AMALITECH

Statistics of Grades

`Complexity` : Beginner `Time estimate` : 6 - 8hrs

Project Objectives:

- Ability to create, initialize, and manipulate arrays to store data
- Proficiency in using conditional statements
- Understanding of string formatting techniques to display results in a clear and organized manner.
- Ability to analyze requirements and develop algorithms to solve the problem efficiently through the generation of a dynamic bar chart in the console.

Description:

Write a program that reads the grades of `N` students in a class on an assignment and stores them in an array `scores` of size N.

1. **Search for and display:**

- the maximum grade of the class,
- the minimum grade of the class,
- the average grade of the class.

2. **From the students' `scores`, establish an array `stats` of size 5 which is composed as follows:**

stats[4] contains the number of grades above 80

stats[3] contains the number of grades from 61 to 80

stats[2] contains the number of grades from 41 to 60

...

stats[0] contains the number of grades from 0 to 20

Create a bar graph representing the `scores` array. Use the symbols `#######` for bar representation and display the grade range below the graph.

Sample input: (The student's grades vary from 0 to 100)

```
2 20 21 22 23 30 48 49 50 55 60 65 72 63 76 80 68 90 85 98
```

Expected output in the console:

```
Values:

The maximum grade is 98
The minimum grade is 2
The average grade is 54.250000



Graph:



   6  >                              #######
   5  >                      #######   #######
   4  >             #######   #######   #######
   3  >             #######   #######   #######   #######
   2  >   #######   #######   #######   #######   #######
   1  >   #######   #######   #######   #######   #######
      +-----------+---------+---------+---------+---------+
      I    0-20   I  21-40  I  41-60  I  61-80  I  81-100 I
```

Grading Criteria:

Criteria	Points
Data Input : (format, control, manipulation, and Storage)	15
Maximum, Minimum, Average Calculation	15
Grades Distribution Array	10
Bar Graph Representation (correctness & formatting)	45
Overall Quality and Clarity (naming conventions, modular functions, comments)	15
Total	**100**

NB:

- For consistency sake, please use the JDK 21 (LTS)
- The graph should be dynamic based on the size of `scores` array and the values it contains. The graph above is generated based on the scores of 20 different students.
- Your program's input should be a line of N integers separated by spaces representing the N scores of the students. Ensure the input is well controlled.
- Your entire project should consist of one java file that can be run. Attach the screenshot of your console capturing your sample input and its corresponding output of from the execution of your program in the final submission.