



# Cambridge O Level

**COMPUTER SCIENCE**

**2210/21**

Paper 2 Problem-solving and Programming

**May/June 2022**

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.

In preparation for the examination candidates should attempt the following practical tasks by **writing and testing a program or programs**.

Friends of Seaview Pier is an organisation devoted to the restoration and upkeep of a pier in the town. A pier is a wooden structure that provides a walkway over the sea. The pier requires regular maintenance and the friends of the pier need to raise money for this purpose.

Members of Friends of Seaview Pier each pay \$75 per year, as a contribution to the pier's running costs. This entitles them to free admission to the pier throughout the year. They can also volunteer to help run the pier, by working at the pier entrance gate, working in the gift shop, or painting and decorating.

To provide additional income, the pier's wooden planks can be sponsored. A brass plaque, which contains a short message of the sponsor's choice, is fitted to a plank on the pier, for a donation of \$200.

Write and test a program or programs for the Friends of Seaview Pier:

- Your program or programs must include appropriate prompts for the entry of data. Data must be validated on entry.
- All outputs, including error messages, 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** – becoming a member of Friends of Seaview Pier

Set up a system to enable people to become members of Friends of Seaview Pier and for each new member enter:

- their first name and last name
- whether or **not** they wish to work as a volunteer
  - if they choose to volunteer, identify the area from:
    - the pier entrance gate
    - the gift shop
    - painting and decorating
- the date of joining
- whether or **not** they have paid the \$75 fee.

All of this information needs to be stored using suitable data structures.

### **Task 2** – using the membership data

Extend the program in **Task 1** so that a list of the first and last names of members can be output in any of the following categories:

- Members who have chosen to work as volunteers.
- Volunteers who would like to work at the pier entrance gate.
- Volunteers who would like to work in the gift shop.
- Volunteers who would like to help with painting and decorating tasks.
- Members whose membership has expired (they have **not** re-joined this year).
- Members who have **not** yet paid their \$75 fee.

### **Task 3** – sponsoring a wooden plank

Add an additional option to the program in **Task 1** to enable the pier's wooden planks to be sponsored. Separate data structures should be used to store the names of the individuals and the short messages they would like to have written on their brass plaque. An output would display everything that was input for the sponsor to confirm. If errors are found, the program should allow data to be re-entered. Once complete, the data is stored and the sponsor is charged \$200.

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