

Documentation

Target Assessment Level

The target assessment level for this work is 3.

Specification

What does the program do?

The program

1. reads data about runners' race information from a file
2. allows user to search for runners based on their gender or age group; for each key (start of the word for their gender or age group), the program prints all those runners with the given key from fastest to slowest.

Data format

Data file

The input data text file consists of lines, each line containing

`firstname lastname gender agegroup runtime`

- `first name` is a single word
- `last name` is a single word
- `gender` is a single word
- `age group` is a single word with the ages it includes in brackets immediately after without a space in between
- `run time` is a decimal number (double)

User input

User input consists of either `end` (terminates program), or another string `key` which is used to find runners whose gender or age group starts with `key` .

Correctness

Typical test case

File runners.txt contains data from 7 runners. The following is a script obtained when running the program:

```
('end' to quit) Please type a search key (gender or age group: youth, master, senior): m
M Seyfu Jamaal, 10k: 29.41, youth(18-29)
M Adrian Bednarek, 10k: 31.14, master(30-45)
M Andrew Mccaskill, 10k: 31.45, master(30-45)
M Ramon Are, 10k: 55.44, senior(46-)
M Steven Edwards, 10k: 70.22, senior(46-)

('end' to quit) Please type a search key (gender or age group: youth, master, senior): f
F Aubrey Frentheway, 10k: 32.51, youth(18-29)
F Becky Briggs, 10k: 34.34, youth(18-29)

('end' to quit) Please type a search key (gender or age group: youth, master, senior): sen
M Ramon Are, 10k: 55.44, senior(46-)
M Steven Edwards, 10k: 70.22, senior(46-)

('end' to quit) Please type a search key (gender or age group: youth, master, senior): y
M Seyfu Jamaal, 10k: 29.41, youth(18-29)
F Aubrey Frentheway, 10k: 32.51, youth(18-29)
F Becky Briggs, 10k: 34.34, youth(18-29)

('end' to quit) Please type a search key (gender or age group: youth, master, senior): mas
M Adrian Bednarek, 10k: 31.14, master(30-45)
M Andrew Mccaskill, 10k: 31.45, master(30-45)

('end' to quit) Please type a search key (gender or age group: youth, master, senior): under
Runners not found

('end' to quit) Please type a search key (gender or age group: youth, master, senior): end

Process finished with exit code 0
```

Non-trivial algorithms

Selection sort

Data is sorted in increasing order according to run times using selection sort.

Searching

Runners whose gender or age group contains the given key are searched for using sequential search.

Arrays

Runners are stored into an array for sorting and sequential search.

Dynamic data structures

- A list is used to read an unspecified amount of data from the data file.
- A list is also used to return an unspecified number of search results

Classes

A class is used to store the data of each runner.