EXCEPTION HANDLING

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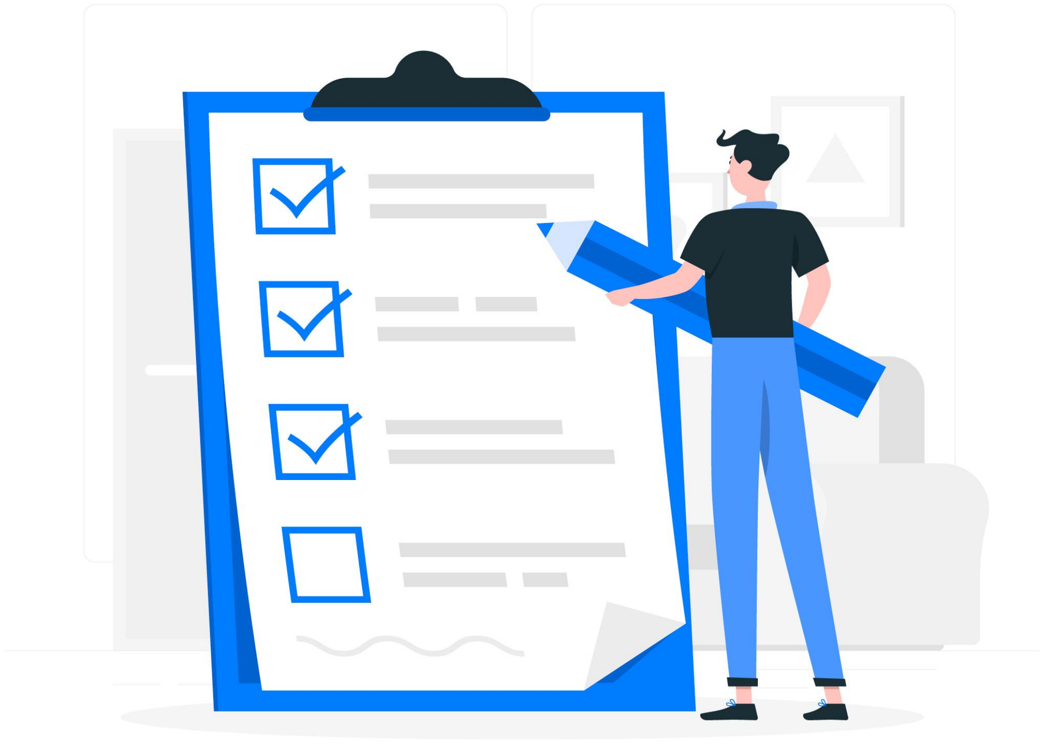

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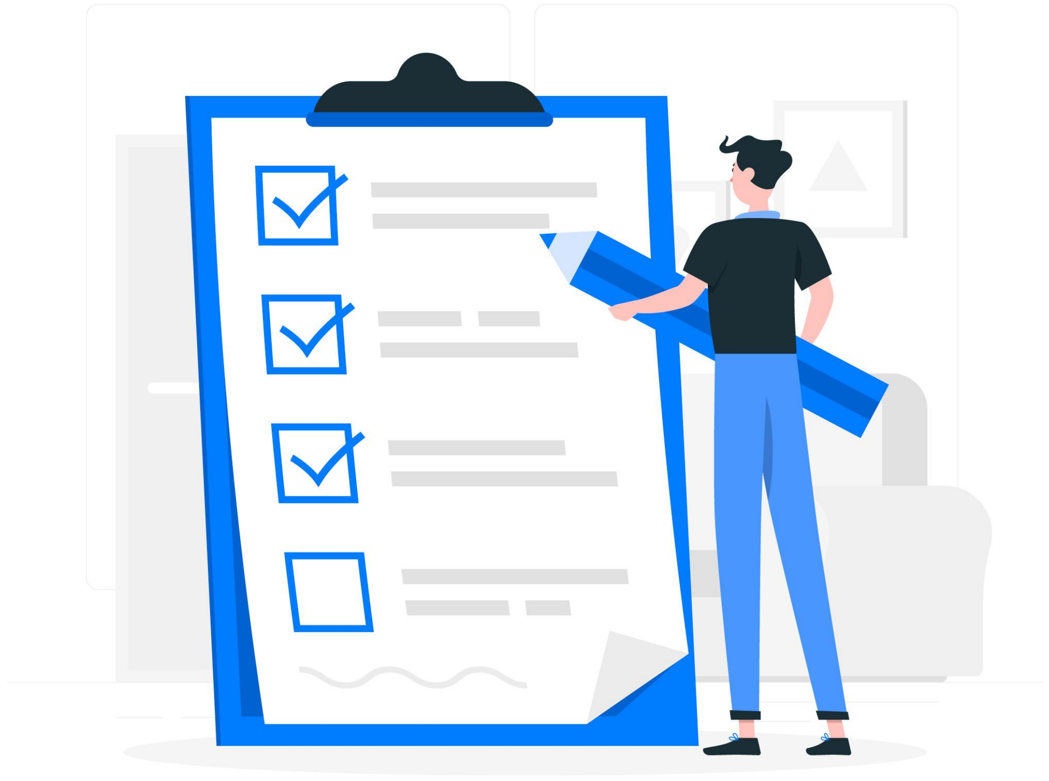

What Is Exception???

Exception is an event during the execution of the program

It disrupts the normal flow of instructions during the execution of a program.

An exception is an unexpected state during the execution of code

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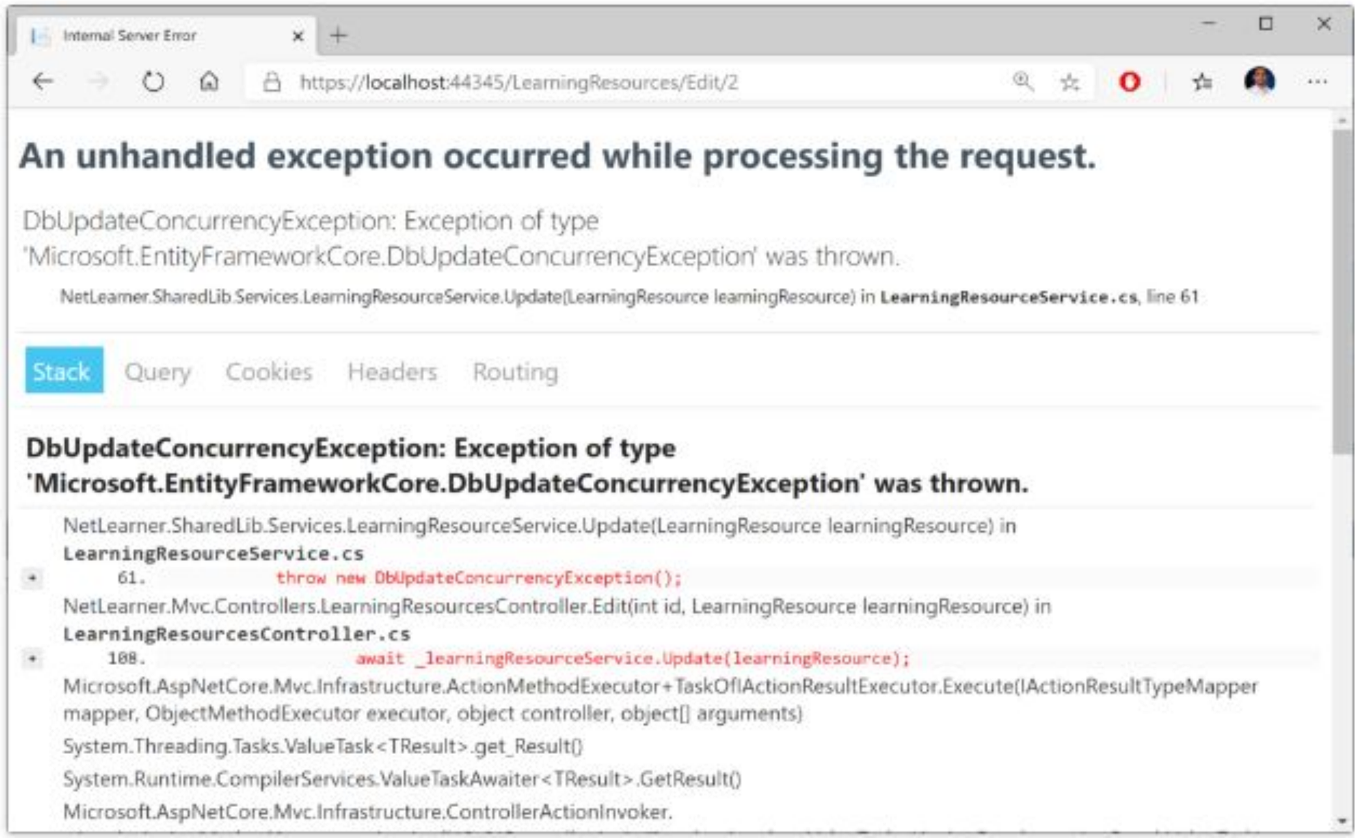
Why should we catch exceptions

- To make your program robust and reliable.
- And it is vital for ensuring the quality of your code .
- A good programmer is someone who never introduce bad code in his projects
- If an exception is not 'handled' in code

  The application will crash and user will see an ugly message.

  Instead, you can catch the exception, log the errors and show a friendly message to the user.

Example:



An unhandled exception occurred while processing the request.

DbUpdateConcurrencyException: Exception of type 'Microsoft.EntityFrameworkCore.DbUpdateConcurrencyException' was thrown.

NetLearner.SharedLib.Services.LearningResourceService.Update(LearningResource learningResource) in `LearningResourceService.cs`, line 61

DbUpdateConcurrencyException: Exception of type 'Microsoft.EntityFrameworkCore.DbUpdateConcurrencyException' was thrown.

```
NetLearner.SharedLib.Services.LearningResourceService.Update(LearningResource learningResource) in
LearningResourceService.cs
    61.             throw new DbUpdateConcurrencyException();
NetLearner.Mvc.Controllers.LearningResourcesController.Edit(int id, LearningResource learningResource) in
LearningResourcesController.cs
   108.                     await _learningResourceService.Update(learningResource);
Microsoft.AspNetCore.Mvc.Infrastructure.ActionMethodExecutor+TaskOfIActionResultExecutor.Execute(IActionResultTypeMapper
mapper, ObjectMethodExecutor executor, object controller, object[] arguments)
System.Threading.Tasks.ValueTask<TResult>.get_Result()
System.Runtime.CompilerServices.ValueTaskAwaiter<TResult>.GetResult()
Microsoft.AspNetCore.Mvc.Infrastructure.ControllerActionInvoker.
```

'

Exception and Error?

An error is the event; an exception is the object that event creates.

When an error interrupts the flow, the program tries to find an exception handler

A block of code that tells it how to react,Which will help it resume the flow.

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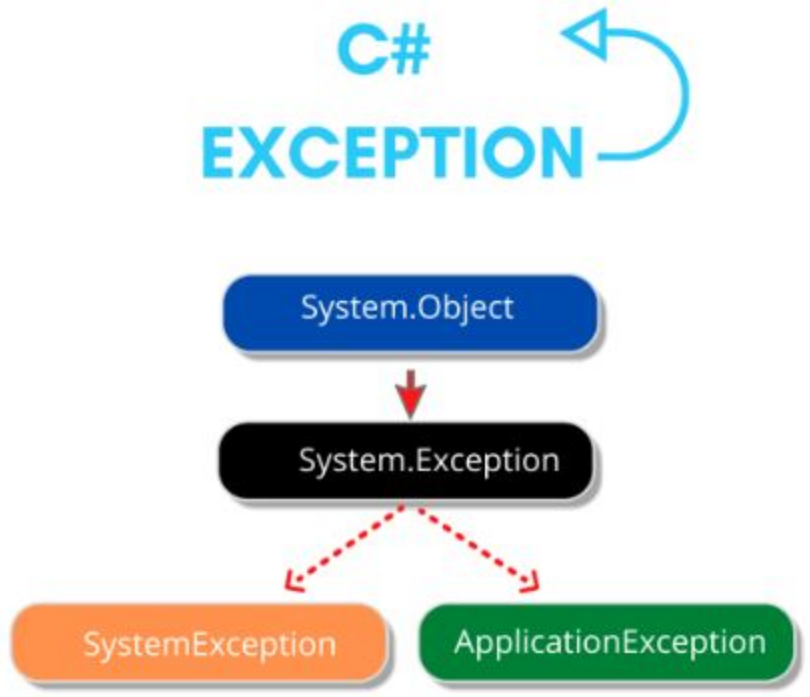
TYPES OF EXCEPTION

SYSTEM EXCEPTION

Thrown by the CLR at run time

APPLICATION EXCEPTION

Thrown By Application,using “throw” Clause



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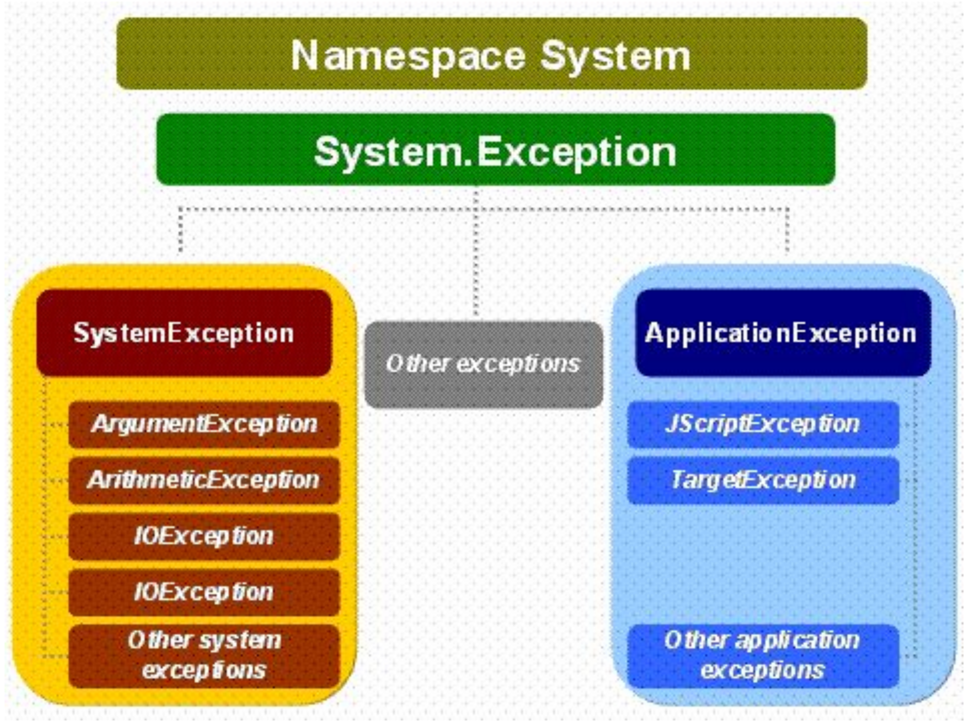
Namespace

System.Exception is the base class for all exceptions in C#.



System/Runtime Exceptions

OutOfMemoryException

NullReferenceException

InvalidCastException

ArrayTypeMismatchException

IndexOutOfRangeException

Arithmetic Exception

OverFlowException

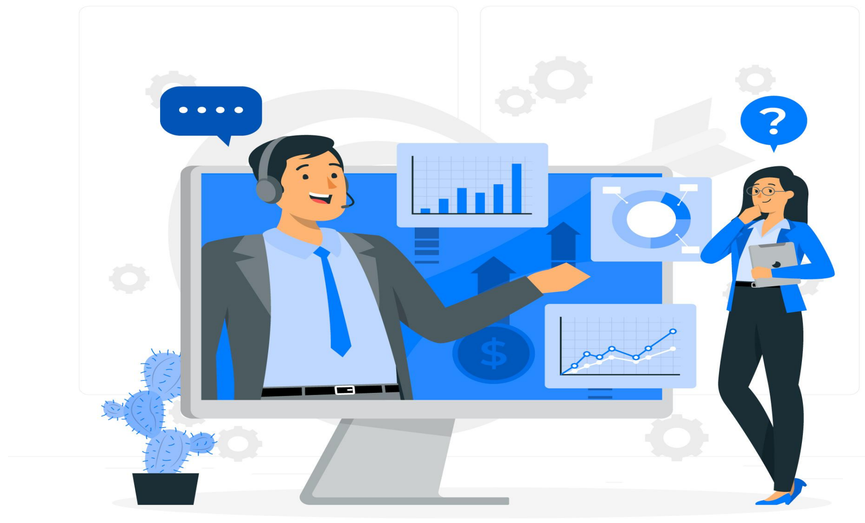
DivideByZeroException

What Is Exception Handling??

“Exception handling" means interpreting and reacting to the exceptions created by errors.

Built mechanism in .NET framework to detect and handle run time errors.

Achieved using the Try - Catch - Finally block



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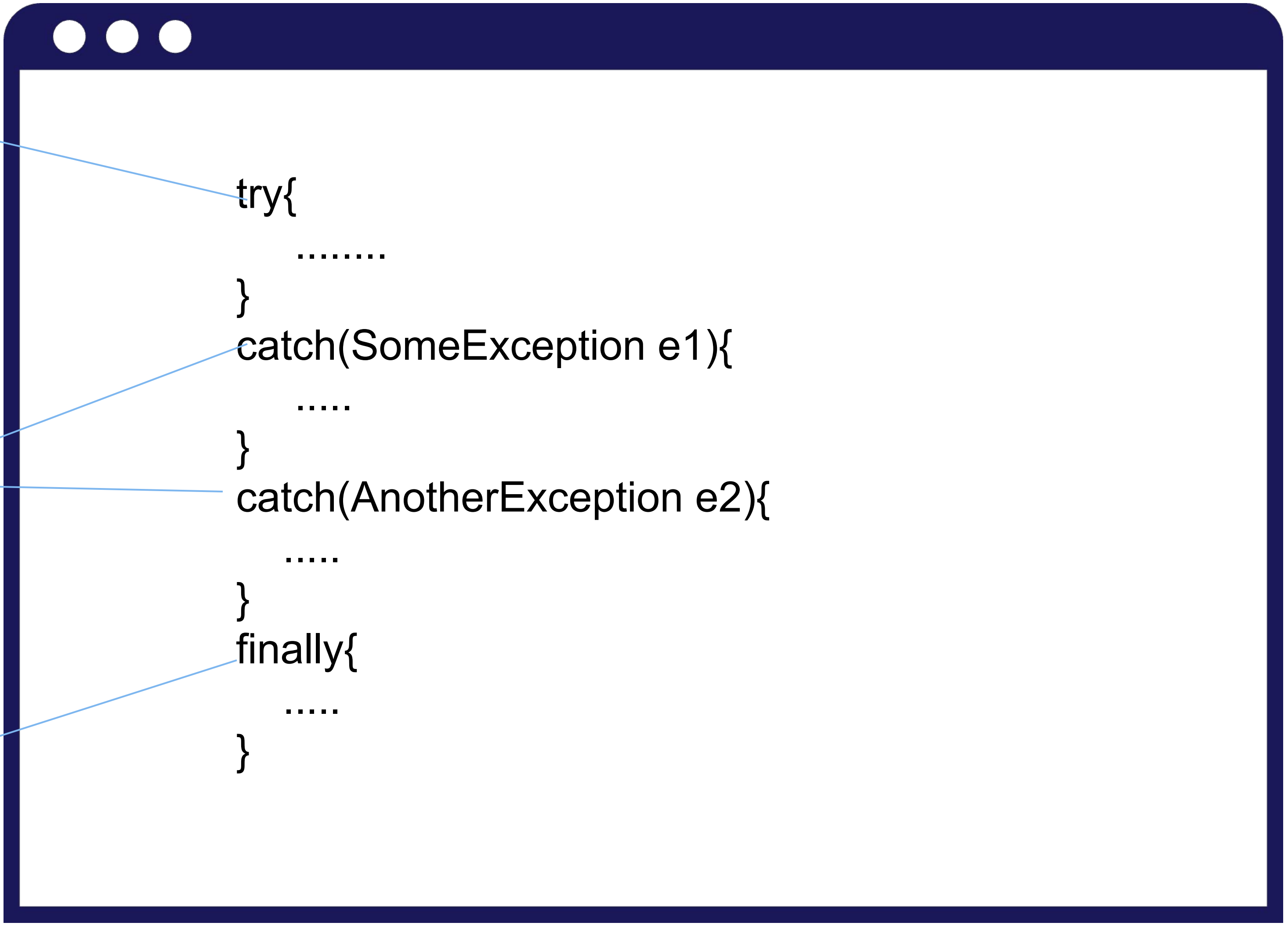
Structure:

Code Block for which we want to catch some Exception

Each catch deals with class of Exceptions,determined by the run-time system based on the type of the argument

The code in finally is executed always after leaving the try-block



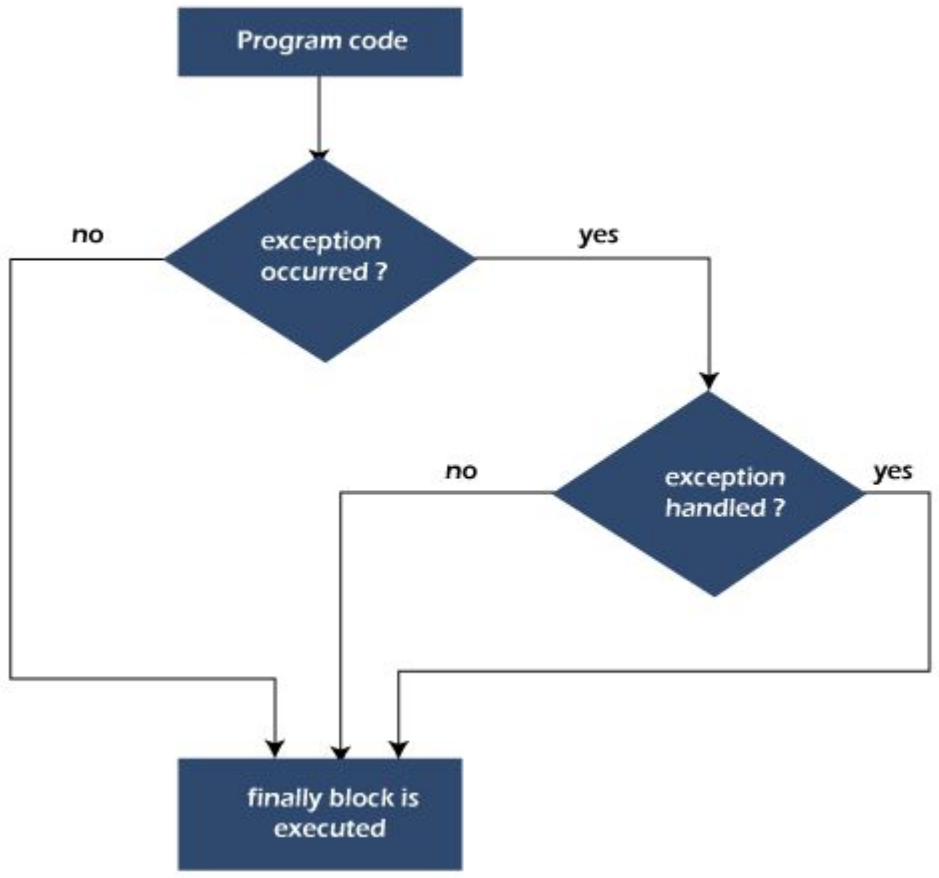
```
try{
     ........
}
catch(SomeException e1){
     .....
}
catch(AnotherException e2){
    .....
}
finally{
    .....
}
```

Work Flow:

Structured exception handling tests specific pieces of the code when exception occurs.

The **Try...Catch...Finally** control structure is fundamental to structured exception handling.

It Reacts differently based on the type of thrown exception.



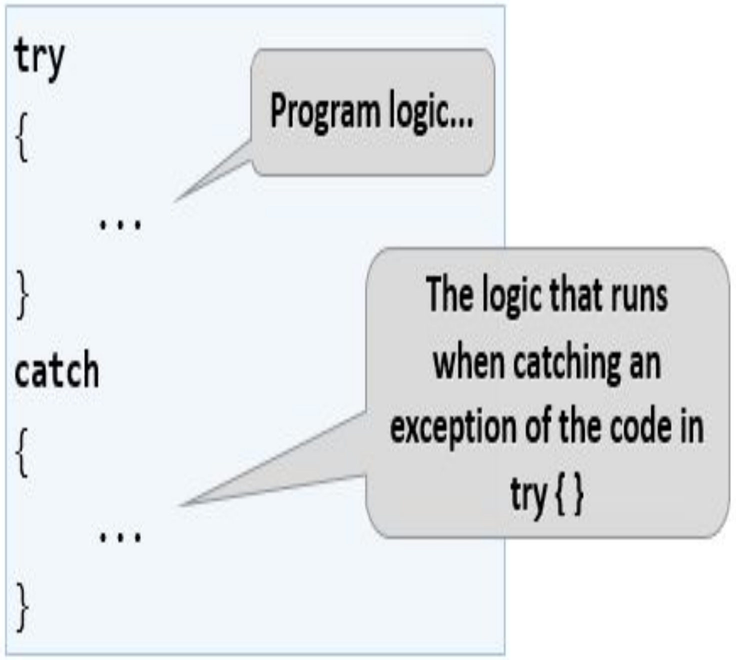
try/catch Blocks

When exceptions are thrown, It must be handled

Done by using try-catch block

Code that could throw an exception is put in the try block

Exception handling code goes in the catch block



```
try
{
      ...
}
catch
{
      ...
}
```

Program logic...
The logic that runs when catching an exception of the code in try { }

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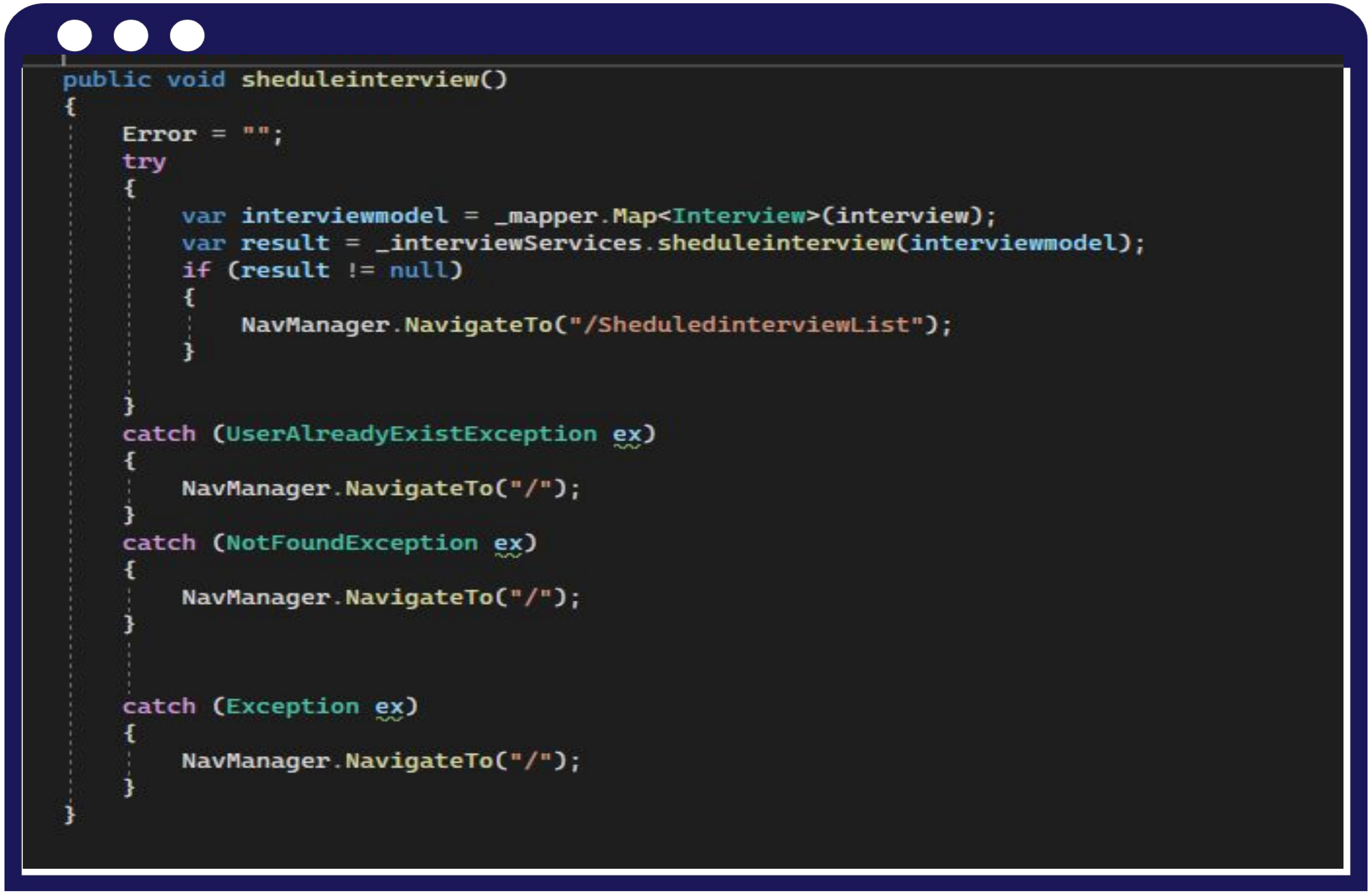
Multiple Catch Blocks

A try block can throw multiple exceptions, which can handle by using multiple catch blocks.

Structure:

```
Class program{
private void DoSomething(){
try
{
      throw new ArgumentNullException();
}
catch(ArgumentNullException ex)
{
      //will  reach here..
}
catch(ArgumentException ex)
{
      will reach here...
}
}
}
```

Example:



```
public void sheduleinterview()
{
    Error = "";
    try
    {
        var interviewmodel = _mapper.Map<Interview>(interview);
        var result = _interviewServices.sheduleinterview(interviewmodel);
        if (result != null)
        {
            NavManager.NavigateTo("/SheduledinterviewList");
        }

    }
    catch (UserAlreadyExistException ex)
    {
        NavManager.NavigateTo("/");
    }
    catch (NotFoundException ex)
    {
        NavManager.NavigateTo("/");
    }


    catch (Exception ex)
    {
        NavManager.NavigateTo("/");
    }
}
```

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Finally Blocks

Finally block must appear after all the catch block.

Contains the code that always executes, whether or not any exception occurs.

If you use transfer control statement in finally block, you will receive compile time error.

When to use finally block ?

- A code fragment that must be executed regardless of exception.
- Cleaning up resources such as closing file objects, releasing database connections etc.
- Only One finally block is associated with try block.

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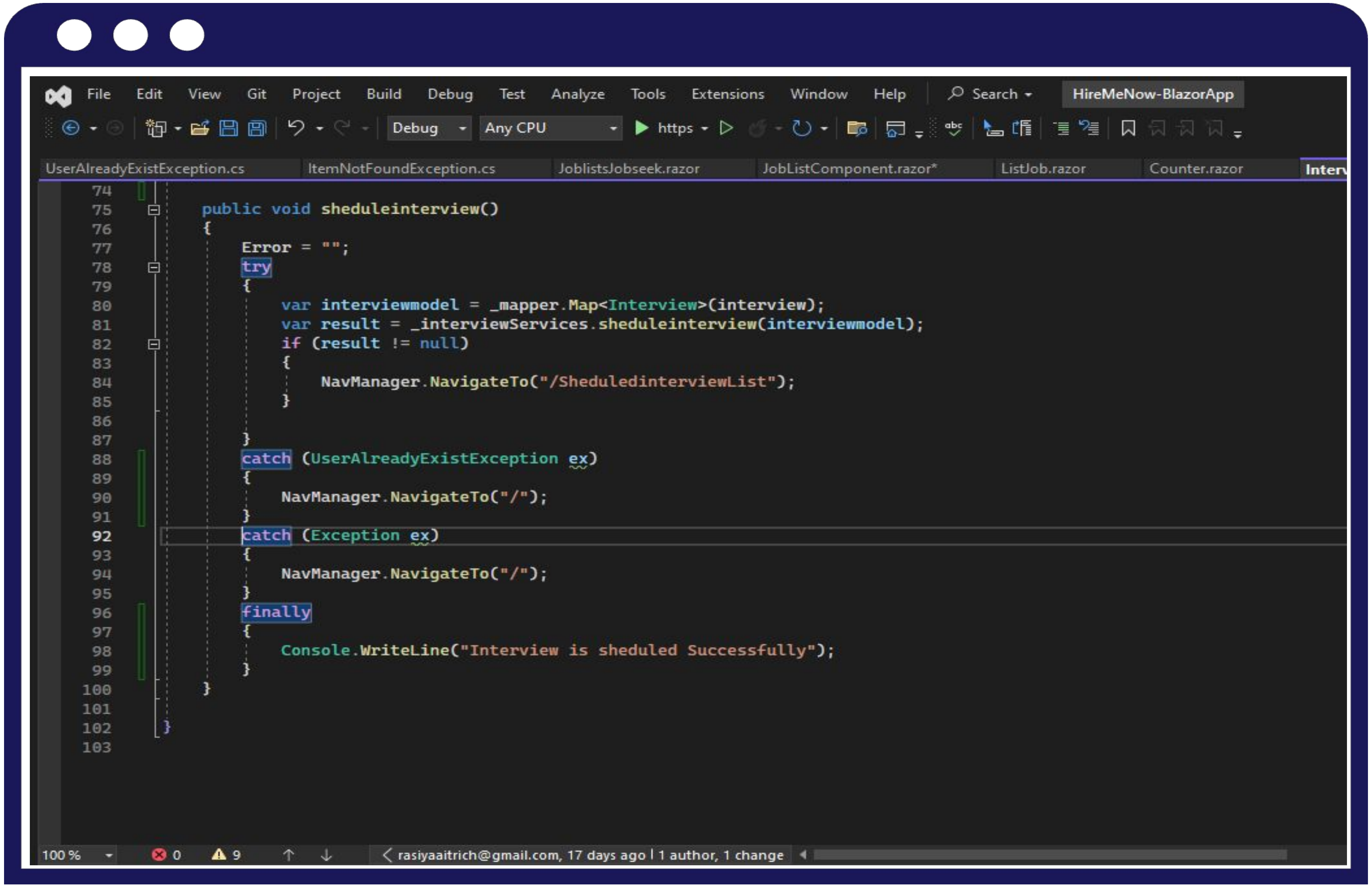
Example
:



```
    public void sheduleinterview()
    {
        Error = "";
        try
        {
            var interviewmodel = _mapper.Map<Interview>(interview);
            var result = _interviewServices.sheduleinterview(interviewmodel);
            if (result != null)
            {
                NavManager.NavigateTo("/SheduledinterviewList");
            }

        }
        catch (UserAlreadyExistException ex)
        {
            NavManager.NavigateTo("/");
        }
        catch (Exception ex)
        {
            NavManager.NavigateTo("/");
        }
        finally
        {
            Console.WriteLine("Interview is sheduled Successfully");
        }
    }

}
```

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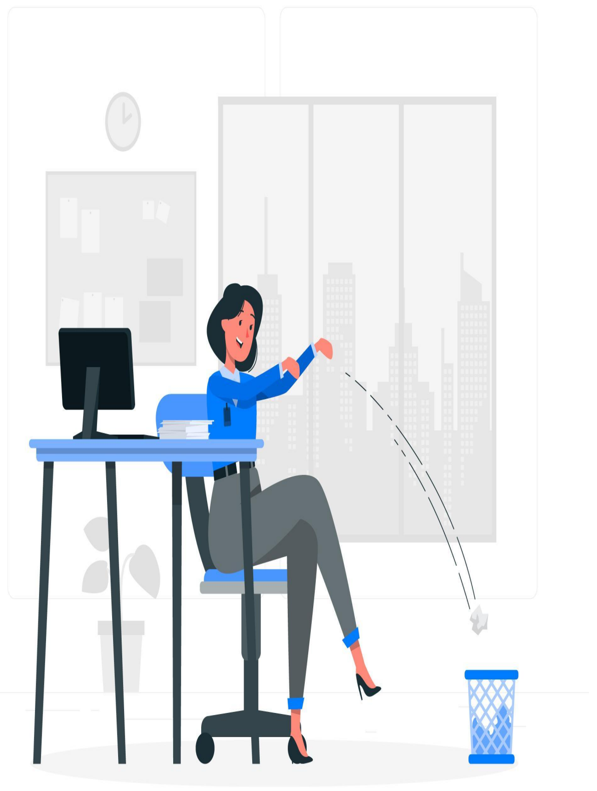
Application Exception

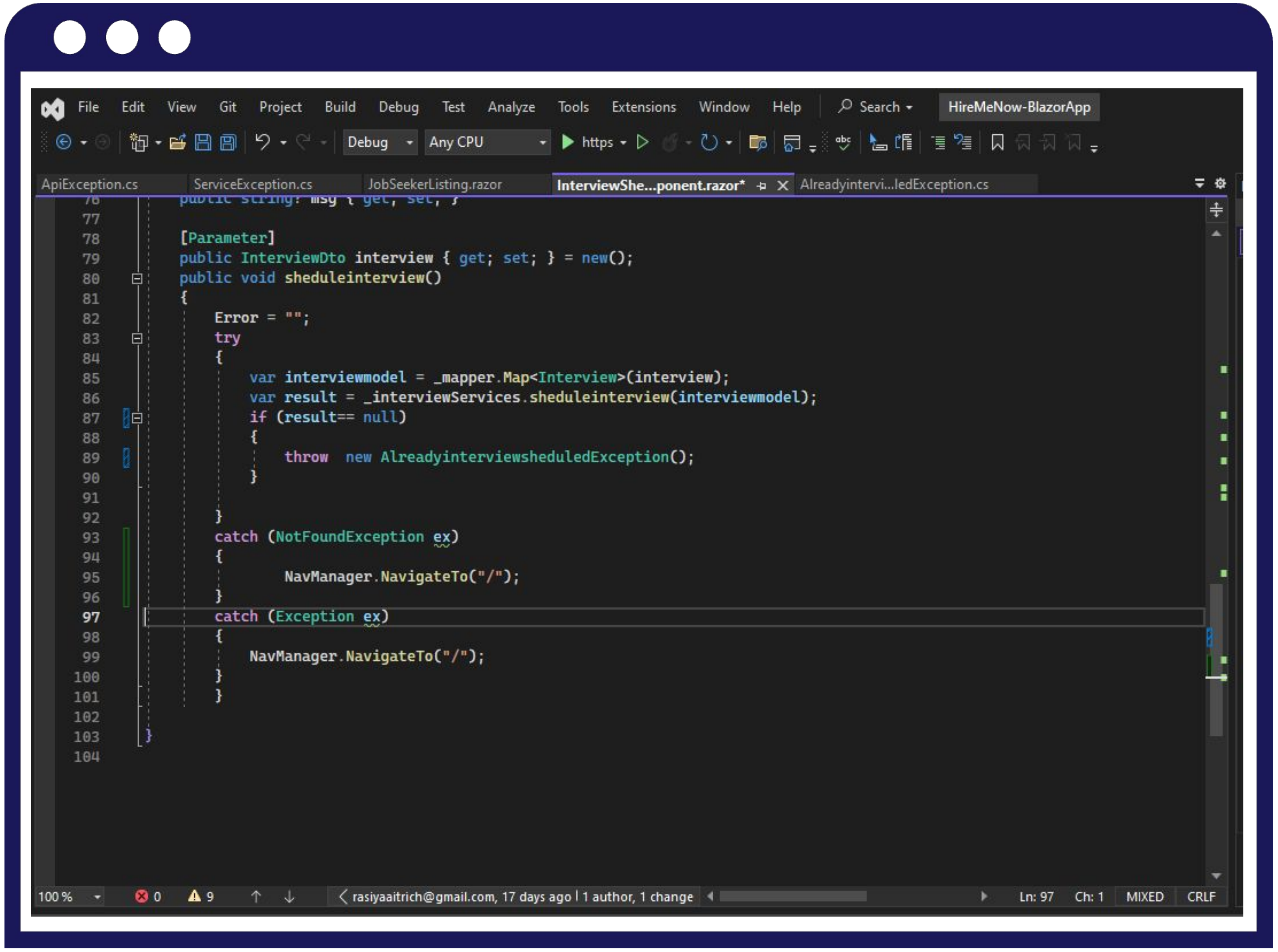
Thrown by a user program, not by the common language runtime

Create a custom exception class by deriving the ApplicationException class.

The **throw** statement is used to signal the occurrence of an anomalous situation (exception) during the program execution.



Example:


File Edit View Git Project Build Debug Test Analyze Tools Extensions Window Help
Search
HireMeNow-BlazorApp
Debug
Any CPU
https
ApiException.cs
ServiceException.cs
JobSeekerListing.razor
InterviewShe...ponent.razor*
Alreadyintervi...ledException.cs
100 %
0
9
rasiyaaitrich@gmail.com, 17 days ago | 1 author, 1 change
Ln: 97
Ch: 1
MIXED
CRLF

```
    public string? msg { get; set; }

    [Parameter]
    public InterviewDto interview { get; set; } = new();
    public void sheduleinterview()
    {
        Error = "";
        try
        {
            var interviewmodel = _mapper.Map<Interview>(interview);
            var result = _interviewServices.sheduleinterview(interviewmodel);
            if (result== null)
            {
                throw  new AlreadyinterviewsheduledException();
            }

        }
        catch (NotFoundException ex)
        {
                NavManager.NavigateTo("/");
        }
        catch (Exception ex)
        {
            NavManager.NavigateTo("/");
        }
        }

}

```

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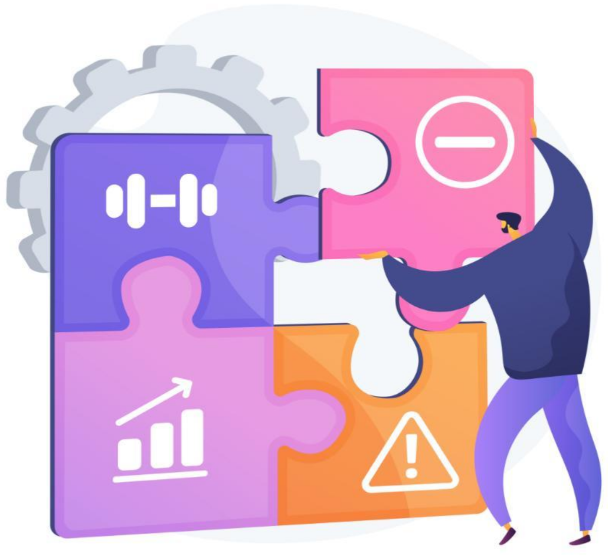
Defensive Programming

Defensive programming is a technique that makes programs more robust to unexpected events .

Less program "crashes" at run time ,It increases the quality of software.

Defensive Programming is the concept of avoiding the exceptional situations to occur, even before it can occur, and exception handling is about handling an exception after it has happened,



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Defensive Programming Strategies

Check For Nulls

Check Object State

Check Your Arguments

Be Careful When Working with Arrays

Use Safe Parsing

Use Safe Casting

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Best Practices for Handling Exceptions

A well-designed set of error handling code blocks can make a program more robust and less prone to crashing the application

Know when to use a try/catch block

Use try/finally blocks around code that can potentially generate an exception and centralize your catch statements in one location.

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End exception class names with the word "Exception".

In C# and the Managed Extensions for C++, use at least the three common constructors when creating your own exception classes.

Use grammatically correct error messages, including ending punctuation

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