

Test 1 | Base Scale

Objective:

To measure the effectiveness of a base scale

Hypothesis:

Providing a base scale enables accurate interpretations of data visualizations

Null Hypothesis:

Absence of a base scale leads to inaccurate assumptive decisions

Result:

G2 is more effective than G1

Effectiveness

Box-Plots

Readings

| Effectiveness | Box-Plots | Readings | | | | | | | | | | | | | | | |
|---------------|--|---|--|------|---------|---|----------------------------------|----------------------------------|------|--|--|---------|--|--|----------|--|--|
| G2>G1 | <p>Q1: What is the average wind speed of the city?</p> | <table border="1"> <thead> <tr> <th></th> <th>Time</th> <th>Answers</th> </tr> </thead> <tbody> <tr> <td>p</td> <td>0.005211181 (Highly Significant)</td> <td>0.006978409 (Highly Significant)</td> </tr> <tr> <td>Mean</td> <td>G1-Q1: 37.48 G2-Q1: 21.96</td> <td>G1-Q1: 1.549666667 G2-Q1: 0.675</td> </tr> <tr> <td>Stddev</td> <td>G1-Q1: 20.22811575 G2-Q1: 17.25900731</td> <td>G1-Q1: 1.132690994 G2-Q1: 0.995301462</td> </tr> <tr> <td>Variance</td> <td>G1-Q1: 409.1766667 G2-Q1: 297.8733333</td> <td>G1-Q1: 1.282988889 G2-Q1: 0.990625</td> </tr> </tbody> </table> | | Time | Answers | p | 0.005211181 (Highly Significant) | 0.006978409 (Highly Significant) | Mean | G1-Q1: 37.48 G2-Q1: 21.96 | G1-Q1: 1.549666667 G2-Q1: 0.675 | Stddev | G1-Q1: 20.22811575 G2-Q1: 17.25900731 | G1-Q1: 1.132690994 G2-Q1: 0.995301462 | Variance | G1-Q1: 409.1766667 G2-Q1: 297.8733333 | G1-Q1: 1.282988889 G2-Q1: 0.990625 |
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| G1>G2 | <p>Q2: From 1 to 10, rate how windy is the city? 1 being the lowest, 10 being the highest.</p> | <table border="1"> <thead> <tr> <th></th> <th>Time</th> <th>Answers</th> </tr> </thead> <tbody> <tr> <td>p</td> <td>0.01333594 (Significant)</td> <td>0.067300845 (Less Significant)</td> </tr> <tr> <td>Mean</td> <td>G1-Q2: 33.95652174 G2-Q2: 51.26086957</td> <td>G1-Q2: 6.847826087 G2-Q2: 10.26086957</td> </tr> <tr> <td>Std Dev</td> <td>G1-Q2: 20.29885411 G2-Q2: 32.30707408</td> <td>G1-Q2: 3.203104966 G2-Q2: 12.10641224</td> </tr> <tr> <td>Variance</td> <td>G1-Q2: 412.0434783 G2-Q2: 1043.747036</td> <td>G1-Q2: 10.25988142 G2-Q2: 146.5652174</td> </tr> </tbody> </table> | | Time | Answers | p | 0.01333594 (Significant) | 0.067300845 (Less Significant) | Mean | G1-Q2: 33.95652174 G2-Q2: 51.26086957 | G1-Q2: 6.847826087 G2-Q2: 10.26086957 | Std Dev | G1-Q2: 20.29885411 G2-Q2: 32.30707408 | G1-Q2: 3.203104966 G2-Q2: 12.10641224 | Variance | G1-Q2: 412.0434783 G2-Q2: 1043.747036 | G1-Q2: 10.25988142 G2-Q2: 146.5652174 |
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| G2>G1 | <p>Q3: What is the minimum wind speed of the city?</p> | <table border="1"> <thead> <tr> <th></th> <th>Time</th> <th>Answers</th> </tr> </thead> <tbody> <tr> <td>p</td> <td>0.304196201 (Insignificant)</td> <td>0.420174137 (Insignificant)</td> </tr> <tr> <td>Mean</td> <td>G1-Q2: 15 G2-Q2: 15.64</td> <td>G1-Q2: 1.538 G2-Q2: 1.376</td> </tr> <tr> <td>Stddev</td> <td>G1-Q2: 9.708243919 G2-Q2: 9.393614853</td> <td>G1-Q2: 2.799005776 G2-Q2: 2.391526709</td> </tr> <tr> <td>Variance</td> <td>G1-Q2: 94.25 G2-Q2: 88.24</td> <td>G1-Q2: 7.834433333 G2-Q2: 5.7194</td> </tr> </tbody> </table> | | Time | Answers | p | 0.304196201 (Insignificant) | 0.420174137 (Insignificant) | Mean | G1-Q2: 15 G2-Q2: 15.64 | G1-Q2: 1.538 G2-Q2: 1.376 | Stddev | G1-Q2: 9.708243919 G2-Q2: 9.393614853 | G1-Q2: 2.799005776 G2-Q2: 2.391526709 | Variance | G1-Q2: 94.25 G2-Q2: 88.24 | G1-Q2: 7.834433333 G2-Q2: 5.7194 |
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| G2>G1 | <p>Q4: Based on the wind speed, would you prefer to live on this city? Yes or No.</p> | <table border="1"> <thead> <tr> <th></th> <th>Time</th> <th>Answers</th> </tr> </thead> <tbody> <tr> <td>p</td> <td>0.097802355 (Insignificant)</td> <td></td> </tr> <tr> <td>Mean</td> <td>G1-Q4: 20.24 G2-Q4: 16.8</td> <td>Can't Say: 5 Yes: 7 No: 6</td> </tr> <tr> <td>Stddev</td> <td>G1-Q4: 16.08125202 G2-Q4: 8.607167556</td> <td>G1-Q4: 3 G2-Q4: 12</td> </tr> <tr> <td>Variance</td> <td>G1-Q4: 258.6066667 G2-Q4: 74.08333333</td> <td>G1-Q4: 3 G2-Q4: 3</td> </tr> </tbody> </table> | | Time | Answers | p | 0.097802355 (Insignificant) | | Mean | G1-Q4: 20.24 G2-Q4: 16.8 | Can't Say: 5 Yes: 7 No: 6 | Stddev | G1-Q4: 16.08125202 G2-Q4: 8.607167556 | G1-Q4: 3 G2-Q4: 12 | Variance | G1-Q4: 258.6066667 G2-Q4: 74.08333333 | G1-Q4: 3 G2-Q4: 3 |
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Test 2 | Symbols

Objective:

To establish that using appropriate symbols enhances the effectiveness of data visualization

Hypothesis:

Using appropriate symbols (graphical shapes) make data visualisation more effective

Null Hypothesis:

Textual visualizations take more time and hence less effective

Result:

G2 is equally effective as G1

Effectiveness

Box-Plots

Readings

| Effectiveness | Box-Plots | Readings | Answers | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|---|--|---------|-------|-------|------|-------------|-------------|---------|-------------|-------------|----------|-------------|-------------|--|--|-------|-------|----------|-------------|-------------|------------|------------|-------------|----------|-------------|-------------|
| G2>G1 | <p>Q1: What is the most common 'cause-of-death'?</p> | <p>Time</p> <p>p 0.062094875 (Less Significant)</p> <table border="1"> <thead> <tr> <th></th> <th>G3-Q1</th> <th>G4-Q1</th> </tr> </thead> <tbody> <tr> <td>Mean</td> <td>33.65217391</td> <td>26.30434783</td> </tr> <tr> <td>Std Dev</td> <td>18.94155772</td> <td>16.3913358</td> </tr> <tr> <td>Variance</td> <td>358.7826087</td> <td>268.6758893</td> </tr> </tbody> </table> | | G3-Q1 | G4-Q1 | Mean | 33.65217391 | 26.30434783 | Std Dev | 18.94155772 | 16.3913358 | Variance | 358.7826087 | 268.6758893 | <table border="1"> <thead> <tr> <th></th> <th>G3-Q1</th> <th>G4-Q1</th> </tr> </thead> <tbody> <tr> <td>Shootout</td> <td>16</td> <td>25</td> </tr> <tr> <td>Bomb Blast</td> <td>7</td> <td>0</td> </tr> <tr> <td>Homicide</td> <td>2</td> <td>0</td> </tr> </tbody> </table> | | G3-Q1 | G4-Q1 | Shootout | 16 | 25 | Bomb Blast | 7 | 0 | Homicide | 2 | 0 |
| | G3-Q1 | G4-Q1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mean | 33.65217391 | 26.30434783 | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Bomb Blast | 7 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Homicide | 2 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | |
| G1>G2 | <p>Q2: How many types of cause-of-death are there?</p> | <p>Time</p> <p>p 0.013938983 (Significant)</p> <table border="1"> <thead> <tr> <th></th> <th>G3-Q2</th> <th>G4-Q2</th> </tr> </thead> <tbody> <tr> <td>Mean</td> <td>14.26086957</td> <td>19.65217391</td> </tr> <tr> <td>Std Dev</td> <td>5.545000953</td> <td>10.60278135</td> </tr> <tr> <td>Variance</td> <td>30.74703557</td> <td>112.4189723</td> </tr> </tbody> </table> | | G3-Q2 | G4-Q2 | Mean | 14.26086957 | 19.65217391 | Std Dev | 5.545000953 | 10.60278135 | Variance | 30.74703557 | 112.4189723 | <table border="1"> <thead> <tr> <th></th> <th>G3-Q2</th> <th>G4-Q2</th> </tr> </thead> <tbody> <tr> <td>Shootout</td> <td>All correct</td> <td>All Correct</td> </tr> </tbody> </table> | | G3-Q2 | G4-Q2 | Shootout | All correct | All Correct | | | | | | |
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| Shootout | All correct | All Correct | | | | | | | | | | | | | | | | | | | | | | | | | |
| G1>G2 | <p>Q3: Which cause-of-death killed the maximum number of people in just one incident?</p> | <p>Time</p> <p>p 0.177924605 (Insignificant)</p> <table border="1"> <thead> <tr> <th></th> <th>G1-Q2</th> <th>G2-Q2</th> </tr> </thead> <tbody> <tr> <td>Mean</td> <td>19.56</td> <td>22.88</td> </tr> <tr> <td>Std Dev</td> <td>8.869798945</td> <td>13.01383879</td> </tr> <tr> <td>Variance</td> <td>78.67333333</td> <td>169.36</td> </tr> </tbody> </table> | | G1-Q2 | G2-Q2 | Mean | 19.56 | 22.88 | Std Dev | 8.869798945 | 13.01383879 | Variance | 78.67333333 | 169.36 | <table border="1"> <thead> <tr> <th></th> <th>G1-Q2</th> <th>G2-Q2</th> </tr> </thead> <tbody> <tr> <td>Shootout</td> <td>3</td> <td>22</td> </tr> <tr> <td>Bomb Blast</td> <td>21</td> <td>3</td> </tr> <tr> <td>Homicide</td> <td>1</td> <td>0</td> </tr> </tbody> </table> | | G1-Q2 | G2-Q2 | Shootout | 3 | 22 | Bomb Blast | 21 | 3 | Homicide | 1 | 0 |
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| Homicide | 1 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | |
| G2>G1 | <p>Q4: How many homicides happened in total?</p> | <p>Time</p> <p>p 0.000397546 (Highly Significant)</p> <table border="1"> <thead> <tr> <th></th> <th>G1-Q4</th> <th>G2-Q4</th> </tr> </thead> <tbody> <tr> <td>Mean</td> <td>16.6</td> <td>11.72</td> </tr> <tr> <td>Std Dev</td> <td>5.759050848</td> <td>3.878573621</td> </tr> <tr> <td>Variance</td> <td>33.16666667</td> <td>15.04333333</td> </tr> </tbody> </table> | | G1-Q4 | G2-Q4 | Mean | 16.6 | 11.72 | Std Dev | 5.759050848 | 3.878573621 | Variance | 33.16666667 | 15.04333333 | <p>0.132624387 (Insignificant)</p> <table border="1"> <thead> <tr> <th></th> <th>G1-Q4</th> <th>G2-Q4</th> </tr> </thead> <tbody> <tr> <td>Shootout</td> <td>0.2</td> <td>0.08</td> </tr> <tr> <td>Bomb Blast</td> <td>0.40824829</td> <td>0.276887462</td> </tr> <tr> <td>Homicide</td> <td>0.166666667</td> <td>0.076666667</td> </tr> </tbody> </table> | | G1-Q4 | G2-Q4 | Shootout | 0.2 | 0.08 | Bomb Blast | 0.40824829 | 0.276887462 | Homicide | 0.166666667 | 0.076666667 |
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