

AYTS5001 – Week 11 Lab (Graded, 6 marks)

Statistical Analysis with Python (Malazan-Themed)

Duration: 2 hours

Marks: 6

TASK 1 — Descriptive Statistics (1 mark)

Compute:

- Mean Power_Level
- Median Morale
- Std Dev of Combat_Skill
- Army with highest average Magic_Aptitude

Provide a short interpretation.

TASK 2 — Distribution Analysis (1 mark)

Plot histograms + KDE for Power_Level, Age, Morale.

Describe skew/symmetry/bimodality + Malazan explanation.

TASK 3 — Correlation & Heatmap (1 mark)

Compute correlation matrix + heatmap.

Identify highest positive correlation, negative correlations, and explain in-world.

TASK 4 — Hypothesis Testing (t-test) (1.5 marks)

Compare Morale between mages (Magic_Aptitude>50) and non-mages.

Report means, t-statistic, p-value, interpretation.

TASK 5 — One-Way ANOVA (1.5 marks)

ANOVA on Power_Level across armies.

Report F-statistic, p-value, significance, interpretation.

TASK 6 — Bootstrap CI (1 mark)

Compute 95% CI for Magic_Aptitude using bootstrapping.

Interpret in 2–3 sentences.