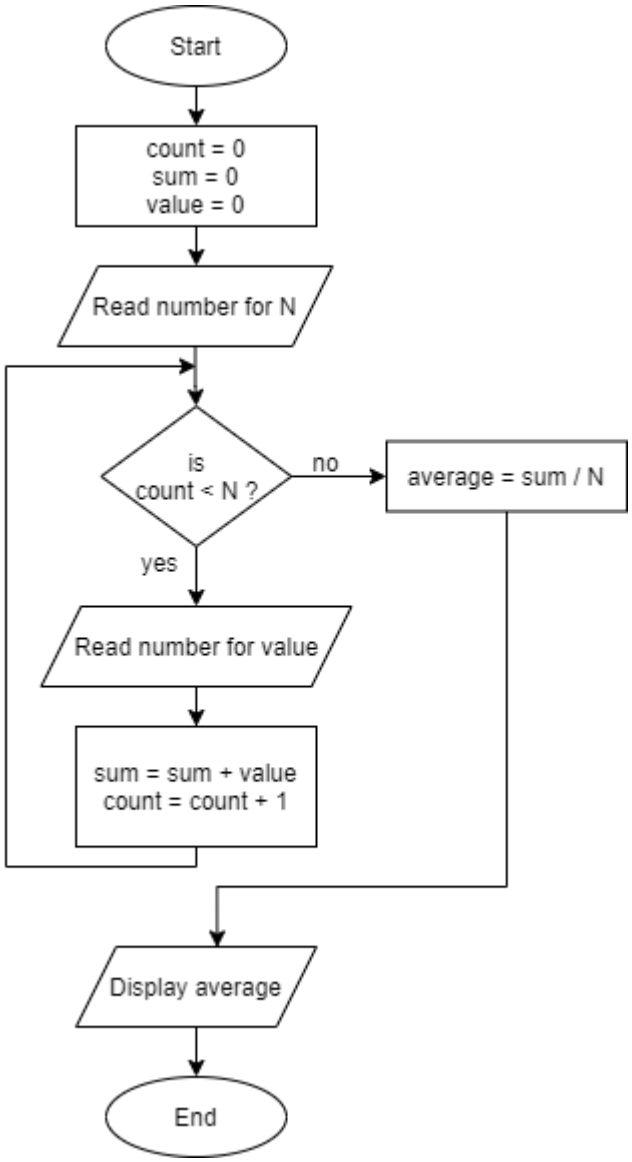
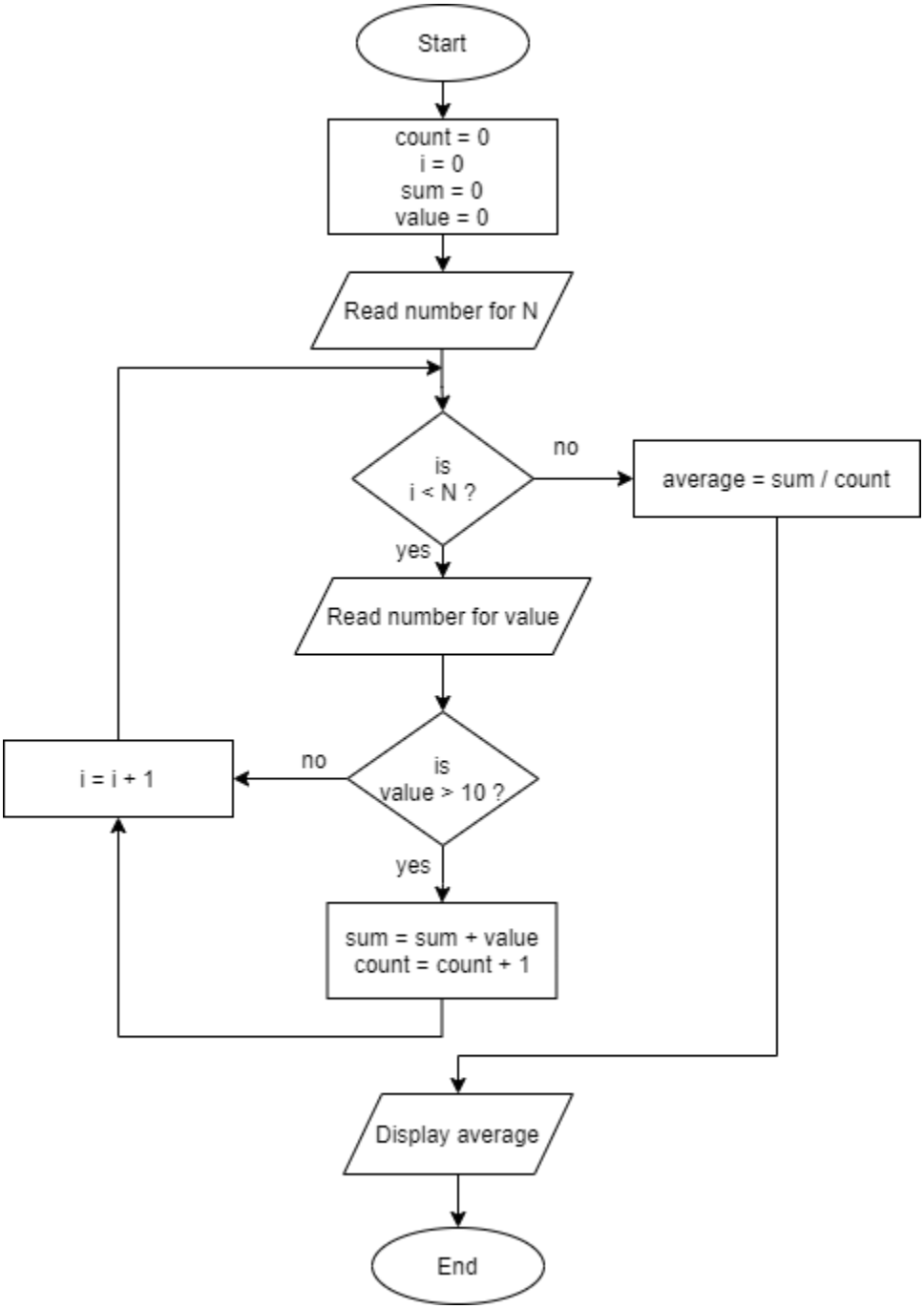
Homework 4

Flow charts

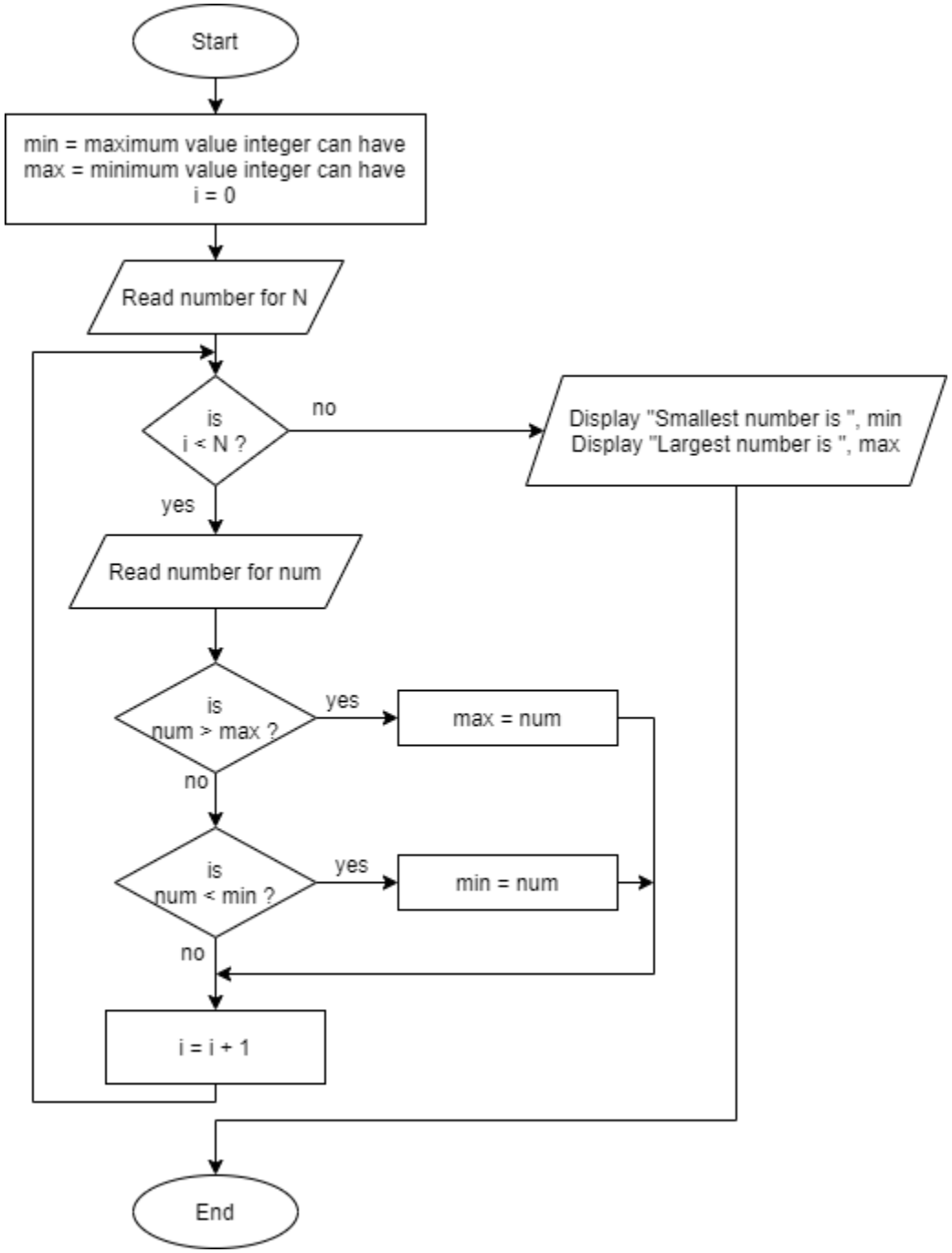
1.



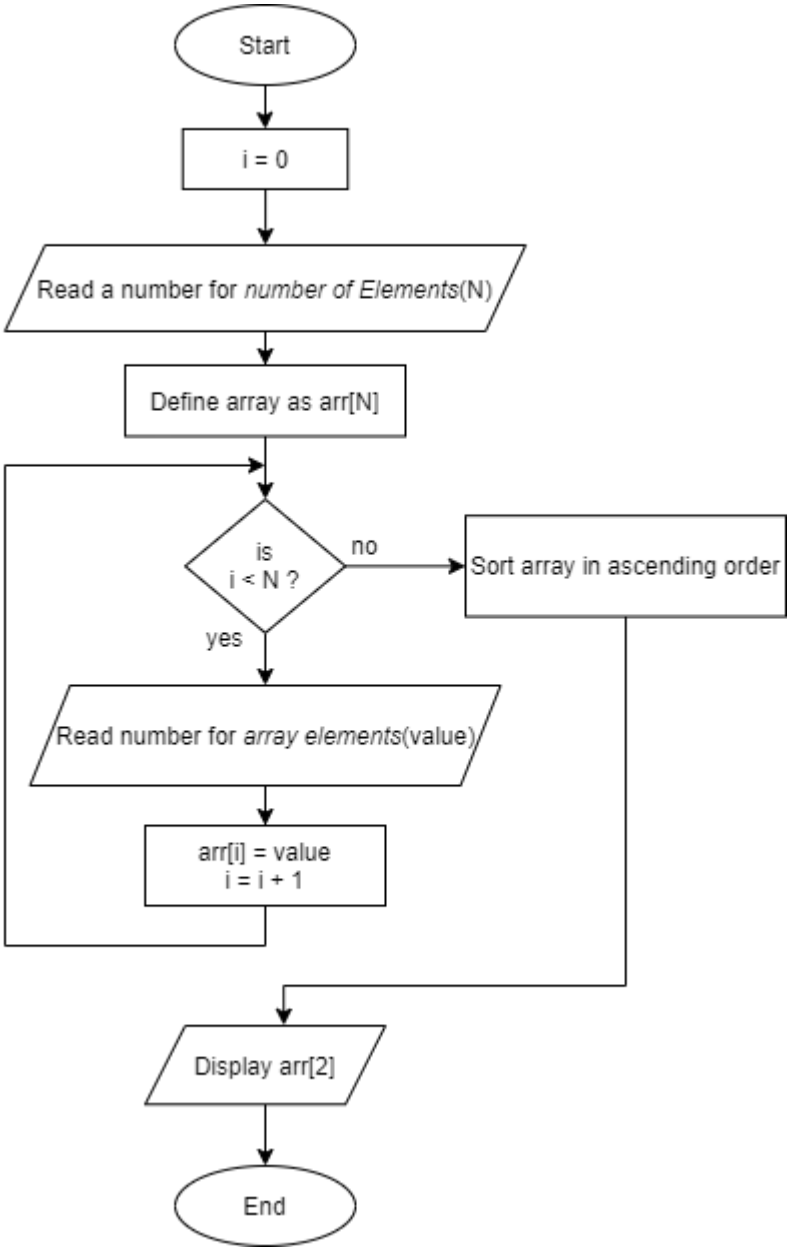
2.


Start
count = 0
i = 0
sum = 0
value = 0
Read number for N
is
i < N ?
no
average = sum / count
yes
Read number for value
is
value > 10 ?
no
i = i + 1
yes
sum = sum + value
count = count + 1
Display average
End

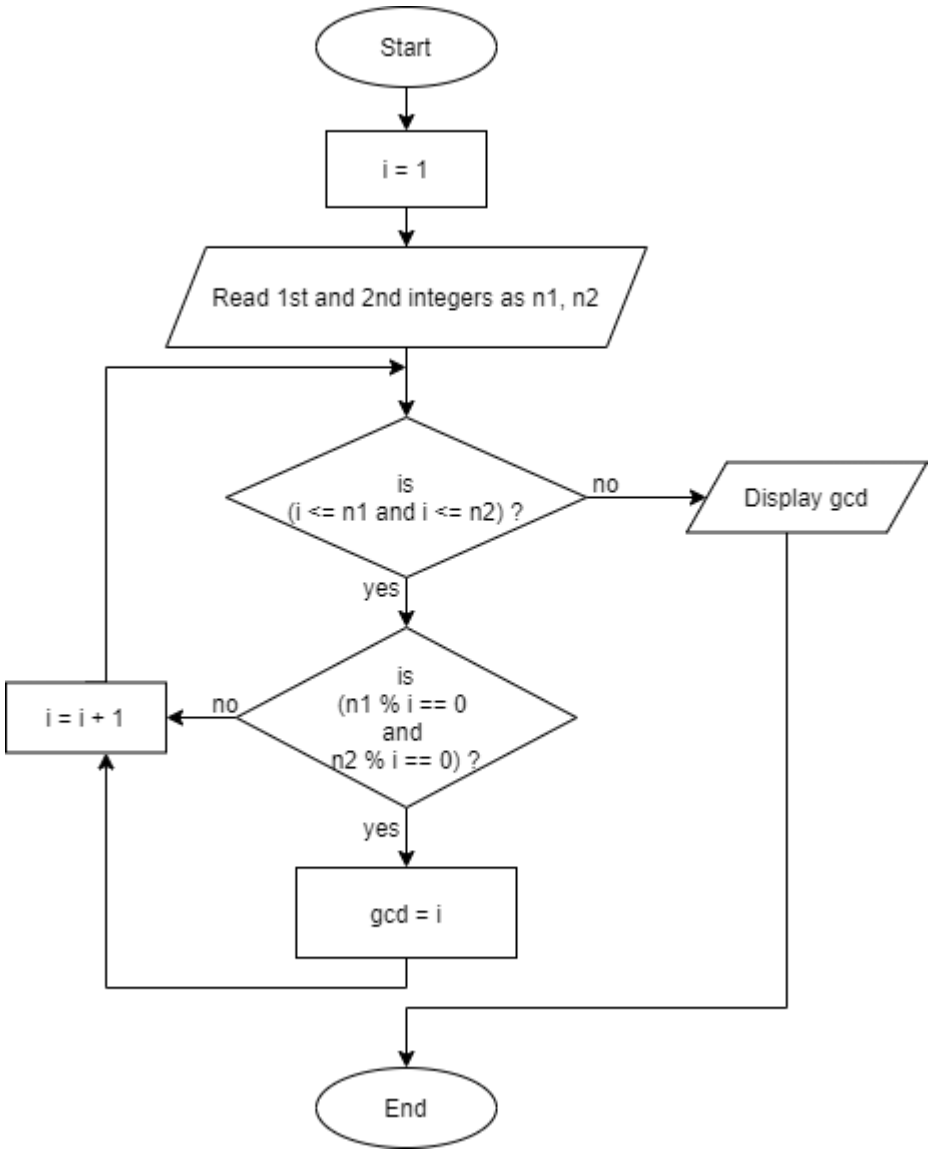
3.


Start
min = maximum value integer can have
max = minimum value integer can have
i = 0
Read number for N
is
i < N ?
no
Display "Smallest number is ", min
Display "Largest number is ", max
yes
Read number for num
is
num > max ?
yes
max = num
no
is
num < min ?
yes
min = num
no
i = i + 1
End

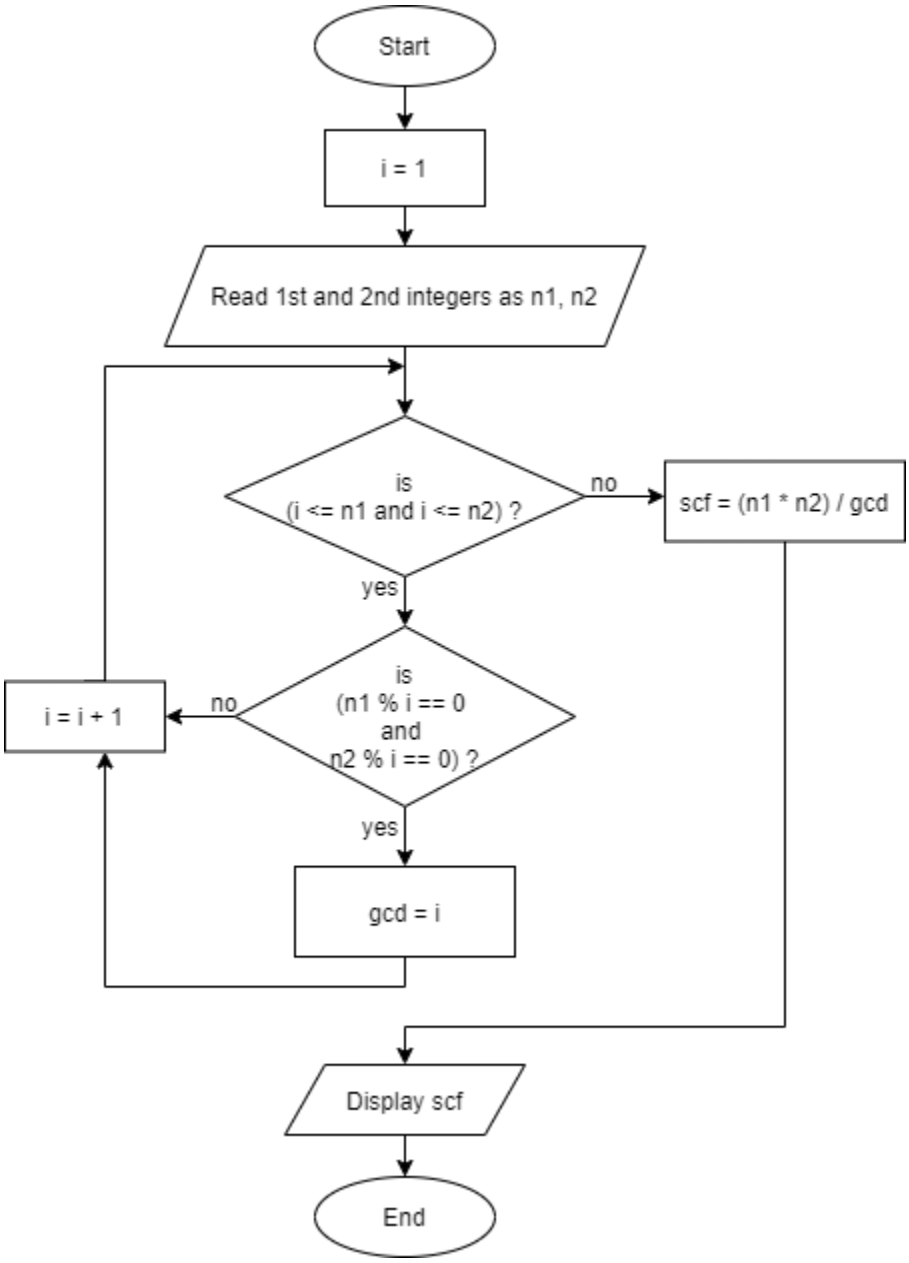
4.


Start
i = 0
Read a number for number of Elements(N)
Define array as arr[N]
is
i < N ?
no
Sort array in ascending order
yes
Read number for array elements(value)
arr[i] = value
i = i + 1
Display arr[2]
End

5.


Start
i = 1
Read 1st and 2nd integers as n1, n2
is
(i <= n1 and i <= n2) ?
no
Display gcd
yes
is
(n1 % i == 0
and
n2 % i == 0) ?
no
i = i + 1
yes
gcd = i
End

6.


Start
i = 1
Read 1st and 2nd integers as n1, n2
is
(i <= n1 and i <= n2) ?
no
scf = (n1 * n2) / gcd
yes
is
(n1 % i == 0
and
n2 % i == 0) ?
no
i = i + 1
yes
gcd = i
Display scf
End

Codes

1.

```
#include <iostream>

using namespace std;

int main()

{
	//create variables
	int N;
	int i, count=0;
	float average, sum=0, value;

	//prompt user inputs for N
	cout << "Enter numbers for N: " ;
	cin >> N;

	//prompt user inputs iteratively
	for (i=0; i<N; i++)
	{
		cout << "Please enter a number: " ;
		cin >> value;

		//if statement to calculate sum of numbers greater than 10
		if (value > 10)
		{
			sum = sum + value;
			count++ ;
		}
	}

	//Calculate the average
	average = sum / count;
	//display average
	cout << "Average = " << average << endl;
	return 0;
}
```

2.

```
#include<iostream>
using namespace std;
int main()
{
	float N,number,sum=0,count,count2=0;			//count2= count the numbers
which greater than 10
	float Average;
	cout<<"Input N:";
	cin>>N;
	for(count=1;count<=N;count++)
	{
		cout<<"Get number"<<count<<"':";
		cin>>number;
		if(number>10){
			count2++;
			sum=sum+number;
			Average=sum/count2;
		}
	}

	cout<<"'Average is="<<Average;

	return 0;
}
```

3.

```
#include <iostream>
using namespace std;

int main()
{
	//variables
	int min, max;
	int n, i, num;

	min = INT_MAX;		//assign maximum value for a int variable type to min
	max = INT_MIN;		//assign minimum value for a int variable type to max

	//prompt user inputs for N
	cout << "Enter number for N: ";
	cin >> n;

	//finding smallest and largest numbers
	for(i=0; i<n; i++)
	{
		cout << "Please enter a number: " ;
		cin >> num;

		if(num>max)
		{
			max = num;
		}

		if(num<min)
		{
			min = num;
		}
	}

	 //display smallest and largest numbers
	cout << "Smallest number = " << min << endl;
	cout << "Largest number = " << max << endl;
}
```

4.

```
#include <iostream>
#include <bits/stdc++.h>  //a header file that includes every standard library
using namespace std;

int main()
{
    int N, i;

    //prompt user inputs for N
    cout << "Enter number for N: ";
    cin >> N;

    int arr[N];   //define array

    //promt user inputs to array
    for (i=0; i<N; i++)
    {
        cout << "Please enter a number: " ;
        cin >> arr[i];
    }
    //output array
    cout << "\nArray: ";
    for(i=0; i<N; i++)
    {
        cout << arr[i] << " ";
    }

    //sort the array in ascending order
    int p = sizeof(arr) / sizeof(arr[0]);  // find the point we want the array to be sorted
    sort(arr, arr + p);                    // sorting statement

    //output after sort
    cout << "\nArray after sorting: ";
    for (int i = 0; i < p; ++i)
        cout << arr[i] << " ";

    //since the 2nd position is the third smallest number...
    cout << "\nThird smallest number is: " << arr[2];

    return 0;
}
```

5.

```
#include <iostream>
using namespace std;

void greatestCommonDivisor()   //define the function
{
int n1, n2, gcd, i;

        //getting user inputs and assigning them
        cout << "Input the 1st integer: ";
        cin >> n1;
        cout << "Input the 2nd integer: ";
        cin >> n2;

        //calculate gcd
        for (i=1; i<=n1 && i<=n2; i++)
        {
           if (n1%i == 0 && n2%i == 0)
           {
                                gcd = i;
           }
        }

        //display gcd
        cout << "Greatest Common Divisor: " << gcd << endl;
}
int main()
{
        greatestCommonDivisor();//call the function
        return 0;
}
```

6.

```
#include <iostream>
using namespace std;

void smallestCommonFactor()    //define the function
{
int n1, n2, gcd, scf, i;

        //getting user inputs and assigning them
        cout << "Input the 1st integer: ";
        cin >> n1;
        cout << "Input the 2nd integer: ";
        cin >> n2;

        //calculate scf
        for (i=1; i<=n1 && i<=n2; i++)                  //first calculate gcd
        {
                if (n1%i == 0 && n2%i == 0)
                {
                        gcd = i;
                }
        }
        scf = (n1*n2)/gcd;                      //then calculate scf using this formula

        //display scf
        cout << "Smallest Common Factor: " << scf << endl;
}

int main()
{
        smallestCommonFactor();         //call the function
return 0;
}
```