Question 1:

Without sorting the array A, determine the second maximum of the array and its index

Example :

A[] = {9, 1, 11, 12, 8, 15, 7}

the second maximum is 12, and its index is 3

Answer:

```
#include <iostream>

#include <stdio.h>

using namespace std;

int main()
{
   float A[100];

   int  n=0 , largest , second , index, mindex;

  cout<<"enter the number";
   cin>>n;

    for(int i=0; i<n ; i++){

       cout<<"enter array element"<<(i+1)<<": ";
       cin>>A[i];

   }
   if (A[0]>A[1]){

       largest = A[1];

       second = A[0];
       index = 0;
```

```
    mindex = 0;
}else{
    largest = A[0];
    second = A[1];
    index = 1;
    mindex = 1;
}
for (int i = 2 ; i<n ; i++){
    if(A[i] > largest){
        second = largest;
        largest = A[i];
        index = mindex;
        mindex = i;
    }
         else if (A[i] > second && A[i] != largest){
        second = A[i];
        index = mindex;
```

```
            mindex = i;
        }
    }
    cout<<"second largest element in array is: "<<second;
    cout<<"its index is"<< index;
     return 0;
}
```

Question 2:

Calculate the sample variance of the array A :

$$SV = \frac{(A[0]-avg)^2+(A[1]-avg)^2+...+(A[n-1]-avg)^2}{n-1}$$

where avg is the average of the values in A.

Answer:

```
#include<stdio.h>
#include<math.h>
#include<iostream>
using namespace std;

int main ()
 {
    float A[100], avg=0, sum =0, SV=0, p=0;
    int n=0;

    cout<<"Enter the number";
    cin>>n;

    for(int i=0; i<n; i++) {
     cout<<"Enter Array Element"<<(i+1)<<": ";
     cout<<A[i];
    }
```

```
for (int i = 0; i<n; i++)
{
sum+=A[i];
}

avg = sum/n;
cout<<avg<<endl;

for(int i = 0; i<n; i++) {
p+= pow((A[i]-avg), 2);
}
SV = p/(n-1);
cout<<"Sample variance is "<<SV;
return 0;
}
```

Question 3:

Determine the index of the last two negative values in A

Example :

A[] = {10, -4, 9, -19, -8, 10, 12, -5, 9}

The indices of the last negative values in A are 7 and 4.

Answer:

```
#include <iostream>
#include <stdio.h>
using namespace std;
int main()
{
   float A[5], n1, n2;
   int n = 0;

   cout<<"enter the number ";
   cin >> n;

   for(int i = 0 ; i>n ; i++){
      cout<<"ener the array element"<<(i+1)<<": ";
      cin>>A[i];
```

```
    }

     for(int i = 0; i<n; i++){

        cout<<"Enter Array Element"<<(i+1)<<";";
        cin>>A[i];
     }
     for(int i=n; i>=0; i--){

        if(A[i]<0){
           n1=i;
           break;
        }
     }

     for(int i=n; i>=0; i--){

        if(A[i]<0 && i!=n1 ){
           n2=i;
           break;
        }
     }

     cout << "The  incices of he last negative values in s are"<<n1<< "and"<< n2;

     return 0;

}
```