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**ABOUT PAGE**

**Daniel Malok (PhD)**

Dr. Daniel Malok has been an information management expert/security analyst at the Africa UnioN based in Addis Ababa, Ethiopia, since 2021. He has been managing the Conflict Early Warning Systems (CEWS) and contributed as an expert to the development of various technical papers on matters of application of international law to cyberspace and ICT, cybersecurity, artificial intelligence, countering radicalization and violent extremism, transnational organization crime and coordinating conferences and capacity development workshops for the African Union –CISSA Member states. He has a wide range of expertise in cyber security, artificial intelligence, counter-terrorism and violent extremism. Dr. Malok’s career spans organizational development, policy formulation and advisory and providing technical consultancy as part of the African Union to various organs of the UN, EU,GIZ, INTERPOL, AFRIPOL and multinational corporations.

From 2016 to 2020, Dr. Daniel Malok was a Research Analyst and Documentation Officer for the National Dialogue Steering Committee (NDSC). The NDSC was initiated to break the deadlock after the 2015 Agreement for the Resolution of Conflict in South Sudan (ARCISS) collapsed in a renewed armed conflict in 2016. In this role, he provided technical notes and policy briefs, documented the process and worked together with external stakeholders in Juba, South Sudan, that were supporting the process, like the United Nations Development Program (UNDP), the United Nations Mission in South Sudan (UNMISS), the African Union (AU), the Intergovernmental Authority on Development (IGAD), In Transformation Initiative (ITI), the Government of Japan, Egypt, and South Africa. In 2017, he was also part of a group of NDSC experts that attended the leadership training retreat in Cape Town on the South African Transitional Peace process and the South African Truth and Reconciliation process under the personal guidance of the then Deputy President of South Africa, H.E Cyril Ramaphosa, Roelf Meyer, the former Chief Negotiator for the National Party (NP) and the South African apartheid Government, and Ebrahim Ebrahim the former prominent ANC leader of Indian origin. Other eminent professors and experts in Peacebuilding and Conflict Management from the Southern Africa Development Community (SADC) shared their knowledge and experience.

He has over fifteen years of experience at the intersection of technology, governance and security in Africa. Dr. Malok holds a PhD in Strategic Management from the United States International University (USIU), an MBL from the University of South Africa and Post Graduate Diploma in Project Planning and Management from the University of Nairobi and a BSC in Information Systems and Technology from USIU. He undertaken several training in governance, international security and research analysis.

**Areas of Expertise/Research Interest**

Strategic Planining and Management, Cyber Security and Emerging Technologies, Conflict Early Warning Systems (CEWS), Counter-Terrorism

**COURSES UNDERTAKEN**

## [**RESEARCH METHODS & PROFESSIONAL PRACTICE**](https://anja-kosar.github.io/week/8/&/9/2025/04/05/Research-Methods-&-Professional-Practice-Week-10-Worksheets.html) **COURSE**

**REPORT OF STATISTICAL ANALYSIS AND INTERPRETATION OF DATASETS OF FOUR DATA SETS: DIET A AND B, AGENT 1 AND 2, MALE AND FEMALE INCOME, AREA 1 AND 2**

**26 MARCH 2025**

# INTRODUCTION

Descriptive statistics was applied to analyse and interpret the four data sets: Diet A and B, Agent 1 and 2, Male and Female Income, and Area 1 and 2. There was an assumption that the data sets had equal variance. According to Hill, Berry, Hill and Berry (2021), descriptive statistics are crucial for simplifying datasets, applying calculations of variability or central decency, identifying outliers, and visualising data through graphs, charts, and tables. Descriptive statistics enable further statistical analysis through predictive modelling or inferential statistics (Hill, Berry, Hill & Berry, 2021).

According to Ghanad (2023), descriptive statistics is a quantitative research method. Quantitative statistics are about collecting quantifiable data, analysing, and interpreting to prove or disprove a hypothesis of the study. Quantitative statistics is systematically collecting data using an instrument, and data is collected from a sample population to answer preset research questions.

The data was analysed using a t-test paired two samples for means and analysis of variance (ANOVA) for a single factor. The paired two-sample t-test determines if the means of two related groups significantly differ. This test is usually applied to two paired small sample data sets. This, therefore, enhances the ability to efficiently and effectively compare two sample data. The single factor ANOVA is important for comparing the means of two or more groups of data sets and reduces the risk of type I error (false positive). The false positive is when the null hypothesis is incorrectly rejected. The single-factor ANOVA also helps determine the statistical difference between the variances of two or more data sets.

# STATISTICAL ANALYSIS OF THE DATA SETS AND INTERPRETATION OF THE RESULTS -DIET A AND DIET B

## **Presentation of Analysis of Data Using Descriptive Statistics**

This analysis was undertaken from a Null Hypothesis (H₀) perspective. This means that there is no difference between the means of diet A and diet B. The null hypothesis is stated below.

H₀: There is no difference in the means of diet A and diet B.

**Table 2.1: Diet A**

|  |  |
| --- | --- |
| Mean | 5.341 |
| Standard Error | 0.359 |
| Median | 5.642 |
| Mode | #N/A |
| Standard Deviation | 2.535602613 |
| Sample Variance | 6.429280612 |
| Kurtosis | 0.404479588 |
| Skewness | -0.609369094 |
| Range | 11.777 |
| Minimum | -1.715 |
| Maximum | 10.062 |
| Sum | 267.06 |
| Count | 50 |
| Confidence Level (95.0%) | 0.720610289 |

**Table 2.2: Diet B**

|  |  |
| --- | --- |
| Mean | 3.710 |
| Standard Error | 0.391601675 |
| Median | 3.745 |
| Mode | #N/A |
| Standard Deviation | 2.769041999 |
| Sample Variance | 7.66759359 |
| Kurtosis | 0.652638378 |
| Skewness | -0.203575964 |
| Range | 14.687 |
| Minimum | -4.148 |
| Maximum | 10.539 |
| Sum | 185.498 |
| Count | 50 |
| Confidence Level (95.0%) | 0.786953029 |

**Table 2.3: Two-Sample Assuming Equal Variances**

|  |  |  |
| --- | --- | --- |
|  | *Variable 1* | *Variable 2* |
| Mean | 5.3412 | 3.70996 |
| Variance | 6.429280612 | 7.66759359 |
| Observations | 50 | 50 |
| Pooled Variance | 7.048437101 |  |
| Hypothesised Mean Difference | 0 |  |
| df | 98 |  |
| t Stat | 3.072143179 |  |
| P(T<=t) one-tail | 0.001375772 |  |
| t Critical one-tail | 1.660551217 |  |
| P(T<=t) two-tail | 0.002751544 |  |
| t Critical two-tail | 1.984467455 |  |

**Table 2.4: Single Factor Analysis of Variance (ANOVA)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| SUMMARY |  |  |  |  |  |  |
| *Groups* | *Count* | *Sum* | *Average* | *Variance* |  |  |
| Wtloss A | 50 | 267.06 | 5.3412 | 6.429281 |  |  |
| Wtloss B | 50 | 185.498 | 3.70996 | 7.667594 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
| *Source of Variation* | *SS* | *df* | *MS* | *F* | *P-value* | *F crit* |
| Between Groups | 66.52359844 | 1 | 66.5236 | 9.438064 | 0.002752 | 3.938111 |
| Within Groups | 690.7468359 | 98 | 7.048437 |  |  |  |
|  |  |  |  |  |  |  |
| Total | 757.2704344 | 99 |  |  |  |  |

**Summary Output**

**Table 2.6: Regression Statistics**

|  |  |
| --- | --- |
| *Regression Statistics* | |
| Multiple R | 0.296389194 |
| R Square | 0.087846554 |
| Adjusted R Square | 0.078538866 |
| Standard Error | 2.654889282 |
| Observations | 100 |

**Table 2.7: Analysis of Variance (ANOVA)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ANOVA |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 1 | 66.52359844 | 66.52359844 | 9.438064 | 0.002752 |
| Residual | 98 | 690.7468359 | 7.048437101 |  |  |
| Total | 99 | 757.2704344 |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* | *Upper 95.0%* |
| Intercept | 5.3412 | 0.375458043 | 14.2258239 | 1.42E-25 | 4.596116 | 6.086284 | 4.596116 | 6.086284 | 6.600991 |
| Diet Code | -1.63124 | 0.530977856 | -3.072143179 | 0.002752 | -2.68495 | -0.57753 | -2.68495 | -0.57753 | 0.25656 |

**Table 2.8: Residual Output**

|  |  |  |
| --- | --- | --- |
| RESIDUAL OUTPUT |  |  |
|  |  |  |
| *Observation* | *Predicted Wtloss* | *Residuals* |
| 1 | 5.3412 | -1.6322 |
| 2 | 5.3412 | 1.7458 |
| 3 | 5.3412 | 1.4128 |
| 4 | 5.3412 | 3.6528 |
| 5 | 5.3412 | 3.7358 |
| 6 | 5.3412 | 1.0718 |
| 7 | 5.3412 | 0.5358 |
| 8 | 5.3412 | -2.7692 |
| 9 | 5.3412 | 2.1788 |
| 10 | 5.3412 | 1.5398 |
| 11 | 5.3412 | 1.9238 |
| 12 | 5.3412 | -1.8642 |
| 13 | 5.3412 | -1.5862 |
| 14 | 5.3412 | 3.4188 |
| 15 | 5.3412 | 1.6908 |
| 16 | 5.3412 | 3.7108 |
| 17 | 5.3412 | 4.7208 |
| 18 | 5.3412 | -0.5012 |
| 19 | 5.3412 | 1.1078 |
| 20 | 5.3412 | 3.6778 |
| 21 | 5.3412 | -7.0562 |
| 22 | 5.3412 | -0.6232 |
| 23 | 5.3412 | -1.3342 |
| 24 | 5.3412 | 1.8998 |
| 25 | 5.3412 | -3.2132 |
| 26 | 5.3412 | 1.6268 |
| 27 | 5.3412 | -0.4882 |
| 28 | 5.3412 | -5.2862 |
| 29 | 5.3412 | -2.6612 |
| 30 | 5.3412 | -1.5952 |
| 31 | 5.3412 | 1.6918 |
| 32 | 5.3412 | -0.3082 |
| 33 | 5.3412 | 0.2278 |
| 34 | 5.3412 | 1.3708 |
| 35 | 5.3412 | -1.6782 |
| 36 | 5.3412 | -2.6002 |
| 37 | 5.3412 | 0.9148 |
| 38 | 5.3412 | 0.0078 |
| 39 | 5.3412 | 1.9588 |
| 40 | 5.3412 | 0.1038 |
| 41 | 5.3412 | -0.3712 |
| 42 | 5.3412 | -1.7282 |
| 43 | 5.3412 | 2.2268 |
| 44 | 5.3412 | 0.5198 |
| 45 | 5.3412 | -1.1842 |
| 46 | 5.3412 | -5.1382 |
| 47 | 5.3412 | -0.9002 |
| 48 | 5.3412 | 0.5338 |
| 49 | 5.3412 | 0.3738 |
| 50 | 5.3412 | -5.0612 |
| 51 | 3.70996 | -4.79696 |
| 52 | 3.70996 | -1.89096 |
| 53 | 3.70996 | -3.63596 |
| 54 | 3.70996 | -1.95496 |
| 55 | 3.70996 | -1.82096 |
| 56 | 3.70996 | -0.62096 |
| 57 | 3.70996 | 0.29804 |
| 58 | 3.70996 | 0.84104 |
| 59 | 3.70996 | -2.33796 |
| 60 | 3.70996 | -0.29696 |
| 61 | 3.70996 | -7.85796 |
| 62 | 3.70996 | -0.88696 |
| 63 | 3.70996 | -0.84496 |
| 64 | 3.70996 | 0.65904 |
| 65 | 3.70996 | 2.62704 |
| 66 | 3.70996 | 2.59804 |
| 67 | 3.70996 | -0.21596 |
| 68 | 3.70996 | 6.82904 |
| 69 | 3.70996 | 0.13004 |
| 70 | 3.70996 | 1.41304 |
| 71 | 3.70996 | 1.77504 |
| 72 | 3.70996 | -5.60396 |
| 73 | 3.70996 | 4.30604 |
| 74 | 3.70996 | -1.39996 |
| 75 | 3.70996 | 0.17204 |
| 76 | 3.70996 | 3.32004 |
| 77 | 3.70996 | 4.01704 |
| 78 | 3.70996 | -3.60496 |
| 79 | 3.70996 | -0.05996 |
| 80 | 3.70996 | 0.83704 |
| 81 | 3.70996 | 1.27504 |
| 82 | 3.70996 | 1.44904 |
| 83 | 3.70996 | 1.05004 |
| 84 | 3.70996 | 1.22404 |
| 85 | 3.70996 | -0.60396 |
| 86 | 3.70996 | 1.88804 |
| 87 | 3.70996 | -1.54796 |
| 88 | 3.70996 | 2.81004 |
| 89 | 3.70996 | 3.33604 |
| 90 | 3.70996 | -1.95296 |
| 91 | 3.70996 | -1.86196 |
| 92 | 3.70996 | -2.61396 |
| 93 | 3.70996 | -1.56496 |
| 94 | 3.70996 | 4.72504 |
| 95 | 3.70996 | 2.38904 |
| 96 | 3.70996 | 0.26204 |
| 97 | 3.70996 | -1.30096 |
| 98 | 3.70996 | -3.14096 |
| 99 | 3.70996 | 3.30304 |
| 100 | 3.70996 | -1.11596 |

## **2.2 Interpretation of the Results of the Statistical Analysis of Diet A and B**

Descriptive statistics was applied. A two-sample t-test was applied while assuming variance between diet A and B. The two-sample t-test was applied because they are two independent diets, and there is a need to find out if there is a significant statistical difference between them in terms of weight loss or weight gain between the two groups. Applying a two-sample test will provide a clear statistical insight into which diet is more effective and provide an informed decision. A single-factor ANOVA test was used to determine whether there were statistically significant differences between the mean of the unrelated groups (Diet A and B).

The mean of Diet A is 5.34, and Diet B is 3.71 for a group of 50 observations. As per the assumption of equal variance, the pooled variance for the two groups is 7.05.

The degree of freedom (df) is 98% for both groups. The standardised difference between the two means is 3.07, relative to the pooled standard error.

The p-value of the two-tailed test is 0.00275, which is less than the significance level of 0.05. This indicates that the Null Hypothesis (H₀) was rejected. The t-statistics was 3.07, exceeding the critical t-value of 1.98 for the two-tail test. This, therefore, means that the null hypothesis was also rejected.

# STATISTICAL ANALYSIS OF THE DATA SETS AND INTERPRETATION OF THE RESULTS -AGENT 1 AND AGENT 2

This analysis was undertaken from a Null Hypothesis (H₀) perspective. This means that there is no difference between the means of Agent 1 and Agent 2. The null hypothesis is stated below.

H₀: There is no difference in the means of Agent 1 and Agent 2.

## **Presentation of Analysis of Data Using Descriptive Statistics**

**Table 3.1: Agent 1**

|  |  |  |
| --- | --- | --- |
| **Agent1** | |  |
|  |  |  |
| Mean | 8.25 |  |
| Standard Error | 0.297081766 |  |
| Median | 8.4 |  |
| Mode | 8.7 |  |
| Standard Deviation | 1.029121426 |  |
| Sample Variance | 1.059090909 |  |
| Kurtosis | -1.682302247 |  |
| Skewness | -0.158842103 |  |
| Range | 2.7 |  |
| Minimum | 6.8 |  |
| Maximum | 9.5 |  |
| Sum | 99 |  |
| Count | 12 |  |
| Confidence Level (95.0%) | 0.653872559 |  |

**Table 3.2: Agent 2**

|  |
| --- |
| **Agent2** |
|  | |  |
| Mean | | 8.683333333 |
| Standard Error | | 0.299705242 |
| Median | | 9 |
| Mode | | #N/A |
| Standard Deviation | | 1.038209414 |
| Sample Variance | | 1.077878788 |
| Kurtosis | | 0.48577068 |
| Skewness | | -1.00867855 |
| Range | | 3.4 |
| Minimum | | 6.4 |
| Maximum | | 9.8 |
| Sum | | 104.2 |
| Count | | 12 |
| Confidence Level (95.0%) | | 0.659646791 |

**Table 3.3: Two-Sample T-Test Assuming Equal Variances**

|  |  |  |
| --- | --- | --- |
| **t-Test: Two-Sample Assuming Equal Variances** | | |
|  |  |  |
|  | *Agent1* | *Agent2* |
| Mean | 8.25 | 8.683333333 |
| Variance | 1.059090909 | 1.077878788 |
| Observations | 12 | 12 |
| Pooled Variance | 1.068484848 |  |
| Hypothesised Mean Difference | 0 |  |
| df | 22 |  |
| t Stat | -1.026865443 |  |
| P(T<=t) one-tail | 0.157821259 |  |
| t Critical one-tail | 1.717144374 |  |
| P(T<=t) two-tail | 0.315642517 |  |
| t Critical two-tail | 2.073873068 |  |

**Table 3.4: Single Factor Analysis of Variance (ANOVA)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Anova: Single Factor** | |  |  |  |  |  |
|  |  |  |  |  |  |  |
| SUMMARY |  |  |  |  |  |  |
| *Groups* | *Count* | *Sum* | *Average* | *Variance* |  |  |
| Agent1 | 12 | 99 | 8.25 | 1.059091 |  |  |
| Agent2 | 12 | 104.2 | 8.683333 | 1.077879 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
| *Source of Variation* | *SS* | *df* | *MS* | *F* | *P-value* | *F crit* |
| Between Groups | 1.126667 | 1 | 1.126667 | 1.054453 | 0.315643 | 4.30095 |
| Within Groups | 23.50667 | 22 | 1.068485 |  |  |  |
|  |  |  |  |  |  |  |
| Total | 24.63333 | 23 |  |  |  |  |

**Table 3.5: Summary Output**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SUMMARY OUTPUT** | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.228896281 |  |  |  |  |  |  |  |
| R Square | 0.052393508 |  |  |  |  |  |  |  |
| Adjusted R Square | -0.158185713 |  |  |  |  |  |  |  |
| Standard Error | 3.880259562 |  |  |  |  |  |  |  |
| Observations | 12 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 2 | 7.492271592 | 3.746136 | 0.248807 | 0.784921 |  |  |  |
| Residual | 9 | 135.5077284 | 15.05641 |  |  |  |  |  |
| Total | 11 | 143 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | -0.317449728 | 9.933886285 | -0.03196 | 0.975204 | -22.7895 | 22.15456 | -22.7895 | 22.15456 |
| Agent1 | -0.134977715 | 2.621230645 | -0.05149 | 0.960057 | -6.06461 | 5.794658 | -6.06461 | 5.794658 |
| Agent2 | 0.913360754 | 2.598285646 | 0.351524 | 0.733284 | -4.96437 | 6.791091 | -4.96437 | 6.791091 |

**Table 3.6: Residual Output**

|  |  |  |
| --- | --- | --- |
| RESIDUAL OUTPUT |  |  |
|  |  |  |
| *Observation* | *Predicted Batch* | *Residuals* |
| 1 | 6.406788272 | -5.40678827 |
| 2 | 7.209018528 | -5.20901853 |
| 3 | 4.610210632 | -1.61021063 |
| 4 | 7.351197364 | -3.35119736 |
| 5 | 7.00249916 | -2.00249916 |
| 6 | 5.692745766 | 0.307254234 |
| 7 | 6.159775589 | 0.840224411 |
| 8 | 5.757086298 | 2.242913702 |
| 9 | 7.093835235 | 1.906164765 |
| 10 | 6.542670457 | 3.457329543 |
| 11 | 7.27335906 | 3.72664094 |
| 12 | 6.900813638 | 5.099186362 |

## **Interpretation of the Results of the Statistical Analysis of Agent 1 and Agent 2**

The means for Agents 1 and 2 are 8.25 and 8.68, respectively. There is a justification for equal variance because their variances are very close, 1.059 for Agent 1 and 1.078 for Agent 2. The t-stat is 1.027, and the degree of freedom (df) is 22.

As per the one-tail test, the p-value of 0.158 is more significant than the critical level of 0.05. This, therefore, means that we fail to reject the null hypothesis. This indicated no evidence that one group was less or greater than the other.

As per the two-tail test, the p-value is 0.316, more significant than the critical level of 0.05. This indicated that there was no significant difference between the two groups.

This, therefore, results in a lack of significant difference between the mean of Agents 1 and 2.

# STATISTICAL ANALYSIS OF THE DATA SETS AND INTERPRETATION OF THE RESULTS –MALE AND FEMALE INCOME

This analysis was undertaken from a Null Hypothesis (H₀) perspective. This means there is no difference between the means of Male and Female Income. The null hypothesis is stated below.

H₀: There is no difference in the means of Male Income and Female Income.

## **Presentation of Analysis of Data Using Descriptive Statistics**

**Table 4.1: Male Income**

|  |  |
| --- | --- |
| *Male income* | |
|  |  |
| Mean | 52.9133333 |
| Standard Error | 1.97116282 |
| Median | 52.05 |
| Mode | 54.6 |
| Standard Deviation | 15.2685615 |
| Sample Variance | 233.128972 |
| Kurtosis | 0.47064083 |
| Skewness | 0.72494335 |
| Range | 69.9 |
| Minimum | 31 |
| Maximum | 100.9 |
| Sum | 3174.8 |
| Count | 60 |
| Confidence Level (95.0%) | 3.94428769 |

**Table 4.2: Female Income**

|  |  |
| --- | --- |
| *Female Income* | |
|  |  |
| Mean | 44.2333333 |
| Standard Error | 1.7803362 |
| Median | 38.15 |
| Mode | 33.4 |
| Standard Deviation | 13.7904249 |
| Sample Variance | 190.175819 |
| Kurtosis | 0.35112373 |
| Skewness | 1.09975931 |
| Range | 52.9 |
| Minimum | 30 |
| Maximum | 82.9 |
| Sum | 2654 |
| Count | 60 |
| Confidence Level (95.0%) | 3.56244451 |

**Table 4.3: Two-Sample T-Test Assuming Equal Variances**

|  |  |  |
| --- | --- | --- |
| **t-Test: Two-Sample Assuming Equal Variances** | | |
|  |  |  |
|  | *Variable 1* | *Variable 2* |
| Mean | 52.91333333 | 44.23333333 |
| Variance | 233.1289718 | 190.1758192 |
| Observations | 60 | 60 |
| Pooled Variance | 211.6523955 |  |
| Hypothesised Mean Difference | 0 |  |
| df | 118 |  |
| t Stat | 3.267900001 |  |
| P(T<=t) one-tail | 0.000709735 |  |
| t Critical one-tail | 1.657869522 |  |
| P(T<=t) two-tail | 0.00141947 |  |
| t Critical two-tail | 1.980272249 |  |

**Table 4.4: Single Factor Analysis of Variance (ANOVA)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Anova: Single Factor** |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| SUMMARY |  |  |  |  |  |  |
| *Groups* | *Count* | *Sum* | *Average* | *Variance* |  |  |
| MALE | 60 | 3174.8 | 52.91333 | 233.129 |  |  |
| FEMALE | 60 | 2654 | 44.23333 | 190.1758 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
| *Source of Variation* | *SS* | *df* | *MS* | *F* | *P-value* | *F crit* |
| Between Groups | 2260.272 | 1 | 2260.272 | 10.67917 | 0.001419 | 3.921478 |
| Within Groups | 24974.98 | 118 | 211.6524 |  |  |  |
|  |  |  |  |  |  |  |
| Total | 27235.25 | 119 |  |  |  |  |

**Table 4.5: Summary Output**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SUMMARY OUTPUT** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.288081 |  |  |  |  |  |  |  |
| R Square | 0.082991 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.075219 |  |  |  |  |  |  |  |
| Standard Error | 14.54828 |  |  |  |  |  |  |  |
| Observations | 120 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 2260.272 | 2260.272 | 10.67917 | 0.001419 |  |  |  |
| Residual | 118 | 24974.98 | 211.6524 |  |  |  |  |  |
| Total | 119 | 27235.25 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 61.59333 | 4.199726 | 14.66604 | 2.33E-28 | 53.27673 | 69.90993 | 53.27673 | 69.90993 |
| Sex Code | -8.68 | 2.65614 | -3.2679 | 0.001419 | -13.9399 | -3.42012 | -13.9399 | -3.42012 |

**Table 4.6: Residual Output**

|  |  |  |
| --- | --- | --- |
| RESIDUAL OUTPUT |  |  |
|  |  |  |
| *Observation* | *Predicted Income* | *Residuals* |
| 1 | 52.91333 | -12.3133 |
| 2 | 52.91333 | 1.686667 |
| 3 | 52.91333 | -14.3133 |
| 4 | 52.91333 | 5.286667 |
| 5 | 52.91333 | -18.3133 |
| 6 | 52.91333 | -10.0133 |
| 7 | 52.91333 | 14.58667 |
| 8 | 52.91333 | 26.88667 |
| 9 | 52.91333 | 1.486667 |
| 10 | 52.91333 | -5.61333 |
| 11 | 52.91333 | 13.48667 |
| 12 | 52.91333 | 16.08667 |
| 13 | 52.91333 | 9.086667 |
| 14 | 52.91333 | -0.41333 |
| 15 | 52.91333 | 19.68667 |
| 16 | 52.91333 | -0.51333 |
| 17 | 52.91333 | 6.586667 |
| 18 | 52.91333 | 6.186667 |
| 19 | 52.91333 | -16.2133 |
| 20 | 52.91333 | 1.686667 |
| 21 | 52.91333 | -0.81333 |
| 22 | 52.91333 | -3.01333 |
| 23 | 52.91333 | -0.91333 |
| 24 | 52.91333 | -5.81333 |
| 25 | 52.91333 | -12.1133 |
| 26 | 52.91333 | -16.4133 |
| 27 | 52.91333 | 4.186667 |
| 28 | 52.91333 | 1.186667 |
| 29 | 52.91333 | -20.5133 |
| 30 | 52.91333 | -18.0133 |
| 31 | 52.91333 | 11.18667 |
| 32 | 52.91333 | 1.086667 |
| 33 | 52.91333 | -1.41333 |
| 34 | 52.91333 | -2.11333 |
| 35 | 52.91333 | -7.81333 |
| 36 | 52.91333 | 28.58667 |
| 37 | 52.91333 | 17.48667 |
| 38 | 52.91333 | -13.7133 |
| 39 | 52.91333 | -7.71333 |
| 40 | 52.91333 | 27.98667 |
| 41 | 52.91333 | -4.31333 |
| 42 | 52.91333 | -21.9133 |
| 43 | 52.91333 | -20.8133 |
| 44 | 52.91333 | -19.0133 |
| 45 | 52.91333 | -21.6133 |
| 46 | 52.91333 | -1.91333 |
| 47 | 52.91333 | 0.486667 |
| 48 | 52.91333 | 5.386667 |
| 49 | 52.91333 | -21.5133 |
| 50 | 52.91333 | 3.386667 |
| 51 | 52.91333 | -11.9133 |
| 52 | 52.91333 | -5.01333 |
| 53 | 52.91333 | -1.51333 |
| 54 | 52.91333 | -19.8133 |
| 55 | 52.91333 | 21.98667 |
| 56 | 52.91333 | 24.28667 |
| 57 | 52.91333 | 4.986667 |
| 58 | 52.91333 | 27.18667 |
| 59 | 52.91333 | -12.7133 |
| 60 | 52.91333 | 47.98667 |
| 61 | 44.23333 | -11.1333 |
| 62 | 44.23333 | -8.43333 |
| 63 | 44.23333 | 24.56667 |
| 64 | 44.23333 | -12.6333 |
| 65 | 44.23333 | -6.03333 |
| 66 | 44.23333 | -2.23333 |
| 67 | 44.23333 | -10.8333 |
| 68 | 44.23333 | 6.066667 |
| 69 | 44.23333 | -4.63333 |
| 70 | 44.23333 | -13.5333 |
| 71 | 44.23333 | -12.9333 |
| 72 | 44.23333 | 17.06667 |
| 73 | 44.23333 | -14.2333 |
| 74 | 44.23333 | -6.13333 |
| 75 | 44.23333 | 12.16667 |
| 76 | 44.23333 | -8.53333 |
| 77 | 44.23333 | -12.9333 |
| 78 | 44.23333 | -3.83333 |
| 79 | 44.23333 | -12.1333 |
| 80 | 44.23333 | 22.16667 |
| 81 | 44.23333 | -7.33333 |
| 82 | 44.23333 | -8.33333 |
| 83 | 44.23333 | 5.366667 |
| 84 | 44.23333 | 18.56667 |
| 85 | 44.23333 | 0.366667 |
| 86 | 44.23333 | -11.7333 |
| 87 | 44.23333 | -10.8333 |
| 88 | 44.23333 | 11.06667 |
| 89 | 44.23333 | 18.46667 |
| 90 | 44.23333 | 10.16667 |
| 91 | 44.23333 | -13.4333 |
| 92 | 44.23333 | 4.866667 |
| 93 | 44.23333 | -2.33333 |
| 94 | 44.23333 | -11.7333 |
| 95 | 44.23333 | -9.03333 |
| 96 | 44.23333 | 3.166667 |
| 97 | 44.23333 | 16.46667 |
| 98 | 44.23333 | -11.2333 |
| 99 | 44.23333 | -0.93333 |
| 100 | 44.23333 | -9.43333 |
| 101 | 44.23333 | -8.23333 |
| 102 | 44.23333 | 7.366667 |
| 103 | 44.23333 | -12.3333 |
| 104 | 44.23333 | -10.1333 |
| 105 | 44.23333 | 34.16667 |
| 106 | 44.23333 | -13.8333 |
| 107 | 44.23333 | 1.066667 |
| 108 | 44.23333 | 8.366667 |
| 109 | 44.23333 | -13.9333 |
| 110 | 44.23333 | -7.63333 |
| 111 | 44.23333 | 8.866667 |
| 112 | 44.23333 | -7.73333 |
| 113 | 44.23333 | -6.43333 |
| 114 | 44.23333 | -10.2333 |
| 115 | 44.23333 | 25.06667 |
| 116 | 44.23333 | 32.96667 |
| 117 | 44.23333 | -11.6333 |
| 118 | 44.23333 | 38.66667 |
| 119 | 44.23333 | -1.93333 |
| 120 | 44.23333 | 13.56667 |

## **Interpretation of the Results of the Statistical Analysis of Male and Female Income**

The mean for Male Income is 52.91, and the Mean for Female Income is 44.23. The variances for the male income are 233.13 and 190.18 for the female income. This demonstrated that males' average income is higher than females'. The t-statistic is 3.27, and the degree of freedom (df) is 118. The p-value for the one tail is 0.00071, and for the two, it is 0.00142, which are all below the critical value of 0.005. The null hypothesis was rejected. This indicated a significant difference between the income of males and females.

# STATISTICAL ANALYSIS OF THE DATA SETS AND INTERPRETATION OF THE RESULTS –AREA 1 AND AREA 2

This analysis was undertaken from a Null Hypothesis (H₀) perspective. This means that there is no difference between the means of Area 1 and Area 2. The null hypothesis is stated below.

H₀: There is no difference in the means of Area 1 and Area 2.

## **Presentation of Analysis of Data Using Descriptive Statistics**

**Table 5.1: Area 1**

|  |  |
| --- | --- |
| *Area 1* | |
|  |  |
| Mean | 23.33333333 |
| Standard Error | 9.492687244 |
| Median | 17 |
| Mode | #N/A |
| Standard Deviation | 16.44181661 |
| Sample Variance | 270.3333333 |
| Kurtosis | #DIV/0! |
| Skewness | 1.476191507 |
| Range | 31 |
| Minimum | 11 |
| Maximum | 42 |
| Sum | 70 |
| Count | 3 |
| Confidence Level (95.0%) | 40.84373668 |

**Table 5.2: Area 2**

|  |  |
| --- | --- |
| *Area 2* | |
|  |  |
| Mean | 30 |
| Standard Error | 6.350852961 |
| Median | 30 |
| Mode | #N/A |
| Standard Deviation | 11 |
| Sample Variance | 121 |
| Kurtosis | #DIV/0! |
| Skewness | 0 |
| Range | 22 |
| Minimum | 19 |
| Maximum | 41 |
| Sum | 90 |
| Count | 3 |
| Confidence Level (95.0%) | 27.32551483 |

**Table 5.3: Two-Sample T-Test for the Means**

|  |  |  |
| --- | --- | --- |
| t-Test: Paired Two Sample for Means | |  |
|  |  |  |
|  | *Area 1* | *Area 2* |
| Mean | 23.33333333 | 30 |
| Variance | 270.3333333 | 121 |
| Observations | 3 | 3 |
| Pearson Correlation | 0.942718215 |  |
| Hypothesised Mean Difference | 0 |  |
| df | 2 |  |
| t Stat | -1.627576918 |  |
| P(T<=t) one-tail | 0.122574322 |  |
| t Critical one-tail | 2.91998558 |  |
| P(T<=t) two-tail | 0.245148644 |  |
| t Critical two-tail | 4.30265273 |  |
|  |  |  |

**Table 5.4: Single Factor Analysis of Variance (ANOVA)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Anova: Single Factor |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| SUMMARY |  |  |  |  |  |  |
| *Groups* | *Count* | *Sum* | *Average* | *Variance* |  |  |
| Area 1 | 3 | 70 | 23.33333 | 270.3333 |  |  |
| Area 2 | 3 | 90 | 30 | 121 |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
| *Source of Variation* | *SS* | *df* | *MS* | *F* | *P-value* | *F crit* |
| Between Groups | 66.66666667 | 1 | 66.66667 | 0.340716 | 0.590747 | 7.708647 |
| Within Groups | 782.6666667 | 4 | 195.6667 |  |  |  |
|  |  |  |  |  |  |  |
| Total | 849.3333333 | 5 |  |  |  |  |

**Table 5.5: Summary Output**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.12744007 |  |  |  |  |  |  |  |
| R Square | 0.016240971 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.010014648 |  |  |  |  |  |  |  |
| Standard Error | 0.770884954 |  |  |  |  |  |  |  |
| Observations | 160 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 1.550099206 | 1.550099206 | 2.608437019 | 0.108291653 |  |  |  |
| Residual | 158 | 93.89365079 | 0.594263613 |  |  |  |  |  |
| Total | 159 | 95.44375 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 4.641269841 | 0.201397244 | 23.04534937 | 2.12754E-52 | 4.243491742 | 5.039047941 | 4.243492 | 5.039048 |
| Area | -0.198412698 | 0.122851167 | -1.615065639 | 0.108291653 | -0.441055064 | 0.044229667 | -0.44106 | 0.04423 |

**Table 5.6: Residential Output**

|  |  |  |
| --- | --- | --- |
| RESIDUAL OUTPUT | |  |
|  |  |  |
| *Observation* | *Predicted Brand code* | *Residuals* |
| 1 | 4.442857143 | -0.442857143 |
| 2 | 4.442857143 | 0.557142857 |
| 3 | 4.442857143 | -1.442857143 |
| 4 | 4.442857143 | -0.442857143 |
| 5 | 4.442857143 | 0.557142857 |
| 6 | 4.442857143 | -1.442857143 |
| 7 | 4.442857143 | 0.557142857 |
| 8 | 4.442857143 | 0.557142857 |
| 9 | 4.442857143 | 0.557142857 |
| 10 | 4.442857143 | 0.557142857 |
| 11 | 4.442857143 | -0.442857143 |
| 12 | 4.442857143 | 0.557142857 |
| 13 | 4.442857143 | 0.557142857 |
| 14 | 4.442857143 | -1.442857143 |
| 15 | 4.442857143 | -1.442857143 |
| 16 | 4.442857143 | -1.442857143 |
| 17 | 4.442857143 | -0.442857143 |
| 18 | 4.442857143 | -1.442857143 |
| 19 | 4.442857143 | 0.557142857 |
| 20 | 4.442857143 | -0.442857143 |
| 21 | 4.442857143 | -1.442857143 |
| 22 | 4.442857143 | -0.442857143 |
| 23 | 4.442857143 | 0.557142857 |
| 24 | 4.442857143 | 0.557142857 |
| 25 | 4.442857143 | -0.442857143 |
| 26 | 4.442857143 | -0.442857143 |
| 27 | 4.442857143 | 0.557142857 |
| 28 | 4.442857143 | 0.557142857 |
| 29 | 4.442857143 | 0.557142857 |
| 30 | 4.442857143 | 0.557142857 |
| 31 | 4.442857143 | 0.557142857 |
| 32 | 4.442857143 | -0.442857143 |
| 33 | 4.442857143 | -0.442857143 |
| 34 | 4.442857143 | 0.557142857 |
| 35 | 4.442857143 | 0.557142857 |
| 36 | 4.442857143 | -0.442857143 |
| 37 | 4.442857143 | -0.442857143 |
| 38 | 4.442857143 | -0.442857143 |
| 39 | 4.442857143 | 0.557142857 |
| 40 | 4.442857143 | 0.557142857 |
| 41 | 4.442857143 | -0.442857143 |
| 42 | 4.442857143 | 0.557142857 |
| 43 | 4.442857143 | 0.557142857 |
| 44 | 4.442857143 | 0.557142857 |
| 45 | 4.442857143 | 0.557142857 |
| 46 | 4.442857143 | 0.557142857 |
| 47 | 4.442857143 | 0.557142857 |
| 48 | 4.442857143 | 0.557142857 |
| 49 | 4.442857143 | 0.557142857 |
| 50 | 4.442857143 | 0.557142857 |
| 51 | 4.442857143 | -1.442857143 |
| 52 | 4.442857143 | 0.557142857 |
| 53 | 4.442857143 | -1.442857143 |
| 54 | 4.442857143 | 0.557142857 |
| 55 | 4.442857143 | 0.557142857 |
| 56 | 4.442857143 | 0.557142857 |
| 57 | 4.442857143 | -1.442857143 |
| 58 | 4.442857143 | -1.442857143 |
| 59 | 4.442857143 | 0.557142857 |
| 60 | 4.442857143 | 0.557142857 |
| 61 | 4.442857143 | 0.557142857 |
| 62 | 4.442857143 | 0.557142857 |
| 63 | 4.442857143 | 0.557142857 |
| 64 | 4.442857143 | 0.557142857 |
| 65 | 4.442857143 | -0.442857143 |
| 66 | 4.442857143 | 0.557142857 |
| 67 | 4.442857143 | -0.442857143 |
| 68 | 4.442857143 | 0.557142857 |
| 69 | 4.442857143 | 0.557142857 |
| 70 | 4.442857143 | -0.442857143 |
| 71 | 4.244444444 | -1.244444444 |
| 72 | 4.244444444 | -0.244444444 |
| 73 | 4.244444444 | -1.244444444 |
| 74 | 4.244444444 | 0.755555556 |
| 75 | 4.244444444 | -1.244444444 |
| 76 | 4.244444444 | -0.244444444 |
| 77 | 4.244444444 | 0.755555556 |
| 78 | 4.244444444 | 0.755555556 |
| 79 | 4.244444444 | -0.244444444 |
| 80 | 4.244444444 | -0.244444444 |
| 81 | 4.244444444 | 0.755555556 |
| 82 | 4.244444444 | -0.244444444 |
| 83 | 4.244444444 | -0.244444444 |
| 84 | 4.244444444 | 0.755555556 |
| 85 | 4.244444444 | 0.755555556 |
| 86 | 4.244444444 | -1.244444444 |
| 87 | 4.244444444 | -0.244444444 |
| 88 | 4.244444444 | -1.244444444 |
| 89 | 4.244444444 | 0.755555556 |
| 90 | 4.244444444 | -0.244444444 |
| 91 | 4.244444444 | 0.755555556 |
| 92 | 4.244444444 | 0.755555556 |
| 93 | 4.244444444 | -1.244444444 |
| 94 | 4.244444444 | 0.755555556 |
| 95 | 4.244444444 | -1.244444444 |
| 96 | 4.244444444 | -0.244444444 |
| 97 | 4.244444444 | 0.755555556 |
| 98 | 4.244444444 | -0.244444444 |
| 99 | 4.244444444 | 0.755555556 |
| 100 | 4.244444444 | -0.244444444 |
| 101 | 4.244444444 | 0.755555556 |
| 102 | 4.244444444 | -0.244444444 |
| 103 | 4.244444444 | 0.755555556 |
| 104 | 4.244444444 | -0.244444444 |
| 105 | 4.244444444 | -1.244444444 |
| 106 | 4.244444444 | -1.244444444 |
| 107 | 4.244444444 | 0.755555556 |
| 108 | 4.244444444 | -0.244444444 |
| 109 | 4.244444444 | 0.755555556 |
| 110 | 4.244444444 | 0.755555556 |
| 111 | 4.244444444 | -1.244444444 |
| 112 | 4.244444444 | -0.244444444 |
| 113 | 4.244444444 | -0.244444444 |
| 114 | 4.244444444 | 0.755555556 |
| 115 | 4.244444444 | 0.755555556 |
| 116 | 4.244444444 | 0.755555556 |
| 117 | 4.244444444 | 0.755555556 |
| 118 | 4.244444444 | -0.244444444 |
| 119 | 4.244444444 | -0.244444444 |
| 120 | 4.244444444 | -0.244444444 |
| 121 | 4.244444444 | 0.755555556 |
| 122 | 4.244444444 | 0.755555556 |
| 123 | 4.244444444 | -0.244444444 |
| 124 | 4.244444444 | -0.244444444 |
| 125 | 4.244444444 | -1.244444444 |
| 126 | 4.244444444 | 0.755555556 |
| 127 | 4.244444444 | -0.244444444 |
| 128 | 4.244444444 | -1.244444444 |
| 129 | 4.244444444 | -1.244444444 |
| 130 | 4.244444444 | -0.244444444 |
| 131 | 4.244444444 | 0.755555556 |
| 132 | 4.244444444 | 0.755555556 |
| 133 | 4.244444444 | 0.755555556 |
| 134 | 4.244444444 | -0.244444444 |
| 135 | 4.244444444 | 0.755555556 |
| 136 | 4.244444444 | 0.755555556 |
| 137 | 4.244444444 | -1.244444444 |
| 138 | 4.244444444 | 0.755555556 |
| 139 | 4.244444444 | -1.244444444 |
| 140 | 4.244444444 | -0.244444444 |
| 141 | 4.244444444 | -0.244444444 |
| 142 | 4.244444444 | 0.755555556 |
| 143 | 4.244444444 | 0.755555556 |
| 144 | 4.244444444 | -0.244444444 |
| 145 | 4.244444444 | 0.755555556 |
| 146 | 4.244444444 | -1.244444444 |
| 147 | 4.244444444 | 0.755555556 |
| 148 | 4.244444444 | -1.244444444 |
| 149 | 4.244444444 | 0.755555556 |
| 150 | 4.244444444 | 0.755555556 |
| 151 | 4.244444444 | 0.755555556 |
| 152 | 4.244444444 | 0.755555556 |
| 153 | 4.244444444 | 0.755555556 |
| 154 | 4.244444444 | -1.244444444 |
| 155 | 4.244444444 | -0.244444444 |
| 156 | 4.244444444 | -1.244444444 |
| 157 | 4.244444444 | -0.244444444 |
| 158 | 4.244444444 | -0.244444444 |
| 159 | 4.244444444 | 0.755555556 |
| 160 | 4.244444444 | 0.755555556 |

## **Interpretation of the Results of the Statistical Analysis of Area 1 and Area 2**

The mean for Area 1 is 23.33, and the Mean for Area 2 is 30. The variances for Area 1 are 270.33 and 121 for Area 2. The t-statistics is 1.628, and the degree of freedom (df) is 2. The p-value for one tail is 0.123, and the p-value is 0.245 for two tails. The critical value for one tail was 2.920, and for two tail was 4.303. For the one tail, the p-value was 0.123, more significant than 0.05; hence, we failed to reject the null hypothesis. There is no sufficient evidence that the mean for Area 1 was significantly greater or less than Area 2.

# 6.0 CONCLUSION

This quantitative study applied descriptive statistical techniques to analyse the four data sets: Diet A and B, Agent 1 and 2, Male and Female Income, and Area 1 and 2. An assumption of equal variance between the datasets was applied.

Regarding the analysis of Data A and B datasets, the p-values were less than the significance level of 0.05. The null hypothesis of no difference in diet A and B's means was rejected.

The analysis of Agent 1 and Agent 2 found a close variance between the two datasets, justifying the assumption of equal variance. We, therefore, fail to reject the null hypothesis that there is no difference in the means of Agent 1 and Agent 2.

The analysis of Male and Female income demonstrated a variance between the two datasets. The incomes for males are higher than the incomes for females. We, therefore, reject the null hypothesis that there is no difference in the means of Male Income and Female Income.

The statistical analysis of Area 1 and Area 2 did not find sufficient evidence that the means of the two datasets have a significant difference. Therefore, we fail to reject the null hypothesis that there is no difference in the means of Area 1 and Area 2.

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## [**INDUCTION TO COMPUTING**](https://anja-kosar.github.io/week/8/&/9/2025/04/05/Research-Methods-&-Professional-Practice-Week-10-Worksheets.html) **COURSE**

The **Induction to Computing** course in the **MSc Cyber Security** program at the **University of Essex** provides a foundational understanding of computing principles essential for cybersecurity professionals. The program emphasizes security by design, digital identity, digital forensics, and network security.

Students gain practical experience with current cybersecurity technologies and develop skills in cryptography, authentication, and AI-driven security solutions. The course is part of a broader curriculum designed to equip graduates with the ability to evaluate security frameworks and engineer solutions to cyber threats critically.

## [**LAUNCHING**](https://anja-kosar.github.io/week/8/&/9/2025/04/05/Research-Methods-&-Professional-Practice-Week-10-Worksheets.html) **INTO CYBERSECURITY COURSE**

The **Launching into Cyber Security** course at the **University of Essex Online** introduces students to key theories and practices in cybersecurity while exploring future developments in the field. The course builds foundational knowledge and emphasizes ethical and professional responsibilities within cybersecurity.

## **NETWORK SECURITY COURSE**

The **Network Security** course in the **MSc Cyber Security** program at the **University of Essex** focuses on securing digital communications and protecting network infrastructures. It covers key topics such as cryptography, authentication, intrusion detection, and secure network design.

Students gain hands-on experience with security protocols and tools to safeguard networks against cyber threats. The course is part of a broader curriculum that equips graduates with the ability to analyze vulnerabilities and implement robust security measures.

## **PRINCIPLES OF DIGITAL FORENSIC AND CYBER LAW COURSE**

The **Principles of Digital Forensics and Cyber Law** course at the **University of Essex Online** explores cybersecurity's legal and ethical aspects while providing a strong foundation in digital forensics.

Students gain an understanding of common legal principles that apply to cyberspace, including regulatory challenges and expert evidence in forensic investigations. The course equips learners with the ability to navigate cyber law frameworks and apply forensic techniques to real-world scenarios.

## [**SECURE**](https://anja-kosar.github.io/week/8/&/9/2025/04/05/Research-Methods-&-Professional-Practice-Week-10-Worksheets.html) **SOFTWARE DEVELOPMENT COURSE**

The **Secure Software Development** course in the **MSc Cyber Security** program at the **University of Essex** focuses on building secure applications by integrating security principles into the software development lifecycle.

Students explore methodologies such as **TOGAF** and **Agile**, secure coding practices, software construction, and testing techniques. The course equips learners with the ability to analyze vulnerabilities and implement robust security measures in software systems.

## [**SECURE**](https://anja-kosar.github.io/week/8/&/9/2025/04/05/Research-Methods-&-Professional-Practice-Week-10-Worksheets.html) **SYSTEMS ARCHITECTURE COURSE**

The **Secure Systems Architecture** course in the **MSc Cyber Security** program at the **University of Essex** focuses on designing and implementing secure computing environments. It covers key security principles by design, cryptographic techniques, and secure network infrastructure.

Students explore methodologies for assessing vulnerabilities, mitigating cyber threats, and engineering resilient security solutions. The course is part of a broader curriculum that equips graduates with the ability to critically evaluate security frameworks and apply best practices in system architecture.

## [**SECURITY**](https://anja-kosar.github.io/week/8/&/9/2025/04/05/Research-Methods-&-Professional-Practice-Week-10-Worksheets.html) **RISK MANAGEMENT COURSE**

The **Security Risk Management** course in the **MSc Cyber Security** program at the **University of Essex** explores the principles of identifying, assessing, and mitigating security risks in digital environments. It covers key topics such as information security governance, threat analysis, business continuity, and compliance with security standards.

Students gain practical insights into risk assessment methodologies and learn how to implement security frameworks that protect organizations from cyber threats. The course will equip graduates to evaluate vulnerabilities and develop strategic security solutions.

## **HUMAN FACTORS COURSE**

The **Human Factors** course in the **MSc Cyber Security** program at the **University of Essex Online** examines the intersection of psychology and cybersecurity, focusing on how human behaviour influences security risks and solutions.

Students explore topics such as **social engineering**, **usability in security design**, and **ethical considerations** in cybersecurity. The course provides insights into how cognitive biases, decision-making processes, and user behaviour impact security vulnerabilities and defence strategies.