Experimental Methods in Computer Science

2020/2021

Exercises on Hypothesis Testing

1) The file data.in supplied with this exercise sheet contains information about a software engineering experiment. The goal of the experiment was to measure the efficacy of two software development processes (SCRUM and Extreme Programming) in terms of the number of bugs produced. Two programmer teams (Team A and Team B) implemented several projects and a quality control team recorded, for each team, the average number of bugs produced per 1000 lines of code in each software project.

Formalize the appropriate hypotheses, test the required assumptions and analyse the experimental results. Discuss the results obtained.

2) The file data2.in supplied with this exercise sheet contains information about the comparison of two heuristics (Genetic Algorithm and Local Search) for solving the Travelling Salesman Problem. Each algorithm was run on different instances of different types (cities clustered or not clustered), and the time, solution quality and amount of memory taken in each run was recorded.

Analyse the performance of the two heuristics and the effect of instance type on each of the three measures (time, solution quality and memory).