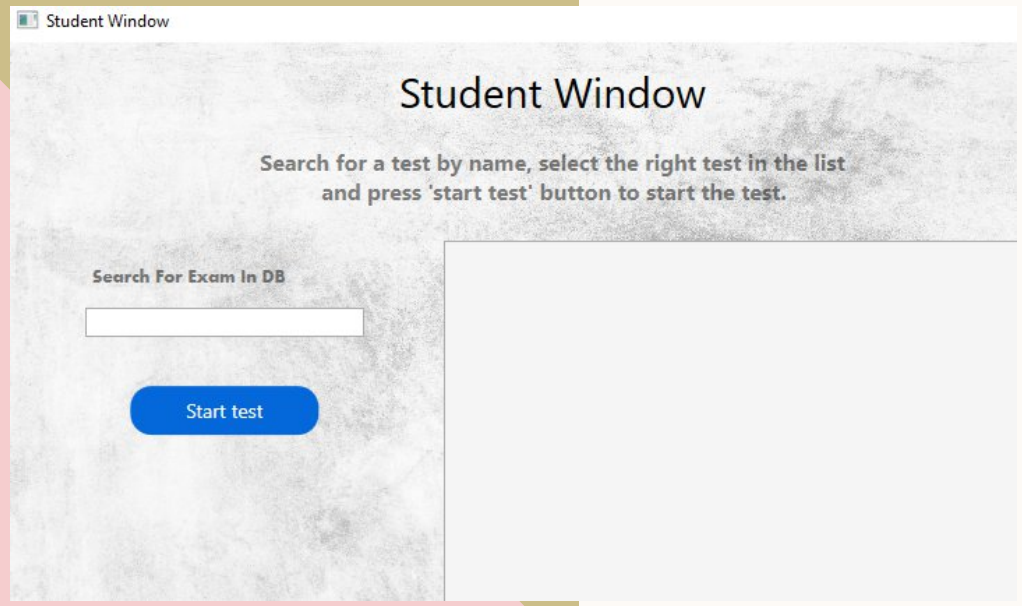
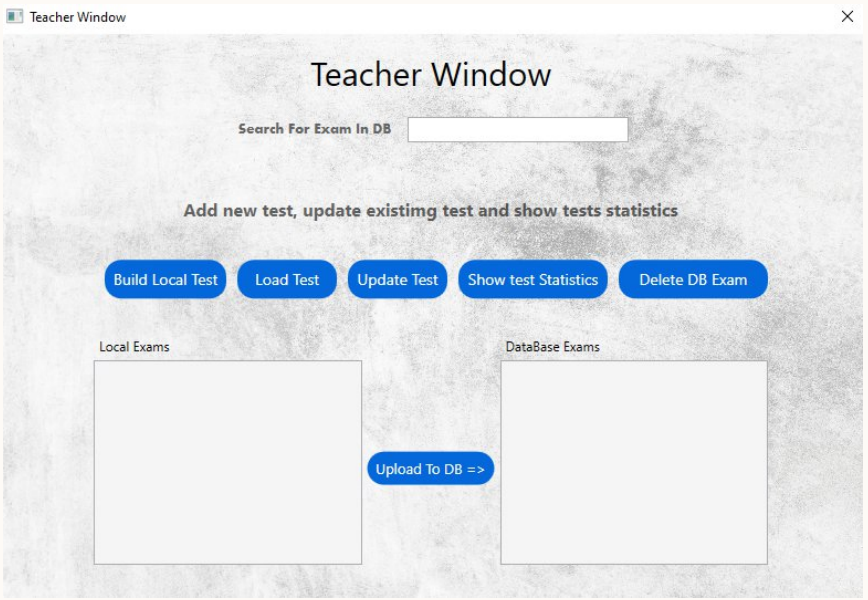
Test Administration

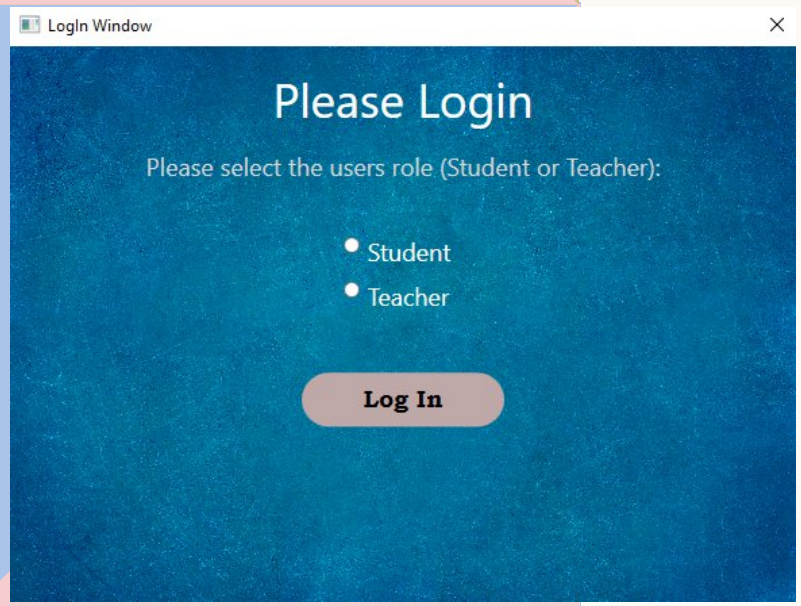
Final Project in :

C#.NET

By: Tomer Ramon







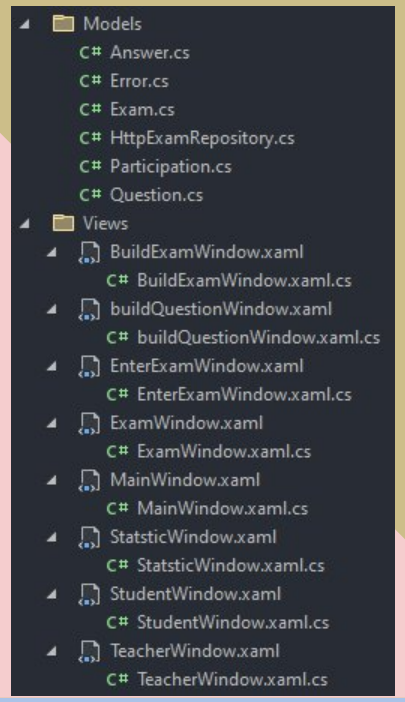
This project is about managing a test interface for both teachers and students.

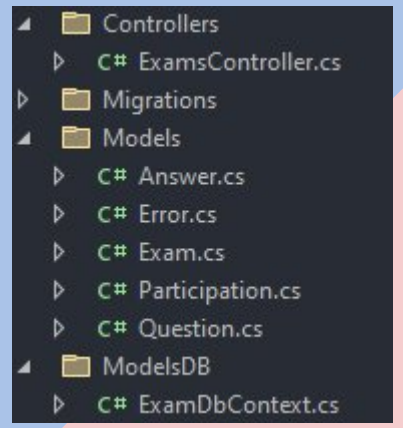
For each of the users, the application provides different options with the help of different management screens.

For a teacher, he has the options of creating, saving, editing, updating and deleting tests within a database.

In addition, he has the option to see statistical data for the test he has chosen.

Student can search and solve an exam.





GENERAL STRUCTURE

Client Side:

- Models:
  - Exam.cs
  - Question.cs
  - Participation.cs
  - Answer.cs
  - Error.cs
- Repositories:
  - HttpExamRepository.cs
- Views:
  - BuildExamWindow.xaml.cs
  - buildQuestionWindow.xaml.cs
  - EnterExamWindow.xaml.cs
  - ExamWindow.xaml.cs
  - MainWindow.xaml.cs
  - StatsticWindow.xaml.cs
  - StudentWindow.xaml.cs
  - TeacherWindow.xaml.cs

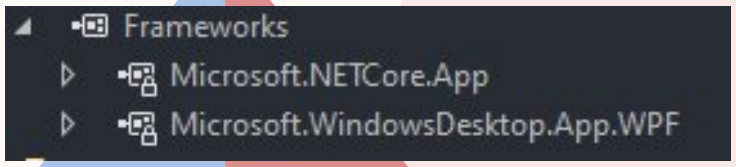
Server Side:

- Models:
  - Exam.cs
  - Question.cs
  - Participation.cs
  - Answer.cs
  - Error.cs
- ModelsDB:
  - ExamDbContext.cs
- Controllers:
  - ExamController.cs

FRAMEWORKS & NUGET TECHNOLOGIES

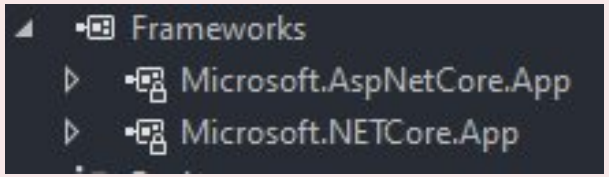
Telhai. CS.Final.Client:

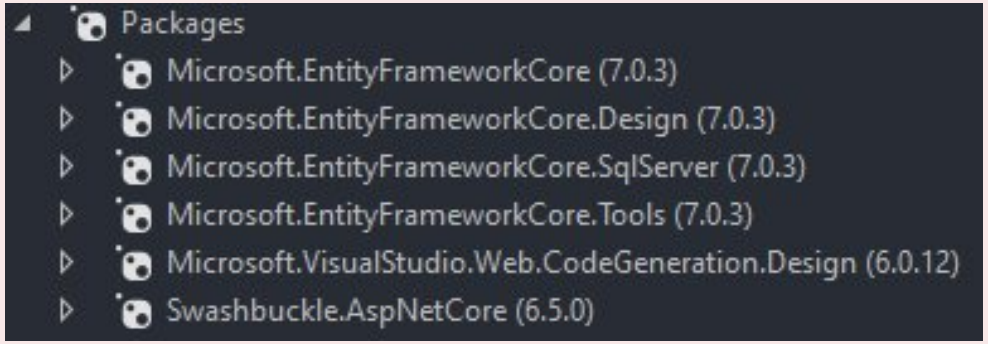
For the client side I used the following Frameworks as required of us:



Telhai.CS.Final.Server:

In the server side, frameworks alone wasn enough and in addition I used some nuget packages for accessing and working with a database





LIST OF SCREENS ON THE CLIENT SIDE

- BuildExamWindow.xaml
- buildQuestionWindow.xaml
- EnterExamWindow.xaml
- ExamWindow.xaml
- MainWindow.xaml
- StatsticWindow.xaml
- StudentWindow.xaml
- TeacherWindow.xaml

LIST OF API FUNCTIONS FOR ACCESSING SERVER

HttpExamRepository.cs functions:

Exam functions:

```
public async Task<List<Exam>> GetAllExamsAsync();
public async Task<Exam> GetExamAsync(int id);
public async Task<Exam?> AddExamAsync(Exam exam);
public async Task<Exam?> UpdateExamAsync(Exam exam);
public async Task<Exam?> RemoveExamAsync(int examId);
```

Question function:

```
public async Task<Question?> AddQuestionAsync(int examId, Question question);
public async Task<Exam?> RemoveQuestionAsync(Exam exam, Question question);
```

Participation function:

```
public async Task<Participation?> AddParticipationAsync(int examId, Participation participation);
```

LIST OF API FUNCTIONS FOR ACCESSING SERVER

ExamController.cs functions:

```
/* Exam functions: */

// GET: api/Exams
[HttpGet]

public async Task<ActionResult<IEnumerable<Exam>>> GetExams();

// GET: api/Exams/5
[HttpGet("{id}")]

public async Task<ActionResult<Exam>> GetExam(int id);

// PUT: api/Exams/5
[HttpPut("{id}")]

public async Task<IActionResult> PutExam(int id, Exam exam);

// POST: api/Exams
[HttpPost]

public async Task<ActionResult<Exam>> PostExam(Exam exam);

// DELETE: api/Exams/5
[HttpDelete("{id}")]

public async Task<IActionResult> DeleteExam(int id);

0 references
private bool ExamExists(int id);
```

```
/* Question functions: */

[HttpPost("{examId}/Questions")]

public async Task<ActionResult<Question>> PostQuestion(int examId, Question question);

// DELETE: api/Exams/5
[HttpDelete("{examId}/Questions/{questionId}")]

public async Task<IActionResult> DeleteQuestion(int examId, int questionId);
```

```
/* Participation functions: */

[HttpPost("{examId}/Participations")]

public async Task<ActionResult<Participation>> PostParticipation(int examId, Participation participation);
```

TABLES DEFINITIONS IN THE EXAMCONTEXT


```
8 references
public DbSet<Exam> Exams { get; set; }
3 references
public DbSet<Question> Questions { get; set; }
0 references
public DbSet<Answer> Answers { get; set; }
1 reference
public DbSet<Participation> Participations { get; set; }
0 references
public DbSet<Error> Errors { get; set; }
```

In addition to these definitions, there is also the definition of the relationships between the tables:

one Exam has -many Questions.

one Question has - many Answers.

one Exam has - many Participations.

one Participation has – many Errors.

.JSON FILES:

For the exam files that are saved locally as a .Json files, there is a dedicated folder in the project folder, the path to the folder is:

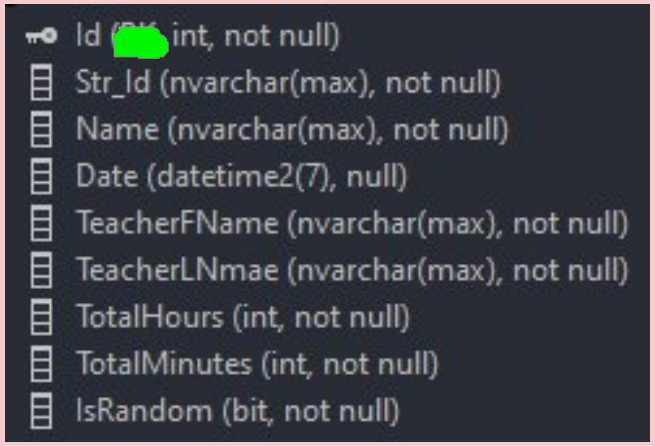
\Final Project\Telhai.CS.Final.Client\bin\Debug\net6.0-windows\Local_Exams

The role of this folder is to save the new tests that are created before they are sent to the server (DB), in addition this is the folder where the tests are saved when you click the save button on the build exam screen.

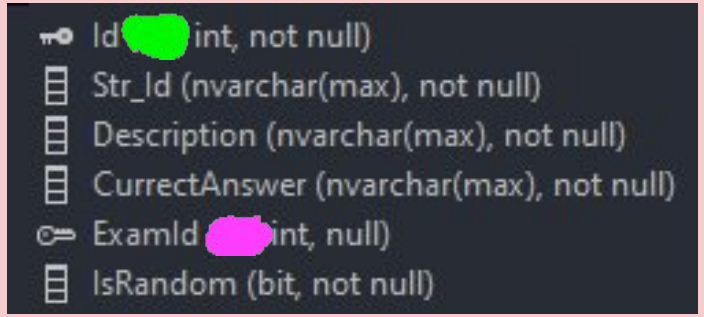
When the teachers window is loaded, the “loadexams()” function is activated from “HttpExamRepository.cs”, which accesses the folder, reads all the JSON files (if any), serialize them to be exam files, and finally sends them to be displayed in the listbox of local exams in the window.

TABLES AND COLUMNS IN THE DATABASE

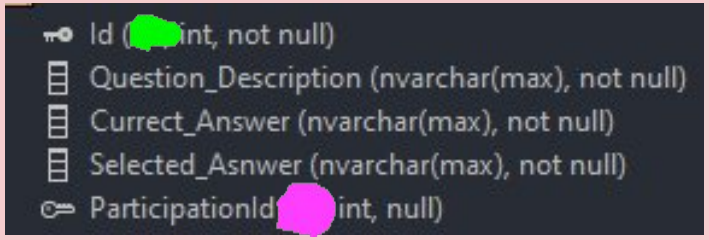
EXAM



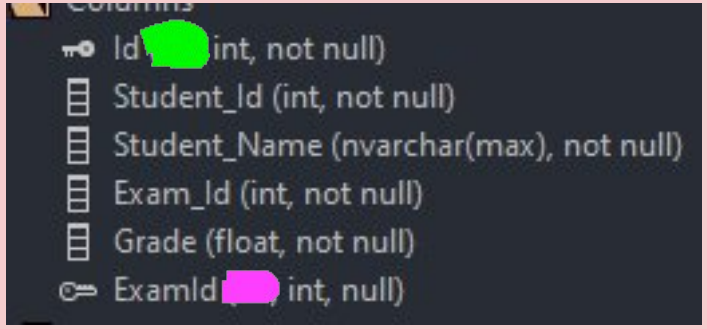
QUESTION



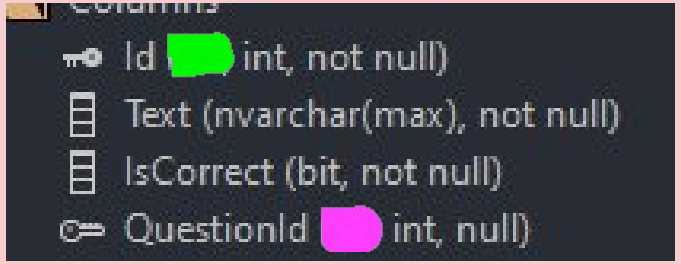
ERROR



PARTICIPATION



ANSWER



TABLES AND COLUMNS IN THE DATABASE – SCREENSHOTS

EXAMS:

Id	Str_Id	Name	Date	TeacherFName	TeacherLNmae	TotalHours	TotalMinutes	IsRandom
5007	c8cdbfb0-2395-4d7d-a517-54e1e7da8085	C#.NET	21-Mar-23 18:25:00	Gad	Shor	3	30	True
5008	e3ae7c8d-7fea-41b4-96e0-0344925daa3f	Discrete Math	21-Mar-23 18:33:00	Soli	Wishkautzen	1	30	True
5009	bacf55e0-e148-486b-8b37-5297184aac11	Java	21-Mar-23 18:39:00	Roni	Sivan	1	45	False
5010	f0e9ddb2-ecb8-4af3-86e9-f091349b1afd	C++	21-Mar-23 18:36:00	Ofer	Shir	3	0	False
NULL	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*

PARTICIPATIONS:

Id	Student_Id	Student_Name	Exam_Id	Grade	ExamId
3002	204621510	tomer ramon	5007	77.777777...	5007
3003	304622545	ben ben	5007	100.00000...	5007
3004	123456789	israel cohen	5007	44.444444...	5007
3005	204621510	tomer ramon	5010	100	5010
3006	123456789	israel cohen	5010	66.666666...	5010
3007	204621510	tomer ramon	5009	40	5009
NULL	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*

ANSWERS:

Id	Text	IsCorrect	QuestionId
7022	A programming language	True	7009
7023	A web framework	False	7009
7024	An operating system	False	7009
7025	A database management system	False	7009
7026	string	False	7010
7027	int	True	7010
7028	class	False	7010
7029	object	False	7010
7030	It specifies that a method does not return a val...	True	7011
7031	It indicates a method is public	False	7011
7032	It declares a variable	False	7011
7033	It initializes an array	False	7011
7034	new	True	7012
7035	create	False	7012
7036	instance	False	7012
7037	allocate	False	7012
7038	private	True	7013
7039	protected	False	7013
7040	public	False	7013
7041	internal	False	7013
7042	for loop	False	7014
7043	while loop	False	7014
7044	switch statement	True	7014
7045	do-while loop	False	7014
7046	A class is a blueprint, while an object is an inst...	True	7015
7047	A class and an object are the same thing	False	7015
7048	An object is a blueprint, while a class is an inst...	False	7015
7049	A class is a method, while an object is a variable	False	7015

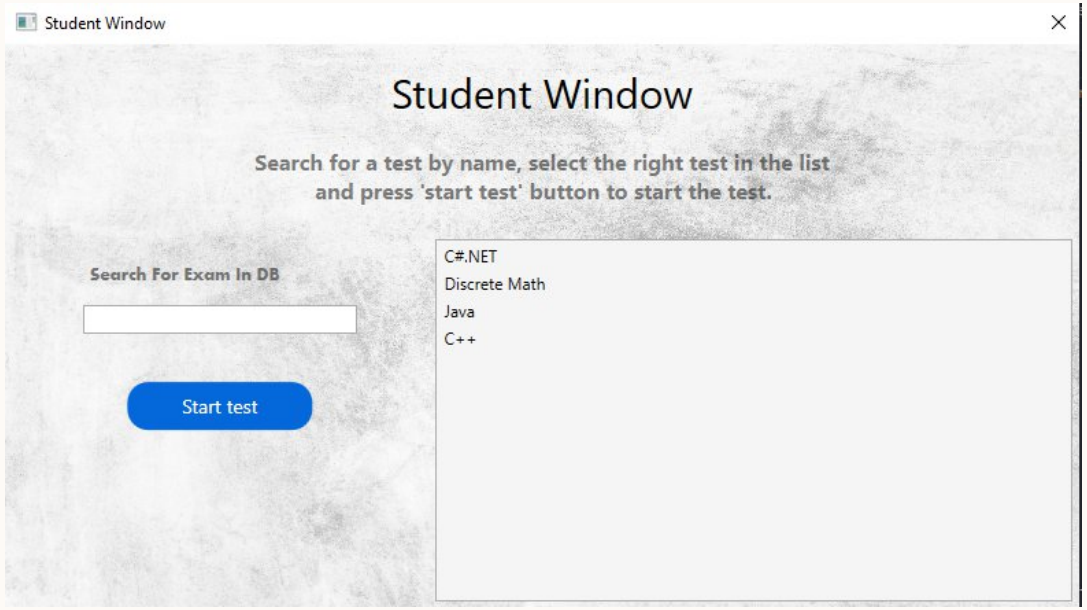
ERRORS:

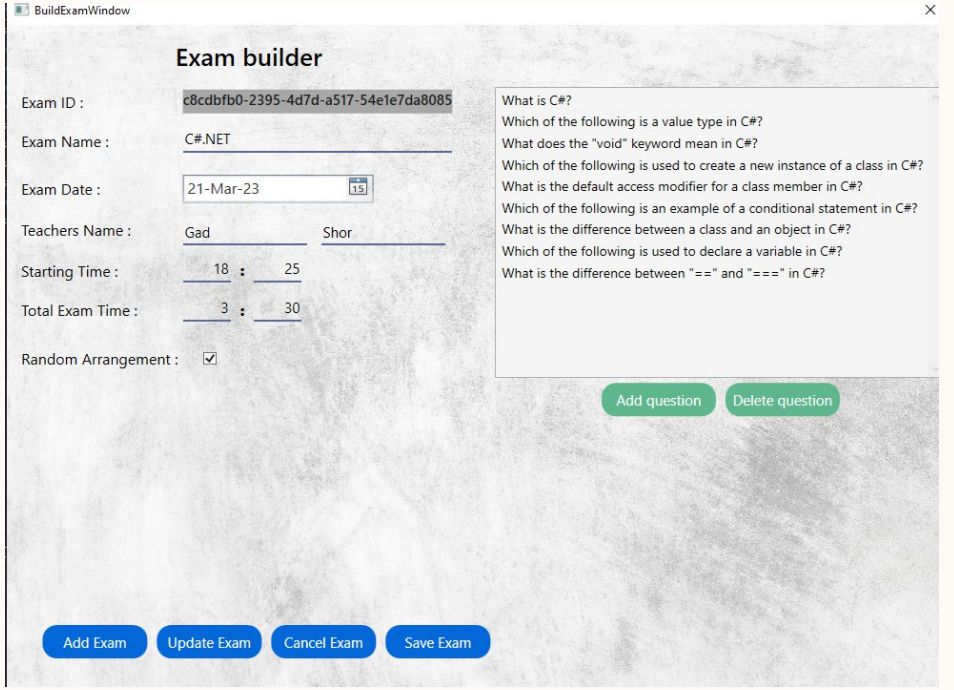
Id	Question_Description	Currect_Answer	Selected_Asnwer	ParticipationId
3002	What is the difference between a class and an object in C#?	A class is a blueprint, while an object is an instance of a class	A class and an object are the same thing	3002
3003	Which of the following is an example of a conditional statement in C#?	switch statement	for loop	3002
3004	Which of the following is a value type in C#?	int	string	3004
3005	Which of the following is used to create a new instance of a class in C#?	new	instance	3004
3006	Which of the following is used to declare a variable in C#?	var	const	3004
3007	What is the default access modifier for a class member in C#?	private	internal	3004
3008	What is the difference between a class and an object in C#?	A class is a blueprint, while an object is an instance of a class	A class and an object are the same thing	3004
3009	What is the purpose of the "cin" statement in C++	It reads input from the user.	It outputs text to the console.	3006
3010	What is the correct syntax for declaring an array in Java?	int[ ] numbers;	int numbers[ ];	3007
3011	Which of the following statements is true regarding inheritance in Java?	A subclass inherits all the properties and methods of its superclass.	A subclass can access the private members of its superclass.	3007
3012	What is the correct syntax for the \u0022if-else\u0022 statement in Java?	if (condition) { } else { }	if (condition) { } else (condition) { }	3007
NULL	*NULL*	*NULL*	*NULL*	*NULL*

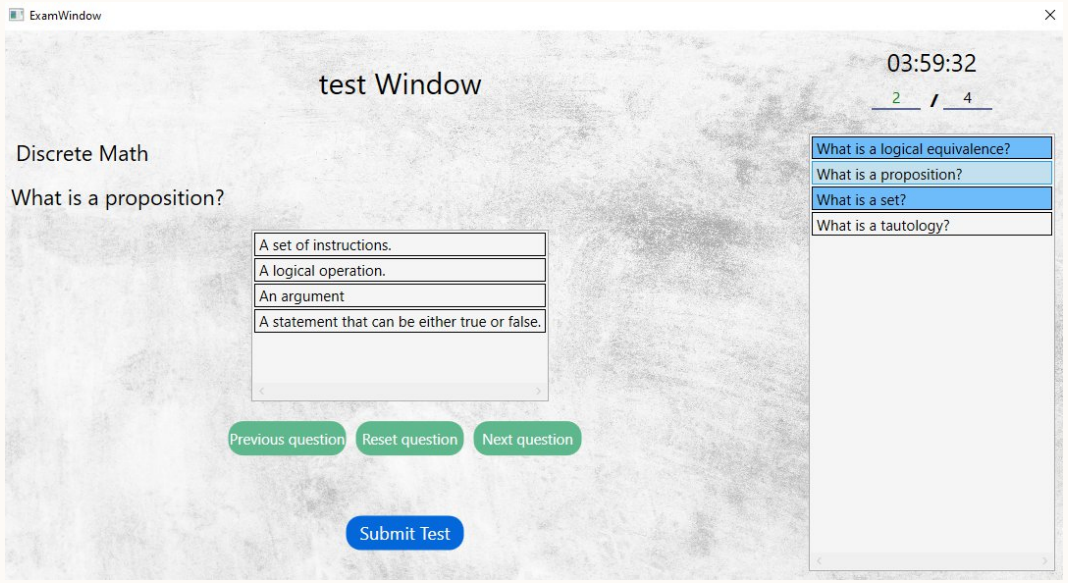
QUESTIONS:

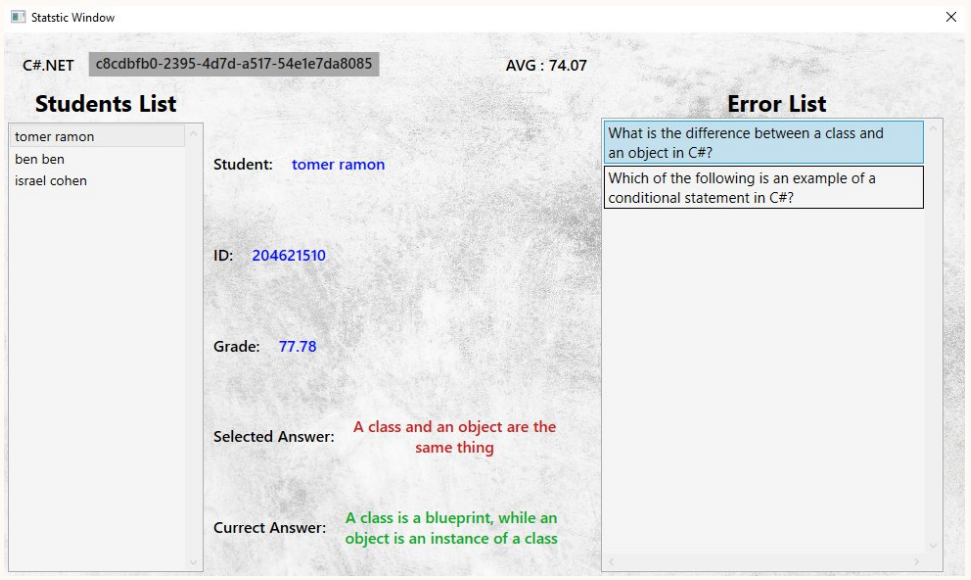
	Id	Str_Id	Description	CurrectAnswer	ExamId	IsRandom
▷	7009	668af499-d407-4abf-8ada-f353c307f68e	What is C#?	A programming language	5007	True
	7010	56c2f282-c8ea-4165-8c6c-b60f23847f8e	Which of the following is a value type in C#?	int	5007	True
	7011	50546bf5-f031-42f3-b848-cbd2bc0de435	What does the "void" keyword mean in C#?	It specifies that a method does not return a value	5007	True
	7012	ad9c7056-ce87-46ae-9522-f336eb59d13e	Which of the following is used to create a new instance of a class in C#?	new	5007	True
	7013	a6d516e5-0a00-4e6c-9e55-6648e21e19bd	What is the default access modifier for a class member in C#?	private	5007	True
	7014	07db7f9a-0046-41ee-8857-347972c08fff	Which of the following is an example of a conditional statement in C#?	switch statement	5007	True
	7015	e6fbc448-bd08-4f2a-bc3b-2d682593884e	What is the difference between a class and an object in C#?	A class is a blueprint, while an object is an instance of a class	5007	True
	7016	ae9771f9-ae77-4cb9-b5a7-87f949f76e14	Which of the following is used to declare a variable in C#?	var	5007	True
	7017	ab9df49b-3b3a-49c3-875f-862e25d8c2e5	What is the difference between "==" and "===" in C#?	"==" compares the value, while "===" compares the value and the type	5007	True
	7018	c5a5805e-88ea-42f0-b67b-e40a065414e9	What is a proposition?	A statement that can be either true or false.	5008	True
	7019	20284127-f129-401a-838b-280609dcd44c	What is a tautology?	A statement that is always true.	5008	True
	7020	5b0971c0-f7fb-4a5f-905a-9d8bbeb3d2a2	What is a logical equivalence?	Two propositions that have the same truth value for all possible inputs.	5008	True
	7021	b5a52c1f-e5ba-4459-8203-d537ddf63816	What is a set?	A collection of unordered elements	5008	True
	7022	86964cf4-800a-4d76-b048-a0a6e636793c	Which of the following is NOT a primitive data type in Java?	string	5009	True
	7023	5985ad12-3580-4a14-b58e-9a14277a7f48	What is the correct syntax for declaring an array in Java?	int[ ] numbers;	5009	True
	7024	1f35576c-e902-42cc-89a7-19386c9b22df	Which of the following statements is true regarding inheritance in Java?	A subclass inherits all the properties and methods of its superclass.	5009	True
	7025	3d1500e7-4d41-4c2d-a1d4-efbe55613e7e	What is the correct syntax for the \u0022if-else\u0022 statement in Java?	if (condition) { } else { }	5009	True
	7026	14e6b7b9-bfde-449c-86ea-c096a5c88fe7	What is the purpose of the "this" keyword in Java?	To reference the current object.	5009	True
	7027	765aad53-8d60-4f44-beaf-860f05b6923e	Which of the following is used to declare a variable in C++	int	5010	True
	7028	86b98932-2dd8-45aa-9cdb-fc46ad03e17a	What is the purpose of the "cin" statement in C++	It reads input from the user.	5010	True
	7029	a28187af-726d-4811-b1fd-32657f422ed4	Which of the following is NOT a C++ control structure?	while-else loop	5010	True
◇	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*	*NULL*

FEW WINDOWS SCREENSHOTS

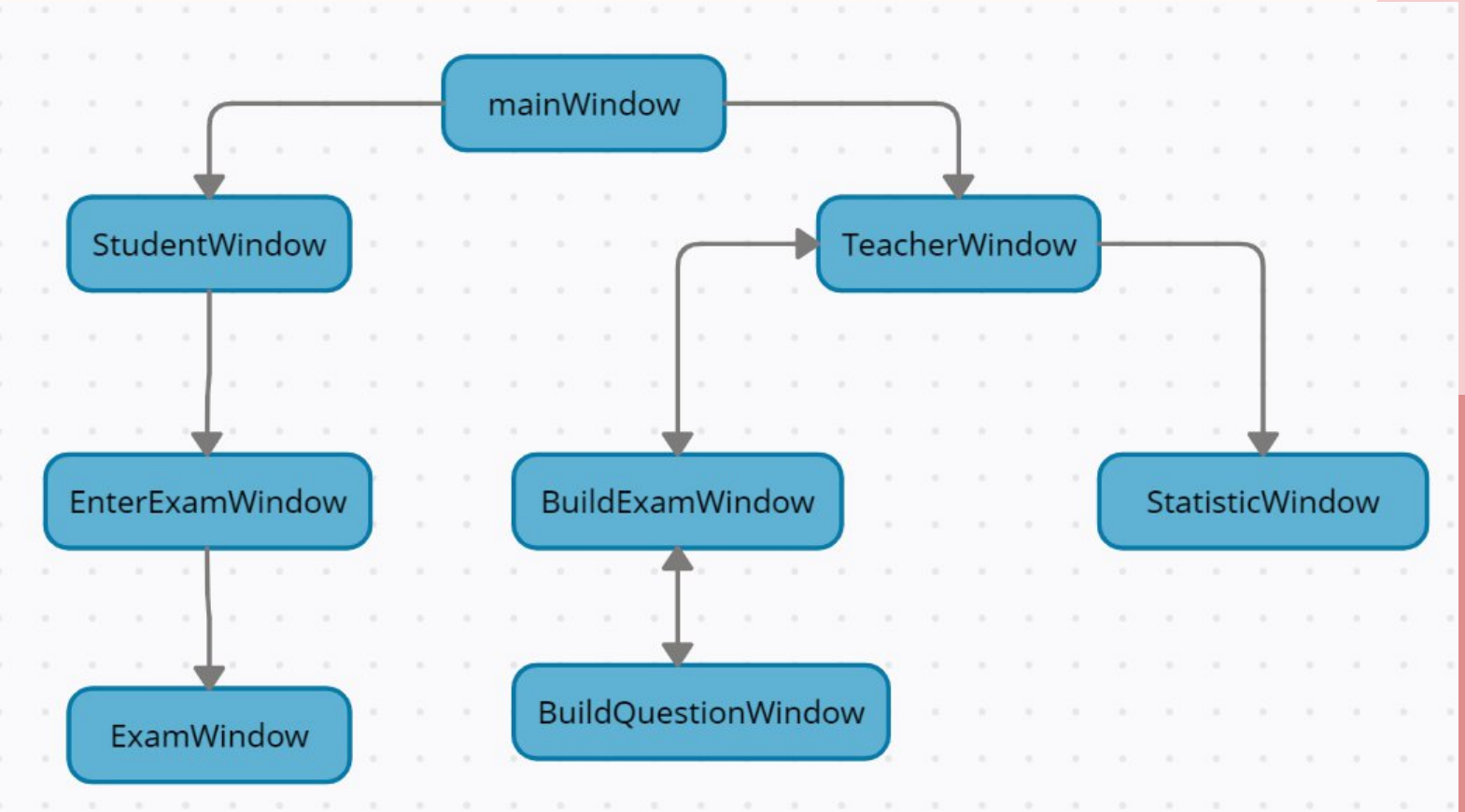








GENERAL DATA FLOW



THANK YOU