International GCSE Computer Science (9210) — Paper 1 Programming

Advaspire Mock Examination 2 — Preliminary Material

To be issued to candidates before the examination, with the electronic Skeleton Program.

Instructions

- This Preliminary Material describes the Skeleton Program, *Race Results*.
- You should study the Skeleton Program, run it and become familiar with how it works before the examination.
- In the examination you will be asked questions about the Skeleton Program, and you will be asked to make changes to it.
- You must not take this copy of the Preliminary Material into the examination. A clean copy will be given to you.

The program

A running club uses *Race Results* to record the finishing times of the runners in a race.

For each runner, the program stores a **name** and a **finishing time**. Up to **20** runners can be stored.

The menu

```
RACE RESULTS
1. Display results
2. Add a result
3. Show fastest runner
4. Sort results
5. Search for a runner
6. Load example results
Q. Quit
```

Option	What it does
1	Displays every runner's name and time, in the order they are stored.
2	Asks for a runner's name and time, and adds them to the results.
3	Displays the name and time of the fastest runner.
4	Sorts the results from fastest to slowest.
5	Asks for a name and displays that runner's time. Capital letters do not matter, so `kai` finds `Kai`.

Option	What it does
6	Replaces the results with a set of eight example results. You will be asked to use these when you test your changes in the examination.

Names and times

- A **name** must be 1 to 12 letters long, and contain only letters.
- A **time** is typed as minutes and seconds, separated by a colon, for example `3:42` or `12:05`. The seconds must be two digits, from `00` to `59`.

If a name or a time is not valid, an error message is displayed and the user is asked again.

How the results are stored

The results are stored in **two lists**, `names` and `times`. The runner whose name is at a position in `names` has their time at the **same position** in `times`.

A time is not stored as the text the user typed. It is converted to a **whole number of seconds**, so `3:42` is stored as `222`. The subroutine `FormatTime` turns a number of seconds back into text such as `3:42` whenever a time is displayed.

The example results

Name	Time
Ava	3:42
Leo	4:05
Mia	3:18
Noah	4:05
Zara	2:57
Omar	3:30
Ella	4:51
Kai	3:18

Programming languages

The Skeleton Program is provided in **Python 3**.

Suggested preparation

You may find it useful to:

- run the program, and try every menu option with and without the example results
- work out what every subroutine does, and which subroutines call which

- trace the bubble sort in `SortResults` and the linear search in `SearchForRunner` by hand, using a short list
- work out how `//` and `%` are used to turn seconds back into minutes and seconds
- find every example of definite and indefinite iteration, selection, and validation
- try out small changes to the program — for example, adding a new menu option — and then put the original program back.