# Inference Analysis for All Variables Combination in Dataset:

An assessment of the normality of data is a prerequisite for many statistical tests because normal data is an underlying assumption in parametric tests. The variables used to test the normality need to be numerical. Additionally, to numerically test the normality, the length of the sample should be taken into account. If the length is smaller than 50 records we use “Shapiro-Wilk test” or else we use “Kolmogorov-Smirnov test”.

Thus, normality test was done for the numerical variables. The results of the tests used -- Shapiro-Wilk or Kolmogorov-Smirnov test - allows us concluding that, with a 95% of confidence, the null hypothesis is rejected if p<0.05/non-rejected if p>0.05, i.e., there is evidence/there is no evidence to reject the null hypothesis and it may not be/ be considered the existence of normality, respectively.

In this sense, the numeric variable has not/has normal distribution and, consequently, non-parametric/parametric tests should be used with that variable.

To compare two or more categorical variables, a cross-tabulation (also called the contingency table) is the most adequate option. However, to analyze the statistical differences, the chi-squared test or fisher test, for independence, should be applied to the crosstab.

To analyze two numerical variables, correlations analysis is applied. If variables have/have not normal distribution, Pearson’s / Spearman’s correlation is more appropriate, respectively.

## Inference Analysis between Variable "id" and "Gender":

| estimate1 | estimate2 | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 96.91954 | 103.2566 | -0.7668348 | 0.4440931 | 198 | -22.63378 | 9.95959 | Two Sample t-test | two.sided |

Analyses show that p-value is 0.444 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups of "id" have the same distribution regarding variable "Gender".

## Inference Analysis between Variable "id" and "Python\_user":

| estimate1 | estimate2 | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 102.4022 | 99.70093 | 0.3286728 | 0.7427521 | 197 | -13.50654 | 18.90902 | Two Sample t-test | two.sided |

Analyses show that p-value is 0.743 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups of "id" have the same distribution regarding variable "Python\_user".

## Inference Analysis between Variable "id" and "R\_user":

| estimate1 | estimate2 | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 100.6374 | 100.3853 | 0.03058974 | 0.9756275 | 198 | -15.99623 | 16.50031 | Two Sample t-test | two.sided |

Analyses show that p-value is 0.976 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups of "id" have the same distribution regarding variable "R\_user".

## Inference Analysis between Variable "id" and "Age":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.02974543 | 1332181 | 0.677412 | Spearman's rank correlation rho | two.sided | id and Age |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.677. This means that the independence of both variables exists. The value of the correlation is -0.03. Since the correlation result is negative, both variables are negatively correlated, i.e., when id increases, Age decreases.

## Inference Analysis between Variable "id" and "Publications":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.02163615 | 1362147 | 0.7610524 | Spearman's rank correlation rho | two.sided | id and Publications |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.761. This means that the independence of both variables exists. The value of the correlation is -0.022. Since the correlation result is negative, both variables are negatively correlated, i.e., when id increases, Publications decreases.

## Inference Analysis between Variable "id" and "Tasks":

| term | df | sumsq | meansq | statistic | p.value | call |
| --- | --- | --- | --- | --- | --- | --- |
| vars.val.pass[, var2type] | 2 | 6025.121 | 3012.561 | 0.8983532 | 0.4089014 | aov(formula = id ~ Tasks) |
| Residuals | 197 | 660624.879 | 3353.426 | NA | NA | aov(formula = id ~ Tasks) |

Analyses show that p-value is 0.409 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups have the same distribution regarding "Tasks" variable.

## Inference Analysis between Variable "id" and "Q1":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.009724527 | 1346266 | 0.8912942 | Spearman's rank correlation rho | two.sided | id and Q1 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.891. This means that the independence of both variables exists. The value of the correlation is -0.01. Since the correlation result is negative, both variables are negatively correlated, i.e., when id increases, Q1 decreases.

## Inference Analysis between Variable "id" and "Q2":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.03998036 | 1386606 | 0.5740557 | Spearman's rank correlation rho | two.sided | id and Q2 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.574. This means that the independence of both variables exists. The value of the correlation is -0.04. Since the correlation result is negative, both variables are negatively correlated, i.e., when id increases, Q2 decreases.

## Inference Analysis between Variable "id" and "Q3":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.08638608 | 1448479 | 0.2238702 | Spearman's rank correlation rho | two.sided | id and Q3 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.224. This means that the independence of both variables exists. The value of the correlation is -0.086. Since the correlation result is negative, both variables are negatively correlated, i.e., when id increases, Q3 decreases.

## Inference Analysis between Variable "id" and "Q4":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.1086021 | 1478099 | 0.1258262 | Spearman's rank correlation rho | two.sided | id and Q4 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.126. This means that the independence of both variables exists. The value of the correlation is -0.109. Since the correlation result is negative, both variables are negatively correlated, i.e., when id increases, Q4 decreases.

## Inference Analysis between Variable "id" and "Q5":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.06164236 | 1415488 | 0.3858788 | Spearman's rank correlation rho | two.sided | id and Q5 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.386. This means that the independence of both variables exists. The value of the correlation is -0.062. Since the correlation result is negative, both variables are negatively correlated, i.e., when id increases, Q5 decreases.

## Inference Analysis between Variable "id" and "Q6":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.02308349 | 1364077 | 0.7455997 | Spearman's rank correlation rho | two.sided | id and Q6 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.746. This means that the independence of both variables exists. The value of the correlation is -0.023. Since the correlation result is negative, both variables are negatively correlated, i.e., when id increases, Q6 decreases.

## Inference Analysis between Variable "id" and "Q7":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.1049794 | 1193331 | 0.1390287 | Spearman's rank correlation rho | two.sided | id and Q7 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.139. This means that the independence of both variables exists. The value of the correlation is 0.105. Since the correlation result is positive, both variables are positively correlated, i.e., when id increases, Q7 increases.

## Inference Analysis between Variable "id" and "Q8":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.01167265 | 1317737 | 0.8696941 | Spearman's rank correlation rho | two.sided | id and Q8 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.87. This means that the independence of both variables exists. The value of the correlation is 0.012. Since the correlation result is positive, both variables are positively correlated, i.e., when id increases, Q8 increases.

## Inference Analysis between Variable "id" and "Q9":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.07538617 | 1232788 | 0.2887129 | Spearman's rank correlation rho | two.sided | id and Q9 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.289. This means that the independence of both variables exists. The value of the correlation is 0.075. Since the correlation result is positive, both variables are positively correlated, i.e., when id increases, Q9 increases.

## Inference Analysis between Variable "id" and "Q10":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.03169528 | 1375559 | 0.6559286 | Spearman's rank correlation rho | two.sided | id and Q10 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.656. This means that the independence of both variables exists. The value of the correlation is -0.032. Since the correlation result is negative, both variables are negatively correlated, i.e., when id increases, Q10 decreases.

## Inference Analysis between Variable "id" and "Year":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.0693511 | 1240834 | 0.3291633 | Spearman's rank correlation rho | two.sided | id and Year |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.329. This means that the independence of both variables exists. The value of the correlation is 0.069. Since the correlation result is positive, both variables are positively correlated, i.e., when id increases, Year increases.

## Inference Analysis between Variable "Gender" and "Python\_user":

| Gender | Python\_user | Freq |
| --- | --- | --- |
| female | no | 26 |
| male | no | 66 |
| female | yes | 60 |
| male | yes | 47 |

| statistic | p.value | parameter | method |
| --- | --- | --- | --- |
| 14.48167 | 0.0001415297 | 1 | Pearson's Chi-squared test with Yates' continuity correction |

The results of the analysis shows that chi-squared test presents a p-value of 0 (p<0.05). Thus, the null hipothesis is rejected with a confidence level of 95%. We can conclude that both variables are dependent.

## Inference Analysis between Variable "Gender" and "R\_user":

| Gender | R\_user | Freq |
| --- | --- | --- |
| female | no | 54 |
| male | no | 37 |
| female | yes | 33 |
| male | yes | 76 |

| statistic | p.value | parameter | method |
| --- | --- | --- | --- |
| 15.88513 | 6.73054e-05 | 1 | Pearson's Chi-squared test with Yates' continuity correction |

The results of the analysis shows that chi-squared test presents a p-value of 0 (p<0.05). Thus, the null hipothesis is rejected with a confidence level of 95%. We can conclude that both variables are dependent.

## Inference Analysis between Variable "Gender" and "Age":

| estimate1 | estimate2 | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 37.18391 | 36.95495 | 0.282977 | 0.7774931 | 196 | -1.366681 | 1.824588 | Two Sample t-test | two.sided |

Analyses show that p-value is 0.777 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups of "Gender" have the same distribution regarding variable "Age".

## Inference Analysis between Variable "Gender" and "Publications":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 5346 | 0.2887106 | Wilcoxon rank sum test with continuity correction | two.sided | Publications by Gender |

Analyses show that p-value is 0.289 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Publications" are similar regarding "Gender" variable.

## Inference Analysis between Variable "Gender" and "Tasks":

| Gender | Tasks | Freq |
| --- | --- | --- |
| female | PhD\_Student | 34 |
| male | PhD\_Student | 44 |
| female | Phd\_Supervisor | 24 |
| male | Phd\_Supervisor | 32 |
| female | Postdoctoral\_research | 29 |
| male | Postdoctoral\_research | 37 |

| statistic | p.value | parameter | method |
| --- | --- | --- | --- |
| 0.01485647 | 0.9925993 | 2 | Pearson's Chi-squared test |

The results of the analysis shows that chi-squared test presents a p-value of 0.993 (p>0.05). Thus, the null hipothesis is non-rejected with a confidence level of 95%. We can conclude that both variables are independent.

## Inference Analysis between Variable "Gender" and "Q1":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4415 | 0.2024545 | Wilcoxon rank sum test with continuity correction | two.sided | Q1 by Gender |

Analyses show that p-value is 0.202 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q1" are similar regarding "Gender" variable.

## Inference Analysis between Variable "Gender" and "Q2":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4225.5 | 0.06760476 | Wilcoxon rank sum test with continuity correction | two.sided | Q2 by Gender |

Analyses show that p-value is 0.068 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q2" are similar regarding "Gender" variable.

## Inference Analysis between Variable "Gender" and "Q3":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4019 | 0.02024381 | Wilcoxon rank sum test with continuity correction | two.sided | Q3 by Gender |

Analyses show that p-value is 0.02 (p<0.05). This means that null hypothesis is rejected (p<0.05) and, therefore, there are statistical differences. Thus, it is possible to assume that groups of "Q3" are very different regarding "Gender" variable.

## Inference Analysis between Variable "Gender" and "Q4":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4757 | 0.6822807 | Wilcoxon rank sum test with continuity correction | two.sided | Q4 by Gender |

Analyses show that p-value is 0.682 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q4" are similar regarding "Gender" variable.

## Inference Analysis between Variable "Gender" and "Q5":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4712 | 0.6042899 | Wilcoxon rank sum test with continuity correction | two.sided | Q5 by Gender |

Analyses show that p-value is 0.604 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q5" are similar regarding "Gender" variable.

## Inference Analysis between Variable "Gender" and "Q6":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4448.5 | 0.2293568 | Wilcoxon rank sum test with continuity correction | two.sided | Q6 by Gender |

Analyses show that p-value is 0.229 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q6" are similar regarding "Gender" variable.

## Inference Analysis between Variable "Gender" and "Q7":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4984.5 | 0.8577984 | Wilcoxon rank sum test with continuity correction | two.sided | Q7 by Gender |

Analyses show that p-value is 0.858 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q7" are similar regarding "Gender" variable.

## Inference Analysis between Variable "Gender" and "Q8":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4711 | 0.6025838 | Wilcoxon rank sum test with continuity correction | two.sided | Q8 by Gender |

Analyses show that p-value is 0.603 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q8" are similar regarding "Gender" variable.

## Inference Analysis between Variable "Gender" and "Q9":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4865.5 | 0.8986473 | Wilcoxon rank sum test with continuity correction | two.sided | Q9 by Gender |

Analyses show that p-value is 0.899 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q9" are similar regarding "Gender" variable.

## Inference Analysis between Variable "Gender" and "Q10":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 5389 | 0.220269 | Wilcoxon rank sum test with continuity correction | two.sided | Q10 by Gender |

Analyses show that p-value is 0.22 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q10" are similar regarding "Gender" variable.

## Inference Analysis between Variable "Gender" and "Year":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4101 | 0.04437565 | Wilcoxon rank sum test with continuity correction | two.sided | Year by Gender |

Analyses show that p-value is 0.044 (p<0.05). This means that null hypothesis is rejected (p<0.05) and, therefore, there are statistical differences. Thus, it is possible to assume that groups of "Year" are very different regarding "Gender" variable.

## Inference Analysis between Variable "Python\_user" and "R\_user":

| Python\_user | R\_user | Freq |
| --- | --- | --- |
| no | no | 29 |
| yes | no | 61 |
| no | yes | 63 |
| yes | yes | 46 |

| statistic | p.value | parameter | method |
| --- | --- | --- | --- |
| 11.96372 | 0.0005424639 | 1 | Pearson's Chi-squared test with Yates' continuity correction |

The results of the analysis shows that chi-squared test presents a p-value of 0.001 (p<0.05). Thus, the null hipothesis is rejected with a confidence level of 95%. We can conclude that both variables are dependent.

## Inference Analysis between Variable "Python\_user" and "Age":

| estimate1 | estimate2 | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 36.8022 | 37.33962 | -0.6671329 | 0.5054759 | 195 | -2.126181 | 1.051331 | Two Sample t-test | two.sided |

Analyses show that p-value is 0.505 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups of "Python\_user" have the same distribution regarding variable "Age".

## Inference Analysis between Variable "Python\_user" and "Publications":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4776.5 | 0.7200261 | Wilcoxon rank sum test with continuity correction | two.sided | Publications by Python\_user |

Analyses show that p-value is 0.72 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Publications" are similar regarding "Python\_user" variable.

## Inference Analysis between Variable "Python\_user" and "Tasks":

| Python\_user | Tasks | Freq |
| --- | --- | --- |
| no | PhD\_Student | 36 |
| yes | PhD\_Student | 41 |
| no | Phd\_Supervisor | 26 |
| yes | Phd\_Supervisor | 30 |
| no | Postdoctoral\_research | 30 |
| yes | Postdoctoral\_research | 36 |

| statistic | p.value | parameter | method |
| --- | --- | --- | --- |
| 0.02533483 | 0.9874125 | 2 | Pearson's Chi-squared test |

The results of the analysis shows that chi-squared test presents a p-value of 0.987 (p>0.05). Thus, the null hipothesis is non-rejected with a confidence level of 95%. We can conclude that both variables are independent.

## Inference Analysis between Variable "Python\_user" and "Q1":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4175 | 0.0566895 | Wilcoxon rank sum test with continuity correction | two.sided | Q1 by Python\_user |

Analyses show that p-value is 0.057 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q1" are similar regarding "Python\_user" variable.

## Inference Analysis between Variable "Python\_user" and "Q2":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4978 | 0.8829259 | Wilcoxon rank sum test with continuity correction | two.sided | Q2 by Python\_user |

Analyses show that p-value is 0.883 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q2" are similar regarding "Python\_user" variable.

## Inference Analysis between Variable "Python\_user" and "Q3":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 5181 | 0.5023687 | Wilcoxon rank sum test with continuity correction | two.sided | Q3 by Python\_user |

Analyses show that p-value is 0.502 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q3" are similar regarding "Python\_user" variable.

## Inference Analysis between Variable "Python\_user" and "Q4":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4616 | 0.4277461 | Wilcoxon rank sum test with continuity correction | two.sided | Q4 by Python\_user |

Analyses show that p-value is 0.428 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q4" are similar regarding "Python\_user" variable.

## Inference Analysis between Variable "Python\_user" and "Q5":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4221 | 0.07331358 | Wilcoxon rank sum test with continuity correction | two.sided | Q5 by Python\_user |

Analyses show that p-value is 0.073 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q5" are similar regarding "Python\_user" variable.

## Inference Analysis between Variable "Python\_user" and "Q6":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4424.5 | 0.1994381 | Wilcoxon rank sum test with continuity correction | two.sided | Q6 by Python\_user |

Analyses show that p-value is 0.199 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q6" are similar regarding "Python\_user" variable.

## Inference Analysis between Variable "Python\_user" and "Q7":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4805 | 0.760236 | Wilcoxon rank sum test with continuity correction | two.sided | Q7 by Python\_user |

Analyses show that p-value is 0.76 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q7" are similar regarding "Python\_user" variable.

## Inference Analysis between Variable "Python\_user" and "Q8":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4814.5 | 0.7843844 | Wilcoxon rank sum test with continuity correction | two.sided | Q8 by Python\_user |

Analyses show that p-value is 0.784 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q8" are similar regarding "Python\_user" variable.

## Inference Analysis between Variable "Python\_user" and "Q9":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4765.5 | 0.6875634 | Wilcoxon rank sum test with continuity correction | two.sided | Q9 by Python\_user |

Analyses show that p-value is 0.688 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q9" are similar regarding "Python\_user" variable.

## Inference Analysis between Variable "Python\_user" and "Q10":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4787 | 0.7269833 | Wilcoxon rank sum test with continuity correction | two.sided | Q10 by Python\_user |

Analyses show that p-value is 0.727 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q10" are similar regarding "Python\_user" variable.

## Inference Analysis between Variable "Python\_user" and "Year":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4770.5 | 0.7086692 | Wilcoxon rank sum test with continuity correction | two.sided | Year by Python\_user |

Analyses show that p-value is 0.709 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Year" are similar regarding "Python\_user" variable.

## Inference Analysis between Variable "R\_user" and "Age":

| estimate1 | estimate2 | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 36.93333 | 37.15741 | -0.2778466 | 0.781423 | 196 | -1.814541 | 1.366393 | Two Sample t-test | two.sided |

Analyses show that p-value is 0.781 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups of "R\_user" have the same distribution regarding variable "Age".

## Inference Analysis between Variable "R\_user" and "Publications":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4346.5 | 0.1324464 | Wilcoxon rank sum test with continuity correction | two.sided | Publications by R\_user |

Analyses show that p-value is 0.132 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Publications" are similar regarding "R\_user" variable.

## Inference Analysis between Variable "R\_user" and "Tasks":

| R\_user | Tasks | Freq |
| --- | --- | --- |
| no | PhD\_Student | 36 |
| yes | PhD\_Student | 42 |
| no | Phd\_Supervisor | 27 |
| yes | Phd\_Supervisor | 29 |
| no | Postdoctoral\_research | 28 |
| yes | Postdoctoral\_research | 38 |

| statistic | p.value | parameter | method |
| --- | --- | --- | --- |
| 0.4316146 | 0.8058906 | 2 | Pearson's Chi-squared test |

The results of the analysis shows that chi-squared test presents a p-value of 0.806 (p>0.05). Thus, the null hipothesis is non-rejected with a confidence level of 95%. We can conclude that both variables are independent.

## Inference Analysis between Variable "R\_user" and "Q1":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 5361 | 0.3088318 | Wilcoxon rank sum test with continuity correction | two.sided | Q1 by R\_user |

Analyses show that p-value is 0.309 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q1" are similar regarding "R\_user" variable.

## Inference Analysis between Variable "R\_user" and "Q2":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4530.5 | 0.2581563 | Wilcoxon rank sum test with continuity correction | two.sided | Q2 by R\_user |

Analyses show that p-value is 0.258 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q2" are similar regarding "R\_user" variable.

## Inference Analysis between Variable "R\_user" and "Q3":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4814.5 | 0.7093144 | Wilcoxon rank sum test with continuity correction | two.sided | Q3 by R\_user |

Analyses show that p-value is 0.709 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q3" are similar regarding "R\_user" variable.

## Inference Analysis between Variable "R\_user" and "Q4":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4474.5 | 0.2114157 | Wilcoxon rank sum test with continuity correction | two.sided | Q4 by R\_user |

Analyses show that p-value is 0.211 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q4" are similar regarding "R\_user" variable.

## Inference Analysis between Variable "R\_user" and "Q5":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 5327 | 0.3509471 | Wilcoxon rank sum test with continuity correction | two.sided | Q5 by R\_user |

Analyses show that p-value is 0.351 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q5" are similar regarding "R\_user" variable.

## Inference Analysis between Variable "R\_user" and "Q6":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 5275.5 | 0.4183278 | Wilcoxon rank sum test with continuity correction | two.sided | Q6 by R\_user |

Analyses show that p-value is 0.418 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q6" are similar regarding "R\_user" variable.

## Inference Analysis between Variable "R\_user" and "Q7":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 5282 | 0.4017385 | Wilcoxon rank sum test with continuity correction | two.sided | Q7 by R\_user |

Analyses show that p-value is 0.402 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q7" are similar regarding "R\_user" variable.

## Inference Analysis between Variable "R\_user" and "Q8":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4937 | 0.9554191 | Wilcoxon rank sum test with continuity correction | two.sided | Q8 by R\_user |

Analyses show that p-value is 0.955 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q8" are similar regarding "R\_user" variable.

## Inference Analysis between Variable "R\_user" and "Q9":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 5116 | 0.6894329 | Wilcoxon rank sum test with continuity correction | two.sided | Q9 by R\_user |

Analyses show that p-value is 0.689 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q9" are similar regarding "R\_user" variable.

## Inference Analysis between Variable "R\_user" and "Q10":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 5215.5 | 0.5097657 | Wilcoxon rank sum test with continuity correction | two.sided | Q10 by R\_user |

Analyses show that p-value is 0.51 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Q10" are similar regarding "R\_user" variable.

## Inference Analysis between Variable "R\_user" and "Year":

| statistic | p.value | method | alternative | data.name |
| --- | --- | --- | --- | --- |
| 4853 | 0.7943633 | Wilcoxon rank sum test with continuity correction | two.sided | Year by R\_user |

Analyses show that p-value is 0.794 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, the distributions are similar. Thus, it is possible to assume that groups of "Year" are similar regarding "R\_user" variable.

## Inference Analysis between Variable "Age" and "Publications":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.5566337 | 573582.5 | 1.667034e-17 | Spearman's rank correlation rho | two.sided | Age and Publications |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.557. Since the correlation result is positive, both variables are positively correlated, i.e., when Age increases, Publications increases.

## Inference Analysis between Variable "Age" and "Tasks":

| term | df | sumsq | meansq | statistic | p.value | call |
| --- | --- | --- | --- | --- | --- | --- |
| vars.val.pass[, var2type] | 2 | 4280.674 | 2140.33719 | 210.8212 | 1.778781e-49 | aov(formula = Age ~ Tasks) |
| Residuals | 195 | 1979.715 | 10.15238 | NA | NA | aov(formula = Age ~ Tasks) |

Analyses show that p-value is 0 (p<0.05). This means that null hypothesis is rejected (p<0.05) and, therefore, there are statistical differences. Thus, it is possible to assume that groups do not have the same distribution regarding "Tasks" variable.

## Inference Analysis between Variable "Age" and "Q1":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.1052082 | 1429807 | 0.1401765 | Spearman's rank correlation rho | two.sided | Age and Q1 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.14. This means that the independence of both variables exists. The value of the correlation is -0.105. Since the correlation result is negative, both variables are negatively correlated, i.e., when Age increases, Q1 decreases.

## Inference Analysis between Variable "Age" and "Q2":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.06426241 | 1376835 | 0.3684092 | Spearman's rank correlation rho | two.sided | Age and Q2 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.368. This means that the independence of both variables exists. The value of the correlation is -0.064. Since the correlation result is negative, both variables are negatively correlated, i.e., when Age increases, Q2 decreases.

## Inference Analysis between Variable "Age" and "Q3":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.04958613 | 1229549 | 0.4878404 | Spearman's rank correlation rho | two.sided | Age and Q3 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.488. This means that the independence of both variables exists. The value of the correlation is 0.05. Since the correlation result is positive, both variables are positively correlated, i.e., when Age increases, Q3 increases.

## Inference Analysis between Variable "Age" and "Q4":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.1442981 | 1480377 | 0.04253722 | Spearman's rank correlation rho | two.sided | Age and Q4 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.043. This means that a significant correlation between both variables exists. The value of the correlation is -0.144. Since the correlation result is negative, both variables are negatively correlated, i.e., when Age increases, Q4 decreases.

## Inference Analysis between Variable "Age" and "Q5":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.07387791 | 1198123 | 0.3009554 | Spearman's rank correlation rho | two.sided | Age and Q5 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.301. This means that the independence of both variables exists. The value of the correlation is 0.074. Since the correlation result is positive, both variables are positively correlated, i.e., when Age increases, Q5 increases.

## Inference Analysis between Variable "Age" and "Q6":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.05324198 | 1362578 | 0.4562921 | Spearman's rank correlation rho | two.sided | Age and Q6 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.456. This means that the independence of both variables exists. The value of the correlation is -0.053. Since the correlation result is negative, both variables are negatively correlated, i.e., when Age increases, Q6 decreases.

## Inference Analysis between Variable "Age" and "Q7":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.08654721 | 1405665 | 0.2253621 | Spearman's rank correlation rho | two.sided | Age and Q7 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.225. This means that the independence of both variables exists. The value of the correlation is -0.087. Since the correlation result is negative, both variables are negatively correlated, i.e., when Age increases, Q7 decreases.

## Inference Analysis between Variable "Age" and "Q8":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.1016067 | 1162251 | 0.1543396 | Spearman's rank correlation rho | two.sided | Age and Q8 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.154. This means that the independence of both variables exists. The value of the correlation is 0.102. Since the correlation result is positive, both variables are positively correlated, i.e., when Age increases, Q8 increases.

## Inference Analysis between Variable "Age" and "Q9":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.04247392 | 1348647 | 0.552415 | Spearman's rank correlation rho | two.sided | Age and Q9 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.552. This means that the independence of both variables exists. The value of the correlation is -0.042. Since the correlation result is negative, both variables are negatively correlated, i.e., when Age increases, Q9 decreases.

## Inference Analysis between Variable "Age" and "Q10":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.04058349 | 1241196 | 0.5702532 | Spearman's rank correlation rho | two.sided | Age and Q10 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.57. This means that the independence of both variables exists. The value of the correlation is 0.041. Since the correlation result is positive, both variables are positively correlated, i.e., when Age increases, Q10 increases.

## Inference Analysis between Variable "Age" and "Year":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.3432552 | 1737768 | 7.394969e-07 | Spearman's rank correlation rho | two.sided | Age and Year |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is -0.343. Since the correlation result is negative, both variables are negatively correlated, i.e., when Age increases, Year decreases.

## Inference Analysis between Variable "Publications" and "Tasks":

| statistic | p.value | parameter | method | data.name |
| --- | --- | --- | --- | --- |
| 37.5156 | 7.138254e-09 | 2 | Kruskal-Wallis rank sum test | Publications by Tasks |

Analyses show that p-value is 0 (p<0.05). This means that null hypothesis is rejected (p<0.05) and, therefore, there are statistical differences. Thus, it is possible to assume that groups are very different regarding "Publications" variable.

## Inference Analysis between Variable "Publications" and "Q1":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.01619449 | 1311708 | 0.8199541 | Spearman's rank correlation rho | two.sided | Publications and Q1 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.82. This means that the independence of both variables exists. The value of the correlation is 0.016. Since the correlation result is positive, both variables are positively correlated, i.e., when Publications increases, Q1 increases.

## Inference Analysis between Variable "Publications" and "Q2":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.06796421 | 1423917 | 0.3389506 | Spearman's rank correlation rho | two.sided | Publications and Q2 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.339. This means that the independence of both variables exists. The value of the correlation is -0.068. Since the correlation result is negative, both variables are negatively correlated, i.e., when Publications increases, Q2 decreases.

## Inference Analysis between Variable "Publications" and "Q3":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.03393085 | 1288060 | 0.6333733 | Spearman's rank correlation rho | two.sided | Publications and Q3 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.633. This means that the independence of both variables exists. The value of the correlation is 0.034. Since the correlation result is positive, both variables are positively correlated, i.e., when Publications increases, Q3 increases.

## Inference Analysis between Variable "Publications" and "Q4":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.02792432 | 1370531 | 0.6946808 | Spearman's rank correlation rho | two.sided | Publications and Q4 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.695. This means that the independence of both variables exists. The value of the correlation is -0.028. Since the correlation result is negative, both variables are negatively correlated, i.e., when Publications increases, Q4 decreases.

## Inference Analysis between Variable "Publications" and "Q5":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.0625779 | 1249865 | 0.3786961 | Spearman's rank correlation rho | two.sided | Publications and Q5 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.379. This means that the independence of both variables exists. The value of the correlation is 0.063. Since the correlation result is positive, both variables are positively correlated, i.e., when Publications increases, Q5 increases.

## Inference Analysis between Variable "Publications" and "Q6":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.1341885 | 1512214 | 0.05817273 | Spearman's rank correlation rho | two.sided | Publications and Q6 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.058. This means that the independence of both variables exists. The value of the correlation is -0.134. Since the correlation result is negative, both variables are negatively correlated, i.e., when Publications increases, Q6 decreases.

## Inference Analysis between Variable "Publications" and "Q7":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.08191822 | 1442522 | 0.248838 | Spearman's rank correlation rho | two.sided | Publications and Q7 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.249. This means that the independence of both variables exists. The value of the correlation is -0.082. Since the correlation result is negative, both variables are negatively correlated, i.e., when Publications increases, Q7 decreases.

## Inference Analysis between Variable "Publications" and "Q8":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.1516051 | 1131165 | 0.03211444 | Spearman's rank correlation rho | two.sided | Publications and Q8 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.032. This means that a significant correlation between both variables exists. The value of the correlation is 0.152. Since the correlation result is positive, both variables are positively correlated, i.e., when Publications increases, Q8 increases.

## Inference Analysis between Variable "Publications" and "Q9":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.02776565 | 1370320 | 0.6963298 | Spearman's rank correlation rho | two.sided | Publications and Q9 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.696. This means that the independence of both variables exists. The value of the correlation is -0.028. Since the correlation result is negative, both variables are negatively correlated, i.e., when Publications increases, Q9 decreases.

## Inference Analysis between Variable "Publications" and "Q10":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.007770501 | 1322940 | 0.9130404 | Spearman's rank correlation rho | two.sided | Publications and Q10 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.913. This means that the independence of both variables exists. The value of the correlation is 0.008. Since the correlation result is positive, both variables are positively correlated, i.e., when Publications increases, Q10 increases.

## Inference Analysis between Variable "Publications" and "Year":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.341057 | 1788031 | 7.731578e-07 | Spearman's rank correlation rho | two.sided | Publications and Year |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is -0.341. Since the correlation result is negative, both variables are negatively correlated, i.e., when Publications increases, Year decreases.

## Inference Analysis between Variable "Tasks" and "Q1":

| statistic | p.value | parameter | method | data.name |
| --- | --- | --- | --- | --- |
| 1.417798 | 0.4921857 | 2 | Kruskal-Wallis rank sum test | Q1 by Tasks |

Analyses show that p-value is 0.492 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups have similar distribution regarding "Tasks" variable.

## Inference Analysis between Variable "Tasks" and "Q2":

| statistic | p.value | parameter | method | data.name |
| --- | --- | --- | --- | --- |
| 2.082281 | 0.3530519 | 2 | Kruskal-Wallis rank sum test | Q2 by Tasks |

Analyses show that p-value is 0.353 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups have similar distribution regarding "Tasks" variable.

## Inference Analysis between Variable "Tasks" and "Q3":

| statistic | p.value | parameter | method | data.name |
| --- | --- | --- | --- | --- |
| 1.525764 | 0.4663206 | 2 | Kruskal-Wallis rank sum test | Q3 by Tasks |

Analyses show that p-value is 0.466 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups have similar distribution regarding "Tasks" variable.

## Inference Analysis between Variable "Tasks" and "Q4":

| statistic | p.value | parameter | method | data.name |
| --- | --- | --- | --- | --- |
| 4.480089 | 0.1064538 | 2 | Kruskal-Wallis rank sum test | Q4 by Tasks |

Analyses show that p-value is 0.106 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups have similar distribution regarding "Tasks" variable.

## Inference Analysis between Variable "Tasks" and "Q5":

| statistic | p.value | parameter | method | data.name |
| --- | --- | --- | --- | --- |
| 2.689925 | 0.2605495 | 2 | Kruskal-Wallis rank sum test | Q5 by Tasks |

Analyses show that p-value is 0.261 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups have similar distribution regarding "Tasks" variable.

## Inference Analysis between Variable "Tasks" and "Q6":

| statistic | p.value | parameter | method | data.name |
| --- | --- | --- | --- | --- |
| 0.1209883 | 0.9412993 | 2 | Kruskal-Wallis rank sum test | Q6 by Tasks |

Analyses show that p-value is 0.941 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups have similar distribution regarding "Tasks" variable.

## Inference Analysis between Variable "Tasks" and "Q7":

| statistic | p.value | parameter | method | data.name |
| --- | --- | --- | --- | --- |
| 6.077338 | 0.0478986 | 2 | Kruskal-Wallis rank sum test | Q7 by Tasks |

Analyses show that p-value is 0.048 (p<0.05). This means that null hypothesis is rejected (p<0.05) and, therefore, there are statistical differences. Thus, it is possible to assume that groups are very different regarding "Tasks" variable.

## Inference Analysis between Variable "Tasks" and "Q8":

| statistic | p.value | parameter | method | data.name |
| --- | --- | --- | --- | --- |
| 4.201447 | 0.1223678 | 2 | Kruskal-Wallis rank sum test | Q8 by Tasks |

Analyses show that p-value is 0.122 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups have similar distribution regarding "Tasks" variable.

## Inference Analysis between Variable "Tasks" and "Q9":

| statistic | p.value | parameter | method | data.name |
| --- | --- | --- | --- | --- |
| 0.4691089 | 0.7909232 | 2 | Kruskal-Wallis rank sum test | Q9 by Tasks |

Analyses show that p-value is 0.791 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups have similar distribution regarding "Tasks" variable.

## Inference Analysis between Variable "Tasks" and "Q10":

| statistic | p.value | parameter | method | data.name |
| --- | --- | --- | --- | --- |
| 2.404332 | 0.3005425 | 2 | Kruskal-Wallis rank sum test | Q10 by Tasks |

Analyses show that p-value is 0.301 (p>0.05). This means that null hypothesis is non-rejected (p>0.05) and, therefore, there are no statistical differences. Thus, it is possible to assume that groups have similar distribution regarding "Tasks" variable.

## Inference Analysis between Variable "Tasks" and "Year":

| statistic | p.value | parameter | method | data.name |
| --- | --- | --- | --- | --- |
| 14.64394 | 0.0006608602 | 2 | Kruskal-Wallis rank sum test | Year by Tasks |

Analyses show that p-value is 0.001 (p<0.05). This means that null hypothesis is rejected (p<0.05) and, therefore, there are statistical differences. Thus, it is possible to assume that groups are very different regarding "Tasks" variable.

## Inference Analysis between Variable "Q1" and "Q2":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2217368 | 1037658 | 0.001601953 | Spearman's rank correlation rho | two.sided | Q1 and Q2 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.002. This means that a significant correlation between both variables exists. The value of the correlation is 0.222. Since the correlation result is positive, both variables are positively correlated, i.e., when Q1 increases, Q2 increases.

## Inference Analysis between Variable "Q1" and "Q3":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2231015 | 1035839 | 0.001495913 | Spearman's rank correlation rho | two.sided | Q1 and Q3 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.001. This means that a significant correlation between both variables exists. The value of the correlation is 0.223. Since the correlation result is positive, both variables are positively correlated, i.e., when Q1 increases, Q3 increases.

## Inference Analysis between Variable "Q1" and "Q4":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2566952 | 991048.3 | 0.000243371 | Spearman's rank correlation rho | two.sided | Q1 and Q4 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.257. Since the correlation result is positive, both variables are positively correlated, i.e., when Q1 increases, Q4 increases.

## Inference Analysis between Variable "Q1" and "Q5":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.4320093 | 757302 | 1.686493e-10 | Spearman's rank correlation rho | two.sided | Q1 and Q5 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.432. Since the correlation result is positive, both variables are positively correlated, i.e., when Q1 increases, Q5 increases.

## Inference Analysis between Variable "Q1" and "Q6":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.4040957 | 794519.2 | 2.956836e-09 | Spearman's rank correlation rho | two.sided | Q1 and Q6 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.404. Since the correlation result is positive, both variables are positively correlated, i.e., when Q1 increases, Q6 increases.

## Inference Analysis between Variable "Q1" and "Q7":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2541174 | 994485.3 | 0.0002822983 | Spearman's rank correlation rho | two.sided | Q1 and Q7 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.254. Since the correlation result is positive, both variables are positively correlated, i.e., when Q1 increases, Q7 increases.

## Inference Analysis between Variable "Q1" and "Q8":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2718036 | 970904.2 | 9.887258e-05 | Spearman's rank correlation rho | two.sided | Q1 and Q8 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.272. Since the correlation result is positive, both variables are positively correlated, i.e., when Q1 increases, Q8 increases.

## Inference Analysis between Variable "Q1" and "Q9":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.537406 | 616776.6 | 2.314376e-16 | Spearman's rank correlation rho | two.sided | Q1 and Q9 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.537. Since the correlation result is positive, both variables are positively correlated, i.e., when Q1 increases, Q9 increases.

## Inference Analysis between Variable "Q1" and "Q10":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2844807 | 954001.9 | 4.45304e-05 | Spearman's rank correlation rho | two.sided | Q1 and Q10 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.284. Since the correlation result is positive, both variables are positively correlated, i.e., when Q1 increases, Q10 increases.

## Inference Analysis between Variable "Q1" and "Year":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.0729241 | 1236070 | 0.3047948 | Spearman's rank correlation rho | two.sided | Q1 and Year |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.305. This means that the independence of both variables exists. The value of the correlation is 0.073. Since the correlation result is positive, both variables are positively correlated, i.e., when Q1 increases, Year increases.

## Inference Analysis between Variable "Q2" and "Q3":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.3128312 | 916202.2 | 6.480094e-06 | Spearman's rank correlation rho | two.sided | Q2 and Q3 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.313. Since the correlation result is positive, both variables are positively correlated, i.e., when Q2 increases, Q3 increases.

## Inference Analysis between Variable "Q2" and "Q4":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2653109 | 979561 | 0.000146568 | Spearman's rank correlation rho | two.sided | Q2 and Q4 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.265. Since the correlation result is positive, both variables are positively correlated, i.e., when Q2 increases, Q4 increases.

## Inference Analysis between Variable "Q2" and "Q5":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2390489 | 1014576 | 0.0006519372 | Spearman's rank correlation rho | two.sided | Q2 and Q5 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.001. This means that a significant correlation between both variables exists. The value of the correlation is 0.239. Since the correlation result is positive, both variables are positively correlated, i.e., when Q2 increases, Q5 increases.

## Inference Analysis between Variable "Q2" and "Q6":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.1933968 | 1075444 | 0.006072257 | Spearman's rank correlation rho | two.sided | Q2 and Q6 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.006. This means that a significant correlation between both variables exists. The value of the correlation is 0.193. Since the correlation result is positive, both variables are positively correlated, i.e., when Q2 increases, Q6 increases.

## Inference Analysis between Variable "Q2" and "Q7":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.138398 | 1148774 | 0.05065506 | Spearman's rank correlation rho | two.sided | Q2 and Q7 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.051. This means that the independence of both variables exists. The value of the correlation is 0.138. Since the correlation result is positive, both variables are positively correlated, i.e., when Q2 increases, Q7 increases.

## Inference Analysis between Variable "Q2" and "Q8":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2253236 | 1032876 | 0.001336901 | Spearman's rank correlation rho | two.sided | Q2 and Q8 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.001. This means that a significant correlation between both variables exists. The value of the correlation is 0.225. Since the correlation result is positive, both variables are positively correlated, i.e., when Q2 increases, Q8 increases.

## Inference Analysis between Variable "Q2" and "Q9":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.02711921 | 1297142 | 0.7030625 | Spearman's rank correlation rho | two.sided | Q2 and Q9 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.703. This means that the independence of both variables exists. The value of the correlation is 0.027. Since the correlation result is positive, both variables are positively correlated, i.e., when Q2 increases, Q9 increases.

## Inference Analysis between Variable "Q2" and "Q10":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.1506518 | 1132436 | 0.03322517 | Spearman's rank correlation rho | two.sided | Q2 and Q10 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.033. This means that a significant correlation between both variables exists. The value of the correlation is 0.151. Since the correlation result is positive, both variables are positively correlated, i.e., when Q2 increases, Q10 increases.

## Inference Analysis between Variable "Q2" and "Year":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.0946009 | 1207169 | 0.182708 | Spearman's rank correlation rho | two.sided | Q2 and Year |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.183. This means that the independence of both variables exists. The value of the correlation is 0.095. Since the correlation result is positive, both variables are positively correlated, i.e., when Q2 increases, Year increases.

## Inference Analysis between Variable "Q3" and "Q4":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.1541836 | 1127727 | 0.02926716 | Spearman's rank correlation rho | two.sided | Q3 and Q4 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.029. This means that a significant correlation between both variables exists. The value of the correlation is 0.154. Since the correlation result is positive, both variables are positively correlated, i.e., when Q3 increases, Q4 increases.

## Inference Analysis between Variable "Q3" and "Q5":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.213342 | 1048851 | 0.002419761 | Spearman's rank correlation rho | two.sided | Q3 and Q5 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.002. This means that a significant correlation between both variables exists. The value of the correlation is 0.213. Since the correlation result is positive, both variables are positively correlated, i.e., when Q3 increases, Q5 increases.

## Inference Analysis between Variable "Q3" and "Q6":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2596651 | 987088.5 | 0.0002047399 | Spearman's rank correlation rho | two.sided | Q3 and Q6 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.26. Since the correlation result is positive, both variables are positively correlated, i.e., when Q3 increases, Q6 increases.

## Inference Analysis between Variable "Q3" and "Q7":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2352399 | 1019655 | 0.000799053 | Spearman's rank correlation rho | two.sided | Q3 and Q7 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.001. This means that a significant correlation between both variables exists. The value of the correlation is 0.235. Since the correlation result is positive, both variables are positively correlated, i.e., when Q3 increases, Q7 increases.

## Inference Analysis between Variable "Q3" and "Q8":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2377118 | 1016359 | 0.0007004652 | Spearman's rank correlation rho | two.sided | Q3 and Q8 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.001. This means that a significant correlation between both variables exists. The value of the correlation is 0.238. Since the correlation result is positive, both variables are positively correlated, i.e., when Q3 increases, Q8 increases.

## Inference Analysis between Variable "Q3" and "Q9":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.07210325 | 1237165 | 0.3102852 | Spearman's rank correlation rho | two.sided | Q3 and Q9 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.31. This means that the independence of both variables exists. The value of the correlation is 0.072. Since the correlation result is positive, both variables are positively correlated, i.e., when Q3 increases, Q9 increases.

## Inference Analysis between Variable "Q3" and "Q10":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2486476 | 1001778 | 0.0003848094 | Spearman's rank correlation rho | two.sided | Q3 and Q10 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.249. Since the correlation result is positive, both variables are positively correlated, i.e., when Q3 increases, Q10 increases.

## Inference Analysis between Variable "Q3" and "Year":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.008764747 | 1344986 | 0.9019664 | Spearman's rank correlation rho | two.sided | Q3 and Year |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.902. This means that the independence of both variables exists. The value of the correlation is -0.009. Since the correlation result is negative, both variables are negatively correlated, i.e., when Q3 increases, Year decreases.

## Inference Analysis between Variable "Q4" and "Q5":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.4235955 | 768520.2 | 4.111204e-10 | Spearman's rank correlation rho | two.sided | Q4 and Q5 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.424. Since the correlation result is positive, both variables are positively correlated, i.e., when Q4 increases, Q5 increases.

## Inference Analysis between Variable "Q4" and "Q6":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.1458776 | 1138801 | 0.03929083 | Spearman's rank correlation rho | two.sided | Q4 and Q6 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.039. This means that a significant correlation between both variables exists. The value of the correlation is 0.146. Since the correlation result is positive, both variables are positively correlated, i.e., when Q4 increases, Q6 increases.

## Inference Analysis between Variable "Q4" and "Q7":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.08169403 | 1224377 | 0.2501399 | Spearman's rank correlation rho | two.sided | Q4 and Q7 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.25. This means that the independence of both variables exists. The value of the correlation is 0.082. Since the correlation result is positive, both variables are positively correlated, i.e., when Q4 increases, Q7 increases.

## Inference Analysis between Variable "Q4" and "Q8":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.3165697 | 911217.6 | 4.949523e-06 | Spearman's rank correlation rho | two.sided | Q4 and Q8 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.317. Since the correlation result is positive, both variables are positively correlated, i.e., when Q4 increases, Q8 increases.

## Inference Analysis between Variable "Q4" and "Q9":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.148947 | 1134709 | 0.03529291 | Spearman's rank correlation rho | two.sided | Q4 and Q9 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.035. This means that a significant correlation between both variables exists. The value of the correlation is 0.149. Since the correlation result is positive, both variables are positively correlated, i.e., when Q4 increases, Q9 increases.

## Inference Analysis between Variable "Q4" and "Q10":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2511493 | 998442.7 | 0.0003342582 | Spearman's rank correlation rho | two.sided | Q4 and Q10 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.251. Since the correlation result is positive, both variables are positively correlated, i.e., when Q4 increases, Q10 increases.

## Inference Analysis between Variable "Q4" and "Year":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2032146 | 1062354 | 0.003901105 | Spearman's rank correlation rho | two.sided | Q4 and Year |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.004. This means that a significant correlation between both variables exists. The value of the correlation is 0.203. Since the correlation result is positive, both variables are positively correlated, i.e., when Q4 increases, Year increases.

## Inference Analysis between Variable "Q5" and "Q6":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.3824241 | 823414 | 2.293383e-08 | Spearman's rank correlation rho | two.sided | Q5 and Q6 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.382. Since the correlation result is positive, both variables are positively correlated, i.e., when Q5 increases, Q6 increases.

## Inference Analysis between Variable "Q5" and "Q7":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.1574585 | 1123361 | 0.02596395 | Spearman's rank correlation rho | two.sided | Q5 and Q7 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.026. This means that a significant correlation between both variables exists. The value of the correlation is 0.157. Since the correlation result is positive, both variables are positively correlated, i.e., when Q5 increases, Q7 increases.

## Inference Analysis between Variable "Q5" and "Q8":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.4381284 | 749143.5 | 8.685437e-11 | Spearman's rank correlation rho | two.sided | Q5 and Q8 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.438. Since the correlation result is positive, both variables are positively correlated, i.e., when Q5 increases, Q8 increases.

## Inference Analysis between Variable "Q5" and "Q9":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.4418933 | 744123.6 | 5.735775e-11 | Spearman's rank correlation rho | two.sided | Q5 and Q9 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.442. Since the correlation result is positive, both variables are positively correlated, i.e., when Q5 increases, Q9 increases.

## Inference Analysis between Variable "Q5" and "Q10":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.267063 | 977225 | 0.0001319261 | Spearman's rank correlation rho | two.sided | Q5 and Q10 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.267. Since the correlation result is positive, both variables are positively correlated, i.e., when Q5 increases, Q10 increases.

## Inference Analysis between Variable "Q5" and "Year":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.03318897 | 1377551 | 0.6408223 | Spearman's rank correlation rho | two.sided | Q5 and Year |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.641. This means that the independence of both variables exists. The value of the correlation is -0.033. Since the correlation result is negative, both variables are negatively correlated, i.e., when Q5 increases, Year decreases.

## Inference Analysis between Variable "Q6" and "Q7":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2280587 | 1029229 | 0.001162476 | Spearman's rank correlation rho | two.sided | Q6 and Q7 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.001. This means that a significant correlation between both variables exists. The value of the correlation is 0.228. Since the correlation result is positive, both variables are positively correlated, i.e., when Q6 increases, Q7 increases.

## Inference Analysis between Variable "Q6" and "Q8":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2218138 | 1037556 | 0.001595786 | Spearman's rank correlation rho | two.sided | Q6 and Q8 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.002. This means that a significant correlation between both variables exists. The value of the correlation is 0.222. Since the correlation result is positive, both variables are positively correlated, i.e., when Q6 increases, Q8 increases.

## Inference Analysis between Variable "Q6" and "Q9":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.3081255 | 922476.3 | 9.04977e-06 | Spearman's rank correlation rho | two.sided | Q6 and Q9 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.308. Since the correlation result is positive, both variables are positively correlated, i.e., when Q6 increases, Q9 increases.

## Inference Analysis between Variable "Q6" and "Q10":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.3388826 | 881467.8 | 9.177312e-07 | Spearman's rank correlation rho | two.sided | Q6 and Q10 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.339. Since the correlation result is positive, both variables are positively correlated, i.e., when Q6 increases, Q10 increases.

## Inference Analysis between Variable "Q6" and "Year":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.09208909 | 1210518 | 0.1946549 | Spearman's rank correlation rho | two.sided | Q6 and Year |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.195. This means that the independence of both variables exists. The value of the correlation is 0.092. Since the correlation result is positive, both variables are positively correlated, i.e., when Q6 increases, Year increases.

## Inference Analysis between Variable "Q7" and "Q8":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.195582 | 1072530 | 0.005512264 | Spearman's rank correlation rho | two.sided | Q7 and Q8 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.006. This means that a significant correlation between both variables exists. The value of the correlation is 0.196. Since the correlation result is positive, both variables are positively correlated, i.e., when Q7 increases, Q8 increases.

## Inference Analysis between Variable "Q7" and "Q9":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.3257177 | 899020.6 | 2.520635e-06 | Spearman's rank correlation rho | two.sided | Q7 and Q9 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.326. Since the correlation result is positive, both variables are positively correlated, i.e., when Q7 increases, Q9 increases.

## Inference Analysis between Variable "Q7" and "Q10":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2517945 | 997582.4 | 0.0003222603 | Spearman's rank correlation rho | two.sided | Q7 and Q10 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.252. Since the correlation result is positive, both variables are positively correlated, i.e., when Q7 increases, Q10 increases.

## Inference Analysis between Variable "Q7" and "Year":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.04455498 | 1392705 | 0.5310104 | Spearman's rank correlation rho | two.sided | Q7 and Year |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.531. This means that the independence of both variables exists. The value of the correlation is -0.045. Since the correlation result is negative, both variables are negatively correlated, i.e., when Q7 increases, Year decreases.

## Inference Analysis between Variable "Q8" and "Q9":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2750938 | 966517.5 | 8.068274e-05 | Spearman's rank correlation rho | two.sided | Q8 and Q9 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.275. Since the correlation result is positive, both variables are positively correlated, i.e., when Q8 increases, Q9 increases.

## Inference Analysis between Variable "Q8" and "Q10":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.207895 | 1056114 | 0.003136896 | Spearman's rank correlation rho | two.sided | Q8 and Q10 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.003. This means that a significant correlation between both variables exists. The value of the correlation is 0.208. Since the correlation result is positive, both variables are positively correlated, i.e., when Q8 increases, Q10 increases.

## Inference Analysis between Variable "Q8" and "Year":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.03695184 | 1382568 | 0.6034261 | Spearman's rank correlation rho | two.sided | Q8 and Year |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.603. This means that the independence of both variables exists. The value of the correlation is -0.037. Since the correlation result is negative, both variables are negatively correlated, i.e., when Q8 increases, Year decreases.

## Inference Analysis between Variable "Q9" and "Q10":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.2491205 | 1001148 | 0.0003747403 | Spearman's rank correlation rho | two.sided | Q9 and Q10 |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0. This means that a significant correlation between both variables exists. The value of the correlation is 0.249. Since the correlation result is positive, both variables are positively correlated, i.e., when Q9 increases, Q10 increases.

## Inference Analysis between Variable "Q9" and "Year":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| -0.004634245 | 1339479 | 0.9480723 | Spearman's rank correlation rho | two.sided | Q9 and Year |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.948. This means that the independence of both variables exists. The value of the correlation is -0.005. Since the correlation result is negative, both variables are negatively correlated, i.e., when Q9 increases, Year decreases.

## Inference Analysis between Variable "Q10" and "Year":

| estimate | statistic | p.value | method | alternative | call |
| --- | --- | --- | --- | --- | --- |
| 0.04460595 | 1273827 | 0.5305401 | Spearman's rank correlation rho | two.sided | Q10 and Year |

To analyze two numerical variables (in this case, one of them is an integer), correlations analysis is applied. Since we have an integer variable, Spearman correlation is more appropriate.

Spearman correlation presents a p-value of 0.531. This means that the independence of both variables exists. The value of the correlation is 0.045. Since the correlation result is positive, both variables are positively correlated, i.e., when Q10 increases, Year increases.