AQA

A-level
COMPUTER SCIENCE

Paper 1

June 2024

Preliminary Material

To be opened and issued to candidates on or after 1 September 2023, subject to the instructions given in the Teacher's Notes (7517/1/TN).

Note

- The Preliminary Material and Skeleton Program are to be seen by candidates and their teachers **only**, for use during preparation for the examination on **10 June 2024**. They **cannot** be used by anyone else for any other purpose, other than that stated in the instructions issued, until after the examination date has passed. They must **not** be provided to third parties.

Information

- A Skeleton Program is provided separately by your teacher and must be read in conjunction with this Preliminary Material.
- You are advised to familiarise yourselves with the Preliminary Material and Skeleton Program before the examination.
- A copy of this Preliminary Material, the Skeleton Program and the Data files **puzzle1.txt**, **puzzle2.txt**, **puzzle3.txt** and **puzzle4.txt** will be made available to you in hard copy and electronically at the start of the examination.
- You must **not** take any copy of the Preliminary Material, Skeleton Program or any other material into the examination room.

INSTRUCTIONS FOR CANDIDATES

Electronic Answer Document

Answers for all questions in all sections must be entered into the word-processed document made available to you at the start of the examination and referred to in the question paper rubrics as the **Electronic Answer Document**.

Preparation for the examination

You should ensure that you are familiar with the **Preliminary Material** and the **Skeleton Program** for your programming language.

Symbol Puzzle

Symbol Puzzle is a simple puzzle where the user places symbols into a grid, trying to maximise their score as they do so.

The user is allowed to place a specified number of symbols (38 in the standard puzzle) into the grid. The puzzle is finished when the last symbol has been placed.

To score points, the user must place symbols into cells in the grid so that they match a pattern. In the standard puzzle the user is able to use the symbols Q, T and X.

To score 10 points using the symbol Q the user needs to place five Q symbols in a 3×3 section of the grid so that they match the pattern shown in **Figure 1**.

Figure 1

Q	Q	
Q	Q	
		Q

To score 10 points using the symbol T the user needs to place five T symbols in a 3×3 section of the grid so that they match the pattern shown in **Figure 2**.

Figure 2

T	T	T
	T	
	T	

To score 10 points using the symbol X the user needs to place five X symbols in a 3×3 section of the grid so that they match the pattern shown in **Figure 3**.

Figure 3

X		X
	X	
X		X

When the user has successfully created one of the allowed patterns within a 3×3 section of the grid, they are no longer allowed to place the symbol used in that pattern in any of the other cells in that 3×3 section. However, other symbols can still be placed in empty cells within that 3×3 section.

Some cells are blocked, denoted by the symbol @. The user is not able to place a symbol in a blocked cell. In the standard puzzle, the number of blocked cells and the position of each blocked cell is generated randomly.

An example of a starting grid for the standard puzzle is shown in **Figure 4**.

The row and column numbers have been shown. The cell in the bottom right corner of the grid is row 1, column 8

Figure 4

	1	2	3	4	5	6	7	8
8			@					
7			@	@				
6								
5							@	
4								
3		@		@				
2								
1						@		

Instead of using the standard puzzle, the user may enter the name of a file containing a puzzle. Four text files containing different 5×5 grid puzzles have been provided: puzzle1, puzzle2, puzzle3 and puzzle4.

There are errors in the implementation of the puzzle in the Skeleton Program, which means that it does not work in the way described in this Preliminary Material under all circumstances.

END OF PRELIMINARY MATERIAL

There is no Preliminary Material printed on this page