

UNIVERSITY OF LONDON

GOLDSMITHS COLLEGE

Department of Computing

B. Sc. Examination 2017

IS53048A

Data Visualisation and the Web

Duration: 2 hours 15 minutes

Date and time:

This paper is in two parts: part A and part B. You should answer ALL questions from part A and TWO questions from part B. Part A carries 40 marks, and each question from part B carries 30 marks. The marks for each part of a question are indicated at the end of the part in [.] brackets.

There are 100 marks available on this paper.

Calculators are not permitted in this examination.

**THIS PAPER MUST NOT BE REMOVED
FROM THE EXAMINATION ROOM**

Part A

Please answer all questions

- Question 1** Explain what explanatory data visualisation is and when it is used. [4]
- Question 2** Explain what exploratory data visualisation is and when it is used. [4]
- Question 3** Define median and mode. [4]
- Question 4** Explain the advantages of box plots over bar graphs. [4]
- Question 5** List four other types of plots other than bar graphs and box plots used in descriptive statistics. [4]
- Question 6** If we say two colours are isoluminant, what do we mean? What can we learn from observing isoluminant colours that can help us in creating more effective data visualisations? [4]
- Question 7** We discussed a three-stage visual perception model. Write down the names of the three stages [4]
- Question 8** Explain the Stroop effect. [4]
- Question 9** Explain “continuity” in the Gestalt laws of visual perception. [4]
- Question 10** When is “Time Series Analysis” used? Give an example. [4]

Part B

Question 11 Information visualisation

- (a) What are the four characteristics of information visualisation? Briefly explain each characteristic. [12]
- (b) Write down and briefly discuss each of the five steps needed in order to turn data into action. [10]
- (c) Explain what ordinal data is and give an example. [4]
- (d) Explain the similarity and difference between scale data and ordinal data. [4]

Question 12 Statistics and plots

- (a) What are descriptive statistics? What are inferential statistics? Give two examples of each. [12]
- (b) Suppose you have 20 students in the class and you have their marks for a coursework assignment. What would you do to understand the distribution of their marks? Discuss two different approaches. [6]
- (c) If you want to understand the relationship between students' marks on coursework A and coursework B in order to answer the question: "did students who performed well in coursework A also perform well in coursework B?", what type of plot would you use? Briefly explain how to draw the plot, and how different patterns (draw the graph to explain) reveal different relationships. [12]

Question 13 Scientific Visualisation

- (a) What is scientific visualisation? Give two examples. [6]
- (b) Describe scalar field and vector field. Give two examples each. [10]
- (c) Describe an isoline (contour line) and an isosurface and their applications. [10]
- (d) List and give a brief description of two tools which can be used for scientific visualisation. [4]