

Program_05_3

Requirements

Write a script that will create 1,000 random resistors in batch 1 with a normal distribution, mean of 100 ohms, and standard deviation of 15 ohms.

Perform the following operations with the resistor data using logical vectors where appropriate

- Output the total number of resistors created in batch 1 along with their actual mean and standard deviation as they will differ slightly from the values given.
- Find the positional number and corresponding resistance value for all resistors in the batch that fall above the upper bound of mean + 1 std or below the lower bound of mean - 1 std.
- Output the number of resistors rejected and the batch number.
- Output the position number and corresponding resistance value for all resistors rejected in the batch.
- If a batch has more than 1 rejected resistor all rejected resistors must be recreated using the randn function and used to replace the rejected resistor in the original vector of resistors.
- Repeat steps 2-5 until there are no resistors outside the lower and upper bounds.

Program

In the code block below, create your program, editing the existing text as necessary.

Tips:

- "Repeat until some condition" should indicate to you that a while loop should be used.
- Recall that there is a function to find positional values.
- Utilize vectorized methods and logical vectors as much as possible to avoid overcomplicating your script.
- Keep in mind that the results will vary for each run of your code due to randomness. You can use the fact that about 1/3 of the values of each batch will be rejected as a way to determine if your output is reasonable.

Note: If you are using Octave then you will need to create a separate script file, save that separate file as the name **Program_05_03**. It will not conflict with this file of the same name since the extension will be different.

```
% Filename: Program_05_3
% Author:
% Assisted by:

% Program Description:
```

Example Output

Your program output should match the following.

Output for Program_05_3 written by Geoff Berl.

A total of 1000 resistors were created.

Actual mean = 100.16 ohms

Actual standard deviation = 14.32 ohms

Resistors falling outside the mean +/- 1 Standard Deviation are Rejected

317 Resistors were rejected in Batch 1

Position #	Resistor Value (Ohms)
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2	72.56
3	131.37
7	123.91
11	77.13
21	85.26
30	80.11
31	77.50
32	115.24
39	75.76
44	81.35
46	85.01
52	78.65
54	117.59
55	68.27
57	63.10
60	74.41
68	71.67
74	59.71
75	123.23
80	85.01
83	83.17
84	124.72
87	79.69
89	123.30
91	84.59
94	123.37
98	83.03
100	85.84
102	70.13
103	85.72
105	117.97
106	116.63
107	75.81
118	81.87
120	82.26
122	83.67
123	74.52
124	80.64
126	132.03
129	124.20
130	118.24
131	124.21
133	115.60
135	77.72

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901	119.44
904	75.30
911	83.06
918	79.67
919	119.36
921	85.76
922	85.15
925	114.48
926	115.28
928	115.40
930	119.90
931	118.28
932	80.97
942	117.21
946	82.52
954	122.39
960	76.71
961	124.89
963	72.51
964	80.31
968	75.97
972	77.91
973	115.30
974	84.08
976	122.70
977	119.94
979	115.93
980	82.71
983	84.56
985	142.88
987	118.67
989	82.63
990	71.52
992	84.76
993	78.33
996	133.79
999	139.12
1000	84.44

95 Resistors were rejected in Batch 2

Position #	Resistor Value (Ohms)
7	119.76
21	119.07
32	74.91
44	80.15
46	77.33
54	115.66
57	85.14
60	115.67
68	127.37
87	115.40
89	85.27
91	123.04
100	82.38
107	84.40
122	132.54
135	72.62
143	72.86
146	117.96
152	120.34
159	118.58
165	78.37
166	77.81
176	72.62
188	81.30
199	119.86
204	70.29

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819	122.15
852	76.17
855	77.30
873	114.60
874	74.80
904	114.90
922	73.35
926	129.80
931	123.64
932	81.93
977	85.40
980	119.66
987	121.21
999	81.54

43 Resistors were rejected in Batch 3

Position #	Resistor Value (Ohms)
7	127.04
32	124.42
54	126.01
57	79.62
60	80.44
68	129.95
87	114.77
100	116.73
135	121.54
143	119.29
152	79.76
159	120.55
165	84.98
166	62.60
218	120.78
260	75.12
266	77.67
275	83.96
287	82.84
292	133.11
348	114.82
418	73.11
420	131.33

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630	117.12
656	82.61
692	65.20
702	84.00
719	123.95
819	80.99
874	128.75
926	74.82
932	122.41
980	83.69
987	119.99

16 Resistors were rejected in Batch 4

Position #	Resistor Value (Ohms)
87	130.52
100	69.91
135	115.35
159	115.52
165	78.00
260	84.54
425	119.11
444	121.36
510	116.05
516	130.41
534	119.46
630	124.14
656	83.16
719	120.96
819	81.24
987	84.76

4 Resistors were rejected in Batch 5

Position #	Resistor Value (Ohms)
135	82.22
159	79.93
516	75.12
534	84.86

2 Resistors were rejected in Batch 6

Position #	Resistor Value (Ohms)
159	78.98
534	83.74

A total of 477 resistors were rejected in a total of 6 batches