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"3-a-day" A-Level Exam Practice Unit 2 (009)

Question 1

A supermarket chain stores over 3 petabytes (10^{15} bytes) of data about sales and customers. The supermarket chain carried out a data mining exercise in which they discovered that whenever there was a hurricane warning, sales of fruit pies increased. This had not been noticed before the data mining exercise. The next time there was a hurricane warning, they placed the fruit pies at the end of the aisles and there was a dramatic increase in sales.

Explain how computational methods were able to reveal this unexpected result.

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..... **[4]**

Question 2

A flight simulator allows a user to take control of a simulated aeroplane. The user can fly the plane in an environment that can simulate different weather conditions and additional planes in the sky.

(a) Identify **three** pieces of information that would need to be researched in order to design this simulator.

1. .....

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2. .....

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3. .....

..... **[3]**

Question3

Explain what is meant by 'concurrent processing' and describe **one** example of how the simulator could make use of it.

Concurrent processing .....

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Example .....

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..... **[4]**

practice

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Answer 1

• Data mining or description (1) which involves searching through unconnected data (1), pattern matching (1) and calculation of correlation (1). There may be no predetermined matching criteria (1); a brute force approach is possible with high speed computers (1).	**4** **AO2.2** **(4)**	Up to 4 marks for a valid explanation. Allow for other examples.

Answer 2

1 mark per data item, accept any appropriate, sensible suggestions

- Number of other planes that could be in the sky (1)
- Speed(1)
- Flight path(1)
- Altitudes(1)
- Rate of acceleration(1)

Answer 3

Max 1 for explanation of concurrent programming. Max 3 for each example. Concurrent processing: • One process does not have to finish before the other starts(1) Example e.g. • Each plane can move independently(1) • All move at the same time (1) • All need to react to different events(1) • The weather(1) • Wind, rain, direction of air etc. (1) • Each element needs to be run simultaneously(1) • It will react to its own stimulii(1)	**4** **AO1.2 (1)** **AO2.1 (3)**	Accept any reasonable suggestion for concurrent programming in the simulator For examples: 1 mark for identifying example. 1 mark for saying how they act concurrently. 1 mark for saying why this is necessary.