Data Structures- Assignment 1

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Section I.1. System Overview

This program handles the reading, organization and output of users in some database.

Section I.1.1. Referenced Documents

No references were made.

Section I.1.2. Concept of Execution

A database of users will be read in from a text file and be outputted to the console and another text file.

Section I.1.3. Abstract Data Type

Not applicable, no custom ADT was used.

Section I.2. Code Outline

Class: User

void Initialize(const char* afName, const char* alName, char aGender, const char* aMajor, const char* aEmail, AddressType aAddress, float aGPA, DateType aDateOfBirth);

void GetFirstName(char afname[]) const;

void GetLastName(char alname[]) const;

void GetMajor(char amajor[]) const;

void GetEmail(char aemail[]) const;

void GetGender(char& agender) const;

DateType GetDateOfBirth() const;

void GetDateOfBirth(DateType& aDateOfBirth) const;

float GetGPA() const;

void GetGPA(float& aGPA) const;

AddressType GetAddress() const;

void GetAddress(AddressType& aAddress) const;

void GetAddress(char aStreetName[], int& aStreetNo, char aCity[], int& aZip, char aState[]) const;

void SetFirstName(const char* afName);

void SetLastName(const char* alName);

void SetMajor(const char* amajor);

void SetEmail(const char* anemail);

void SetGender(char aGender);

void SetDateOfBirth(DateType aDateOfBirth);

void SetGPA(float aGPA);

void SetAddress(AddressType aAddress);

void SetAddress(char aStreetName[], int aStreetNo, char aCity[], int aZip, char aState[]);

void Display() const;

void Display(std::ofstream& outFile) const;

Class: Test Driver

int Populate(const char* input, User users[]);

void Test(User users[], int count) const;

void Test(std::ofstream& outFile, User users[], int count) const;

Section I.2.1. Detailed Design

Class: User

void Initialize(const char* afName, const char* alName, char aGender, const char* aMajor, const char* aEmail, AddressType aAddress, float aGPA, DateType aDateOfBirth);

Purpose: Creates a new user

Arguments: Char arrays for the user's first name, last name, major and email. A float for GPA. An AddressType for the user's address and DateType for the user's date of birth.

Return Value: Void

void GetFirstName(char afname[]) const;

Purpose: Gets the user's first name

Arguments: A character array that is the user's first name

Return Value: Void

void GetLastName(char alname[]) const;

Purpose: Gets the user's last name.

Arguments: A character array that is the user's last name

Return Value: Void

void GetMajor(char amajor[]) const;

Purpose: Gets the user's major

Arguments: A char array that is the user's major

Return Value: Void

void GetEmail(char aemail[]) const;

Purpose: Gets the user's email

Arguments: A char array that is the user's email

Return Value:

void GetGender(char& agender) const;

Purpose: Gets the user's gender

Arguments: A char that is the user's gender

Return Value: Void

DateType GetDateOfBirth() const;

Purpose: Gets the user's date of birth

Arguments: None

Return Value: Returns a DateType which is three integers representing the user's date of birth

void GetDateOfBirth(DateType& aDateOfBirth) const;

Purpose: Gets the user's date of birth

Arguments: DateType which is three integers representing the user's date of birth

Return Value: Void

float GetGPA() const;

Purpose: Gets the user's GPA

Arguments: None

Return Value: Returns a float which is the user's GPA

void GetGPA(float& aGPA) const;

Purpose: Gets the user's GPA

Arguments: A float which is the user's GPA

Return Value: Void

AddressType GetAddress() const;

Purpose: Gets the user's address

Arguments: None

Return Value: Returns an AddressType which is three char arrays and two integers making up the user's address

void GetAddress(AddressType& aAddress) const;

Purpose: Gets the user's address

Arguments: An AddressType which is three char arrays and two integers making up the user's address

Return Value: Void

void GetAddress(char aStreetName[], int& aStreetNo, char aCity[], int& aZip, char aState[]) const;

Purpose: Gets the user's address

Arguments: Three char arrays and two integers making up the user's address

Return Value: Void

void SetFirstName(const char* afName);

Purpose: Sets the user's first name

Arguments: A char array of the user's new first name

Return Value: Void

void SetLastName(const char* alName);

Purpose: Sets the user's last name

Arguments: A char array of the user's new last name

Return Value: Void

void SetMajor(const char* amajor);

Purpose: Sets the user's major

Arguments: A char array of the user's new major

Return Value: Void

void SetEmail(const char* anemail);

Purpose: Sets the user's email

Arguments: A char array of the user's new email

Return Value: Void

void SetGender(char aGender);

Purpose: Sets the user's gender

Arguments: A char representing the user's gender

Return Value: Void

void SetDateOfBirth(DateType aDateOfBirth);

Purpose: Sets the user's date of birth

Arguments: A DateType of three integers representing the user's new birthday

Return Value: Void

void SetGPA(float aGPA);

Purpose: Sets the user's GPA

Arguments: A float representing the user's new GPA

Return Value: Void

void SetAddress(AddressType aAddress);

Purpose: Sets the user's address

Arguments: An AddressType of three char arrays and two integers representing the user's new address

Return Value: Void

void SetAddress(char aStreetName[], int aStreetNo, char aCity[], int aZip, char aState[]);

Purpose: Sets the user's new address

Arguments: Three char arrays and two integers representing the user's new address

Return Value: Void

void Display() const;

Purpose: Displays all the data from the user to the console

Arguments: None

Return Value: Void

void Display(std::ofstream& outFile) const;

Purpose: Prints all the data of the user into a file

Arguments: An ofstream representing the file being printed to

Return Value: Void

Class: Test Driver

int Populate(const char* input, User users[]);

Purpose: Reads in all users from a file into an users array

Arguments: A char array representing the file to read from and a users array to store the data into

Return Value: An integer representing the number of users that were read in

void Test(User users[], int count) const;

Purpose: Tests the user class and its helpers class, printing results to the console

Arguments: An users array to test on and an integer representing the number of users in the user array.

Return Value: Void

void Test(std::ofstream& outFile, User users[], int count) const;

Purpose: Tests the user class and its helpers class, printing results to a file

Arguments: An ofstream representing the file being printed to, an users array to test on and an integer representing the number of users in the user array.

Return Value: Void

Test Plan

This software is tested by the exhaustive method. Every method is called and every variable is used to confirm functionality.

Section II.1. Test Procedures

Main Testing

•Purpose - To test most of the methods

•Procedure - Reads in users and then displays them

•Inputs - Users

•Expected Outputs - The same Users

•Success Criteria - Inputs match the outputs

Secondary Testing

•Purpose - To test the remaining redundant methods

•Procedure - Alters current users and then displays alterations

•Inputs - Users

•Expected Outputs - The altered Users

•Success Criteria - Outputs are successfully altered and do NOT match the inputs

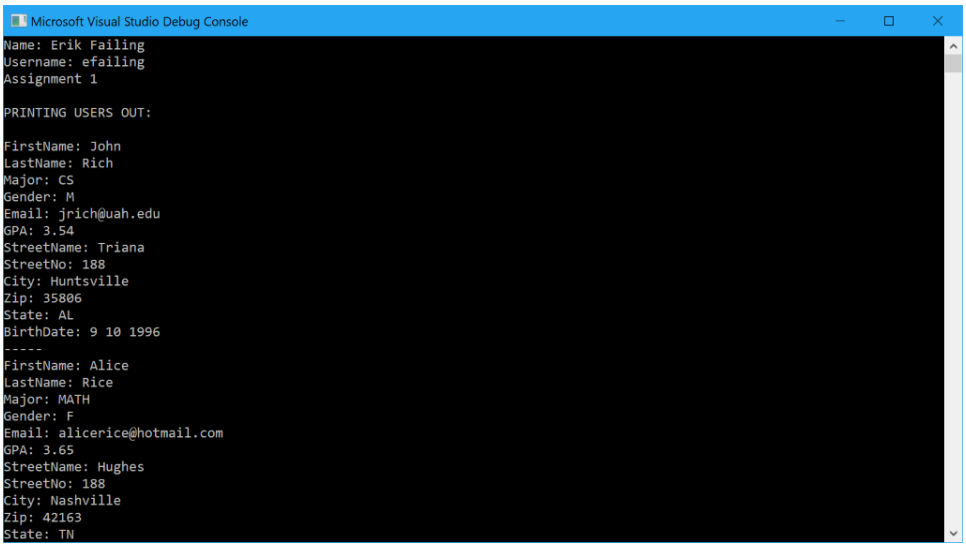
Section II.2. Sample Runs

Sample Run 1:

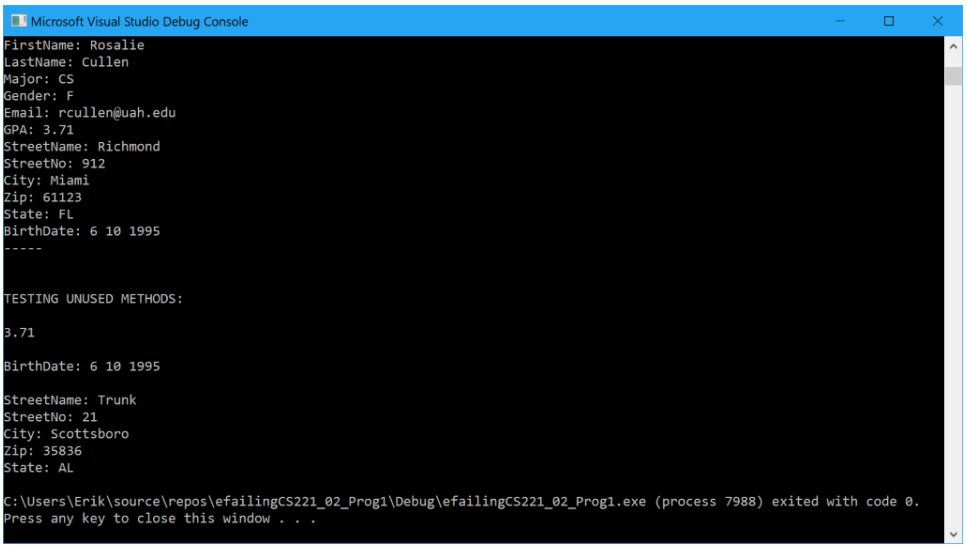
•Inputs - Sample user text file hw1samplefile.txt

•Outputs - efailingHw1Outfile.txt

•Snapshots:


Microsoft Visual Studio Debug Console
Name: Erik Failing
Username: efailing
Assignment 1
PRINTING USERS OUT:
FirstName: John
LastName: Rich
Major: CS
Gender: M
Email: jrich@uah.edu
GPA: 3.54
StreetName: Triana
StreetNo: 188
City: Huntsville
Zip: 35806
State: AL
BirthDate: 9 10 1996

FirstName: Alice
LastName: Rice
Major: MATH
Gender: F
Email: alicerice@hotmail.com
GPA: 3.65
StreetName: Hughes
StreetNo: 188
City: Nashville
Zip: 42163
State: TN


Microsoft Visual Studio Debug Console
FirstName: Rosalie
LastName: Cullen
Major: CS
Gender: F
Email: rcullen@uah.edu
GPA: 3.71
StreetName: Richmond
StreetNo: 912
City: Miami
Zip: 61123
State: FL
BirthDate: 6 10 1995

TESTING UNUSED METHODS:
3.71
BirthDate: 6 10 1995
StreetName: Trunk
StreetNo: 21
City: Scottsboro
Zip: 35836
State: AL
C:\Users\Erik\source\repos\efailingCS221_02_Prog1\Debug\efailingCS221_02_Prog1.exe (process 7988) exited with code 0.
Press any key to close this window . . .