CST8333 Programming Language Research Project

Assignment 3 – Project Review 2 - See Brightspace for due date

* Refer to the Course Section Information (CSI) document posted in Blackboard under Course Information for additional requirements common to all assignments as well as details on the required use of the data set specified for the course.
* Refer to the documents in the dataset area in Brightspace for the list of dataset columns to use, note that all listed columns need to be used, and need to be present within your source code to verify you are using the dataset provided.
* The first record in the data set may contain the column names, if so you may skip over this record when reading in and parsing the data set data.
* You may use your previous work in this course as a reference / starting-point but I expect modifications,

i.e. passing in older work again with none to very small changes will not earn marks.

# Tasks

* Augment your project, developed via assignment 2, by utilizing **one** advanced language feature from the list below, using the examples as a guide.

o Inheritance and Polymorphism

* + - Author your own super-class (or interface), and one or more sub-classes (implementing classes), then declare a method in the super-class (or interface) and override it in the subclasses (implementing classes) and demonstrate polymorphic method calls.
    - E.g. Super class record object, sub-classed to change format of record output. o Database Connectivity
    - Create a database table with fields named after the column names, and use a database driver, to connect your program to a database. This can replace the reliance on the File-IO of the dataset. Your Create, Read, Update, and Delete options would then manipulate the database rather than the CSV file.
    - Populate the database table with all the data from the dataset, using field names in the database table

o Data Structures (containers), Algorithms (that manipulate containers)

▪ Use a List, Set, or Tree (etc.) rather than a simple array, and sort the records in the data structure based on single column from the dataset. You may use built-in API libraries to complete this task. Offer the user the option to use this functionality. (You must perform sorting using programming code (or an API call) and not an SQL statement sent into a database).

o Generics

* + - Create your own generic method or class and note that you need to define a generic class and then use it, simply using an existing generic class from the API is not enough.
    - You cannot use dynamically typed languages like Python to earn marks for this learning topic. To demonstrate learning you must actively write code using a generics feature. Python’s dynamic typing is, in a sense, generics done automatically i.e. there is no demonstrated learning and application of a generics topic.

o Multithreading

▪ Load the dataset from file using a separate thread of execution or use a thread (or asynchronous task) to enhance your program by doing something in parallel, e.g. use a thread of execution to display the records on screen or to update the data in memory.

o Anything else you think might be interesting, check with your professor to confirm ▪

Did you use a GUI? Then talk about the API

* + - Did you use a web framework? (On-Rails, ASP.Net, ASP.Net MVC, Django etc.) Then talk about the API
    - Did you create a REST+JSON web-service? Then document how you used it.

o Display your full name on screen so it remains visible at all times, or after each user interaction. o Provide the user the options and functionality to:

* + - Reload the data from the dataset, replacing the in-memory data or use a database
    - Display all the records held in the simple data structure, for Assignment 4 loading all records is required.
    - Create a new record and store it in the simple data structure or database
    - Select, display and edit a record held in the simple data structure or database
    - Delete a record from the simple data structure or database o Take a screen shot of your program performing the selected learning topic above, ensuring your full name is within the screen shot(s). (Not all learning topics will be visible on screen, for example the screen shot might not show multithreading visibly for example, but screen shot the program running the task that was updated to use multithreading)

o Comment your source code files using documentation comments (docstrings in Python, XMLdocument in C# or VB.Net etc.)

* Write a single unit-test using a testing framework to test your new advanced topic. o Unit-Test Examples (you would only do one, or a similar test):
  + - If using a separate thread does it complete its task correctly?
    - If using inheritance to format records with a parental record-type, and child formattedrecordtypes, is the overridden output format correct?
    - If using a sorting algorithm, did the program sort the records correctly? ▪ Etc.

o Comment your unit-test source code using documentation comments (docstrings in Python, XMLdocument in C# or VB.Net etc.)

# Your video demo should have this general format

There is no written report for assignment 3, instead there is a video demo. Please note assignment 4 will be a written report and not a video demo.

Before you being making your video ensure the following:

1. That your code has documentation (such as docstrings) at the beginning of every file and above every method and that this documentation includes your name
2. Please ensure the font is big enough
3. Read your feedback from assignment 2
4. **READ THE RUBRIC**

**The max length of video is 2.5 minutes, I will not watch anything past that point.**

* Video demo will be submitted as a single MP4 video
* For those who do not feel comfortable speaking on camera, you can add text which makes the demo clear. This can be done by using video editing software or interspersing powerpoint slides in the demo for example.
* If providing verbal explanations, ensure that the final video has clear audio and you can be understood by the professor.
* The video will clearly state your name and which assignment you are demoing as well as the course name and professor’s name.
* Compile and run your code
* There will be an introduction where you briefly show and describe what was done for assignment 2 and describe what was **added** in assignment 3.
* Clearly indicate where the new feature is in use, some features e.g. multithreading, database may have no visible presence on screen so use a brief statement indicating what is happening within the program e.g. “multithreading was used to asynchronously load the csv file at this point in program execution although the user interface was un-affected”
* Now show “Unit Testing Demonstration”. Show your unit test code for your new feature and demo the running unit test(s), this may either be within an IDE or run from a console.
* Your unit test should test the new feature implemented where possible (GUI frameworks are an exception); minimally this must test your own code and not duplicate the same test from the previous assignment.

Do not copy and paste code from the web into your demonstration program, it must be your own work. In other words, even properly cited and referenced code copied from a website will not earn marks, as you must provide your own work. Your professor while grading your submission will make this determination.

Feel free to be creative as long as your video contains the required elements.

Your entire video must contain only your original code and any additions (text, diagrams, video clips) must be your original work. This means you cannot use videos, diagrams or text found on the internet. If I can find images or text used in your video on the internet (other than the supplied CSV dataset) then you will receive a zero and possibly be written up for academic misconduct.

* Do not copy and paste code from the web into your demonstration program, it must be your own work. In other words, even properly cited and referenced code copied from a website will not earn marks, as you must provide your own work. Your professor while grading your submission will make this determination.

# Submission Requirements

* Upload your video demo MP4 file and original source code files by the due date o One video demo MP4 file

o One zip file containing your original source code file(s)

\*\*Submitting any other format other than .MP4 will result in zero for this assignment.

Do not bundle your video inside the source code zip-archive keep them separate instead. Ensure your full name is included in all materials as asked.

* **REREAD THE RUBRIC – make sure you have done everything required for full marks**

# Grading (Total 18 Points)

**Note: There is no entry in this rubric for a cover page with your full name in it, however a mark deduction of 3 points will be applied if you do not have a cover page in your MS Word document.**

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| --- | --- | --- | --- | --- |
| Criteria | Poor/Missing (0) | Below Expectations (1) | Meets Expectations (2) | Exceeds Expectations (3) |
| Evidence of Learning | Poor/Missing or program does not use the dataset as required. Code samples are simple showcase items that do not integrate with the application, for example like cats and dogs for inheritance that have nothing to do with the program’s functionality. | New feature does not build and/or run or is incomplete. | New feature does build and/or run, but is not fully functional, i.e. does not work to produce correct results or does not meet expectations as specified. | New feature is complete, functional, and working correctly meets or exceeds expectations specified. |
| Program Changes | Poor / Missing or not separated out into filebased layers. E.g. A program consisting of a single code file with methods. Student does not outline where the advanced language feature is located. | Vague explanation of where the advanced language feature occurs in the layers, or vague overview of an alternative framework driven architecture. | Student discusses where the advanced feature occurs within the layers with detail. Alternatively,  the student discusses the new framework architecture. | Student discusses how the layered  architecture, or alternative architecture, has helped with refactoring and testing of new program features. |
| Demo,  Running  Program | Poor/Missing  E.g.  Demo does not show or indicate selected advanced language feature. | Some project functionality missing or program crashes. The advanced language feature is partly complete. | Project functionality is working. Demo briefly indicates presence of advanced language feature. | Project functionality is working. Student provides brief yet detailed description of advanced language feature. |
| Demo,  Running Unit  Test(s) | Poor/Missing  E.g. Demo does not demonstrate unit testing with a framework. | Demo shows that test framework runs but does not actually test anything meaningful or crashes, does not test advanced language feature. | Demo shows that test framework runs and performs a basic or rudimentary test on advanced language feature. | Demo shows that test framework runs test and tests aspect of program related to advanced language feature selected. |
| Source Code, programmer comments. | Poor/Missing  E.g. missing full name as programmer comment at the top of the file as author of the file. | Student uses minimal comments in source code, e.g. the student does not comment (m)any class members. | Student comments some class and class members, however does not use documentation comments. | Student uses documentation comments in an accepted coding style specific to their language of study. If the language does not support documentation comments student provides evidence of this from reputable source, yet still comments code following best practices. |
| Source Code and Source  Code files | Poor / Missing or video demo file is not MP4 format or is bundled inside the code zip archive. | Not used for this criteria | Not used for this criteria | Student uploads both video demo MP4 file, and source-code zip file keeping them separate, i.e. video demo is not inside zip file. |

# Additional Notes

**Video Game Software projects are not acceptable in this course.**

Your source code within the MS Word document, should match the code in your source code files, this includes the programmer comments. If there are large or many differences, you will lose marks.

**If you do not submit your full source code in a zip archive to so your code can be verified this entire Assignment will be awarded zero points. It is your responsibility to submit the correct files.**

*Name your project something similar to CST8333ProjectByYourName, where ‘Your Name’ is your ACSIS name. Where you develop the project through assignments 1 through 4, naming your project “Assignment 1” (etc.) will not look professional.*