

The screenshot shows a software interface, likely a development environment, with a code editor window open. The title bar of the code editor says "main() : int". Below the title bar is a toolbar with several icons. The main area of the window is a code editor showing a C++ program named "Q10.cpp". The code is as follows:

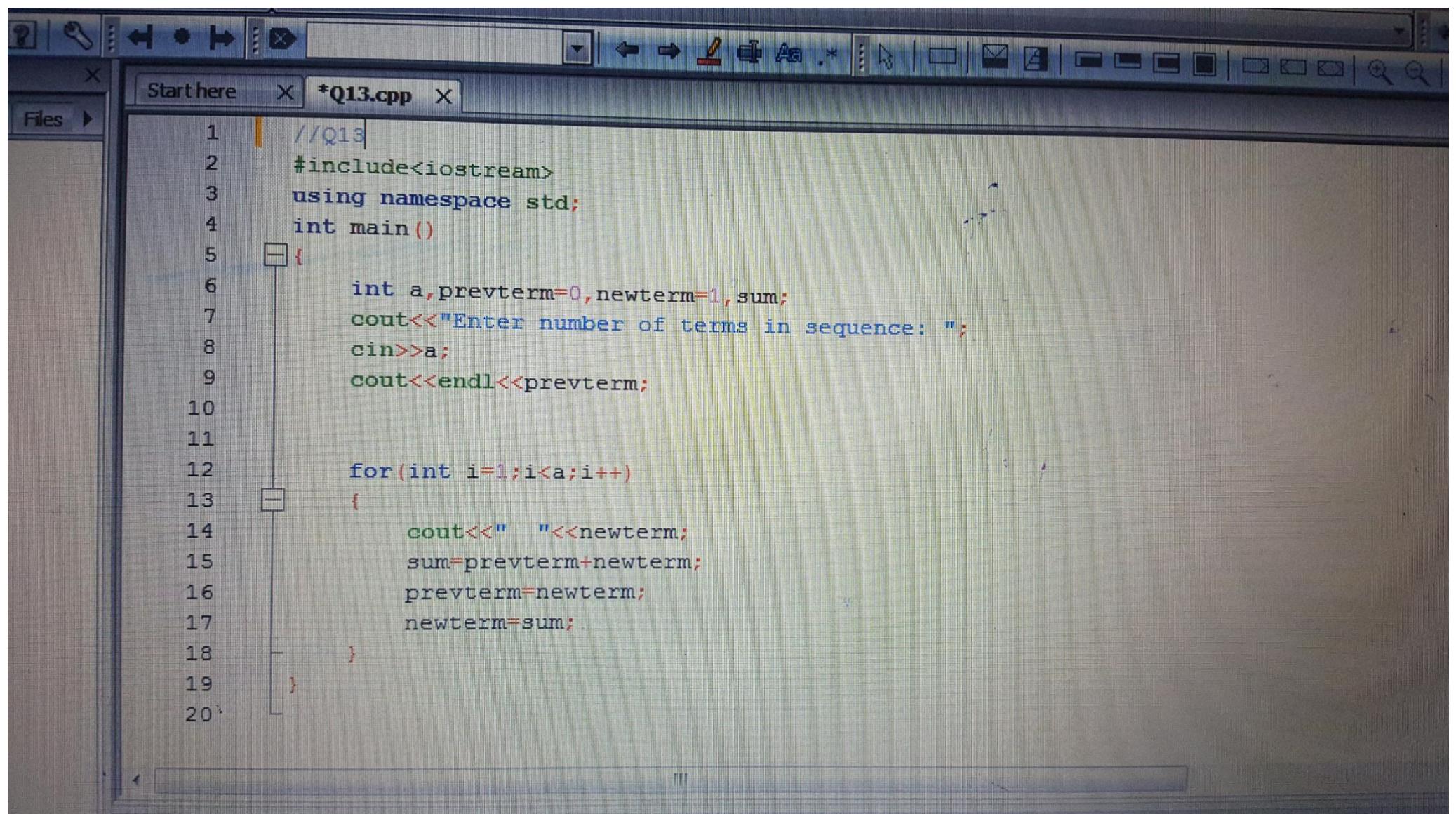
```
1 //QUESTION 10
2 #include <iostream>
3 using namespace std;
4 int main()
5 {
6     int a, num1, num2, num3, num4, num5;
7     cout<<"Enter a five digit number: ";
8     cin>>a;
9     num5=a%10;
10    a=a/10;
11    num4=a%10;
12    a=a/10;
13    num3=a%10;
14    a=a/10;
15    num2=a%10;
16    a=a/10;
17    num1=a%10;
18    cout<< num1<<" "<< num2<<" "<< num3<<" "<< num4<<" "<< num5<<endl;
19 }
20
```

The code uses a series of modulus and division operations to extract digits from a five-digit number and then prints them out separated by spaces. The code editor has a status bar at the bottom with tabs for "Logs & others", "Build log", "Build messages", "CppCheck/Vera++", and "CppCheck/Vera++ messages".

```
1 //Q11
2 #include <iostream>
3 using namespace std;
4 int main()
5 {
6     float hours,rate,salary,a,b;
7     cout<<"Enter hours worked (-1 to end):";
8     cin>>hours;
9
10    while(hours!= -1)
11    {
12        cout<<"Enter hourly rate: ";
13        cin>>rate;
14        if(hours>40)
15        {
16            a=(40*rate);
17            b=((hours-40)*rate*1.5);
18            salary=a+b;
19        }
20        else
21        {
22            salary=a+b;
23        }
24        cout<<"salary of employee is: "<<salary<<endl<<endl;
25        cout<<"Enter hours worked (-1 to end): ";
26        cin>>hours;
27    }
28 }
29 }
```

The image shows a screenshot of a Windows operating system desktop. In the center is a code editor window titled "Q12.cpp". The window has a dark blue header bar with various icons for file operations, search, and help. Below the header is a toolbar with icons for back, forward, and other functions. The main area of the window displays the following C++ code:

```
1 //Q12
2 #include<iostream>
3 using namespace std;
4 int main()
5 {
6     int a,fact;
7     int b;
8     cout<<"Enter a number to find its factorial: ";
9     cin>>a;
10    b=a;
11    for(int i=(a-1);i>=1;i--)
12    {
13        a=a*i;
14    }
15    for(int c=b;c>=1;c--)
16    {
17        cout<<c<<"x";
18    }
19    cout<<"\b= "<<a;
20
21
```



The image shows a screenshot of a computer screen displaying a code editor and a file explorer window.

The code editor window is titled "Q13.cpp" and contains the following C++ code:

```
1 //Q13
2 #include<iostream>
3 using namespace std;
4 int main()
5 {
6     int a, prevterm=0, newterm=1, sum;
7     cout<<"Enter number of terms in sequence: ";
8     cin>>a;
9     cout<<endl<<prevterm;
10
11
12     for(int i=1;i<a;i++)
13     {
14         cout<<"    "<<newterm;
15         sum=prevterm+newterm;
16         prevterm=newterm;
17         newterm=sum;
18     }
19 }
20
```

The screenshot shows a C++ IDE interface with the following details:

- Title Bar:** Shows tabs for "Start here", "\*Q13.cpp", and "\*Q14.cpp".
- Toolbar:** Includes standard icons for file operations, search, and code navigation.
- Code Editor:** Displays the following C++ code:

```
1 //Q14
2 #include <iostream>
3 using namespace std;
4 int main()
5 {
6     double a,b,c;
7     cout<<"Enter length of 3 sides of triangle: ";
8     cin>>a>>b>>c;
9
10    if( ((a+b)>c) && ((b+c)>a) && ((a+c)>b) )
11    {
12        cout<<"They are sides of triangle";
13    }
14
15    else
16    {
17        cout<<"They are not sides of a triangle";
18    }
19
20
21 }
```

The code is a simple program that checks if three input values (a, b, c) can form a triangle based on the triangle inequality theorem. It outputs "They are sides of triangle" if true, and "They are not sides of a triangle" if false.

The screenshot shows a C++ IDE interface with a toolbar at the top and a tab bar below it. The tab bar has four tabs: "here" (disabled), "\*Q13.cpp" (disabled), "\*Q14.cpp" (disabled), and "\*Q15.cpp" (selected). The main window displays the following C++ code:

```
//Q15
#include<iostream>
#include<iomanip>
using namespace std;
int main()
{
    float a,b,c;
    cout<<"Enter Lengths of three sides :";
    cin>>a>>b>>c;
    if((a*a-b*b-c*c<=0.0001) || (b*b-a*a-c*c<=0.0001) || (c*c-a*a-b*b<=0.0001))
    {
        cout<<"The given sides fulfill condition to be right angled triangle";
    }
    else
    {
        cout<<"They are not right angle triangle sides";
    }
}
```

```
1 #include <iostream>
2 #include<cstdlib>
3 #include<iomanip>
4 using namespace std;
5 int main()
6 {
7     int a,n;
8     float b,sum=1,t=1;
9
10    cout<<"Enter the number whose exponential is needed :";
11    cin>>b;
12    cout<<"Enter number of terms for accuracy :";
13    cin>>n;
14
15    for(a=1;a<=n;a++)
16    {
17        t=t*b/a;
18        sum=sum+t;
19
20    }
21    system("cls");
22
23    cout<<"The exponential of "<<b<<" ="<<setprecision(4)<<sum<<endl;
24
25 }
```

```
1 //Q17
2 #include<iostream>
3 #include <iomanip>
4 using namespace std;
5 int main()
6 {
7     int n;
8     float x,a,b;
9     cout<<"Enter the value of angle in degrees to calculate its sine :";
10    cin>>x;
11
12    cout<<"Enter no of terms: ";
13    cin>>n;
14
15    x=x*(3.14159/180);
16    b=x;
17    a=x;
18    for(int i=1;i<=n;i++)
19    {
20        b=(b*(-1)*x*x)/(2*i*(2*i+1));
21        a=a+b;
22    }
23    cout<<"The value of Sine("<<x<<") ="<<setprecision(4)<<a;
24 }
25 }
```

```
Start here X *Q17.cpp X *Q18.cpp X
1 //Q18
2 #include<iostream>
3 #include<iomanip>
4 using namespace std;
5 int main()
6 {
7     for(int i=1;i<=10;i++)
8     {
9         for(int j=1;j<=i;j++)
10        {
11            cout<<"*";
12        }
13        cout<<endl;
14    }
15    cout<<endl<<endl;
16
17    for(int i=10;i>0;i--)
18    {
19        for (int j=1;j<=i;j++)
20        {
21            cout<<"*";
22        }
23        cout<<endl;
24    }
25    cout<<endl<<endl;
26    for(int i=1;i<=10;i++)
27    {
28        for(int j=10-i;j>0;j--)
29        {
30            cout<<" ";
31        }
32    }
33 }
```

```
22         }
23         cout<<endl;
24     }
25     cout<<endl<<endl;
26     for(int i=1;i<=10;i++)
27     {
28         for(int j=10-i;j>0;j--)
29         {
30             cout<<" ";
31         }
32         for(int k=1;k<=i;k++)
33         {
34             cout<<"**";
35         }
36         cout<<endl;
37     }
38     cout<<endl<<endl;
39     for(int i=10;i>0;i--)
40     {
41         for (int j=0;j<10-i;j++)
42         {
43             cout<<" ";
44         }
45         for (int k=1;k<=i;k++)
46         {
47             cout<<"**";
48         }
49         cout<<endl;
50     }
51 }
```

Symbols Files ▶

Q19.cpp Q19.cpp X Q19.cpp X

```
1 //Q19
2 #include <iostream>
3 using namespace std;
4 int main()
5 {
6     int rows=5,i,j,k;
7
8     for (i=1 ; i<=rows ; i++)
9     {
10         for (j=rows-i ; j>=1 ; j--)
11         {
12             cout<<" ";
13         }
14         for (k=1 ; k<=2*i-1 ; k++)
15         {
16             cout<<"*";
17         }
18         cout<<endl;
19     }
20     for (i=rows-1 ; i>=1 ; i--)
21     {
22         for (j=1 ; j<=rows-i ; j++)
23         {
24             cout<<" ";
25         }
26         for (k=2*i-1 ; k>=1 ; k--)
27         {
28             cout<<"*";
29         }
30         cout<<endl;
31 }
```

```
8     for (i=1 ; i<=rows ; i++)
9     {
10        for (j=rows-i ; j>=1 ; j--)
11        {
12            cout<<" ";
13        }
14        for (k=1 ; k<=2*i-1 ; k++)
15        {
16            cout<<"**";
17        }
18        cout<<endl;
19    }
20    for (i=rows-1 ; i>=1 ; i--)
21    {
22        for (j=1 ; j<=rows-i ; j++)
23        {
24            cout<<" ";
25        }
26        for(k=2*i-1 ; k>=1 ; k--)
27        {
28            cout<<"**";
29        }
30        cout<<endl;
31    }
32    return 0;
33 }
```

Logs & others

```
1 //Q20
2 #include <iostream>
3 using namespace std;
4 int main()
5 {
6     int rows,i,j,k;
7     cout<<"Enter Number Of Rows\n";
8     cin>>rows;
9     if((rows>1)&&(rows<=19)&&(rows%2!=0))
10    {
11        for (i=1 ; i<=rows ; i++)
12        {
13            for (j=rows-i ; j>=1 ; j--)
14            {
15                cout<<" ";
16            }
17            for (k=1 ; k<=2*i-1 ; k++)
18            {
19                cout<<"**";
20            }
21            cout<<endl;
22        }
23        for (i=rows-1 ; i>=1 ; i--)
24        {
25            for (j=1 ; j<=rows-i ; j++)
26            {
27                cout<<" ";
28            }
29            for (k=2*i-1 ; k>=1 ; k--)
30            {
31                cout<<"**";
32            }
33        }
34    }
35 }
```

```
16
17     }
18     for (k=1 ; k<=2*i-1 ; k++)
19     {
20         cout<<"**";
21     }
22     cout<<endl;
23 }
24 for (i=rows-1 ; i>=1 ; i--)
25 {
26     for (j=1 ; j<=rows-i ; j++)
27     {
28         cout<<"  ";
29     }
30     for (k=2*i-1 ; k>=1 ; k--)
31     {
32         cout<<"**";
33     }
34     cout<<endl;
35 }
36 else
37 {
38     cout<<"Entered rows are not between 1-19"<<endl;
39 }
40 return 0;
41 }
42
43 }
```

The screenshot shows a C++ IDE interface with a dark blue header bar containing various icons. The main window displays a file named "q21.cpp". The code is a program to find Pythagorean triplets (a, b, c) where  $a^2 = b^2 + c^2$ , with all variables ranging from 1 to 500.

```
1 //Q21
2 #include<iostream>
3 using namespace std;
4 int main()
5 {
6     int a,b,c;
7     for(a=1;a<=500;a++)
8     {
9         for(b=1;b<=500;b++)
10        {
11            for(c=1;c<=500;c++)
12            {
13                if( (a*a==b*b+c*c) || (b*b==a*a+c*c) || (c*c==a*a+b*b) )
14                {
15                    cout<<a<<" , " <<b<<" , " <<c<<endl<<endl;
16                }
17            }
18        }
19    }
20 }
21 }
22 }
```

Start here X \*Q22.cpp X

```
1 //Q22
2 #include <iostream>
3 using namespace std;
4
5 int *insertionsort(int *a, int size);
6 int main()
7 {
8     int data[10]={};
9     int *result;
10    cout<<"Enter 10 elements: ";
11    for(int i=0;i<10;i++)
12    {
13        cin>>data[i];
14    }
15    result=insertionsort(data,10);
16    for(int i=0;i<10;i++)
17    {
18        cout<<result[i]<<"\t";
19    }
20 }
21 int *insertionsort(int*a, int size)
22 {
23     int temp,pos;
24     for(int i=1;i<size;i++)
25     {
26         temp=a[i];
27         pos=i;
28         while( (pos>0) && (a[pos-1]>temp) )
29         {
30             a[pos]=a[pos-1];
31         }
32     }
33 }
```

```
0 int data[10]={};
1 int *result;
2 cout<<"Enter 10 elements: ";
3 for(int i=0;i<10;i++)
4 {
5     cin>>data[i];
6 }
7 result=insertionsort(data,10);
8 for(int i=0;i<10;i++)
9 {
10     cout<<result[i]<<"\t";
11 }
12
13 int *insertionsort(int*a,int size)
14 {
15     int temp,pos;
16     for(int i=1;i<size;i++)
17     {
18         temp=a[i];
19         pos=i;
20         while((pos>0)&&(a[pos-1]>temp))
21         {
22             a[pos]=a[pos-1];
23             pos--;
24         }
25         a[pos]=temp;
26     }
27     return a;
28 }
```

```
1 //Q23
2 #include <iostream>
3 using namespace std;
4 int *selectionsort(int *a,int size);
5 void swap(int *p1, int *p2);
6 int main()
7 {
8     int data[10]={};
9     int *result;
10    cout<<"Enter elements of the sequence: ";
11    for(int i=0;i<10;i++)
12    {
13        cin>>data[i];
14    }
15    result=selectionsort(data,10);
16    for(int i=0;i<10;i++)
17    {
18        cout<<result[i]<<"\t";
19    }
20 }
21 void swap(int *p1, int*p2)
22 {
23     int temp=*p1;
24     *p1=*p2;
25     *p2=temp;
26
27 }
28 int *selectionsort(int *a,int size)
29 {
30     int s_index;
31     for(int i=0;i<size-1;i++)
32     {
```

Symbols Files > starthere X \*Q23.cpp X

```
18         cout<<result[i]<<"\t";
19     }
20 }
21 void swap(int *p1, int*p2)
22 {
23     int temp=*p1;
24     *p1=*p2;
25     *p2=temp;
26 }
27 }
28 int *selectionsort(int *a,int size)
29 {
30     int s_index;
31     for(int i=0;i<size-1;i++)
32     {
33         s_index=i;
34         for(int index=i+1;index<size;index++)
35         {
36             if(a[index]<a[s_index])
37             {
38                 s_index=index;
39             }
40         }
41         swap(&a[i], &a[s_index]);
42     }
43     return a;
44 }
45
46
47
48 }
```

```
Start here X *Q24.cpp X
1 //Q24
2 #include <iostream>
3
4 using namespace std;
5 void swap(int *p1, int *p2);
6 int *bubblesort(int *a, int size);
7 int main()
8 {
9     int data[10]={};
10    int *result;
11
12    cout<<"Enter 10 elements of sequence: ";
13    for(int i=0;i<=9;i++)
14    {
15        cin>>data[i];
16    }
17    result=bubblesort(data,10);
18
19    cout<<endl<<endl<<"Sorted array is:"<<endl;
20    for(int i=0;i<=9;i++)
21    {
22        cout<<result[i]<<"\t";
23    }
24 }
25 int*bubblesort(int *a, int size)
26 {
27     bool swapped;
28     for(int i=0;i<size;i++)
29     {
30         swapped=false;
31         for(int j=0;j<size;j++)
32         {
33             if(a[j]>a[j+1])
34             {
35                 int temp=a[j];
36                 a[j]=a[j+1];
37                 a[j+1]=temp;
38                 swapped=true;
39             }
40         }
41     }
42     return result;
43 }
```

The screenshot shows a C++ IDE interface with a code editor containing a file named "Q24.cpp". The code implements a bubble sort algorithm with a swap function.

```
24 }
25 int*bubblesort(int *a,int size)
26 {
27     bool swapped;
28     for(int i=0;i<size;i++)
29     {
30         swapped=false;
31         for(int j=0;j<size;j++)
32         {
33             if(a[j]>a[j+1])
34             {
35                 swap(&a[j],&a[j+1]);
36                 swapped=true;
37             }
38         }
39         if(swapped==false)
40         {
41             break;
42         }
43     }
44     return a;
45 }
46 void swap(int *p1,int *p2)
47 {
48     int temp=*p1;
49     *p1=*p2;
50     *p2=temp;
51 }
52
53
54 }
```

Start here X \*Q25.cpp X

```
1 //Q25
2 #include<iostream>
3 #include<vector>
4 using namespace std;
5 int main()
6 {
7     vector <int>a;
8     int x;
9     cout<<"Enter an integer number: ";
10    cin>>x;
11    while(x!=0)
12    {
13        a.push_back(x%10);
14        x=x/10;
15    }
16    for(int i=a.size()-1
17         ;i>=0;i--)
18    {
19        cout<<a[i]<<"\t";
20    }
21 }
22 }
```

Start here

Q26.cpp

```
1 //Q26
2 #include <iostream>
3 #include<vector>
4 using namespace std;
5 class Array{
6 private:
7     vector<double>v;
8     int i;
9 public:
10    Array(int n):i(0)
11    {
12        v.resize(n);
13    }
14    void insert_element(double value)
15    {
16        v[i]=value;
17        i++;
18    }
19    void index_elementreplace(int index,double value)
20    {
21        if(index>=i)
22        {
23            return ;
24        }
25        else
26            v[index]=value;
27    }
```

```
28     void index_findreplace(double val,double val1)
29     {
30         if(find_element(val)>=0)
31         {
32             v[find_element(val)]=val1;
33         }
34         else
35         {
36             return;
37         }
38     }
39     void index_elementremove(int index)
40     {
41         if(index>=i)
42         {
43             return;
44         }
45         else
46         {
47             for(int j=index;j<i;j++)
48             {
49                 v[j]=v[j+1];
50             }
51             i--;
52         }
53     }
54     int find_element(double value)
55     {
```

```
54     int find_element(double value)
55     {
56         for (int j=0;j<i;j++)
57         {
58             if (v[j]==value)
59             {
60                 return j;
61             }
62         }
63     }
64     void display()
65     {
66         for (int j=0;j<i;j++)
67         {
68             cout<<v[j]<<"\t";
69         }
70         cout<<endl;
71     }
72 }
```

```
73     int main()
74 {
75     Array a(10);
76     a.insert_element(2);
77     a.insert_element(4);
78     a.insert_element(6);
79     a.insert_element(8);
80     a.insert_element(10);
81     a.insert_element(12);
82     a.insert_element(14);
83     a.insert_element(16);
84     a.insert_element(18);
85     a.insert_element(20);
86     a.display();
87     a.index_findreplace(12,30);
88     a.display();
89     a.index_elementreplace(9,30);
90     a.display();
91     cout<<"Index at value 18 is: "<<a.find_element(18)<<endl;
92     a.index_elementremove(4);
93     a.display();
94 }
```