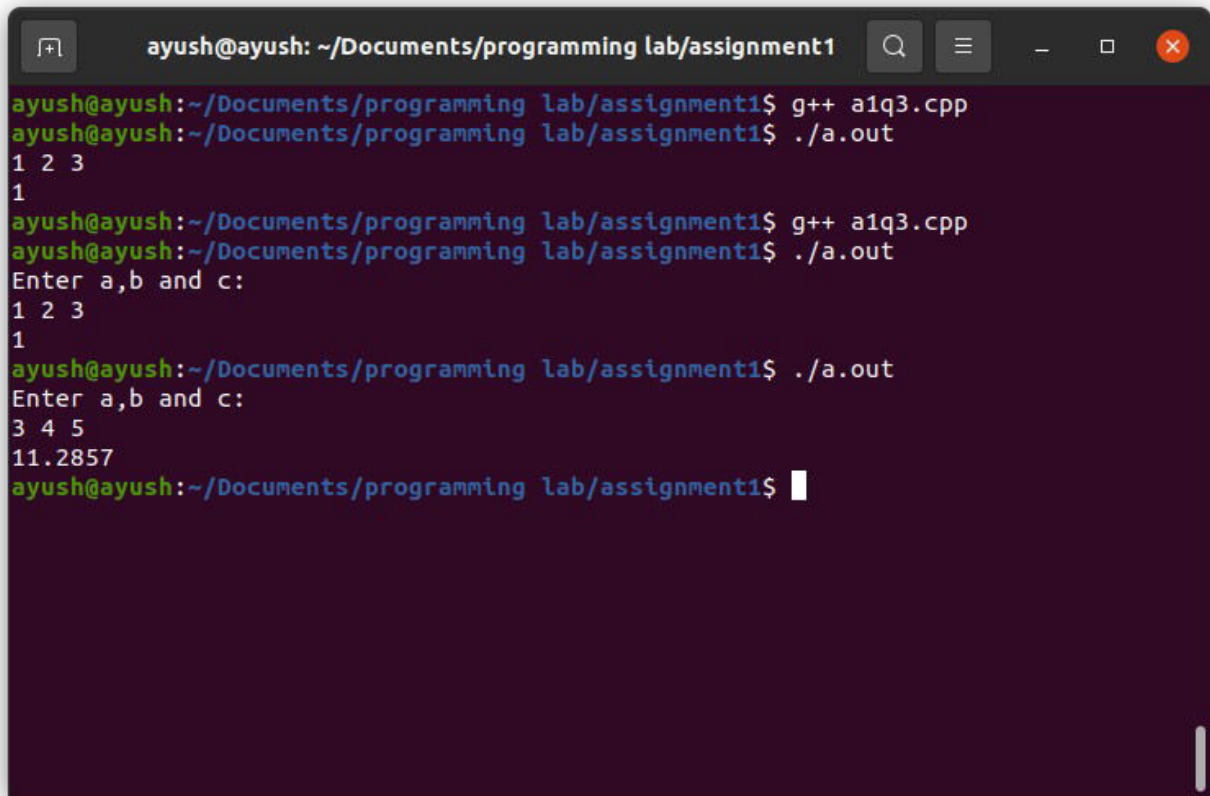
Program:-



```
1 #include <bits/stdc++.h>
2 using namespace std ;
3 class cal
4 {
5     public:
6         float a,b,c,d,x;
7         void inp(float aa[3])
8         {
9             a=aa[0];
10            b=aa[1];
11            c=aa[2];
12        }
13        float s()
14        {
15            d=a+b;
16            x=a*b-c/d;
17            return x;
18        }
19 };
20 int main()
21 {
22     cout<<"Enter a,b and c:"<<endl;
23     float a[3];
24     for(int i=0;i<3;i++)
25     {
26         cin>>a[i];
27     }
28     float ans;
29     cal c1;
30     c1.inp(a);
31     ans=c1.s();
32     cout<<ans<<endl;
33 }
```

The screenshot shows a C++ IDE window titled 'a1q3.cpp' with the file path '~/Documents/programming lab/assignment1'. The code defines a class 'cal' with a public section containing a float array 'a' and methods 'inp' and 's'. The 'main' function prompts the user to enter three values, stores them in an array, creates a 'cal' object, calls 'inp' and 's', and prints the result. The status bar at the bottom indicates 'C++', 'Tab Width: 4', 'Ln 22, Col 36', and 'INS'.

Output:-



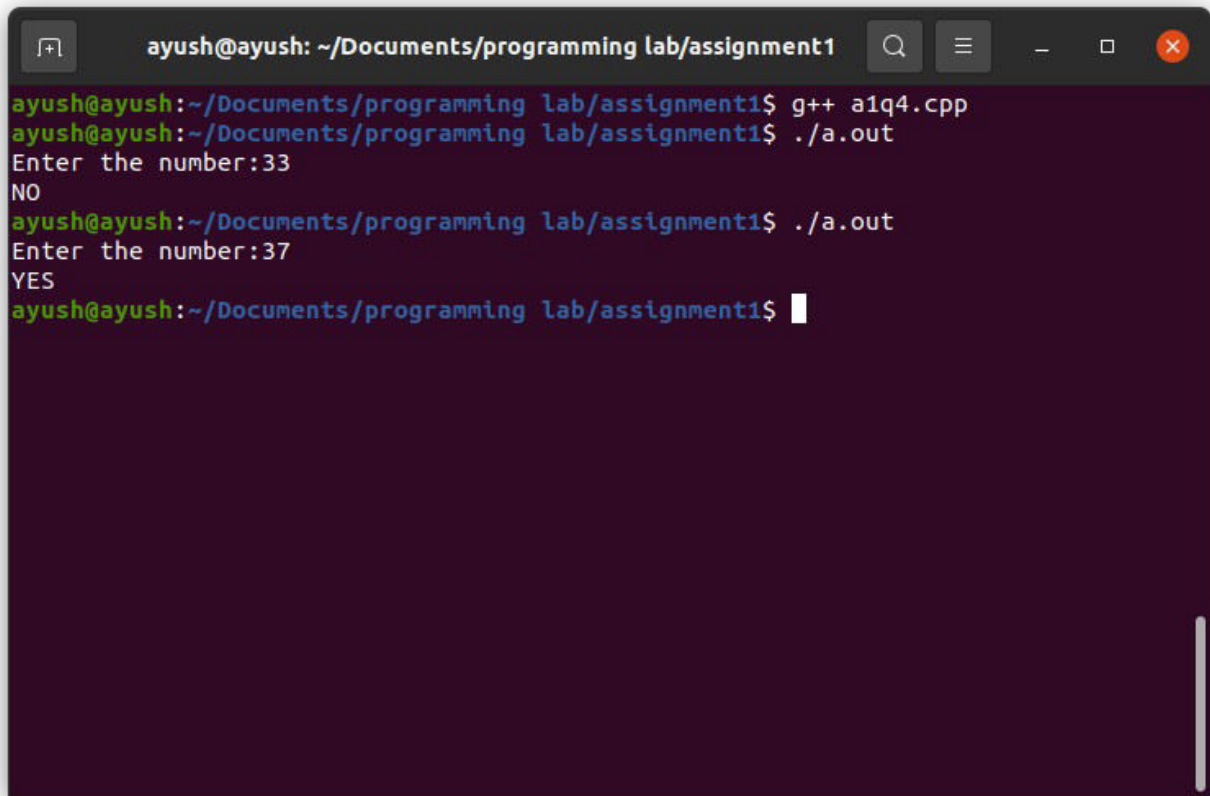
```
ayush@ayush: ~/Documents/programming lab/assignment1
ayush@ayush:~/Documents/programming lab/assignment1$ g++ a1q3.cpp
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
1 2 3
1
ayush@ayush:~/Documents/programming lab/assignment1$ g++ a1q3.cpp
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
Enter a,b and c:
1 2 3
1
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
Enter a,b and c:
3 4 5
11.2857
ayush@ayush:~/Documents/programming lab/assignment1$
```

Q4.

Program:-

```
1 #include<iostream>
2 using namespace std;
3 int isprime(int a){
4     int count=0;
5     for (int i=1;i<=a;i++){
6         if (a%i==0){
7             count++;
8         }
9     }
10    if (count==2){
11        return 1;
12    }
13    else{
14        return 0;
15    }
16 }
17 class sprime
18 {
19     public:
20     int a;
21     void inp(int aa){
22         a=aa;
23     }
24     int out()
25     {
26         if (isprime(a)==1){
27             while (a>0){
28                 if(isprime(a%10)==0){
29                     return 0;
30                 }
31                 a=a/10;
32             }
33             return 1;
34         }
35         else{
36             return 0;
37         }
38     }
39 };
40
41 int main()
42 {
43     int a;
44     sprime s1;
45     cout<<"Enter the number:";
46     cin>>a;
47     s1.inp(a);
48     if (s1.out()){
49         cout<<"YES"<<endl;
50     }
51     else{
52         cout<<"NO"<<endl;
53     }
54     return 0;
55 }
```


Output:-



```
ayush@ayush: ~/Documents/programming lab/assignment1
ayush@ayush:~/Documents/programming lab/assignment1$ g++ a1q4.cpp
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
Enter the number:33
NO
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
Enter the number:37
YES
ayush@ayush:~/Documents/programming lab/assignment1$
```

The image shows a terminal window with a dark purple background. The window title is "ayush@ayush: ~/Documents/programming lab/assignment1". The terminal displays the following sequence of commands and outputs: 1. Command: `g++ a1q4.cpp` 2. Command: `./a.out` 3. Input: `Enter the number:33` 4. Output: `NO` 5. Command: `./a.out` 6. Input: `Enter the number:37` 7. Output: `YES` 8. The prompt `ayush@ayush:~/Documents/programming lab/assignment1$` is shown again with a cursor.

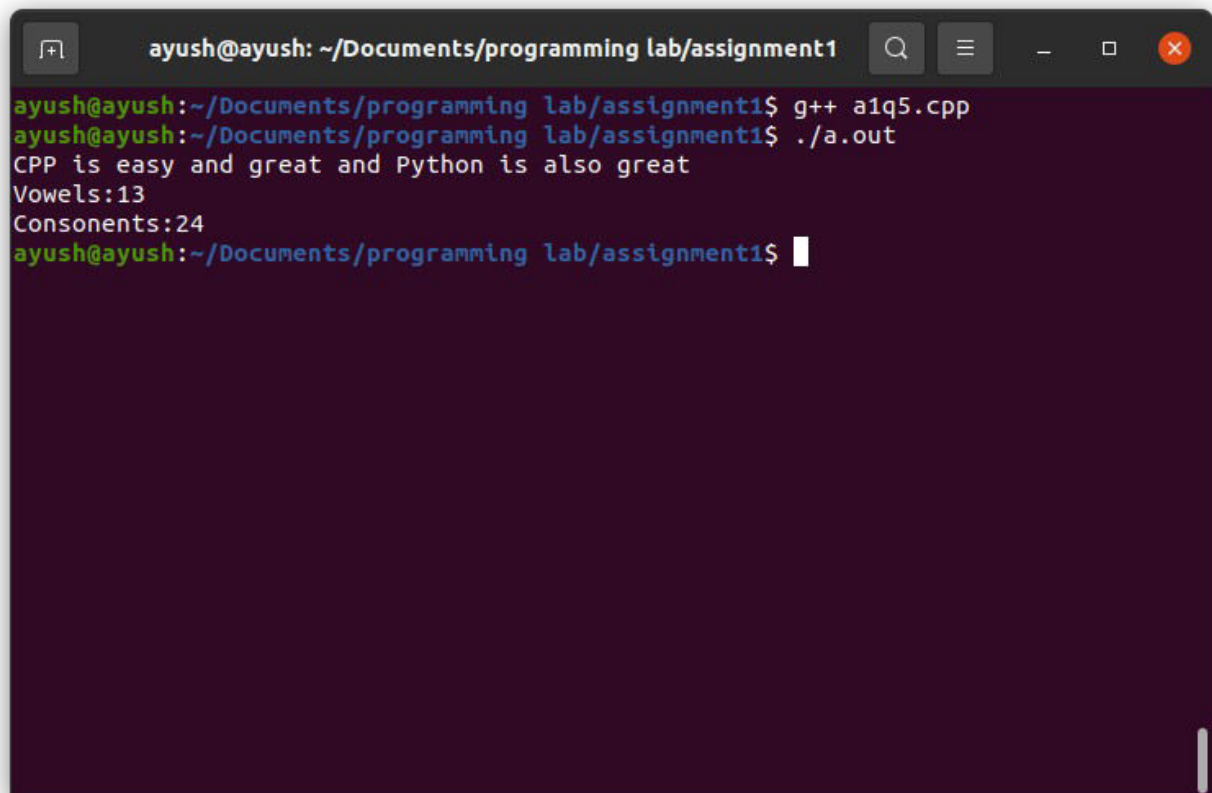
Q5.

Program:-

```
Open  a1q5.cpp
~/Documents/programming lab/assignment1 Save

#include <bits/stdc++.h>
#define r a[i]
using namespace std;
class str
{
public:
    string a;
    int v=0,c=0,s=0;
    void inp(string aa)
    {
        a=aa;
    }
    void calculate()
    {
        for (int i=0;i<a.size();i++)
        {
            if((r>='a' && r<='z') || (r>='A' && r<='Z'))
            {
                if (r=='a' || r=='A' || r=='e' || r=='E' || r=='i' || r=='I' || r=='o' || r=='O' || r=='u' || r=='U')
                {
                    v++;
                }
            }
            else if(r==' ')
            {
                s++;
            }
            else
            {
                c++;
            }
        }
    }
    c=a.size()-v-s;
}
void out()
{
    cout<<"Vowels:"<<v<<endl;
    cout<<"Consonants:"<<c<<endl;
}
};
int main()
{
    string a;
    getline (cin>>s,a);
    str s1;
    s1.inp(a);
    s1.calculate();
    s1.out();
    return 0;
}
```

Output:-



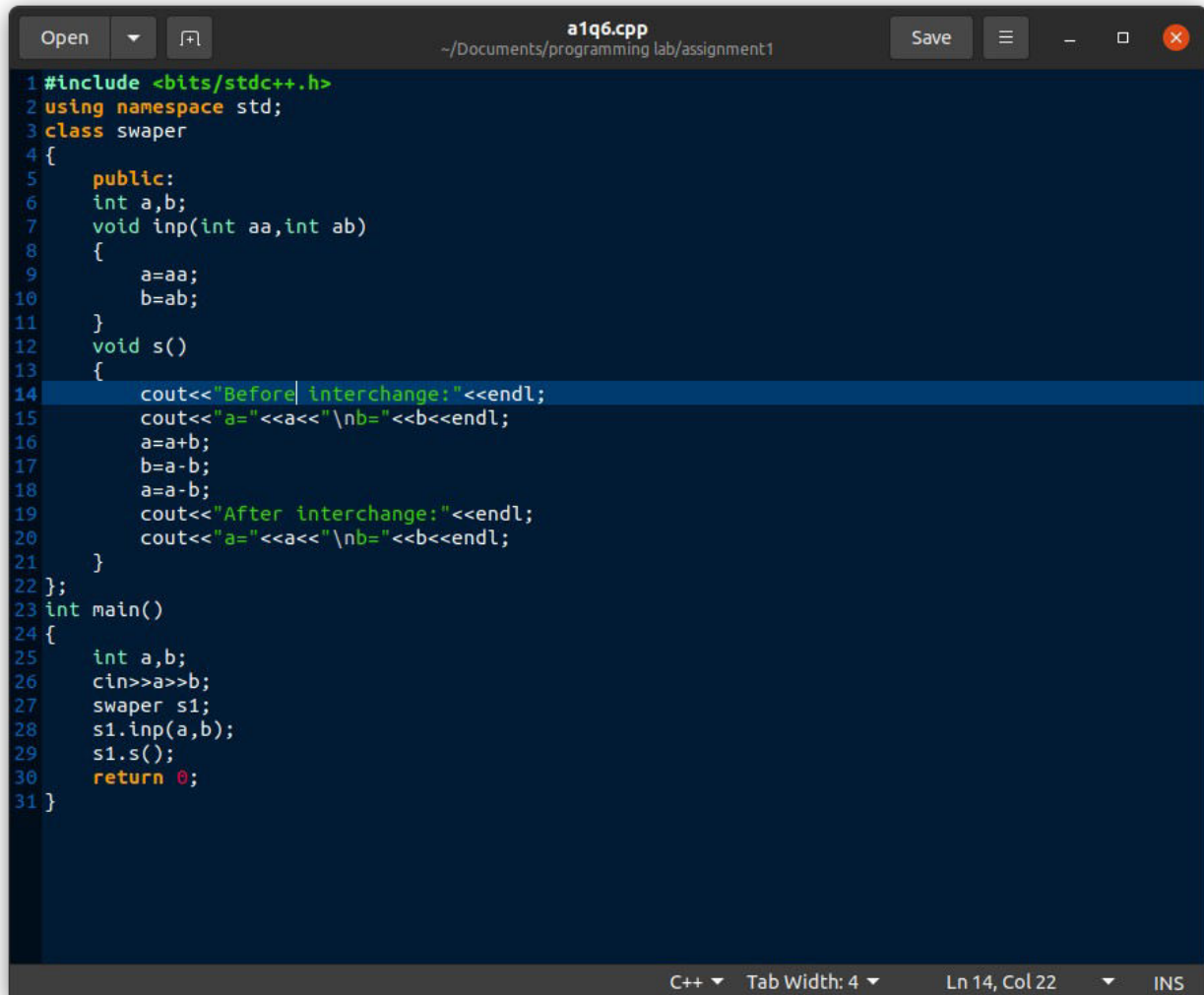
```
ayush@ayush: ~/Documents/programming lab/assignment1
ayush@ayush:~/Documents/programming lab/assignment1$ g++ a1q5.cpp
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
CPP is easy and great and Python is also great
Vowels:13
Consonents:24
ayush@ayush:~/Documents/programming lab/assignment1$
```

The image shows a terminal window with a dark purple background. The window title is "ayush@ayush: ~/Documents/programming lab/assignment1". The terminal displays the following commands and output:

- `g++ a1q5.cpp`
- `./a.out`
- Output: `CPP is easy and great and Python is also great`
- Output: `Vowels:13`
- Output: `Consonents:24`
- The prompt `ayush@ayush:~/Documents/programming lab/assignment1$` is shown again with a cursor.

Q6.

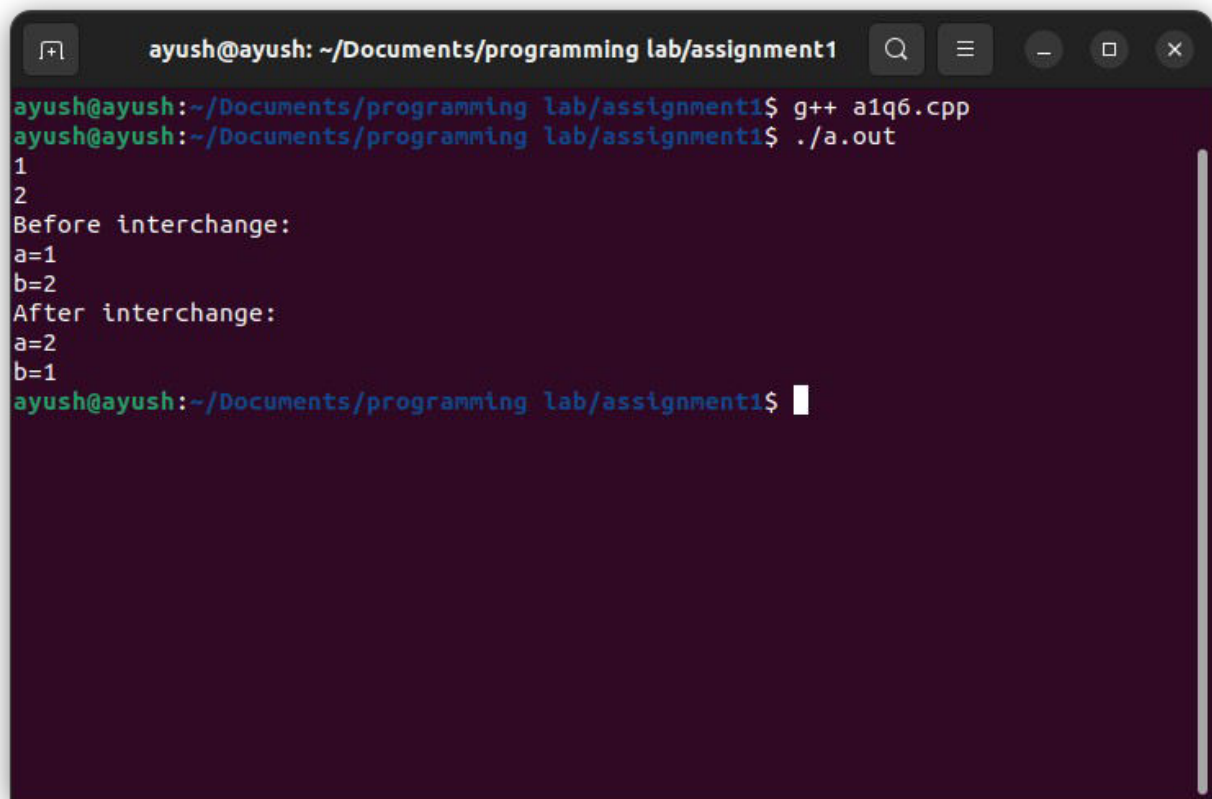
Program:-



```
1 #include <bits/stdc++.h>
2 using namespace std;
3 class swaper
4 {
5     public:
6     int a,b;
7     void inp(int aa,int ab)
8     {
9         a=aa;
10        b=ab;
11    }
12    void s()
13    {
14        cout<<"Before interchange:"<<endl;
15        cout<<"a="<<a<<"\nb="<<b<<endl;
16        a=a+b;
17        b=a-b;
18        a=a-b;
19        cout<<"After interchange:"<<endl;
20        cout<<"a="<<a<<"\nb="<<b<<endl;
21    }
22 };
23 int main()
24 {
25     int a,b;
26     cin>>a>>b;
27     swaper s1;
28     s1.inp(a,b);
29     s1.s();
30     return 0;
31 }
```

The screenshot shows a C++ IDE window titled 'a1q6.cpp' with the file path '~/Documents/programming lab/assignment1'. The code defines a 'swaper' class with an 'inp' method to take input and an 's' method to perform the swap using arithmetic operations. The 'main' function takes two integers as input, creates a 'swaper' object, and calls its methods to display the values before and after the swap. The status bar at the bottom indicates 'C++', 'Tab Width: 4', 'Ln 14, Col 22', and 'INS'.

Output:-



```
ayush@ayush: ~/Documents/programming lab/assignment1
ayush@ayush:~/Documents/programming lab/assignment1$ g++ a1q6.cpp
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
1
2
Before interchange:
a=1
b=2
After interchange:
a=2
b=1
ayush@ayush:~/Documents/programming lab/assignment1$
```

The image shows a terminal window with a dark purple background. The window title is "ayush@ayush: ~/Documents/programming lab/assignment1". The terminal displays the following commands and output:

- Command: `g++ a1q6.cpp`
- Command: `./a.out`
- Output: `1`
- Output: `2`
- Output: `Before interchange:`
- Output: `a=1`
- Output: `b=2`
- Output: `After interchange:`
- Output: `a=2`
- Output: `b=1`
- The prompt `ayush@ayush:~/Documents/programming lab/assignment1$` is shown at the bottom with a cursor.

Q7.

Program:-

```
Open [icon] a1q7.cpp
~/Documents/programming lab/assignment1 Save [icon] [icon] [icon] [icon]

1 #include<bits/stdc++.h>
2 #include<string>
3 using namespace std;
4
5
6 class change
7 {
8     public:
9     int a;
10    string inp,ans;
11    void input(int aa)
12    {
13        a=aa;
14        cout<<"Enter your Input:";
15        cin>>inp;
16    }
17
18    string binToHex(string a)
19    {
20        string b,ans;
21        int d=-a.size()/4;
22        while(d!=0)
23        {
24            b+="0";
25            d--;
26        }
27        b+=a;
28        for (int i=0;i<a.size();i+=4)
29        {
30
31            string c;
32            c+=b[i];
33            c+=b[i+1];
34            c+=b[i+2];
35            c+=b[i+3];
36
37            if(c=="0000") ans+="0";
38            else if(c=="0001") ans+="1";
39            else if(c=="0010") ans+="2";
40            else if(c=="0011") ans+="3";
41            else if(c=="0100") ans+="4";
42            else if(c=="0101") ans+="5";
43            else if(c=="0110") ans+="6";
44            else if(c=="0111") ans+="7";
45            else if(c=="1000") ans+="8";
46            else if(c=="1001") ans+="9";
47            else if(c=="1010") ans+="A";
48            else if(c=="1011") ans+="B";
49            else if(c=="1100") ans+="C";
50            else if(c=="1101") ans+="D";
51            else if(c=="1110") ans+="E";
52            else if(c=="1111") ans+="F";
53            else ans=" Invalid Input";
54        }
55        return ans;
56    }
57 }
```

```
Open [icon] a1q7.cpp
~/Documents/programming lab/assignment1 Save [icon] [icon] [icon] [icon]

55 }
56 string binToOct(string a)
57 {
58     string b,ans;
59     int d=-a.size()/3;
60     while(d!=0){
61         b+="0";
62         d--;
63     }
64     b+=a;
65     for (int i=0;i<a.size();i+=3){
66         string c;
67         c+=b[i];
68         c+=b[i+1];
69         c+=b[i+2];
70
71         if(c=="000") ans+="0";
72         else if(c=="001") ans+="1";
73         else if(c=="010") ans+="2";
74         else if(c=="011") ans+="3";
75         else if(c=="100") ans+="4";
76         else if(c=="101") ans+="5";
77         else if(c=="110") ans+="6";
78         else if(c=="111") ans+="7";
79         else ans=" Invalid Input";
80     }
81     return ans;
82 }
83
84 string hexToBin(string a){
85     for (int i=0;i<a.size();i++){
86         switch(a[i]){
87             case '0':ans+="0000";
88                 break;
89             case '1':ans+="0001";
90                 break;
91             case '2':ans+="0010";
92                 break;
93             case '3':ans+="0011";
94                 break;
95             case '4':ans+="0100";
96                 break;
97             case '5':ans+="0101";
98                 break;
99             case '6':ans+="0110";
100                break;
101             case '7':ans+="0111";
102                break;
103             case '8':ans+="1000";
104                break;
105             case '9':ans+="1001";
106                break;
107             case 'A':ans+="1010";
108                break;
109         }
110     }
111 }
```

```
Open  a1q7.cpp  Save  -/Documents/programming lab/assignment1
109 | case '0':ans+="1011";
110 |     break;
111 | case 'C':ans+="1100";
112 |     break;
113 | case 'D':ans+="1101";
114 |     break;
115 | case 'E':ans+="1110";
116 |     break;
117 | case 'F':ans+="1111";
118 |     break;
119 | default:ans=" Invalid input";
120 |     break;
121 | }
122 | }
123 | return ans;
124 | }
125 | string octToBin(string a)
126 | {
127 |     for (int i=0;i<a.size();i++)
128 |     {
129 |         switch(a[i])
130 |         {
131 |             case '0':ans+="000";
132 |                 break;
133 |             case '1':ans+="001";
134 |                 break;
135 |             case '2':ans+="010";
136 |                 break;
137 |             case '3':ans+="011";
138 |                 break;
139 |             case '4':ans+="100";
140 |                 break;
141 |             case '5':ans+="101";
142 |                 break;
143 |             case '6':ans+="110";
144 |                 break;
145 |             case '7':ans+="111";
146 |                 break;
147 |             default:ans=" Invalid input";
148 |                 break;
149 |         }
150 |     }
151 | }
152 | }
153 | return ans;
154 | }
155 | }
156 | string chooseFun()
157 | {
158 |     switch(a)
159 |     {
160 |         case 1:ans=binToHex(inp);
161 |             return ans ;
162 |         case 2:ans=binToOct(inp);
163 |             return ans ;
164 |         case 3:ans=hexToBin(inp);
165 |             return ans;
166 |         case 4:ans=hexToBin(inp);
167 |             ans=binToOct(ans);
168 |             return ans;
169 |         case 5:ans=octToBin(inp);
170 |             return ans;
171 |         case 6:ans=octToBin(inp);
172 |             ans=binToHex(ans);
173 |             return ans;
174 |     }
175 | }
176 | }
177 | }
178 | }
179 | }
180 | int main()
181 | {
182 |     int a;
183 |     string ans;
184 |     cout<<"Enter the number that represent the format you want to change:"<<endl;
185 |     cout<<"1.Binary to Hexadecimal."<<"\n2.Binary to Octal."<<"\n3.Hexadecimal to Binary."<<"\n4.Hexadecimal to Octal."<<"\n5.Octal to Binary."<<"\n6.Octal to Hexadecimal"<<endl;
186 |     cin >>a;
187 |     change c1;
188 |     c1.input(a);
189 |     ans=c1.chooseFun();
190 |     cout<<ans<<endl;
191 |     return 0;
192 | }
```

```
163 |     return ans ;
164 | case 3:ans=hexToBin(inp);
165 |     return ans;
166 | case 4:ans=hexToBin(inp);
167 |     ans=binToOct(ans);
168 |     return ans;
169 | case 5:ans=octToBin(inp);
170 |     return ans;
171 | case 6:ans=octToBin(inp);
172 |     ans=binToHex(ans);
173 |     return ans;
174 | }
175 | }
176 | }
177 | }
178 | }
179 | }
180 | int main()
181 | {
182 |     int a;
183 |     string ans;
184 |     cout<<"Enter the number that represent the format you want to change:"<<endl;
185 |     cout<<"1.Binary to Hexadecimal."<<"\n2.Binary to Octal."<<"\n3.Hexadecimal to Binary."<<"\n4.Hexadecimal to Octal."<<"\n5.Octal to Binary."<<"\n6.Octal to Hexadecimal"<<endl;
186 |     cin >>a;
187 |     change c1;
188 |     c1.input(a);
189 |     ans=c1.chooseFun();
190 |     cout<<ans<<endl;
191 |     return 0;
192 | }
```

Output:-

```
ayush@ayush: ~/Documents/programming lab/assignment1
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
Enter the number that represent the format you want to change:
1.Binary to Hexadecimal.
2.Binary to Octal.
3.Hexadecimal to Binary.
4.Hexadecimal to Octal.
5.Octal to Binary.
6.Octal to Hexadecimal
1
Enter your Input:111000
38
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
Enter the number that represent the format you want to change:
1.Binary to Hexadecimal.
2.Binary to Octal.
3.Hexadecimal to Binary.
4.Hexadecimal to Octal.
5.Octal to Binary.
6.Octal to Hexadecimal
2
Enter your Input:111000
70
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
Enter the number that represent the format you want to change:
1.Binary to Hexadecimal.
2.Binary to Octal.
3.Hexadecimal to Binary.
4.Hexadecimal to Octal.
5.Octal to Binary.
6.Octal to Hexadecimal
3
Enter your Input:38
0B11000
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
Enter the number that represent the format you want to change:
1.Binary to Hexadecimal.
2.Binary to Octal.
3.Hexadecimal to Binary.
4.Hexadecimal to Octal.
5.Octal to Binary.
6.Octal to Hexadecimal
4
Enter your Input:38
070
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
Enter the number that represent the format you want to change:
1.Binary to Hexadecimal.
2.Binary to Octal.
3.Hexadecimal to Binary.
4.Hexadecimal to Octal.
5.Octal to Binary.
6.Octal to Hexadecimal
5
Enter your Input:70
111000
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
```

```
ayush@ayush:~/Documents/programming lab/assignment1$ ./a.out
Enter the number that represent the format you want to change:
1.Binary to Hexadecimal.
2.Binary to Octal.
3.Hexadecimal to Binary.
4.Hexadecimal to Octal.
5.Octal to Binary.
6.Octal to Hexadecimal
6
Enter your Input:70
38
ayush@ayush:~/Documents/programming lab/assignment1$
```