Group Project 103

By Arthur Werner, William Giles, Jacob Rosner

Chosen Program / Task: C (NZ School Information System)

User Requirements:

- **Easy navigation**
  - Text that is easy to read
    - Good size
    - Contrasting colour with the background
- **Identification / Authorisation**
  - Login check
  - Maximum 3 login attempts
- **Announcements**
  - Notify staff, students and parents if there is a big event at the school, such as a lunchtime concert.
  - Announce competitions between classes and/or schools, such as for sports.
  - Announcements will be made by the school's principal
  - Will have a principal login
- **Settings**
  - Choose a language for the site
  - Choose whether or not you want to use dark mode
- **Grades**
  - Shows how well a student did on a test
- **Teacher comments**
  - Allows the teacher to leave comments on the student in their class, such as how they are doing with the work.
  - Allows the student and parents to see the comments as well
- **Accessibility**
  - Have the ability to switch to other languages
  - Allow users to use dark mode

Business Requirements:

- **Student/Teacher Timetable**
  - It should contain a timetable for students and teachers to use to know what classes they have and what to plan for incase they need to get books or devices.
- **Maintain Records**
  - A school management system should be able to maintain the records for each student. It should also keep track of all the activities of every single student and their basic information. This info could be year group, classes, name, grades and other notes, such as if they have a disability. This is an easy way

to check how the student is going at school and can be used to provide information to teachers and parents.

- **Tracking student attendance**
  - Keeping track of a student's attendance to each class could be helpful to keeping track if students are on time and to help them inform of the students' absence. This can also be used to notice a student might be struggling and would give the teacher the heads up they need help to grow in the right direction.
- **Administration**
  - It should provide users access to school information and permit users to access the information within their admin rights. And should be able to manage and store your day to day school business. And for the teacher to be able to look at your test to mark and view.
- **Fee Collection**
  - The system should be able to provide costs for the students education and any additional costs like books or equipment. It can also be good to keep track of what needs to still be paid off.
- **Exam Timetable**
  - A school schedule should be made available to the students and their parents. This way they would be able to check and be informed about upcoming tests so it can help them be well informed and prepare them for them.

User experience:

- **Accessibility**
  - School systems should have this consistent throughout a website as when a student needs to check their test results or check a timetable this is very important that the designer has implemented this for an overall good experience and that the information is properly provided.
- **Usability**
  - Usability is all about the layout of a website so if a school has not programmed one well it can cause confusion with the navigation on where to find topics or results. In a school system you would want it to stay simple and readable with a good contrast between colours eg: white text on black background.
- **Consistency**
  - The school system should have the same colour scheme as the school they are promoting, such as red and green for Onslow College. It should also have the same pages and tabs for each school, just using different logos and colours for different schools. It should have the same layout and formatting across the site.
- **User Control**
  - The school system should allow users to search for a specific school and find information about it. There should also be options to see what the school offers in terms of things like sports.
- **Hierarchy**
  - The school system should have the same tabs in the same order across the entire website. It would be weird if sports and support were swapped for example.

Problems in Existing Systems:

VISUAL:

- **Outdated design**
  - Looks like something from 20 years ago. Doesn't have as many features as websites tend to nowadays.
- **Low-res buttons**
  - This makes the buttons hard to see, such as if they're blurry or blend in with the background too much.
- **Sometimes the text is hard to read**
  - This could be because you used red text on a red background for example. Use contrasting colours to make the site easier to read.
- **Too many icons**
  - I consider more than six icons to be overdoing it with the icons. It can overwhelm the users
- **Bland colour schemes**
  - By this, I mean using common colours such as grey and brown. To make your site stand out more, use lesser-used colours such as orange.
- **Parts of the interface not fitting**
  - This could be a problem with the images, such as having the logo for the wrong school.

FUNCTIONALITY:

- **Too many bugs**
  - This could make for a website that people would not want to use, as it could crash their computer.
- **Unrelated links**
  - Links that lead to stuff unrelated to the site, such as a cooking video on a website about historical events or a Rick Roll on a site about anything that is not to do with Rick Astley. This can cause confusion.
- **Slow load times**
  - This can get really annoying waiting for the darn thing to load. This could be a hardware problem. To solve it, try using faster hardware.
- **Bad login system**
  - Constantly displaying random messages if you fail to log in, such as asking you what the square root of a fish is.

SWOT Analyze:

Black Board	
Strengths	Blackboard is a very functional piece of software. It can manage student assessments, grades, hand-ins, calendar and announcements.

Weaknesses	It has a very outdated design and does not support modern features such as responsive design. A lot of the buttons and icons are low-res and on modern screens it is really noticeable. In some areas the text colour and the background colour are similar and make the text hard to read. Examples of this are light grey on with background and light blue on white background. The user interface almost feels cobbled together. By this I mean they add feature after feature and don't check if it fits with the rest of the interface.
Opportunities	An opportunity is to change the colours on the site. This could be text colour to fix the hard to read text. It could also be other colours to make the page more appealing to the eye. They could redesign some onscreen elements to make them all fit together and be more appealing. Making the website responsive would help mobile users because at the moment it is almost unusable.
Threats	With the bad overall layout of Blackboard this could lead users away and could possibly cause a school to change who they host their stuff on. The system can also be destructive as even tutors could have the possibility of changing a students grade without knowing or clicking on the wrong button causing this to change a students test results. Their overall design on how to access things is quite badly laid out so trying to find test papers could cause a student to stress out as the navigation is quite messy and unclear. There are also font colours that almost blend into the background or are hard to see. This could also leave a user to miss it. Tests that are hosted on blackboard also have the problem with the layout, the text is small and hard to read but zooming in caused more problems as the responsive design wasn't made to zoom in. All these problems can cause the user to stress out and make their studying or marking quite difficult.

Competitor:

Kamar	
Strengths	I find the navigation of the website quite easy. I also like that they use some usability heuristics, such as a match between system and real world, which is done in this case by using paper for reports and using a bag of money for finances for example. This is done with the icons. The text can be read quite easily.
Weaknesses	The images can be a bit hard to see, as the text on the images is quite small. The blue colour scheme can get a bit boring for some people. The design of the nav bar has too many icons in my opinion. There are 10 icons. I counted them.
Opportunities	I think the site should have some tutorial videos to show you how to use certain parts of the site which may be tricky to figure out. I also think that the site can use different colour schemes for certain occasions, such as orange and black for Halloween. Although this is just a personal thing for me.
Threats	With the amount of icons, people will get overwhelmed and not want to

	use the site. They will switch to something that is less overwhelming. Some people might not like the colour scheme and want something more interesting, so they will move to a site with a colouir scheme they like. There is also the chance that students will miss out on important stuff just because they didn't like the site aesthetically.

Student Portal	
Strengths	The navigation for the website is quite well laid out with the navigation bar being in the top in the middle of the screen so it's obvious to find and see. It has a display on the main menu when you login the most important events happening informing the students.
Weaknesses	The colour choice although some might like it, personally it's quite straining to the eye. There is a lot of white used in the overall design so starting at it for too long can hurt/strain the eye. The font is pretty basic with thin text, this could cause reading problems for some users as it's quite small. The overall layout of everything has a lot of whitespace causing it to look bland and boring.
Opportunities	Some opportunities that would improve this website is adding the option to change the colour scheme to a darker colour as people that are sensitive to bright lights would find it hard to use this website for long periods. Changing the font type and overall style to something bigger or dyslexia friendly would make it easier for everyone in general to look at a larger font size.
Threats	The boring overall design could turn users away and cause them to not want to use it in the future as some students could miss out on important notices, just because they didn't want to use a badly designed website. There is also the problem of some misleading links in the navigation bar which could mislead a user to somewhere and get confused or frustrated with it. The whole font design and layout could also mean that some people can miss out on what they look at.

Possibilities in console Applications:

- Compared to GUI apps, console applications usually consume fewer system resources and are simpler to create. They can run in a terminal without a graphical user interface, and they are easy to transfer to many systems.
- For tasks requiring automation and scripting, console apps are excellent. They can be used to create batch files or scripts to automate repeated tasks, making them ideal for system administration or command-line utilities.
- Console applications have a smaller memory footprint than GUI ones. They might make better use of resources and work with dated or weak hardware.
- Compared to GUI applications, console applications can be created and tested more quickly. They allow for the quick development and testing of logic and algorithms before investing effort in constructing a fully functional GUI.
- Console programmes provide for simple integration with other command-line utilities and tools. Because it allows for smooth interchange with current applications and systems, this makes it easier to leverage functionality that already exists.

Limitations in console Applications:

- Console programmes mostly use text-based input and output because they lack the graphical elements seen in GUI (Graphical User Interface) applications. This may make creating aesthetically pleasing interactive interfaces challenging.
- Console software usually requires users to use a keyboard to enter commands or data. This restricts the interactions that are permitted and could feel less natural to people who are used to using GUI programmes.
- Console apps do not natively support multimedia elements like images, audio, and video. Displaying or changing such content in a console environment is more difficult.
- Console apps can take keyboard input, but they don't have native mouse functionality. This can limit several commonly used user gestures and interactions in GUI software.
- There are few options for text formatting and style in console software. Font, colour, and layout customization is more complicated and less flexible with GUI software.

Team member responsibilities:

- **Arthur**
  - Main menu
    - Contact Details Page
    - Events Page
    - Ability to Exit
    - Merge Contact and Event on same file
  - Log in and sign up
    - Parent registration layout
    - Teacher registration layout
  - Teachers
    - Delete Student Record Layout
    - Update Record Layout
    - View The Records Layout
  - Parent
    - Home screen layout
      - Includes basic layout for Child's report (does not display data yet)
      - Page for notices
  - Admin
    - Home screen
      - Parents Records Layout
      - Class Records Layout
      - Students Report Layout
      - Ability to Exit
  - Displaying Data
    - View Childs Records (Parent Perm)
    - View Student Records (Teacher Perm)
    - View Parent Records (Admin Perm)

- ■ Student Report (Admin Perm)

- **Jacob (Needs help)**
  - Teachers
    - ■ Home Screen layout
      - Student Records Layout
        - ○ Add Student Layout
        - ○ Edit Student Record Layout
  - Students
    - ■ Student record screen
  - Displaying Data
    - ■ View Class Records (Admin Perm)

- **William**
  - Storing Register Details
  - Timer for Login
  - Fix up Parent Details
  - Displaying the data
    - ■ Update Student Record (Teacher Perm)
    - ■ Delete Student Record (Teacher Perm)
    - ■ Edit Student Record (Teacher Perm)
    - ■ Add Student (Teacher Perm)
  - Creating a Database
    - ■ Student Data
      - Preset Students
      - Vector to store new students
    - ■ Parent Data
      - Vector to store new parents
    - ■ Teacher Data
      - Vector to store new teachers
    - ■ Login Details
      - Preset logins for admins
      - Vector to store new accounts

Screen layout:

Start up screen	Welcome to (School Name)'s Info System 1) Sign Up 2) Login 3)Upcoming Events: 4)Contact Details
Contact Page	Contact Details Email: ---------- Phone Number : ---- ---- ----
Upcoming Events Page	Upcoming Events -------- ---- --- --- ---- ---- ------ ----- -----

Sign Up page	Sign Up Occupation 1) Teacher 2) Parent
Sign In page	Sign In Username: Password:

Sign Up Teacher	**Teacher Sign Up** Full Name: Gender: Date of Birth: Email: Contact Number: Classroom Number: Teaching Year(eg: year 1): Username: Password:
Sign Up Parent	Parent Sign Up Full Name: Gender: Date of Birth: Email: Contact Number: Child Full Name(s): Child Classroom Number: Parent/Caregiver EmergencyContact Number: Username: Password:

Teacher Home Screen	Welcome 'Teacher Name' 1) Student Records 2) Exit
Parents Home Screen	Welcome 'Parent Name' 1) View Childs Records 2) School Notices 3) Exit
Student Records	Student Records 1) Add Student 2) Edit Student Record 3) Delete Student Record 4) Update Record 5)View The Records

| Adding a Student | Add Student

Full Name:
Gender:
Maths:
Science:
Writing:
Reading:
Others:
Learning Progress: |

Edit Student Record	**Edit Student Record** Student's Name: Student's Class: Pick what you wanted edited: 1)Full Name 2)Gender 3)Maths 4)Science 5)Writing 6)Reading 7)Others
Delete Student Record	**Delete Student Record** Enter Students Name and Class: Student's Name: Student's Class: Type 'Delete' to confirm

Update Record	Update Record Student's Name: Student's Class: What is 'Student's Name" Current Progress 1) Achieved 2) Progressing 3)Needs Help
View the Student's Records	View the Records Student's Name: Student's Class: This is the Record for "student's name" Full Name: -------- Gender: ------- Maths: ---- Science: ---- Writing: ---- Reading: ---- Others: ---- Learning Progress: ----

Admin Home Screen	Welcome 'Admin Name'
	1)Parents Records 2)Class Records 3)Students Report 4) Exit
Parent Records	Parent Records Partent Name: This is 'Parents Name' Record: Full Name: Gender: Date of Birth: Email: Contact Number: Child Full Name(s): Child Classroom Number: Parent/Caregiver EmergencyContact Number:

|	

Class Records	Class Records
	
	What Class do you want to view?
	
	Room 12
	
	Room 12's Records:
	
	1) William Brown
	    (William's Student Details)
	2) Steve Gine
	    (Steve's Student Details)
	3) Alex Humbin
	    (Alex's Student Details)
	. . .

Student Report	Student Report What Group do you want to view? 1)Needs Help 2)Progressing State 1 Student that need help: 1) Robert Heinz 2) Lizzy Phill 3) Harry Tase . . .

UML:

Structure Diagram	
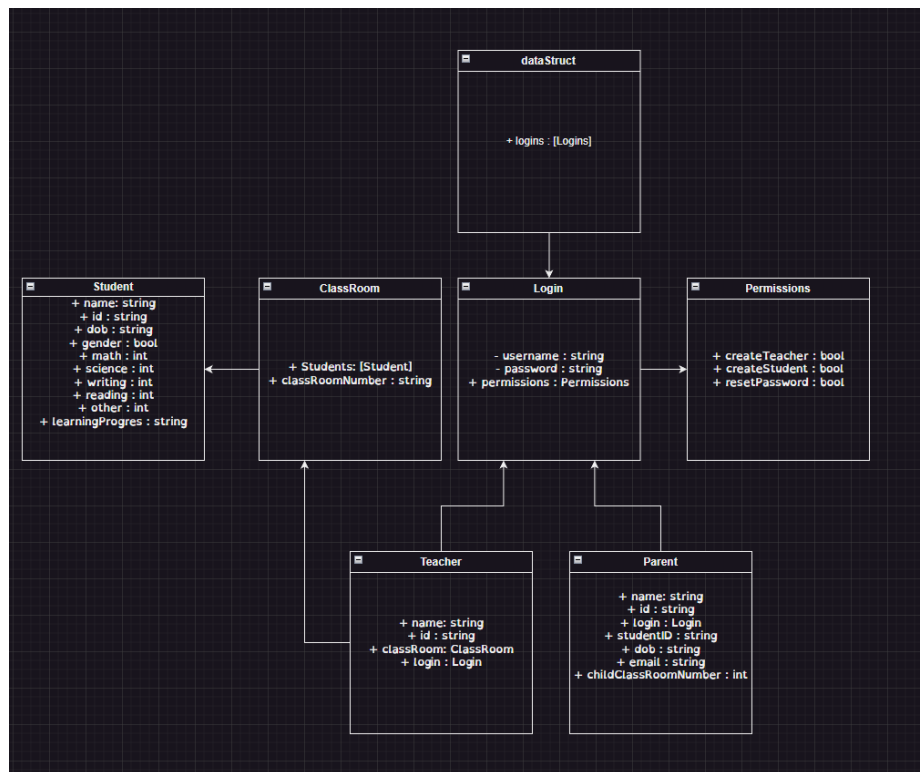
| Use Case | |
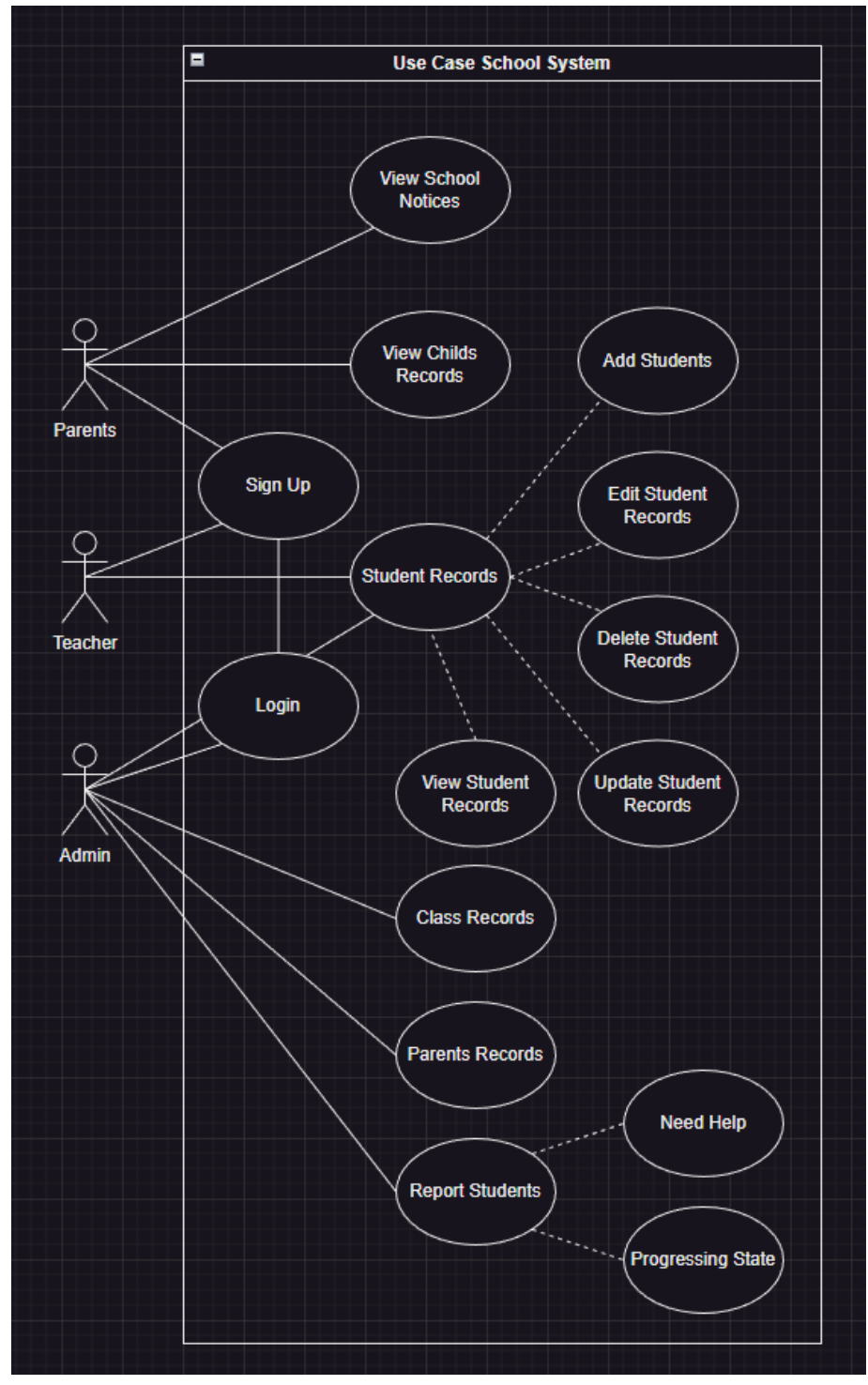
Flow Chart	
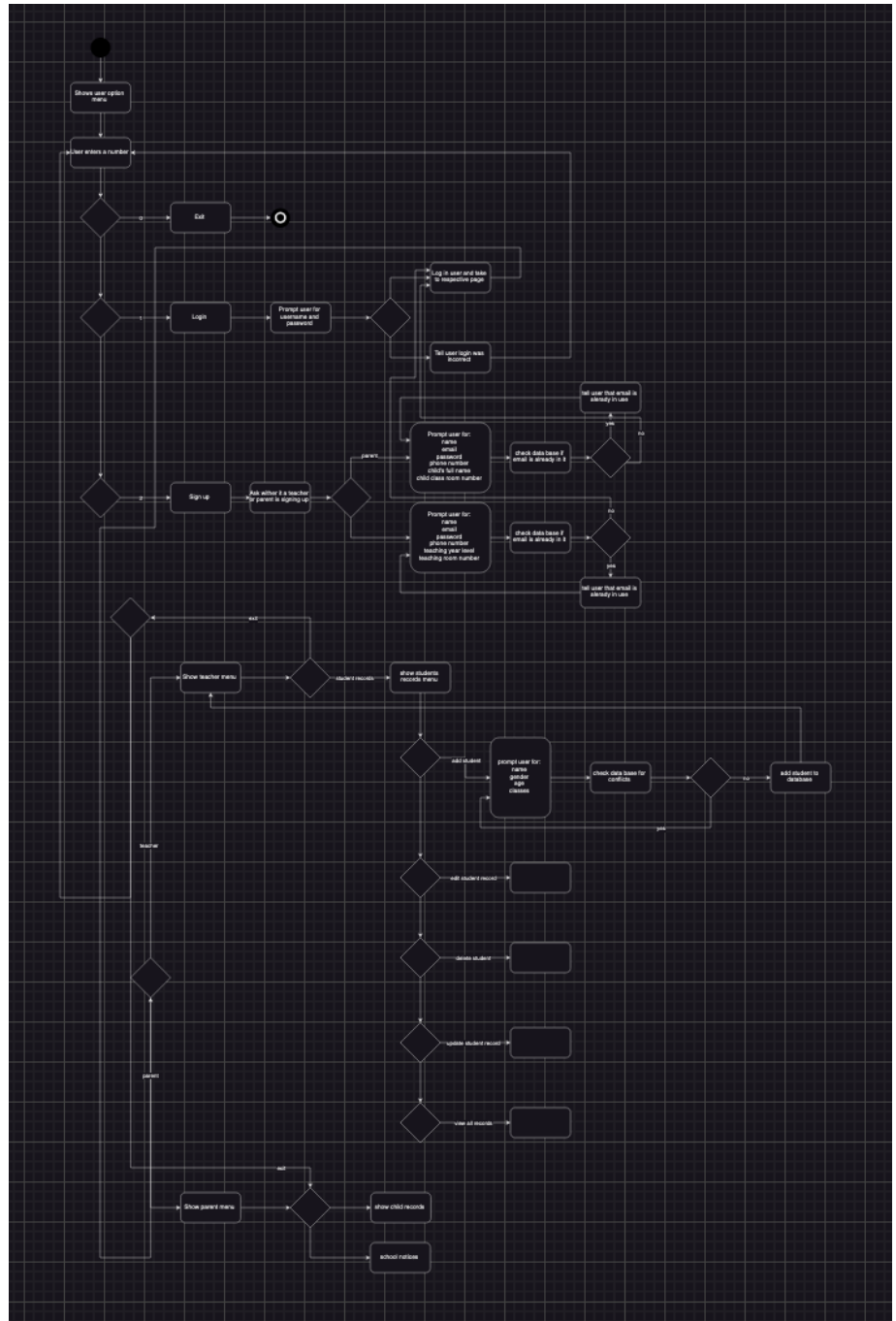
Style Guide:

- Indentation and Style
  - For braces we plan to use Allman throughout our development with our project. And with the text we plan to use 4 spaces/ 1 tab. An example of Allman and the indentation would be this:

```
int main()
{
    return 0;
}
```

- Naming Convention
  - When it comes to naming everything we are going to stick with camelcase for variables and pascal case for classes and structs as it's something we have all learnt to use so would be best to use as a group. An example of CamelCase would be naming a String like "userName". All we do for this is capitalise the first letter for the 2nd word and keep the 1st word all lowercase. Most variables and functions will be written in camel case eg `int userAge = 5;`

```
string name;
string id;
string email;
string dob;
string contactNumber;
Gender gender;
```

- Other
  - Every external file should be limited to 1 class or one purpose. This means a user menu file can have more than 1 function but must all be related to the user menu. This also means a function that for example combines two strings may be used in the user menu but it is not related to it. This function should be put into the correct utility file.
  - Classes in external files must have the same name as the file.

- The naming of constants should be all caps with underscore for spaces eg `int DAYS_IN_YEAR = 365;`

```
const string SAVEFILE = "save.json";
```

- The naming of files is different for utility files and menu files. The menu files are

```
h  db.h
h  Menu_Admin.h
```

pascal case and the utility files are camelcase.
- Internal variables and function props should be prefixed with an underscore eg `int _userAge = 5;`

```
class Student
{
public:
    Student(string _name, string _id, string _dob, Gender
    Student(string _name, string _dob, Gender _gender);
```

- Every external file should be limited to 1 class or one purpose. This means a user menu file can have more than 1 function but must all be related to the user menu. This also means a function that for example combines two strings may be used in the user menu but it is not related to it. This function should be put into the correct utility file.
- Keep the number of indents 3 or less.
- Never abbreviate code names.

Testing and errors:

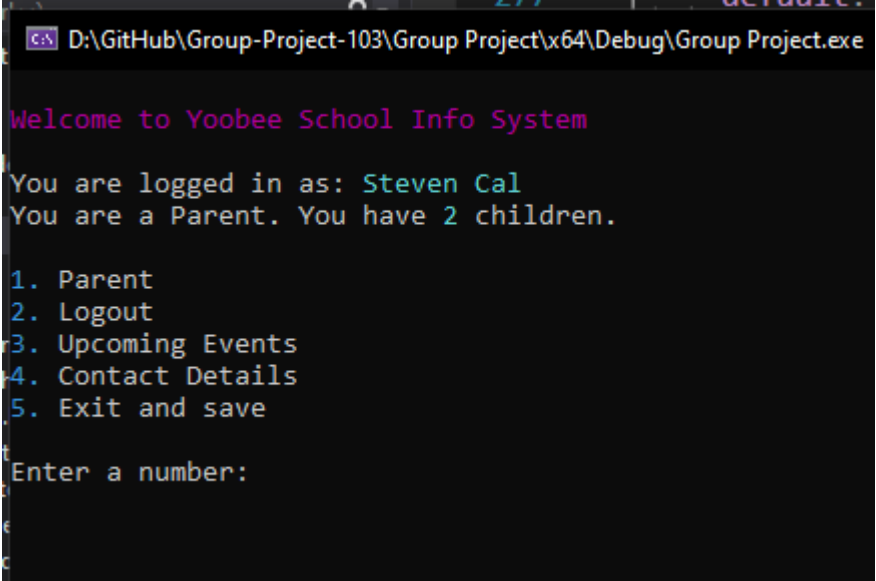|	
Wrong Gender and Does Not Display the Learning Progress correctly	**D:\GitHub\Group-Project-103\Group Project\x64\Debug** View Child's Record Enter your kid's Name and Class: Student's Name: Billy Student's Class: 6 This is the Record for 'students name' Full Name: Billy Gender: Female Maths: 23% / 100% Science: 16% / 100% Writing: 28% / 100% Reading: 28% / 100% Others: 45% / 100% Learning Progress: 2 Press any key to continue...
Only Displaying one of the Parents Child	Parent Records Enter the Parent's Name: Steven Cal This is 'Steven Cal' Record: Full Name: Steven Cal Gender: Male Date of Birth: 02/03/1998 Email: steven.pal@gmail.com Contact Number: 021 734 8235 Child(s) Full Name: Emma Child(s) Classroom Number: 5 Parent/Caregiver Emergency Contact Number: 021 374 2134 Press any key to continue...

| Running the program auto logs you into a user you last used | ```
D:\GitHub\Group-Project-103\Group Project\x64\Debug\Group Project.exe

Welcome to Yoobee School Info System

You are logged in as: Steven Cal
You are a Parent. You have 2 children.

1. Parent
2. Logout
3. Upcoming Events
4. Contact Details
5. Exit and save

Enter a number:
``` |
| | |
| | |

- Test iteratively considering the feedback from users.

User Feedback

Jacob's User Feedback	
How would you describe your overall experience with the program?	
How easy was it for you to achieve what you wanted to do?	
What things did you like/dislike about the program and why?	
Did everything work the way you wanted it to? If not, why?	

William's User Feedback	
How would you	Very responsive and easy to use. Good layout and instructions on

describe your overall experience with the program?	how to navigate the program.
How easy was it for you to achieve what you wanted to do?	Very easy and straightforward to navigate the database.
What things did you like/dislike about the program and why?	It's clear and easy to navigate and change records. Very quick program.
Did everything work the way you wanted it to? If not, why?	Everything worked without issues.

Arthur's User Feedback	
How would you describe your overall experience with the program?	My overall experience was alright. It was a bit confusing at times to navigate around this program but after getting used to its layout it was easy to use and understand.
How easy was it for you to achieve what you wanted to do?	I was given the task to sign up as a parent and find your child's details. This was easy to do as I had already gotten the idea on how everything worked so signing up as a parent was simple and looking at 'my' kids school results was a piece of cake to complete.
What things did you like/dislike about the program and why?	I like the colours that have been added to the text gives this program life and I prefer it way more than a black and white program. Their layout for everything could be improved and changed up. Like adding a table for the students' results as I personally think that would be really good for this type of displaying of student results and all.
Did everything work the way you wanted it to? If not, why?	Everything that I wanted to do seemed to work well but there were a few errors that I ran into just by a misinput that I did. There was nothing more that broke so everything else worked fine and the way I expected it to.

Hack n Plan

Jacob Rosner's Profile	Arthur Werner's Profile	William Gile's Profile
Jacob Rosner 💼 Owner	Guntar (@ ⚙️ Admin	william (@ ⚙️ Admin

Sprint 1	✔ Completed 10
	#13 User Requirements ⏳ 1h 15m / 1h
	#12 Business Requirements ⏳ 2h 47m / 1h 30m
	#16 User experience ⏳ 1h 5m / 2h
	#4 SWOT analysis ⏳ 2h / 1h
	#18 Possibilities n Limitations ⏳ 2h 32m / 3h
	#8 Create base program ⏳ 30m / 30m
	#14 Create UML diagram ⏳ 30m / 30m
	#15 Technical style guide ⏳ 1h / 2h
	#17 Problems in Existing Systems ⏳ 1h 29m / 2h
	#39 Create Database for the Data

Sprint 2	

✔ Completed 16

</> #24 Main menu
⏳ 30m / 30m

</> #20 Contact Page
⏳ 30m / 30m

</> #25 Event Page
⏳ 30m / 30m

</> #21 Login n Sign Up Page
⏳ 30m / 30m

</> #28 Delete Student Record Page
⏳ 30m / 30m

</> #29 Update Record Page
⏳ 30m / 30m

</> #30 View The Record Page
⏳ 30m / 30m

</> #22 Admin home screen
⏳ 30m / 30m

</> #31 Parent Record Page
⏳ 30m / 30m

✔ Completed 16

</> #22 Admin home screen
⏳ 30m / 30m

</> #31 Parent Record Page
⏳ 30m / 30m

</> #33 Class Records Page
⏳ 30m / 30m

</> #34 Student Report Page
⏳ 30m / 30m

</> #36 Parents Home Screen
⏳ 30m / 30m

</> #37 View Child Records Page
⏳ 30m / 30m

</> #38 Display School Notices
⏳ 30m / 30m

</> #26 Student Records Menu

</> #19 Teacher home screen
⏳ 15m / 0h

Sprint 3	**✔ Completed 14**
	</> #23 Student/Parent/Teacher data
	</> #35 Display Student Data
	</> #40 Storing Register Details
	</> #42 Display Childrens Records (Parent Perm)
	</> #43 Display Student Records (Teacher Perm)
	</> #44 View Parent Records (Admin Perm)
	</> #27 Edit Student Records Page
	</> #46 Display Class Records (Admin Perm)
	</> #45 Student Report (Admin Perm)
	</> #41 Login lockout after 3 incorect attemps
	</> #47 Update Student Data
	</> #48 Delete Student Records
	</> #49 Edit Student Records
	</> #50 Add Students
Sprint 4	**🔧 In Progress 1** **⛓ Testing 0** **✔ Completed 1**
	✏ #51 User Feedback **</> #52** Touching Up on Errors and Display

Links:

HacknPlan: https://app.hacknplan.com/p/187825/kanban?categoryId=0&boardId=512784
Github: https://github.com/DCRalph/Group-Project-103