//Week 4 Sample Solution to build upon in Week 5

//CS 215

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**#include** <iostream>

**#include** <string>

**#include** <fstream>

**#include** <cstdlib>

**using** **namespace** std;

**class** Question // super class

{

**public**:

string **getQuestion**()//gets the question

{

**return** question;

}

**virtual** **int** **getValue**() //gets the point value of the question

{

**return** value;

}

**virtual** string **getQuestionType**()// gets the type of question

{

**return** questiontype;

}

**virtual** **void** **setQuestion**(string answer, **int** value)

{

}

**virtual** **void** **setNewQuestion**(string answer, **int** value)

{

}

**virtual** **void** **printOptions**()

{

}

**virtual** string **getAnswer**()

{

**return** answer;

}

**private**:

string question, answer;

**int** value;

string questiontype;

};

**class** QuestionTF: **public** Question// class for true and false questions

{

**public**:

**void** **setQuestion**(string theQuestion, **int** pointValue)

{

string theAnswer;

questiontype = "TF";

question = theQuestion;

value = pointValue;

options = "true/false";

//get the answer from the file

getline(cin,theAnswer);

answer = theAnswer;

}

**void** **setNewQuestion**(string theQuestion, **int** pointValue)

{

string theAnswer;

questiontype = "TF";

question = theQuestion;

value = pointValue;

options = "true/false";

//get the answer from user

cout<<"Enter answer true/false\n";

getline(cin,theAnswer);

answer = theAnswer;

}

**int** **getValue**() //gets the point value of the question

{

**return** value;

}

string **getQuestionType**()// gets the type of question

{

**return** questiontype;

}

**void** **printOptions**()//prints the options for that question

{

cout<<question<<endl;

cout<<answer<<endl;

}

string **getAnswer**()//outputs the answer for that question

{

**return** answer;

}

**private**:

string question, questiontype;

string answer;

string options;

**int** value;

};

**class** QuestionMC: **public** Question//class for multiple choice

{

**public**:

**void** **setQuestion**(string theQuestion, **int** pointValue)

{

string line;

questiontype = "MC";

getline(cin,line);

numberOfOptions = **atoi**(line.c\_str());

cout<<numberOfOptions<<endl;

question = theQuestion;

value = pointValue;

//get the individual choice lines and load to options array

**for** (**int** count = 0; count<numberOfOptions;count++){

getline(cin,line);

options[count] = line;

}

//get the answer from the file and load into answer

getline(cin, line);

answer = line;

}

**void** **setNewQuestion**(string theQuestion, **int** pointValue)

{

string line;

questiontype = "MC";

//get the number of choices from the user

cout<<"Enter the number of choices: ";

getline(cin,line);

numberOfOptions = **atoi**(line.c\_str());

question = theQuestion;

value = pointValue;

//get the individual choice lines and load to options array

**for** (**int** count = 0; count<numberOfOptions;count++){

cout<<"\nEnter next option: ";

getline(cin,line);

options[count] = line;

}

//get the answer from the user and load into answer

cout<<"\nEnter Answer: ";

getline(cin, line);

answer = line;

}

**void** **printOptions**()// prints the questions, options, and answer

{

//char first = 'A';

cout<<question<<endl;

**for**(**int** count = 0; count<numberOfOptions;count++){

cout<<options[count]<<"\n";

}

cout<< answer << "\n";

}

**int** **getValue**() //gets the point value of the question

{

**return** value;

}

string **getQuestionType**()// gets the type of question

{

**return** questiontype;

}

string **getAnswer**()// prints the answer

{

**return** answer;

}

**private**:

**int** numberOfOptions;

string question, answer;

string options[6];

string questiontype;

**int** value;

};

**class** Exam

{

**public**:

**int** **loadExam**()

{

//ifstream infile;

//string examName = exam;

ifstream infile("exam.txt");

streambuf \*cinbuf = cin.rdbuf(); //save old buf

cin.rdbuf(infile.rdbuf()); //redirect std::cin to infile.txt!

string line, theQuestion, questiontype, theAnswer;

**int** questionvalue;

//get the number of questions from the first line in the file

getline(cin,line);

numquestions = **atoi**(line.c\_str());

**for**(**int** count = 0; count<numquestions;count++){

getline(cin,line);

//get the next line with the question type and the value of the question

**int** npos = line.size();

**int** prev\_pos = 0;

**int** pos = 0;

**while**( line[pos]!=' ')

pos++;

questiontype = line.substr(prev\_pos, pos-prev\_pos);

prev\_pos = ++pos;

questionvalue = **atoi**(line.substr(prev\_pos, npos-prev\_pos).c\_str()); // Last word

//process a true/false question

**if** (questiontype == "TF")

{

myQuestions[count] = **new** QuestionTF;

getline(cin,theQuestion);

myQuestions[count]->setQuestion(theQuestion,questionvalue);

}

//process a multiple choice question

**if** (questiontype =="MC")

{

myQuestions[count] =**new** QuestionMC;

getline(cin,theQuestion);

myQuestions[count]->setQuestion(theQuestion,questionvalue);

}

}

cin.rdbuf(cinbuf); //restore cin to standard input

**return** numquestions;

}

**void** **displayExamQuestions**(**int** numquestions)

{

string qtype;

//print out the questions that have been processed

**for**(**int** count = 0; count<numquestions;count++)

{

qtype=myQuestions[count]->getQuestionType();

cout<<qtype<<" "<<myQuestions[count]->getValue()<<"\n";

myQuestions[count]->printOptions();

cout<<"\n";

}

}

**private**:

Question \*myQuestions[10];

**int** numquestions;

};

**int** **displayMenu**(); //function prototype

**int** **main**() {

Exam myExam;

**int** numquestions, choice;

string examName = "exam.txt";

**while**((choice = displayMenu())!=3)

**switch**(choice)

{

**case** 1: numquestions = myExam.loadExam();

**break**;

**case** 2: myExam.displayExamQuestions(numquestions);

**break**;

**default**: cout<<"Invalid choice. Try again.\n";

}

**getchar**();

**return** 0;

}

**int** **displayMenu**()

{

**int** choice;

cout<< "Enter your choice for this Exam."<<endl;

cout<< "1. Load Exam "<<endl;

cout<< "2. Display Exam "<<endl;

cout<< "3. Quit"<<endl;

cin>>choice;

**return** choice;

}