**ABCU Course App**

**Report for Students and Advisors: Menu Usage and Error Handling**

**Introduction**

The ABCU Course App is designed to assist students and advisors at ABC University in managing course information efficiently using a Binary Search Tree (BST). The app provides a user-friendly, menu-driven interface to load course data, display course lists, query specific courses, and exit the program. This report focuses on how to use the menu effectively and addresses common error messages, such as those caused by incorrect file names, to ensure smooth operation for non-technical users like students and advisors.

**Menu Structure:**

* Load Next 100 Courses to Memory: Reads course data from a text file into memory for processing. This function saves the filename for future queries.
* Print Course List: Displays all courses in sorted order (by course ID).
* Print Course: Shows details of a specific course, including prerequisites, based on user-entered course ID.
* Exit: Terminates the program.

**User Input Handling:**

Input: The program handles invalid inputs, for example, non-numeric entries for numbers by assigning a default value, which triggers an error message: “This is not an appropriate entry. Please try again.”

**File Input and Error Handling:**

File Loading: The program prompts users for a file name (appending “.txt” automatically) and parses course data from the file into memory. The file is expected to contain lines of comma-separated course data, for example:

“CSCI100,Introduction to Programming,CSCI101”

If BST will not load, check file for corruption.

**Error Checks:**

* Non-Existent File: The program checks if the file exists. If not, an error message is displayed: “Error, File doesn't exist.”
* File Opening Failure: If the file cannot be opened (e.g., due to permissions or corruption), the app displays: “Failure to open a file of this name, please make sure the file exists in programs directory.
* Invalid Course List Format: If the file’s data is not properly formed, such as missing course ID or name, course IDs are not 7 characters, names are not 3–40 characters, and prerequisites do not exist as courses. Failed insertions trigger: “Not inserted: [course ID].” The BST will be cleared and the mistake can be fixed in the text file manually.

**Design Choices:**

* The menu uses clear, concise prompts to guide users, minimizing confusion for non-technical audiences.
* The app processes files in batches of 100 courses but holds the file name for ease of use. (To change filename, reload application).

**Performance:**

Menu operations are nearly instantaneous (< 100ms at less than 500 courses for building data structure.) As the tree grows for large files, occasional BST balancing will occur, causing some additional computational time.

**Limitations:**

* File Name Sensitivity: Users must know the exact file name (without “.txt”) and ensure it’s in the program directory, which may confuse non-technical users.
* Limited Error Guidance: While messages identify issues, for example, “File doesn't exist”, it does not suggest specific file names or formats, requiring users to consult documentation.
* Manual File Correction: Invalid file formats (e.g., incorrect course IDs) require users to edit the file manually, which may be challenging for advisors without technical skills.
* Single File Dependency: The app relies on a single text file, and errors in file access halt loading until corrected.