HW11/src/Problem1.java

```
 1  /*
 2  Name: Hunter Poole
 3  Date: 4/21/25
 4  HW #: 11
 5  Problem #: 1
 6  Source Code: Problem1.java
 7  Action: Creates an integer array of size [5]. Calls a function to fill it
 8          with random numbers. Prints the array contents. Calls a function to
 9          determine the average value of the array. Prints the average value.
10          Then calls a function to determine the total variance of the array.
11          Prints this total variance.
12  */
13
14  public class Problem1
15  {
16      public static void main(String[] args)
17      {
18          int Average;
19          float Variance;
20          int[] MainArray = new int[5];
21
22          FillTheArray(MainArray);
23
24          System.out.println("Array is as follows");
25          for (int i = 0; i < 5; i++)
26          {
27          System.out.print(MainArray[i] + " ");
28          }
29
30          Average = FindAverage(MainArray);
31          System.out.printf("%n%n%s %d%n","Average of all numbers is", Average);
32
33          Variance = FindVariance(MainArray, Average);
34          System.out.print("The variance is " + Variance);
35      }
36
37
38
39
40  /*
41  Action: Fills an integer array up to its specified length with
42          random numbers in [0-100]
43  Parameters: int Array[]
44  Returns: void
45  Precondition: Array is initialized / Array is of size > 0
46  */
47
```

```
48      static void FillTheArray (int Array[])
49      {
50          for (int i = 0; i < Array.length; i++)
51          {
52              Array[i] = (int)Math.round(Math.random() * 101);
53          }
54      }
55
56
57  /*
58  Action: Given an integer array, finds and returns its average value
59  Parameters: int Array[]
60  Returns: int FoundAverage
61  Precondition: Array is initialized / Array is of size > 0
62  */
63
64      static int FindAverage (int Array[])
65      {
66          int FoundAverage, ArraySum = 0;
67          for (int i = 0; i < Array.length; i++)
68          {
69              ArraySum += Array[i];
70          }
71
72          FoundAverage = ArraySum / Array.length;
73          return FoundAverage;
74      }
75
76  /*
77  Action: Finds and returns the total variance in an integer array
78  Parameters: int Array[], int Average
79  Returns: float FoundVariance
80  Precondition: Array is initialized / Array is of size > 0
81  */
82
83      static float FindVariance (int Array[], int Average)
84      {
85          float FoundValues = 0, FoundVariance;
86          for (int i = 0; i < Array.length; i++)
87          {
88              FoundValues += (float)Math.pow((Array[i] - Average), 2);
89          }
90
91          FoundVariance = FoundValues / Array.length;
92          return FoundVariance;
93      }
94
95  }
96
```

```
/*
Array is as follows
45 87 70 83 95

Average of all numbers is 76
The variance is 305.6

////

Array is as follows
16 99 23 7 58

Average of all numbers is 40
The variance is 1151.8

////

Array is as follows
44 92 5 70 27

Average of all numbers is 47
The variance is 945.4

////

Array is as follows
19 49 28 44 87

Average of all numbers is 45
The variance is 549.2
*/
```