School Information System

Group Project

Develop a console application using C++ in collaboration with your peers forming a team.

Alex Legner, Alex Craig, Jone Salauneune and Ritika Ritika

Client Needs

Add new staff records/edit

Add new student/edit

Attendance management

Faculty management

Student record management (Student Information)

Create edit and update school notices

User Needs

View academic results

View School Notices

Sign Up Parent

Target Audience

Lydia is a teacher at Upper Hutt College who teachers English101.

As a teacher, Lydia wants to empower her students to better by appreciating the English language and its beauty.

Instead of doing admin duties, she prefers to use that time to better help her students.

John is a student at Hutt Valley High School who studies Math101
As a student, John requires quick and easy access to his report cards to work and improve on his studies and get feedback from his tutors.

Time is his greatest problem as he would rather study than spend time messing around with his report card.

A bonus would be easy access for his parents so they could check up on his work without having to contact John directly, saving extra time and work.

Assumptions

Assumptions (Users):

- All users will understand English
- All users know how to type on a keyboard
- All users would push enter after putting in text

Assumptions (Console Applications):

- Users would push 'enter' or 'return' when using the application without instruction to do so.
- Users will type help when they are unsure what to do.
- Exit will typically exit the application
- Help will show a help menu
- Back will go back to the previous menu
- Options are easier to select when they are numbered for input, i.e., 1 for start.

Research – Collaboration

- **Trello** - the visual tool that empowers your team to manage any type of project, workflow, or task tracking. Add files, checklists, or even automation.

- **Click Up** - Click up is a large-scale task manager for large companies to allow workers to see tasks and organize them as needed.

- **Monday.com** - Workflow software which allows you to manage tasks within a team and manage a timeline.

Research – Technical Options

- **C++** - is a general-purpose language used in systems, GUIs, and embedded software.

- **C#** - is an object-oriented, modern language

- **Java** - Java is an object-oriented, and multi-platform language

- **Python** - Python language used to make websites, software, automate tasks, and data analysis

Research – IDE Options

- **Visual Studio Code** - VSC is one of the most popular free open-source code editors by Microsoft. Provides many extensions including C++.

- **Code::Blocks** - is an open-source and free IDE for C and C++ used on multiple platforms and build in C++ using a GUI widget tool called wxWidget.

- **CLion** - CLion is a modern IDE by JetBrains which is designed to run C and C++ on various platforms like Windows, Linux, and macOS.

- **Visual Studio 2019** - Visual Studio is the most popular choice for good reasons: an impressive collection of available Visual Studio extensions. likely the most popular C++ IDE for Windows.

Research – Version Control

- **CVS** - Concurrent Versioning System, is a free client-server revision control system in the field of software

- **SVN** - SVN is a free and open-source software as an alternative to CVS that is aimed to be more reliable and bug free.

- **GitHub or git** - GitHub is a code hosting platform for version control and collaboration. let's you and others work together on projects.

- **Microsoft Teams Files** - Microsoft Teams is cloud-based team collaboration software that includes messaging, calling, video meetings and file sharing.
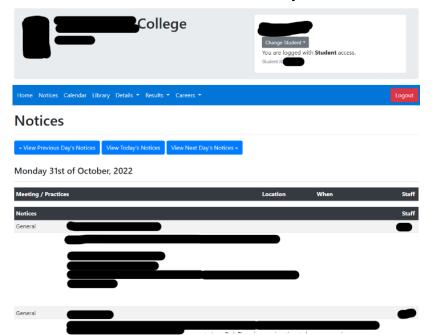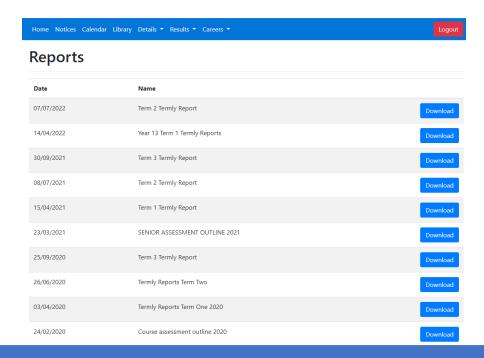
File Management

Git will allow for file collaboration, but any

Coding related files should be in the coding folder and all other files in the main directory:

📁 SchoolSystemApplication	⊘	11/10/2022 4:59 PM	File folder
📄 .gitignore	⊘	11/10/2022 4:59 PM	Text Document	1 KB
📄 Extra Requirements	⊘	11/10/2022 4:59 PM	Text Document	3 KB
[] readme	⊘	11/7/2022 11:32 AM	MD File	1 KB

Research - Swot Analysis - Kamar
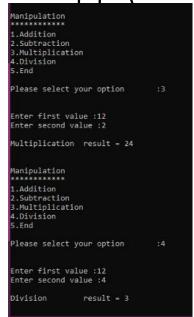
Strengths	**Easy to read Menu Bar. Reports list is easy to read and easy to use -> download the report you want. Login/Logout simple with a timeout feature.**
Weakness'	Some links don't work -> library not setup properly and still showing, notices don't show ALL notices, only some of them.
Opportunities	Few competitions for this type of software. Kamar is widely used in NZ. Include tutorials on how to use, with feature to never show again.
Threats	No clear instructions on how to use KAMAR, you must learn your way around to find what you are looking for.

Research - Swot Analysis – Console App (calculator)

The information provided is clear and concise, focuses on information and selection of data, little to no clutter of unneeded information. Spacing horizontally is easy to follow with like information next each other and unlike separated.

Some of the spacing across is not even and hard to follow

Could allow in line operations i.e., 1 x 2 instead of selecting option 3 and entering 1, 2.

Console is very restrictive, can't push buttons like a normal calculator.

Code – Style Guide

Naming Convention

Function names will follow the camelCase naming convention. -> camelCase

```cpp
void getInput() {
```

Local variables will follow the camelCase naming convention. -> camelCase

```cpp
int varaibleOne
```

Const variables will be SNAKE_CASE to show their difference. -> SNAKE_CASE

```cpp
const int SCREEN_WIDTH = 300;
```

```cpp
// header files
#include <iostream>

// enum definitions
enum enumExample {
    a,
    b,
    c
};

// struct definitions
struct structExample {
    int a;
    int b;
    int c;
};

// class definitions
class classExample {

};

// function prototypes
void FunctionExample();

// main function
int main()
{

}

// function definitions
void FunctionExample() {

}
```

Code layout:

From top to button follow-> C++ headers, enum definition, struct definition, class definition, function prototypes, main function, function prototypes definitions.

Using

Using namespace std is bad practice and is not allowed, however, to prevent repetition, you can use using std::member where member is what you are using. For example using std::string allows us to write string instead of std::string everywhere. Using statements are to be put under the header file in preprocessor.

```
std::string input;
std::getline(std::cin >> std::ws, input);
```

Comments

All functions and classes must have ///XML comments

Variables can have // comments above or next to it to define what the variable is used for.

To summarize code use a // comment above it.

Add blank lines in between lines of code that aren't similar or don't apply to that content

```
/// <summary>
/// I am a XML tag for a function
/// </summary>
void test() {

    // I am a comment for a variable
    int testVar = 2;

}
```

```cpp
// header files
#include <iostream>

// enum definitions
enum enumExample {
    a,
    b,
    c
};

// struct definitions
struct structExample {
    int a;
    int b;
    int c;
};

// class definitions
class classExample {

};

// function prototypes
void FunctionExample();

// main function
int main()
{

}

// function definitions
void FunctionExample() {

}
```

Bracket convention
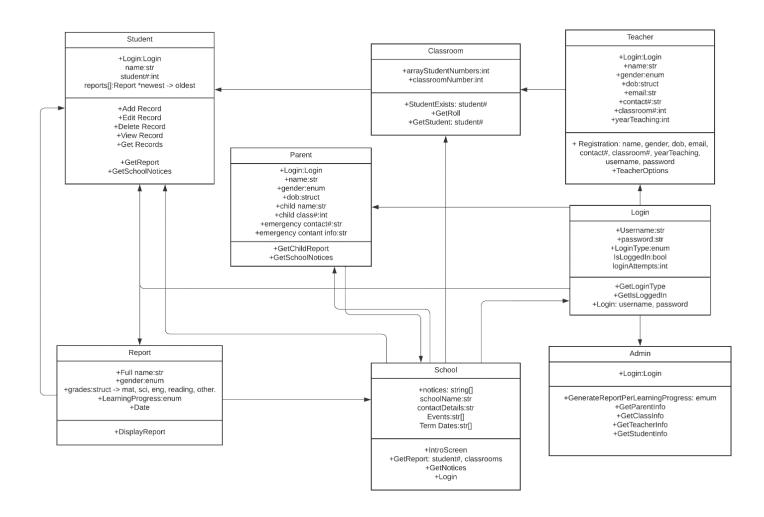
```
void proper(){


}



void improper()
{


}
```

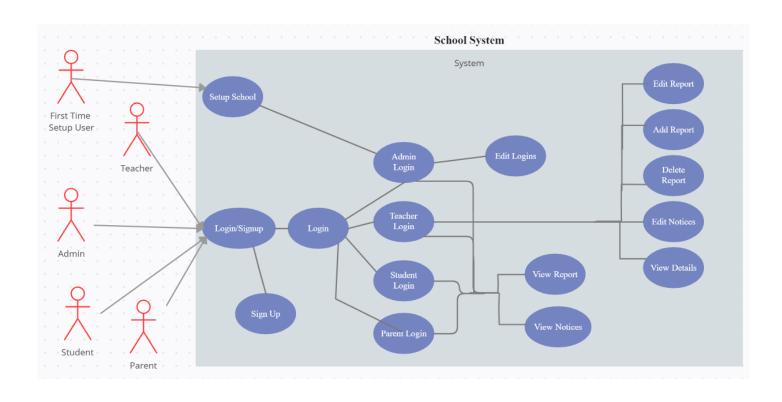Use C++style convention with { next to last line and } understand last line as shown in example

Data structures

To store data we will use file loading and saving. File saved which contain data will be csv's and stored under the naming convention " _name.csv". Multiple files are allowed for different types of stored data. Data will be loaded to vector<vector<string>>to store data as if it were in the csv format. Data should not be directly edited/read to/from the file instead using the internal memory and then saved/loaded from memory.

UML
Diagram

Student

+Login:Login
name:str
student#:int
reports[]:Report *newest -> oldest

+Add Record
+Edit Record
+Delete Record
+View Record
+Get Records

+GetReport
+GetSchoolNotices

Classroom

+arrayStudentNumbers:int
+classroomNumber:int

+StudentExists: student#
+GetRoll
+GetStudent: student#

Teacher

+Login:Login
+name:str
+gender:enum
+dob:struct
+email:str
+contact#:str
+classroom#:int
+yearTeaching:int

+ Registration: name, gender, dob, email,
contact#, classroom#, yearTeaching,
username, password
+TeacherOptions

Parent

+Login:Login
+name:str
+gender:enum
+dob:struct
+child name:str
+child class#:int
+emergency contact#:str
+emergency contant info:str

+GetChildReport
+GetSchoolNotices

Login

+Username:str
+password:str
+LoginType:enum
IsLoggedIn:bool
loginAttempts:int

+GetLoginType
+GetIsLoggedIn
+Login: username, password

Report

+Full name:str
+gender:enum
+grades:struct -> mat, sci, eng, reading, other.
+LearningProgress:enum
+Date

+DisplayReport

School

+notices: string[]
schoolName:str
contactDetails:str
Events:str[]
Term Dates:str[]

+IntroScreen
+GetReport: student#, classrooms
+GetNotices
+Login

Admin

+Login:Login

+GenerateReportPerLearningProgress: emum
+GetParentInfo
+GetClassInfo
+GetTeacherInfo
+GetStudentInfo

Flow Chart

User Survey Analysis

- **User 1:** "ADMIN TASKS" entering letter for cancel command not preferable, when adding students to classroom confused by Null student error, adding a student to database does not give confirmation, edit function is tiresome having to reinput all the information instead of selection what you want to edit. Would prefer text instead of numbers for selection.

- **User 2:** "TEACHER TASKS" typed in name of student for input instead of corresponding number, 'grade name' is confusing and vague, report section confused user due to gender and grade name selection.

- **User 3:** "PARENT TASKS" parent number was confusing due duplicates, 'Emergency contact' should be direct and say 'Emergency Contact Number.

- **User 4:** "ALL TASKS" unable to decipher selection process (description added at start of program), continued to select exit program after signing up "accidentally".

- **User 5:** "PARENT TASKS" was unsure if he managed to reach the proper report page, found the letter spacing to be well made and selection process easy to understand.

Final Changes to product


```
Login SAVED...

Login as an admin to edit the school...
********************************************

Welcome to (EDIT SCHOOL NAME)
Contact details:
(EDIT CONTACT INFO)
********************************************


Select a number from options below to navigate this program

Options:
1. Login
2. Exit
3. Parent Sign Up

Selection :
```

Final Product

```
Options:
1. Login
2. Exit
3. Parent Sign Up

Selection : 3

Enter a new parent number : 21
Is your child already enrolled with us?
y or n : n
Enter a new student number : 11
Enter student's full name : StudentTestName

-----------------------------------------
---------Create Login : Student---------
-----------------------------------------
Enter New Username: studenttest
Enter New Password: studenttest

Login SAVED...

Enter adult's name : ParentTestName
Enter emergency contact phone number : 0123456789
Enter address : 123 Address Street
Enter DOB : 12/12/2012
Enter email : parent.email.test@mail.com

Parent Created...

-----------------------------------------
---------Create Login : Parent---------
-----------------------------------------
Enter New Username: parenttest
Enter New Password: parenttest

Login SAVED...

Options:
1. Login
2. Exit
3. Parent Sign Up

Selection :
```

```
Options:
1. Login
2. Exit
3. Parent Sign Up

Selection : 1


Enter your Username: admin
Enter your Password: admin
```

```
*********************************************

Welcome to (SETUP SCHOOL NAME)
Contact details:

*********************************************

Select a number from options below to navigate this program

Options:
1. Login
2. Exit
3. Parent Sign Up

Selection :
```

```
-----------School Notices-------------
We're no strangers to love
You know the rules and so do I (do I)
A full commitment's what I'm thinking of
You wouldn't get this from any other guy
|
I just wanna tell you how I'm feeling
Gotta make you understand

Never gonna give you up
Never gonna let you down
Never gonna run around and desert you
Never gonna make you cry
Never gonna say goodbye
Never gonna tell a lie and hurt you

-------------Notices - Menu-------------
Options :
0. Back
1. View
2. Add
3. Edit
```

```
Please create an ADMIN account to continue...
-----------------------------------------
---------Create Login : Admin-----------
-----------------------------------------
Enter New Username: _
```