Data Structure – C Practice Problems

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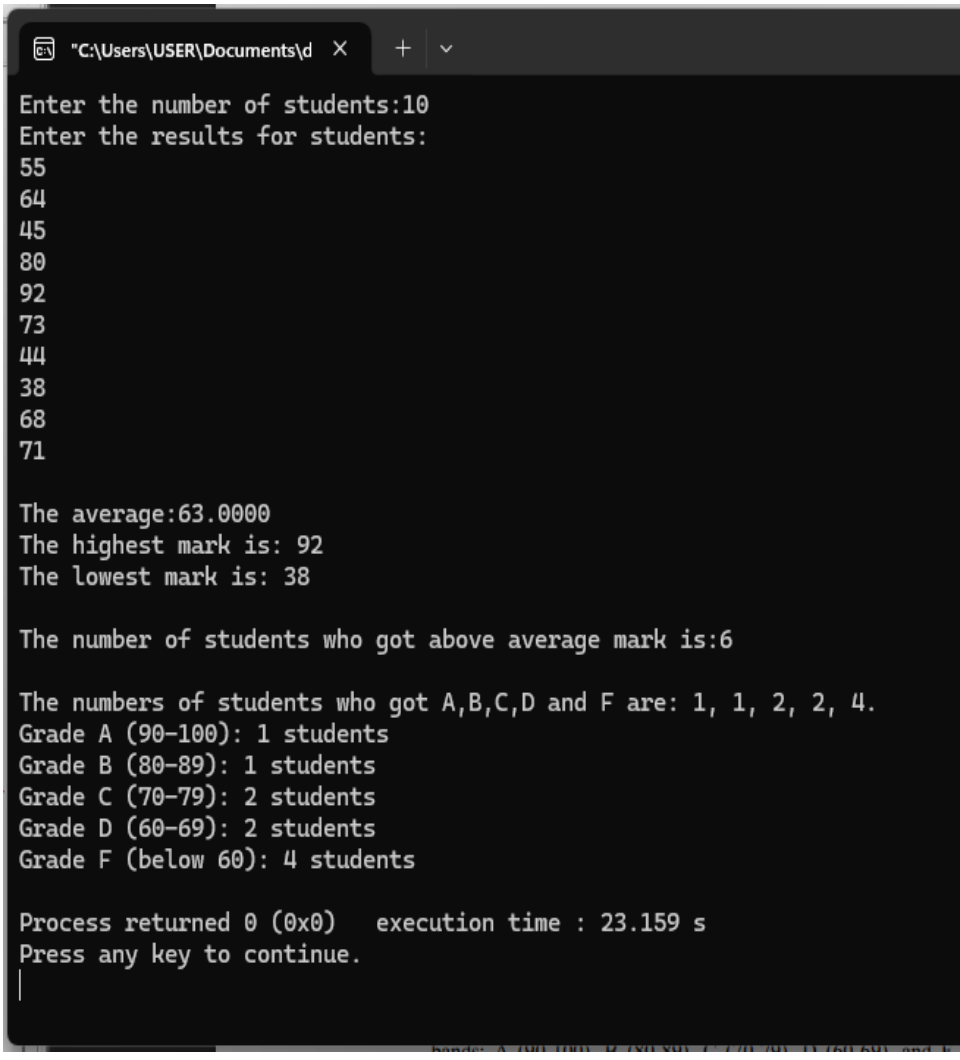
Part A

1. solution: (i, ii, iii, iv, v)

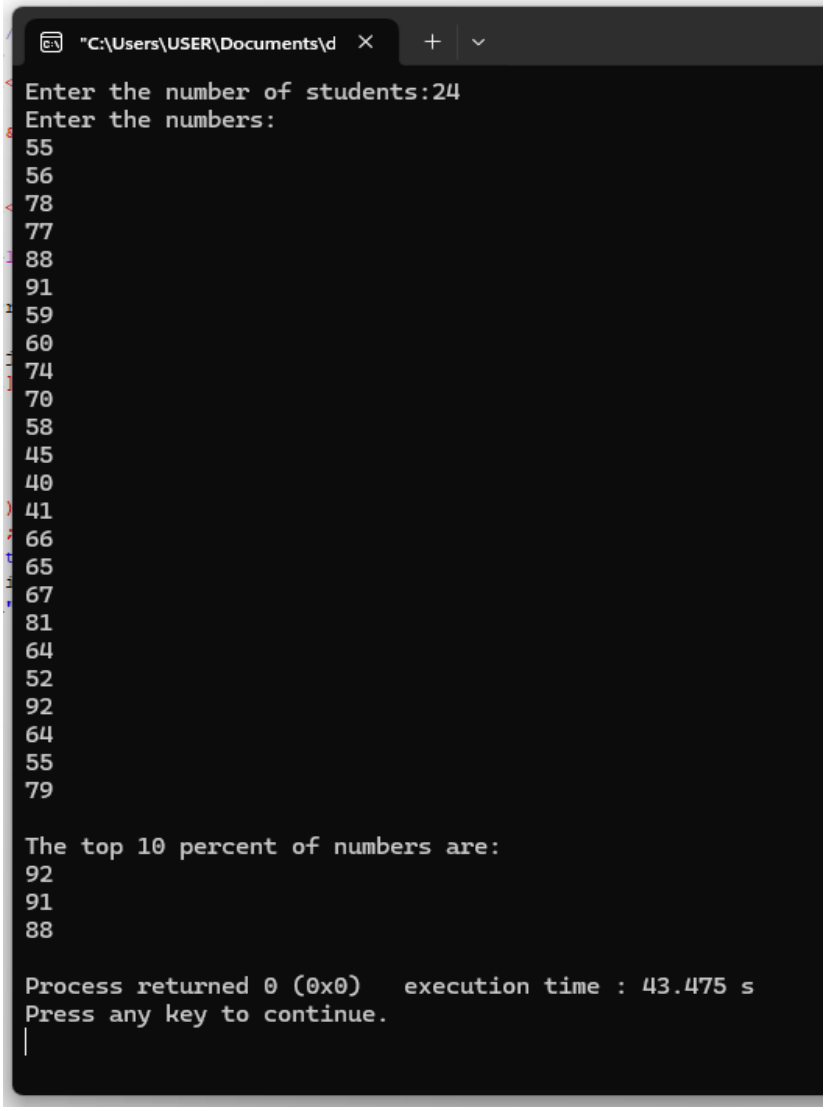
```
#include<stdio.h>
int main()
{
 int n;                 //students number from user
 printf("Enter the number of students:");
 scanf("%d",&n);

 int arr[n];            //the marks from user
 printf("Enter the results for students:\n");
 for (int i=0;i<n;i++)

 {
 scanf("%d",&arr[i]);
 }
 printf("\n");

 int sum=0;             //the average code
 for (int i=0;i<n;i++)
 {
 sum=sum+arr[i];
 }
 double ave=(double)sum/n;
 printf("The average:%.4f\n",ave);

int max=arr[0];         //max, min code
int min=arr[0];

for (int i=0;i<n;i++)
{
if(arr[i]>max)
 {
max=arr[i];
 }
if(arr[i]<min)
 {
```



```
 min=arr[i];
  }
 }
 printf("The highest mark is: %d\n",max);
 printf("The lowest mark is: %d\n",min);
 printf("\n");

 int count=0;                    //The number of students who got above average mark code
 for (int i=0;i<n;i++){
 if(arr[i]>ave)      {
 count++;
 }
 }
printf("The number of students who got above average mark is:%d\n",count);
printf("\n");

int count1=0;                // Grade Distribution code
int count2=0;
int count3=0;
int count4=0;
int count5=0;
for (int i=0;i<n;i++){
     if(arr[i]>=90 && arr[i]<101){
 count1++;
 }else if(arr[i]>=80 && arr[i]<90){
 count2++;
 }else if(arr[i]>=70 && arr[i]<80){
 count3++;
 }else if(arr[i]>=60 && arr[i]<70){
 count4++;
 }else {count5++;}
 }
printf("The numbers of students who got A,B,C,D and F are: %d, %d, %d, %d,
%d.",count1,count2,count3,count4,count5);
printf("\n");
   printf("Grade A (90-100): %d students\n",  count1);
   printf("Grade B (80-89):  %d students\n",   count2);
   printf("Grade C (70-79):  %d students\n",   count3);
   printf("Grade D (60-69):  %d students\n",   count4);
   printf("Grade F (below 60): %d students\n",count5);
  return 0;
}
```

v)

```
#include<stdio.h>
int main()
{
int n;                  //students number from user
printf("Enter the number of students:");
scanf("%d",&n);

int arr[n];             //the marks from user
printf("Enter the numbers:\n");
for(int i=0;i<n;i++)
 {
 scanf("%d",&arr[i]);
 }

for(int i=0;i<n-1;i++)     //Top Performers code
   {
 for(int j=i+1;j<n;j++)
   {
 if(arr[j]>arr[i])
   {
 int tmp=arr[j];
 arr[j]=arr[i];
 arr[i]=tmp;
   }
   }
   }
 float x=(0.1)*n;
 printf("The top 10 percent of numbers are:\n");
 for(int i=0;i<x;i++){
 printf("%d\n",arr[i]);
 }
 return 0;
}
```



2. solution:

```
#include<stdio.h>
int main(){
double arr[7];                  //the temperature readings for each day,user input
printf("Enter the temperature recorded each day of this week:\n");
for(int i=0;i<7;i++){
 scanf("%lf",&arr[i]);
}
double max=arr[0];          //the highest and lowest temperatures
double min=arr[0];
for(int i=0;i<7;i++){
 if(arr[i]>max){
 max=arr[i];
 }if (arr[i]<min){
 min=arr[i];
 }
}
printf("\n");
printf("The maximum temperatures recorded during the week was %.0f degree celsius\n",max);
printf("The lowest temperatures recorded during the week was %.0f degree celsius\n",min);
return 0;
}
```