CST8002 Programming Language Research Project

# Practical Project Part 1 – Project Proof of Concept - See Brightspace for due date

* Refer to the Weekly Schedule document posted in Brightspace under Course Information for additional requirements common to all assessments as well as details on the required use of the data set specified for the course.
* Make reference to the documents in the dataset content area in Brightspace for the dataset to use, note that all columns need to be used unless your professor has indicated otherwise, the dataset column names must be used in your source code as variable names as well 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 on this course as a reference / starting point, but I expect modifications, i.e. submitting older work again with none to very small changes will not earn marks.

## Tasks

### Version Control

* Using your GitHub account:
  + Create a private remote repository for your project development over the semester, give the repository a name like “CST8002\_PracticalProject\_Section\_YourName”
    - The section would be your lab section, e.g. 350, 360 and so on.
    - YourName would be your name as it appears in ACSIS or in Brightspace.
  + Invite your professor to your repository as a collaborator, so they can review your commit history as well as clone your repository for marking purposes. See the contact information area in Brightspace for your professor’s name and email address.
* As you work on your project you are expected to follow an iterative development process, making commits that have brief, but detailed comments explaining what program feature or functionality was achieved. These will correspond to tasks / requirements below.
* For Practical Project 1 create a new branch called Project1. [1]
  + E.g., git branch project1
  + E.g., git checkout project1
* Tag your last commit for practical project 1 as V1.0. [2]

### Program Functionality

* For Phase 1, using the programming language you have selected to study for this course, create a computer program and:
  + Create a record object (also known as entity object, data-transfer object) that uses the column names from the dataset as part of the source code, e.g. variable names, accessors/mutators names, or constants.
    - You must author a class or struct for this record object yourself using a separate source code file. A record object provided by or exposed by a framework is not acceptable.
    - Commit your code and tag the commit once this part is completed.
  + Use File-IO on startup to open and read the dataset, initializing a few record objects with data parsed from the first few records in the csv file. The record objects should be stored in a simple data structure (array or a list), use exception handling in case the file is missing or not available.
    - Note that you must separate each of the records into separate data items, storing each part into an instance of a record object’s fields.
    - Commit your code and tag the commit once this part is completed.
  + Loop over the data structure and output the record data on screen.
    - Commit your code and tag the commit once this is completed.
  + Display your full name on screen so it always remains visible.
    - Commit your code and tag the commit once this is completed.
* **Warning**
* **Taking the simplistic approach of storing each line of text from the CSV as an un-parsed String in a list or array of String type will result in a loss of marks for this assessment.**
* **If the language you have selected has support for Object Oriented Programming, your project must use the Object-Oriented Approach.**
* **Minimally, your record object code must be in a separate source code file from the main-line logic.**
* Take a screen shot of your program performing each task above, ensuring your full name is within each screen shot. Place this into your Practical Project 1 report.
* Comment your source code file using documentation comments (docstrings in Python, XML-document in C# or VB.Net, JSDoc for server-side JavaScript etc.)
  + This includes each class header, each constant, and each method (or function of procedure) and constructor header.
  + You must also include a comment section at the top of all source code files with the course number and name, your professor’s name, the due date, and your name as the author of the file.
  + Commit your code and tag the commit once this part is completed.
* Your program should use the following programming concepts: variables, methods, a loop structure, File-IO reading from the dataset, exception handling, use of an API library, an array (or similar data structure).

## Your single MS Word document for your Practical Project 1 report should have this general format

* Cover page with your full name within it, the content of your report should start on page 2.
* Heading with name “Evidence of Learning”
* Sub-headings:
  + Variables, methods, a loop structure, File-IO reading from the dataset, exception handling, use of an API library, an array (or similar data structure).
  + Then either:
    - Use small code examples for each topic taken from your project with brief descriptive text, or
    - Indicate what line numbers in a larger code sample (including the file name) illustrate each concept within brief descriptive text (line numbers must be present in the code examples as well to match).
    - **You must indicate clearly to your professor that you can identify what parts of your code illustrate and match each programming concept.**
* Heading with name “Program Demonstration via Screen Shots”
  + Include screen shots of your running program; I should see records from the data set specified for our course section for this semester displayed on screen. As well as your full name.
* Heading with name “Source Code Commenting Example”
  + Copy and paste all the source code, including programmer comments, from **one** source code file from your project to demonstrate you can write **documentation-comments**. Use a font size of 10 point, with a monospaced font of your choosing (E.g., Consolas)
  + Note: Some frameworks generate many code files, which you never edit yourself. Only include a source code file you created or edited directly.
* Do not copy and paste code from the web or an AI agent 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.

## Demonstration in Lab Period

* The week following the due date, you will be expected to demonstrate your program to your lab professor in the lab period.
* You will be asked to run the program to show that it works, then will be asked to answer two questions. One based on theory, and one related to making source code modification.
* Sample Theory Questions
  + Can you differentiate a variable from a method/function/procedure in your source code?
  + Is the language you are studying object oriented; can you indicate a class in your code?
  + Can you show the place in your code where the records are loaded into the list or array data structure?
  + Similar questions on theory knowledge are possible at the discretion of the lab professor.
* Sample Code Modification Questions
  + If we change the data set file name in your code does the program gracefully exit due to a file-io error?
  + If your program limits the number of records loaded, can you modify the code to reduce or increase the number of records loaded?
  + If your program does not limit the number of records loaded, can you modify the code so that it does limit the number of records loaded?
  + Similar questions on modifying the code are possible at the discretion of the lab professor.

## Submission Requirements:

* Upload your MS Word document by the due date to Brightspace.
* Compress your local project repository into a zip file and upload this to Brightspace as well.
* Provide a plain-text link to your project GitHub repository in the comment section of your Brightspace submission. You should have already invited your professor as a collaborator when you started working on this assessment.
* Demonstrate your practical project to your lab professor in the lab period following the submission due date.
* **While the demonstration carries no direct marks, missing the demonstration will result in a zero for this assignment. Additionally, if you cannot answer simple questions to demonstrate concepts in this assignment to your lab professor you will lose up to 100% of the score on this assignment. Please refer to the Course Outline under Department Information.**

## Grading (Total 15 Points)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Criteria | Poor/Missing (0) | Below Expectations (1) | Meets Expectations (2) | Exceeds Expectations (3) |
| Evidence of Learning | Poor/Missing or program does not use data set column names as specified within the source code or program is not using correct data set. | Many learning topics are missing, or the presentation is vague i.e. student does not indicate clearly at all what parts of their code match each learning topic.  Program is simplistic based on array or list of text entries and/or is only a single source code file. | Almost all of the learning topics are present in code samples and clearly indicated with brief explanatory write up. | Student documents that all learning topics are in use by presenting either small, focused examples with brief explanatory write up or a large code sample with visible line numbers used to focus the discussion of program topics. |
| Screen Shots, Running Program | Poor/Missing  E.g., missing full name from all images, image file not within the MS Word document. Screen shot does not demonstrate use of the dataset or program is not using correct data set. | Screen shots are within MS Word document. No explanation of the image except for headings or subheadings. Has partial name or nickname but full name missing from some screen shots. Some project functionality missing or program crashes. | Screen shots are within MS Word document. Student provides brief generalized description of most images using one to two sentences. Has full name in nearly all screen shots. Most of the requested project functionality is working. | Screen shots are within MS Word document. Student provides brief yet detailed description using one to two sentences for each image. Has full name in nearly all screen shots. All project functionality is documented and working. |
| 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 or program is not using correct data set. | Student uses minimal comments in source code, e.g. the student does not comment (m)any class members.  Program is simplistic based on array or list of text entries and/or is only a single source code file. | 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. |
| Version Control | Poor / Missing or there are no incremental commits in the commit history or program is not using correct data set. | Student project development shows the use of a few commits; however, commits do not have a detailed description or no description. Not all the requested commits are present. | Student project has regular commits providing evidence of incremental builds, not all commits briefly overview what was changed. Missing at most one of the requested commits. | Student project has regular commits providing evidence of incremental builds, each commit details what was changed. Requested commits are present. |
| Source Code and Source Code files | Poor / Missing or program is not using correct data set. The professor was not given access to the remote GitHub repository or there is no repository or no source code uploaded in a zip file. | Student submitted one of: MS Word document, remote repository link, or zip file with project source code. | Student submitted two of: MS Word document, remote repository link, or zip file with project source code. | Student submitted all requested parts, and professor was added as collaborator to remote repository. |

# Recommended Resources / Sources Cited

[1] git (n.d.) 2.6 Git Basics – Tagging. git-scm.com. [online] Available at: <https://git-scm.com/book/en/v2/Git-Basics-Tagging> [Accessed on Nov 10, 2024]

[2] git (n.d.) 3.1 Git Branching – Branches in a Nutshell. [online] Available at: <https://git-scm.com/book/en/v2/Git-Branching-Branches-in-a-Nutshell> [Accessed on April 24, 2025]

Download GitHub Desktop. (n.d.). desktop.github.com. [online] Available at: <https://desktop.github.com/download/> [Accessed on Nov 10, 2024]

## 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 in your repository, this includes the programmer comments. If there are large or many differences, you will lose marks.

If you do not provide your GitHub link and include your professor as a collaborator so they can review your commit history and source code files you will receive a score of zero for this assessment.

Not using the correct data set for your course section will result in a zero for this assessment, note that a Canadian Cheeses dataset if present was for demonstration purposes only and is not the correct data set for your project.