**4-3 Project One Milestone Two: Hash Table Data**

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**Introduction**

The purpose of this milestone is to design pseudocode for loading course data into a hash table, validating the file format, storing course objects, and retrieving course information efficiently. The pseudocode will ensure proper data organization and error checking, preparing for full implementation in Project One.

**Section 1: File Input & Validation Pseudocode**

This section outlines how the program opens the course data file, reads its content, parses course details, and validates prerequisites.

BEGIN

OPEN file "CourseData.txt"

IF file cannot be opened THEN

PRINT "Error: Cannot open file."

EXIT

ENDIF

WHILE not end of file DO

READ line from file

SPLIT line using comma as delimiter into tokens (courseNumber, name, prerequisites)

IF length of tokens < 2 THEN

PRINT "Error: Incorrect format."

EXIT

ENDIF

STORE course information in an array for validation

ENDWHILE

CLOSE file

END

BEGIN

FOR each course in course array DO

FOR each prerequisite in course.prerequisites DO

IF prerequisite does not exist in course array THEN

PRINT "Error: Invalid prerequisite"

EXIT

ENDIF

ENDFOR

ENDFOR

END

**Section 2: Course Object Creation & Storage in Hash Table**

This section defines how course objects are structured and stored within the hash table for efficient access.

BEGIN

DEFINE struct Course

courseNumber

name

prerequisites (list)

INITIALIZE hashTable

FOR each course in course array DO

CREATE Course object

STORE Course object in hashTable using courseNumber as key

ENDFOR

END

**Section 3: Searching and Printing Course Information**

The search function retrieves course details and displays prerequisites.

BEGIN

FUNCTION searchCourse(HashTable<Course> courses, String courseNumber)

IF courseNumber exists in hashTable THEN

RETRIEVE Course object from hashTable

PRINT courseNumber, name

PRINT "Prerequisites:", prerequisites (comma-separated list)

ELSE

PRINT "Course not found."

ENDIF

END

END

**Conclusion**

This pseudocode ensures proper storage and retrieval of course information using a hash table, effectively handling validation and search operations. By implementing this milestone, we set the foundation for a functional and efficient system for ABC University’s Computer Science department.