MultipleChoiceCorrectTest.c

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Macintosh OSX 10.7.5

**Step 1: Analyze the Problem**

**OUTPUT**: Output to file: Student ID and number of the multiple choice questions that student got correct and how many students answered each question correctly.

GradedTest.txt

**INPUT:** Text file that contains how many questions are on the multiple-choice test, the answer key, student ID’s and the respective student’s answers.

StudentAnswers.txt

**Step 2: Design (Structure Chart, Pseudo code, Algorithmic pattern, Modular Specs)**

**Main pseudo code:**

DECLARE local variable numElems, infile=StudentAnswers.txt, outfile=GradedTest.txt

OPEN infile and outfile

* PRINT error message and quit the program if either text can’t be opened.

ASSIGN numElems, readElems(infile, answerArray)

(IF 0<numElems<=100)

CALL processStudentData(infile, answerArray, frequencyArray,outfile)

* INIT frequencyArray to 0
* PRINT to outfile, headers for “Student ID” and “Test Score”
* ASSIGN studentIDArray, from infile
* ASSIGN stuAnswerArray, from infile
* ASSIGN studentScoreArray, correctTest(answerArray, stuAnswerArray, frequencyArray)
* WHILE less than numElems, PRINT(studentIDArray,studentScoreArray) to outfile

PRINT, questionsCorrect(numElems,answerArray,frequencyArray) to outfile

**Logic:** Reads the provided file of number of test questions, the test answers, student ID and the student’s answers.

readElems

Return Value: number of answers (int)

Receives: infile(file) and answerArray(int array)

Preconditions: infile must be declared and able to open, answerArray and numElems must be declared

Logic: readElems reads the file ‘infile’ by the first line that contains an element. This element represents how many test answers there are. The element is then assigned to numElems. The function then uses numElems to determine how many elements/test answers are read in and the elements are read into answerArray

processStudentData

Return Value: none

Receive: infile(file) and answerArray(array) and frequencyArray

Preconditions: infile must be able to open, answerArray must be initialized

Logic: processStudent first initialized the frequency Array to 0 and then prints the headers “Student ID” and “Test Score” into outfile. Infile is then read and the student IDs are read into studentIDArray. The function then calls stuTestAnswers. The value returned is assigned to stuAnswerArray. Afterwards, correctTest is called and the value returned is assigned to studentsScoreArray. The values in studentIDArray, studentScoreArray, and frequencyArray are printed to outfile.

correctTest

Return Value: studentScoreArray(int)

Receives: (answerArray, stuAnswerArray, frequencyArray)

Preconditions: answerArray, stuAnswerArray, frequencyArray are initialized

Logic: The function corrects the test by comparing answerArray and stuAnswer. The function returns an int for the student’s score. FrequencyArray is updated by reading how many students answered each test question correctly.

questionsCorrect

Return Value: none

Receives: numElems(int), answerArray(int array) and frequency array(int array)

Preconditions:

Logic: Print a header for each answer onto outfile.. Below, print answerArray and frequencyArray. The number of answers printed are determined by numElems.