

```

1 import java.util.ArrayList;
2 import java.util.concurrent.ThreadLocalRandom;
3
4 public class Alumni {
5     static double Yearorder=0;
6     static double variance=0;
7     static double sd=0;
8     static double Q1total = 0;
9     static double Q2total = 0;
10    static double Q3total = 0;
11    static double Q4total = 0;
12    static double total= 0;
13    static ArrayList<Double> Q1profits=new ArrayList<
Double>();
14    static ArrayList<Double> Q2profits=new ArrayList<
Double>();
15    static ArrayList<Double> Q3profits=new ArrayList<
Double>();
16    static ArrayList<Double> Q4profits=new ArrayList<
Double>();
17    static ArrayList<Double> TotalProfits=new
ArrayList<>();
18    public static void main(String args []){
19        for(int i = 0; i<=10; i++) {
20            Q1total=0;
21            Q2total=0;
22            Q3total=0;
23            Q4total=0;
24            Q1profits=new ArrayList<>();
25            Q2profits=new ArrayList<>();
26            Q3profits=new ArrayList<>();
27            Q4profits=new ArrayList<>();
28            System.out.println("Year "+ i);
29            QuarterlyDemand();
30            for (int j = 0; j < Q1profits.size(); j++) {
31                variance += Math.pow(Q1profits.get(j) - (
Q1total/13), 2);
32            }
33            variance /= Q1profits.size();
34            sd = Math.sqrt(variance);
35            System.out.println("Q1 Average profit: "+(
Q1total/13)+" Variance: "+variance+" Standard deviation: "
+sd);
36            sd=0;
37            variance=0;

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Test correction Chris Stewart

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38         for (int k = 0; k < Q2profits.size(); k++) {
39             variance += Math.pow(Q2profits.get(k) - (
Q2total/13), 2);
40         }
41         variance /= Q2profits.size();
42         sd = Math.sqrt(variance);
43         System.out.println("Q2 Average profit: "+(
Q2total/13)+" Variance: "+variance+" Standard deviation: "
+sd);
44         sd=0;
45         variance=0;
46         for (int l = 0; l < Q3profits.size(); l++) {
47             variance += Math.pow(Q3profits.get(l) - (
Q3total/13), 2);
48         }
49         variance /= Q3profits.size();
50         sd = Math.sqrt(variance);
51         System.out.println("Q3 Average profit: "+(
Q3total/13)+" Variance: "+variance+" Standard deviation: "
+sd);
52         sd=0;
53         variance=0;
54         for (int m = 0; m < Q4profits.size(); m++) {
55             variance += Math.pow(Q4profits.get(m) - (
Q4total/13), 2);
56         }
57         variance /= Q4profits.size();
58         sd = Math.sqrt(variance);
59         System.out.println("Q4 Average profit: "+(
Q4total/13)+" Variance: "+variance+" Standard deviation: "
+sd);
60         sd=0;
61         variance=0;
62         System.out.println("Year profit: "+(Q1total+
Q2total+Q3total+Q4total));
63         TotalProfits.add((Q1total+Q2total+Q3total+
Q4total));
64         total=total+(Q1total+Q2total+Q3total+Q4total);
65     }
66     for (int n=0; n< TotalProfits.size(); n++){
67         variance += Math.pow(TotalProfits.get(n)-((
Q1total+Q2total+Q3total+Q4total)/10),2);
68     }
69     variance /= TotalProfits.size();
70     sd= Math.sqrt(variance);
```

Test correction Chris Stewart

```
71         System.out.println("Average profit: "+(total/10)+
    " Variance: "+variance+" Standard deviation: "+ sd);
72
73     }
74     public static void QuarterlyDemand(){
75         int demand = 0;
76         int ordered = 0;
77         int totalD = 0;
78         int totalO = 0;
79         for(int i = 0; i<=4; i++){
80             for(int j=1;j <=13; j++){
81                 int random = ThreadLocalRandom.current().
nextInt(1, 100+1);
82                 if(i == 1){
83                     ordered = delivered(50);
84                     if(random <= 30){
85                         demand = 40;
86                     }
87                     else if(random <= 50){
88                         demand=50;
89                     }
90                     else if(random<=80){
91                         demand=60;
92                     }
93                     else if(random<=90){
94                         demand=70;
95                     }
96                     else {demand=80;}
97                     double profit = (demand*17)-(ordered*
7);
98                     Q1profits.add(profit);
99                     Q1total=Q1total+profit;
100                    System.out.println("Q1 W "+ j+"
Demand: " + demand+" Ordered: "+ 50+" Delivered: "+
ordered + " Profit: "+ profit);
101                    totalD= totalD + demand;
102                    totalO= totalO + ordered;
103
104                }
105                else if(i == 2){
106                    ordered= delivered(60);
107                    if(random <= 15){
108                        demand = 40;
109                    }
110                    else if(random <= 55){
```

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```
111         demand=50;
112     }
113     else if(random <= 80){
114         demand=60;
115     }
116     else if(random<=90){
117         demand=70;
118     }
119     else {demand=80;}
120     double profit = (demand*17)-(ordered*
121     7);
122     Q2profits.add(profit);
123     Q2total=Q2total+profit;
124     System.out.println("Q2 W "+ j+"
125     Demand: " + demand+" Ordered: "+ 50+" Delivered: "+
126     ordered + " Profit: "+ profit);
127     totalD= totalD + demand;
128     totalO= totalO + ordered;
129 }
130 if(i == 3){
131     ordered=delivered(60);
132     if(random <= 5){
133         demand = 40;
134     }
135     else if(random <= 15){
136         demand=50;
137     }
138     else if(random<=45){
139         demand=60;
140     }
141     else if(random<=85){
142         demand=70;
143     }
144     else {demand=80;}
145     double profit = (demand*17)-(ordered*
146     7);
147     Q3profits.add(profit);
148     Q3total=Q3total+profit;
149     System.out.println("Q3 W "+ j+"
150     Demand: " + demand+" Ordered: "+ 50+" Delivered: "+
151     ordered + " Profit: "+ profit);
152     totalD= totalD + demand;
153     totalO= totalO + ordered;
154 }
```

```

150         if(i == 4){
151             ordered = delivered(50);
152             if(random <= 30){
153                 demand = 40;
154             }
155             else if(random <= 50){
156                 demand=50;
157             }
158             else if(random<=80){
159                 demand=60;
160             }
161             else if(random<=90){
162                 demand=70;
163             }
164             else {demand=80;}
165             double profit = (demand*17)-(ordered*
166                 7);
167             Q4profits.add(profit);
168             Q4total=Q4total+profit;
169             System.out.println("Q4 W "+ j+"
170                 Demand: " + demand+" Ordered: "+ 50+" Delivered: "+
171                 ordered + " Profit: "+ profit);
172             totalD= totalD + demand;
173             totalO= totalO + ordered;
174         }
175     }
176     Yearorder = totalO;
177     public static int delivered(int a){
178         int random = ThreadLocalRandom.current().nextInt(
179             1,100+1);
180         if(random <= 10){
181             a = a - 5;
182         }
183         else if(random<=30){
184             a =a + 10 ;
185         }
186         return a;
187     }
188 }

```