Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/22**

Paper 2 Problem-solving and Programming **February/March 2017**

PRE-RELEASE MATERIAL

No Additional Materials are required.

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

READ THESE INSTRUCTIONS FIRST

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

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **2** printed pages.

CAMBRIDGE International Examinations

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

An experiment has taken place which measures the reaction speeds of students. Each student is aged from 12 to 16, and belongs to a school house (Saturn or Mars). A program is required to store the age, school house and reaction time of each student in the school. There are 650 students in the school. The program should be able to output the reaction times of different student groups.

Write and test a program for the school.

- Your program must include appropriate prompts for the entry of data.
- Error messages and other output need to be set out clearly.
- 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 – Set up arrays and store records

Set up one-dimensional arrays for the whole school to store the following data:

- The age of each student in whole years
- The school house of each student
- The reaction time of each student

Input and store the records for an **appropriate sample** of students. Inputs must be validated on entry and any invalid inputs rejected.

TASK 2 – Output school house based statistics

Using your sample, calculate and output the average reaction times for students in Saturn and students in Mars.

TASK 3 – Output statistics based on user input

Extend your program to prompt users to input a specific age and school house. Using only records that match the criteria input, the program should identify, calculate and output:

- The average reaction time
- The slowest reaction time

The output should include a suitable message for each of the reaction times identified.