

Design and Analysis of Data Structures and Algorithms 2017 – 18;

July 2018 Resit

Assignment Specification

Assignment Background and Context

A small college that offers degrees in Higher Education has an aspiring team of young researchers that want to organize, coordinate and promote their research outputs.

They propose to build a repository to store the details of their research publications and they want you to design and implement it.

The system should offer the following functionality

- Add a new publication to the list and then automatically sort the list in descending order according to author surname.
- As new publications are added the system should not allow for more than six publications by the same author to be stored in the repository at any one time. Thus with new additions older publications (based on year of publication) will have to be automatically removed.
- Publications older than five years for the current date (consider year only!) will be automatically erased from the repository, even if this means that all of the publications of a specific author will be removed.

Resources

You will be given a list of 20 publications to start with and you should be able to read these and import them into the repository.

Assumption

Assume that each publication has a single author only.

Note of caution

Do not hardcode data into your programme's code. Any attempt to hardcode data will result in a zero mark for the coursework overall.

Tasks to be completed

1. Identify and justify the choice of data structures and algorithms to be used to implement the five storage locations (data storage) and manipulate the data – not more than 500 words.
2. Design the software and provide an efficient algorithm that would support the above requirements. Write relevant and detailed pseudo code.
3. Implement the system with the following functionality.
 - a. Import and save the initially twenty publications
 - b. Your system should automatically remove any publication that is more than five years old (based on year of publication)

- c. Add a new publication and save this
 - d. Delete an existing publication
 - e. Reject a new entry if the publication is more than five years old
 - f. Automatically remove the oldest of publications for a specific author if their total of publications is more than six.
4. Produce well-structured and fully commented code.
 5. Complete appropriate test data sets to thoroughly test your software and use them to test your system thoroughly.
 6. Explain and Demonstrate the novelty and effectiveness of your solution.

PLEASE NOTE

- A GUI is not an essential requirement for the work to be submitted and it is not reflected in the mark scheme. Some students though might find it beneficial to have a GUI to demonstrate their work.

Resources provided

1. Partially complete test-data set that would help you explore different conditions that your system should test.

NOTE – You may create and use your own data, but the structure of it (fields comprising the information re any item) will have to be as shown in the test-data provided

Deliverables and due date

By the due date (17 July 2018) you should submit via Blackboard

- A zipped folder, containing all the files that provide answers to the tasks that you have attempted. The software should be implemented in Python. Any data that you have used must appropriately be packaged in the folder so that it can be accessed without any errors.

Marking Criteria

To achieve a PASS (40%) you must complete the following tasks successfully.

Tasks 1, 2, 3 a-c.

To achieve a higher PASS (41-69%)

You must complete all for a PASS and tasks 3 d-f, 4 and 5

To achieve a FIRST CLASS mark you must achieve all the previous tasks and demonstrate an excellent understanding of evaluating the performance and efficiency of algorithms in completing task 6 successfully.