

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)
        {
```

```
"C:\Users\USER\Documents\d" + 
Enter the number of students:10
Enter the results for students:
55
64
45
80
92
73
44
38
68
71

The average:63.0000
The highest mark is: 92
The lowest mark is: 38

The number of students who got above average mark is:6

The numbers of students who got A,B,C,D and F are: 1, 1, 2, 2, 4.
Grade A (90-100): 1 students
Grade B (80-89): 1 students
Grade C (70-79): 2 students
Grade D (60-69): 2 students
Grade F (below 60): 4 students

Process returned 0 (0x0)  execution time : 23.159 s
Press any key to continue.
```

```

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;
}

```

```

" C:\Users\USER\Documents\d "
+ | v

Enter the number of students:24
Enter the numbers:
55
56
78
77
88
91
59
60
74
70
58
45
40
41
66
65
67
81
64
52
92
64
55
79

The top 10 percent of numbers are:
92
91
88

Process returned 0 (0x0)   execution time : 43.475 s
Press any key to continue.
|
```

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;
}
```

```
C:\Users\USER\Documents\d > Enter the temperature recorded each day of this week:
24
21
23
21
20
25
24

The maximum temperatures recorded during the week was 25 degree celsius
The lowest temperatures recorded during the week was 20 degree celsius

Process returned 0 (0x0)   execution time : 10.085 s
Press any key to continue.
```