



# Cambridge IGCSE™

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**COMPUTER SCIENCE**

**0478/23**

Paper 2 Problem-solving and Programming

**May/June 2021**

PRE-RELEASE MATERIAL



No additional materials are needed.

**This material should be given to the relevant teachers and candidates as soon as it has been received at the centre.**

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**INSTRUCTIONS**

- You should use this material in preparation for the examination.
- You should attempt the practical programming tasks using your chosen high-level, procedural programming language.

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This document has **2** pages.

Your preparation for the examination should include attempting the following practical tasks by **writing and testing a program or programs**.

A school would like a system to allow students and staff to show their preference on matters relating to the school, such as a proposal for changing the start and finish times of the school day.

| Option | Proposed start and finish times of the school day |
|--------|---|
| A      | Start: 08:00 – Finish: 15:00                      |
| B      | Start: 08:20 – Finish: 15:20                      |
| C      | Start: 08:40 – Finish: 15:40                      |
| D      | Start: 09:00 – Finish: 16:00                      |
| E      | Start: 09:30 – Finish: 16:30                      |

The school has 150 students and 20 members of staff. The system is required to accept preferences, and count and report the results to show student preferences, staff preferences and overall results.

Write and test a program or programs for the system.

- Your program or programs must include appropriate prompts for the entry of data; data must be validated on entry.
- Error messages and other output need to be set out clearly and understandably.
- All variables, constants and other identifiers must have meaningful names.

You will need to complete these **three** tasks. Each task must be fully tested.

**Task 1** – Setting up the system and recording preferences.

Set up a system to allow preferences to be recorded for each of five different options, labelled A to E.

- Allow a description for each option to be entered.
- Allow students and staff to enter their unique number before their preferences can be entered (everyone is given a unique number by the school).
- Check if the unique number has already been used:
  - if so, supply a suitable message and do not allow preferences to be entered
  - if not:
    - record that the entered unique number has been used
    - allow preferences from 1 to 5 to be entered for each option (1 is 'strongly agree' and 5 is 'strongly disagree')
    - store the preferences in suitable data structures, keeping student and staff preferences separate.

**Task 2** – Totalling the preferences and reporting the results.

Extend **Task 1** to achieve the following:

- Allow the preferences for each of the options to be totalled, keeping student and staff preferences separate.
- Display the results as a list of the options, with the totals given for each one as:
  - student results
  - staff results
  - combined results.

**Task 3** – Changing the program to include a counting method.

Extend **Task 2** to achieve the following:

- Count the number of times the preference 1, 'strongly agree', was given for each option, counting student and staff preferences separately.
- Display the results as a list of the options, with the number of times preference 1 was given for each option as:
  - student results
  - staff results
  - combined results.

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