DA Assignment 6

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The following table shows the number of times a 95% confidence interval **failed** I.e, population mean did not lie in 95% CI. (Checked for 100 iterations of each sample size, number of samples).

⇩Number of Samples	Sample Size : 30	Sample Size : 60	Sample Size : 90
100	22%	21%	7%
1000	12%	3%	0%
10000	0%	0%	0%

We can deduce that, chances of failure decreases when:

1. Number of samples is increased. [If sample size remains constant]
2. Sample size increases [If number of samples remain constant]

Also, for any sample size, it is better to increase the number of samples sampled to decrease the chances of failure, (instead of increasing the sample size keeping number of samples constant).

The following table shows the proportion of samples where population mean lay within the confidence interval around sample mean

⇩Number of Samples	Sample Size : 30	Sample Size : 60	Sample Size : 90
100	.78	.79	.93
1000	.88	.97	1
10000	1	1	1

Sample output :

sample size: 30 CI: 0.95 no of samples: 100 count: 7 proportion: 0.93

sample size: 30 CI: 0.95 no of samples: 1000 count: 45 proportion: 0.955

sample size: 30 CI: 0.95 no of samples: 10000 count: 444 proportion: 0.9556

sample size: 60 CI: 0.95 no of samples: 100 count: 4 proportion: 0.96

sample size: 60 CI: 0.95 no of samples: 1000 count: 46 proportion: 0.954

sample size: 60 CI: 0.95 no of samples: 10000 count: 394 proportion: 0.9606

Population mean: 27524.03

PLOTS:

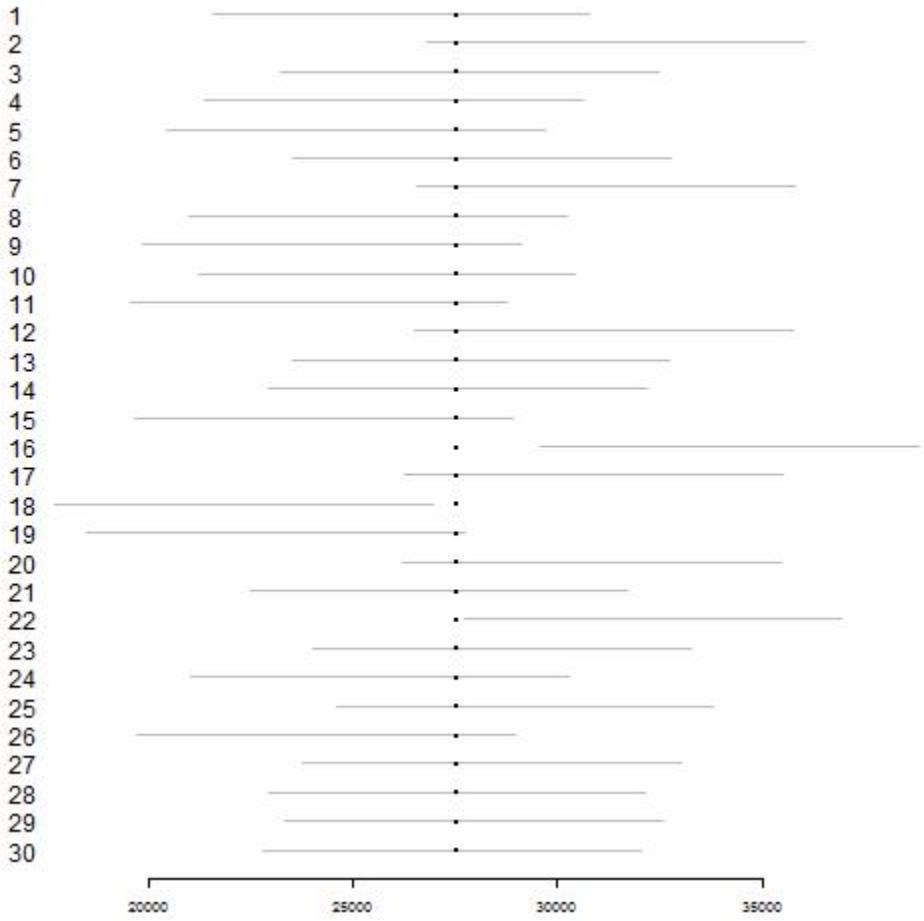

Figure 1 : Sample size: 30, Number of samples: 30

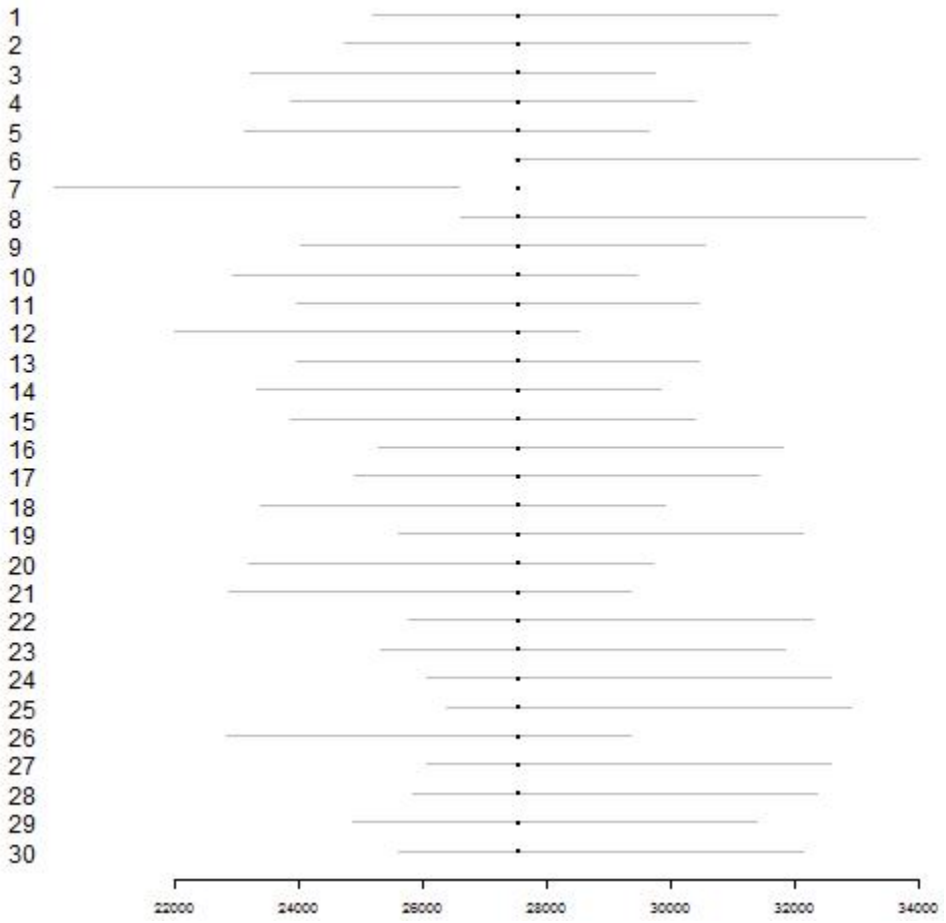

Figure 2 : Sample size: 60, Number of samples: 30

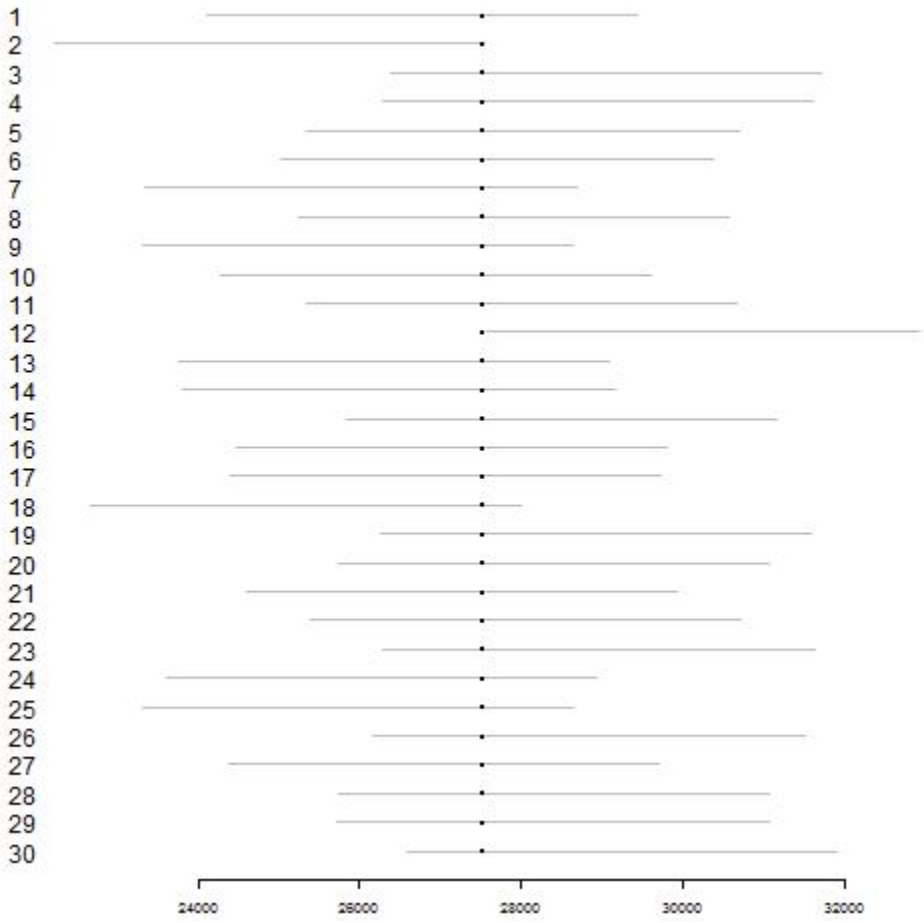

Figure 3 : Sample size: 90, Number of samples: 30