Survey Engine

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# **Introduction**

This project aims to design and implement a dynamic Survey Engine using C++ as the core programming language. The primary goal is to create a console-based system that allows administrators to define surveys with customizable questions and enables users to respond to them interactively. The system stores and organizes responses efficiently, providing a foundation for further data analysis and reporting.

The second phase expands the functionality into a web-based interface using HTML, CSS, JavaScript, PHP, and MySQL. This transition enables a user-friendly online experience, making surveys accessible through browsers while storing results in a structured database for easy retrieval and manipulation.

# **How to Compile and Run**

The program can be compiled and run using g++ by running the following command within the source directory:

g++ Question.cpp Response.cpp Survey.cpp User.cpp Record.cpp Survey\_Engine.cpp main.cpp -o a; ./a.exe

# **Flowchart**

A black and white diagram

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A screenshot of a computer screen

AI-generated content may be incorrect.

# **UML Diagrams**

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# **Glossary of Classes**

## **Question Class**

### **Question Members Variables**

|  |  |  |  |
| --- | --- | --- | --- |
| **Member** | **Type** | **Access** | **Description** |
| text | string | Private | The text of the question |
| choices | vector<string> | Private | Answer’s choices |
| isMultipleChoice | bool | Private | Indicates whether the question has multiple choices |

### **Question Member Functions**

|  |  |  |  |
| --- | --- | --- | --- |
| **Function** | **Return** | **Access** | **Description** |
| Question | Constructor | Public | Initializes a question with text and type |
| addChoice | void | Public | Adds a choice if the question is multiple choice |
| display | void | Public | Displays the question and its choices |
| getIsMultipleChoice | bool | Public | Returns whether the question is multiple choice |
| getChoices | vector<string> | Public | Returns all answers choices |
| getText | string | Public | Returns the question text |
| getChoiceText | string | Public | Returns the text of a specific choice or an error message |

## **Responses Class**

### **Response Member Variables**

|  |  |  |  |
| --- | --- | --- | --- |
| **Member** | **Type** | **Access** | **Description** |
| userName | string | Private | Name of the user who submitted the response |
| surveyIndex | int | Private | Index of the survey this response is associated with |
| answers | map<int, string> | Private | Map of question indices to user-submitted answers |

### **Response Member Functions**

|  |  |  |  |
| --- | --- | --- | --- |
| **Function** | **Return** | **Access** | **Description** |
| Response | Constructor | Public | Initializes a response with the user's name and the survey index |
| getUser | string | Public | Returns the name of the user who submitted the response |
| getSurveyIndex | int | Public | Returns the index of the associated survey |
| recordAnswer | void | Public | Records the user’s answer for a given question |
| display | void | Public | Displays the response, including question text and formatted answer |
| getAnswers | map<int, string> | Public | Returns the map of question indices to answers |

## **Survey Class**

### **Survey Member Variables**

|  |  |  |  |
| --- | --- | --- | --- |
| **Member** | **Type** | **Access** | **Description** |
| title | string | Private | Title of the survey |
| questions | vector<Question> | Private | A list of all questions included in the survey |

### **Survey Member Variables**

|  |  |  |  |
| --- | --- | --- | --- |
| **Function** | **Return** | **Access** | **Description** |
| Survey | Constructor | Public | Initializes the survey with a given title |
| addQuestion | void | Public | Add a Question object to the survey |
| display | void | Public | Display the survey title and all its questions |
| getQuestion | Question | Public | Return the question at a given index |
| getAllQuestions | vector<Question> | Public | Return a vector containing all questions in the survey |
| getTitle | string | Public | Return the title of the survey |

## **User class**

### **User Member Variables**

|  |  |  |  |
| --- | --- | --- | --- |
| **Member** | **Type** | **Access** | **Description** |
| userName | string | Private | Username |
| isAdmin | bool | Private | Indicates whether the user has admin privileges. |
| takenSurveys | vector<int> | Private | Stores the indices of surveys the user has taken. |

### **User Member Functions**

|  |  |  |  |
| --- | --- | --- | --- |
| **Function** | **Return** | **Access** | **Description** |
| User | Constructor | Public | Initializes a user with a name and admin status |
| getUsername | string | Public | Return the username |
| getIsAdmin | bool | Public | Return true if the user is an admin |
| setAdmin | void | Public | Set the admin status for the user |
| userToFile | void | Public | Write the user data to a binary file |
| userFromFile | void | Public | Read the user data from a binary file |

## **Record class**

### **Record Member Functions**

|  |  |  |  |
| --- | --- | --- | --- |
| **Function** | **Return** | **Access** | **Description** |
| saveUsers | void | Public | Save a list of users to a binary file |
| loadUsers | vector<User> | Public | Load users from a binary file |
| saveSurveys | bool | Public | Save a list of surveys and their questions to a binary file. |
| loadSurveys | vector<Survey> | Public | Loads surveys and their questions from a binary file. |
| saveResponses | void | Public | Save a list of user responses to a binary file |
| loadResponses | vector<Response | Public | Load user responses from a binary file. |

## **Survey\_Engine class**

### **Survey\_Engine Member Variables**

|  |  |  |  |
| --- | --- | --- | --- |
| **Member** | **Type** | **Access** | **Description** |
| surveys | vector<Survey> | Private | Store all created survey |
| responses | list<Response> | Private | Store all user responses to surveys |
| users | vector<User> | Private | List of all users in the system |
| currentUser | User\* | Private | Pointer to currently logged-in user |

### **Survey\_Engine Member Functions**

|  |  |  |  |
| --- | --- | --- | --- |
| **Function** | **Return** | **Access** | **Description** |
| Survey\_Engine | Constructor | Public | Initializes the engine by loading users, surveys, and responses from file. |
| loginUser | void | Public | Handle login or account creation and assigns the current user. |
| saveData | void | Public | Saves all users, surveys, and responses to binary files. |
| createSurvey | void | Public | Allows admin users to create a new survey. |
| takeSurvey | void | Public | Allow a user to take a survey and record responses. |
| viewResults | void | Public | Display users who took a specific survey and lets you view their answers. |
| start | void | Public | Starts the program and displays user-specific menu options. |

## **Proof of a working product**

This is an example of the program executing. The output log in steps of the program and the process of creating a survey, taking a survey, viewing the results of the survey, and the different menus whether the user is admin or not.

A screen shot of a computer

AI-generated content may be incorrect.

A screenshot of a computer program

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