Assignment 3

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Exercise 1 Please refer to the code for the implementation...

Exercise 2 Please refer to the code for the implementation...

Exercise 3 The results of the tests are summarised in table 1. We observe that only 3 samples result in a p-value smaller than 0.05. That is, in seven of the 20 samples we would not reject $H_0 : \mu = 1.5$ and therefore the test does only return the correct answer in seven of the 20 cases.

The results of the final t-test with all the 400 random values are shown in table 2. We observe a very small p-value in this case and are confident in rejecting the null-hypothesis in this case.

	Estimated Mean	Lower Bound	Upper Bound	p-Value
1	2.3351320	1.5594636	3.1108005	0.0362362
2	1.9266657	1.3544401	2.4988912	0.1351176
3	1.7549305	1.1746239	2.3352371	0.3693754
4	2.1664972	1.2977806	3.0352139	0.1248079
5	2.0282766	1.3779259	2.6786273	0.1054140
6	1.9164520	1.2814165	2.5514876	0.1858660
7	1.9128686	1.4469787	2.3787585	0.0792072
8	1.8441143	1.1578699	2.5303586	0.3070979
9	1.3951930	0.6714262	2.1189598	0.7651179
10	2.2350091	1.7097991	2.7602191	0.0086095
11	2.2184988	1.5349824	2.9020152	0.0403693
12	2.2720401	1.5953447	2.9487356	0.0274862
13	1.9426886	1.2160205	2.6693568	0.2176538
14	2.4721206	1.8610119	3.0832293	0.0035233
15	1.9028432	1.2747726	2.5309139	0.1952675
16	2.5228839	2.0024516	3.0433162	0.0005909
17	1.8695263	1.1689361	2.5701164	0.2833938
18	2.3905279	1.7729180	3.0081378	0.0070752
19	1.6815761	1.1193657	2.2437865	0.5071986
20	1.7849574	1.1942924	2.3756224	0.3253033

Tab. 1: Results of the 20 t-tests on samples of size 20 each. Shown are the computed sample mean, the bounds of the 95% confidence interval and the p-value.

Estimated Mean	Lower Bound	Upper Bound	p-Value
2.02864	1.893207	2.164073	1.296e-13

Tab. 2: Results of the final t-tests with all of the 400 random values. Shown are the computed sample mean, the bounds of the 95% confidence interval and the p-value.