Cambridge IGCSE™

COMPUTER SCIENCE **0478/21**

Paper 2 Problem-solving and Programming **October/November 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.

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.

This document has **2** pages.

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

A program is needed for a swimming club to manage the annual audit of its membership details.

The data stored about each member includes name, age, gender, type of membership, whether a team member or **not**, annual fee and if the fee has been paid. Team members are allowed a discount of 10% on their annual membership fee.

The types of membership available are:

Membership	Age range in years	Annual fee
junior	>= 2 and < 18	$10.00
adult	>= 18 and < 50	$20.00
senior	>= 50 and < 80	$15.00
golden	80 and over	free

Write and test a program or programs for the swimming club annual audit:

- 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 – setting up the system to store the membership details

Set up your program to:
- store the members' details in arrays
- populate the arrays with at least 20 members' details
- use the array index as the annual membership number.

Task 2 – providing annual audit statistics

Count the number of current members by membership type. For each type of membership count the number of members who did **not** pay the annual fee. Display these counts as a percentage of the total number of members for each membership type. Calculate and display the total of the annual fees expected and the annual fees received for this year.

Task 3 – updating the membership details for the next year

Extend your program to:
- check if any members have **not** paid and output a list of all these members
  - remove these members from the system
- update the age of all the members by one year and whether they are in a team
  - update the type of membership and the annual fee if required
- set the fee for every member as **not** yet paid
- display lists of current team members grouped by membership type.