**Activity: Understanding confidence intervals**

**Exercise Sheet**

**NOTE: Complete questions 1 to 3 INDIVIDUALLY (not as a group).**

In this activity, we will be working with a dataset obtained from a survey of students in an introductory statistics course in Vancouver in 2016. The students were asked how many friends they had on their Facebook profile. Students without a Facebook profile were instructed to enter ‘0’ in the survey.

1. Sample 10 observations from the population data using the 10 random integers you have drawn. Write down the 10 observations below.

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\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_

1. Calculate the mean and standard deviation for the 10 observations that you sampled. (You can use the mean and standard deviation calculator available at <https://www.easycalculation.com/statistics/standard-deviation.php>; use the fields marked “Mean (Average)” and “Standard deviation”.) Write down the values below.

Mean: \_\_\_\_\_\_\_\_\_ Standard deviation: \_\_\_\_\_\_\_\_\_
2. Calculate the 95% confidence interval. Write down the lower and upper bounds of the confidence interval. (Round to 2 decimal places.)

Lower bound: \_\_\_\_\_\_\_\_\_\_\_ Upper bound: \_\_\_\_\_\_\_\_\_\_\_

***Stop here. Wait for further instructions.***

1. Does your confidence interval contain the true mean? Submit your response.
2. What percentage of your classmates found confidence intervals that contain the true mean? Your instructor will provide you the number.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. In theory, what percentage of confidence intervals should contain the true mean? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Compare the numbers you have for questions 5 and 6. Are they the same or different? Why do you think that is the case?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What was the focus of this activity? Why were you asked to do this? What have you learned?

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| **Subj #**  | **# Friends** | **Subj #** | **# Friends** | **Subj #** | **# Friends** | **Subj #** | **# Friends** | **Subj #** | **# Friends** | **Subj #** | **# Friends** | **Subj #** | **# Friends** |
| 1 | 165 | 32 | 700 | 63 | 300 | 94 | 938 | 125 | 481 | 156 | 673 | 187 | 54 |
| 2 | 350 | 33 | 300 | 64 | 260 | 95 | 489 | 126 | 0 | 157 | 250 | 188 | 400 |
| 3 | 700 | 34 | 30 | 65 | 260 | 96 | 179 | 127 | 276 | 158 | 340 | 189 | 830 |
| 4 | 47 | 35 | 1700 | 66 | 10 | 97 | 15 | 128 | 350 | 159 | 788 | 190 | 700 |
| 5 | 70 | 36 | 77 | 67 | 603 | 98 | 997 | 129 | 200 | 160 | 233 | 191 | 365 |
| 6 | 690 | 37 | 330 | 68 | 70 | 99 | 487 | 130 | 30 | 161 | 724 | 192 | 334 |
| 7 | 150 | 38 | 146 | 69 | 834 | 100 | 457 | 131 | 100 | 162 | 300 | 193 | 220 |
| 8 | 42 | 39 | 674 | 70 | 620 | 101 | 1185 | 132 | 792 | 163 | 768 | 194 | 1044 |
| 9 | 245 | 40 | 150 | 71 | 200 | 102 | 25 | 133 | 1196 | 164 | 455 | 195 | 0 |
| 10 | 413 | 41 | 280 | 72 | 138 | 103 | 1250 | 134 | 200 | 165 | 233 | 196 | 3 |
| 11 | 50 | 42 | 0 | 73 | 700 | 104 | 349 | 135 | 120 | 166 | 692 | 197 | 1235 |
| 12 | 453 | 43 | 179 | 74 | 400 | 105 | 887 | 136 | 680 | 167 | 223 | 198 | 105 |
| 13 | 200 | 44 | 45 | 75 | 300 | 106 | 350 | 137 | 423 | 168 | 300 | 199 | 296 |
| 14 | 174 | 45 | 660 | 76 | 700 | 107 | 800 | 138 | 439 | 169 | 71 | 200 | 0 |
| 15 | 512 | 46 | 200 | 77 | 250 | 108 | 128 | 139 | 400 | 170 | 585 | 201 | 2 |
| 16 | 588 | 47 | 259 | 78 | 250 | 109 | 0 | 140 | 977 | 171 | 650 | 202 | 100 |
| 17 | 0 | 48 | 676 | 79 | 326 | 110 | 526 | 141 | 453 | 172 | 300 | 203 | 10 |
| 18 | 923 | 49 | 947 | 80 | 1000 | 111 | 100 | 142 | 748 | 173 | 746 | 204 | 478 |
| 19 | 212 | 50 | 407 | 81 | 160 | 112 | 162 | 143 | 50 | 174 | 921 | 205 | 300 |
| 20 | 584 | 51 | 0 | 82 | 694 | 113 | 0 | 144 | 400 | 175 | 177 | 206 | 2770 |
| 21 | 280 | 52 | 326 | 83 | 870 | 114 | 400 | 145 | 577 | 176 | 205 | 207 | 300 |
| 22 | 282 | 53 | 664 | 84 | 624 | 115 | 733 | 146 | 878 | 177 | 287 | 208 | 300 |
| 23 | 230 | 54 | 67 | 85 | 100 | 116 | 1 | 147 | 550 | 178 | 980 | 209 | 350 |
| 24 | 350 | 55 | 0 | 86 | 600 | 117 | 560 | 148 | 226 | 179 | 700 | 210 | 520 |
| 25 | 960 | 56 | 508 | 87 | 103 | 118 | 184 | 149 | 0 | 180 | 338 | 211 | 120 |
| 26 | 523 | 57 | 35 | 88 | 501 | 119 | 483 | 150 | 400 | 181 | 312 | 212 | 20 |
| 27 | 766 | 58 | 1110 | 89 | 682 | 120 | 275 | 151 | 484 | 182 | 1076 | 213 | 704 |
| 28 | 757 | 59 | 420 | 90 | 790 | 121 | 300 | 152 | 135 | 183 | 543 | 214 | 134 |
| 29 | 730 | 60 | 342 | 91 | 195 | 122 | 760 | 153 | 350 | 184 | 140 | 215 | 1744 |
| 30 | 82 | 61 | 96 | 92 | 170 | 123 | 970 | 154 | 420 | 185 | 350 |  |  |
| 31 | 0 | 62 | 98 | 93 | 675 | 124 | 463 | 155 | 800 | 186 | 478 |  |  |