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POS 604: Quantitative Methods

Dr. Meserve

Confidence Intervals

**Question 1**

**Table 1. Western European countries with their mean level of democracy**

|  |  |  |
| --- | --- | --- |
| **Rank** | **Country** | **Mean level of democracy** |
| **1** | Netherlands | 0.8377 |
| **2** | Ireland | 0.8358 |
| **3** | United Kingdom | 0.8354 |
| **4** | France | 0.8315 |
| **5** | Belgium | 0.8306 |
| **6** | Portugal | 0.5674 |
| **7** | Spain | 0.5431 |

**Figures have been rounded to 4 decimal places.**

From the table 1 above, Netherlands has the highest level of democracy on average. The mean level of democracy for Netherlands is 0.8377. The country with the least level of democracy on average is Spain with 0.5430 score.

**Question 2**

**Table 2. Western European countries mean level of democracy at 90 percent confidence interval**

|  |  |  |  |
| --- | --- | --- | --- |
| **Country** | **Mean level of democracy** | **Upper limits** | **Lower limits** |
| Netherlands | 0.8377 | 0.8278 | 0.8477 |
| Ireland | 0.8358 | 0.8277 | 0.8439 |
| United Kingdom | 0.8354 | 0.8309 | 0.8400 |
| France | 0.8315 | 0.8157 | 0.8472 |
| Belgium | 0.8306 | 0.8144 | 0.8467 |
| Portugal | 0.5674 | 0.4982 | 0.6366 |
| Spain | 0.5431 | 0.4671 | 0.6191 |

**Figures have been rounded to 4 decimal places.**

From the table 2 above,

Netherland’s mean level of democracy is 0.8377 and the range of values of the population mean would be between 0.8278 and 0.8477 at 90 percent confidence level.

Ireland’s mean level of democracy is 0.8358 and the range of values of the population mean would be between 0.8277 and 0.8439 at 90 percent confidence level.

United Kingdom’s mean level of democracy is 0.8354 and the range of values of the population mean would be between 0.8309 and 0.8400 at 90 percent confidence level.

France’s mean level of democracy is 0.8315 and the range of values of the population mean would be between 0.8157 and 0.8472 at 90 percent confidence level.

Belgium’s mean level of democracy is 0.8306 and the range of values of the population mean would be between 0.8144 and 0.8467 at 90 percent confidence level.

Portugal’s mean level of democracy is 0.5674and the range of values of the population mean would be between 0.4982 and 0.6366 at 90 percent confidence level.

Spain’s mean level of democracy is 0.5431and the range of values of the population mean would be between 0.4671 and 0.6191at 90 percent confidence level.

**Question 3**

**Table 3. Western European countries mean level of democracy at 95 percent confidence interval**

|  |  |  |
| --- | --- | --- |
| **Country** | **Upper limits** | **Lower limits** |
| Netherlands | 0.8258 | 0.8472 |
| Ireland | 0.8260 | 0.8451 |
| United Kingdom | 0.8301 | 0.8410 |
| France | 0.8124 | 0.8471 |
| Belgium | 0.8113 | 0.8466 |
| Portugal | 0.4740 | 0.6442 |
| Spain | 0.4448 | 0.6296 |

**Figures have been rounded to 4 decimal places.**

From the table 3 above,

There is 95 percent confidence that the population mean of Netherlands’s level of democracy would fall between 0.8258 to 0.8472.

There is 95 percent confidence that the population mean of Ireland’s level of democracy would fall between 0.8260 to 0.8451.

There is 95 percent confidence that the population mean of United Kingdom’s level of democracy would fall between 0.8301to 0.8410.

There is 95 percent confidence that the population mean of France’s level of democracy would fall between 0.8124 to 0.8471.

There is 95 percent confidence that the population mean of Belgium’s level of democracy would fall between 0.8113 to 0.8466.

There is 95 percent confidence that the population mean of Portugal’s level of democracy would fall between 0.4740 to 0.6442.

There is 95 percent confidence that the population mean of Spain’s level of democracy would fall between 0.4448 to 0.6296.

**Question 4a**

**Country mean level of democracy at 95 percent confidence interval**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Country** | **Mean level of democracy** | **T Test** | **Upper limits** | **Lower limits** |
| Great Britain | 0.8354 | 308.9 | 0.8301 | 0.8410 |
| Portugal | 0.5674 | 13.667 | 0.4740 | 0.6442 |

**Figures have been rounded to 4 decimal places.**

From the table, the mean level of democracy of Great Britain is higher than Portugal. The mean level of democracy score for Great Britain is 0.835 and that of Portugal is 0.567. Also, when the t-test are compared, Great Britain (308.9) is greater than Portugal (13.667). Additionally, the population mean for Britain (from 0.8301 to 0.8410) is higher than Portugal’s (from 0.4740 to 0.6442).

**Question 4b**

**Graph 1**

**Chart, histogram

Description automatically generated**

**Graph 2**

**Line chart

Description automatically generated**

**Graph 3**

**Chart, histogram

Description automatically generated**

From the graphs above, graph 1 and 2 depicts the 95 percent confidence level for Portugal and Great Britain. The third graph shows a combined level of democracy mean for both Portugal and Great Britain. The last, graph shows Portugal has a wide range of values for the population mean compared to that of Great Britain at 95 percent confidence level.

**Question 5**

**Regression model of Western European countries level of democracy with gender as predictor at 99 percent confidence interval**

|  |  |  |  |
| --- | --- | --- | --- |
| **Regression line** | **Estimates** | **Upper limit** | **Lower limit** |
| Intercepts | -0.016 | -0.055 | 0.023 |
| Coefficients | 1.02 | 0.967 | 1.07 |

**Figures have been rounded to 3 decimal places.**

The fitted regression line for level of Democracy model with women empowerment is;

Y = -0.016 + 1.02a

The coefficient of women’s empowerment is 1.02, which does not overlap zero. The coefficient of women’s empowerment means when the level of women empowerment changes by a unit, it leads to a 1.02 increase in the level of democracy. The positive coefficient of women’s empowerment implies the level of democracy increase with women’s empowerment. The intercept (-0.016) overlaps the zero. The intercept (-0.016) is where the regression line crosses the y-axis and, in this case, the level of democracy in the absence of women’s empowerment (independent variable).