**Student ID: IT24102836**

**Module Code: IT2120**

**Lab Sheet: 08**

**Exercise**

**Instructions**: Create a folder in your desktop with your registration number (Eg: “IT. . . . . . .”). You need to save the R script file and take screenshots of the command prompt with answers and save it in a word document inside the folder. Save both R script file and word document with your registration number (Eg: “IT. . . . . . ..”). After you finish the exercise, zip the folder and upload the zip file to the submission link.

1. Calculate the population mean and population standard deviation of the laptop bag weights.

|  |  |
| --- | --- |
| **Population Mean** | 2.468 |
| **Population Standard Deviation** | 0.2561069 |

A white background with black text

Description automatically generated

2. Draw 25 random samples of size 6 (with replacement) and calculate the sample mean and sample standard deviation for each sample.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sample** | **Mean** | **SD** |  | **Sample** | **Mean** | **SD** |
| 1 | 2.528333 | 0.18313019 | 14 | 2.596667 | 0.27089974 |
| 2 | 2.493333 | 0.23627667 | 15 | 2.376667 | 0.39550811 |
| 3 | 2.571667 | 0.25568861 | 16 | 2.520000 | 0.17064583 |
| 4 | 2.338333 | 0.21084750 | 17 | 2.463333 | 0.24451312 |
| 5 | 2.601667 | 0.16773988 | 18 | 2.388333 | 0.21572359 |
| 6 | 2.473333 | 0.12754084 | 19 | 2.628333 | 0.29403515 |
| 7 | 2.338333 | 0.15765997 | 20 | 2.603333 | 0.21294757 |
| 8 | 2.638333 | 0.26430412 | 21 | 2.500000 | 0.16260381 |
| 9 | 2.540000 | 0.31240999 | 22 | 2.445000 | 0.28119388 |
| 10 | 2.540000 | 0.33553937 | 23 | 2.548333 | 0.09887703 |
| 11 | 2.528333 | 0.21141586 | 24 | 2.598333 | 0.09600347 |
| 12 | 2.538333 | 0.29123301 | 25 | 2.396667 | 0.22259081 |
| 13 | 2.643333 | 0.16120380 |

A computer screen shot of a code

Description automatically generated

A screenshot of a computer

Description automatically generatedA white background with numbers and letters

Description automatically generated

3. Calculate the mean and standard deviation of the 25 sample means and state the relationship of them with true mean and true standard deviation.

|  |  |
| --- | --- |
| **Mean** | 2.504467 |
| **Standard Deviation** | 0.09975516 |

A close-up of a number

Description automatically generated

Population mean vs. sample mean

|  |  |
| --- | --- |
| **True mean vs. sample mean**  A close-up of numbers  Description automatically generated  The two values are approximately similar. | **True SD vs. sample SD**    Both values differ in size because the samplesd covers only a few entries while truesd covers the entire dataset. |