Task 1: software design and development

Problem description

Thirty athletes have qualified for the final of the Scottish Jumping Jacks competition. Qualifying events were held at four locations, where each athlete performed as many jumping jacks as they could in 1 minute.

The following details are stored in a CSV file, for each athlete who qualified for the final:

- Entry ID
- Qualifying location
- Forename
- Surname
- Number of jumping jacks completed

Purpose

A program is required to read each of the athlete's data from the existing CSV file. A bib value for each of the finalists will be generated and stored in a new CSV file along with the entry ID. The program will also display the full name of the athlete(s) who completed the highest number of jumping jacks.

An example of the bib value generated for the athlete Daniel Currie, who qualified at the Inverness event, is shown below. Note that 73 is the ASCII value of 'I', the first character of Inverness.

Assumptions

- The CSV file has data for thirty athletes, is formatted correctly and is error-free.
- Each line of the CSV file stores the entry ID, qualifying location, forename, surname and number of jumping jacks completed at qualification, as shown below:

```
f01,Motherwell,Ellie,McAninch,85
f02,Inverness,Ayat,Whyte,83
f03,Kirkcaldy,Simra,Zamora,42
f04,Motherwell,Dai,Nguyen,37
f05,Coatbridge,Max,Hughes,113
…
```

Task 1: software design and development (part A)

1a Using the problem description, identify the functional requirements of the program.

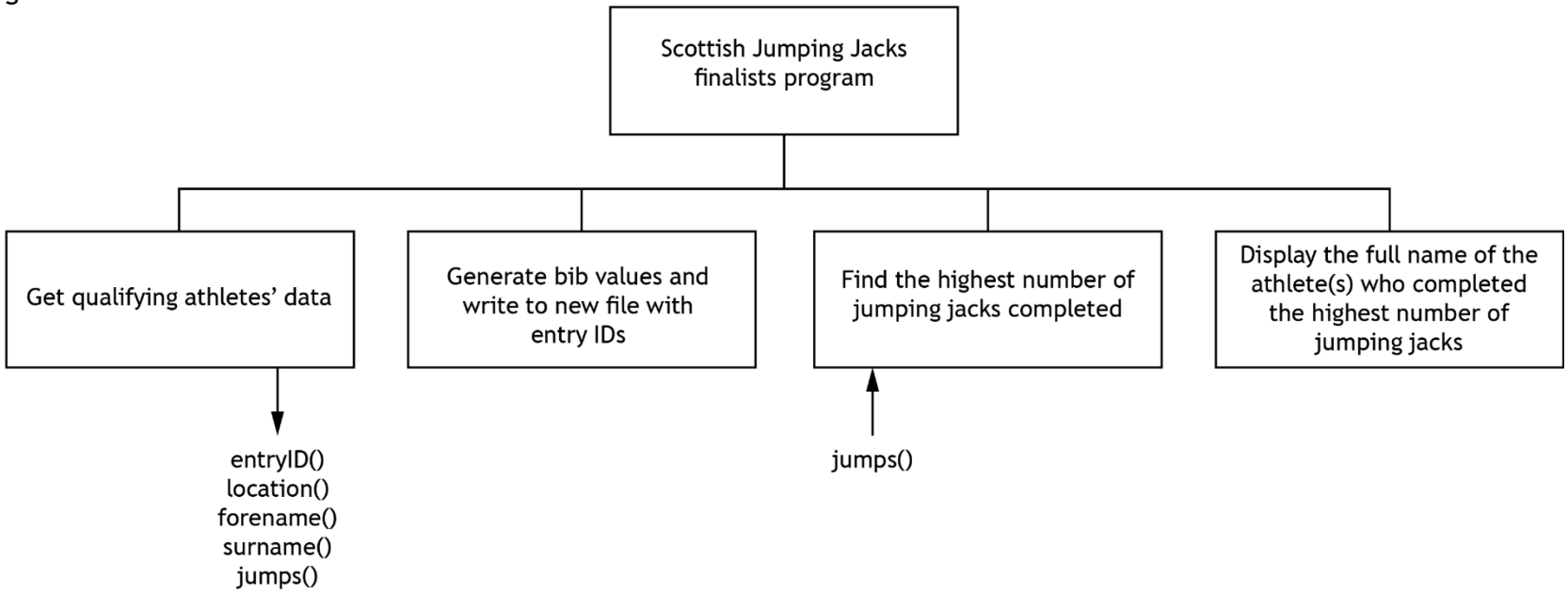
(2 marks)

Input(s)
Process(es)
Output(s) ♦ Store entry ID and bib values in file ♦ Full name of athlete(s)

Candidate name_____ Candidate number_____

1b Each athlete at the national final will be identified by their bib value, as shown previously.

A top-level design of the main steps of the program is shown below. Data read from the CSV file is stored in parallel arrays in the program.



Complete the diagram to show the data flow for the program. Your completed diagram should include:

- the required data (arrays and variables)
- arrows to indicate the flow of the data

(3 marks)

- Check your answers carefully, as you cannot return to part A after you hand it in.
- When you are ready, hand part A to your teacher or lecturer and collect part B.

Candidate name_____ Candidate number_____