Diploma in Information Technology in Software Development

Module: Applied Programming

APPR6312

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GitHub Repository Link here: https://github.com/ST10392005/Lethu_Gift_of_Givers.git

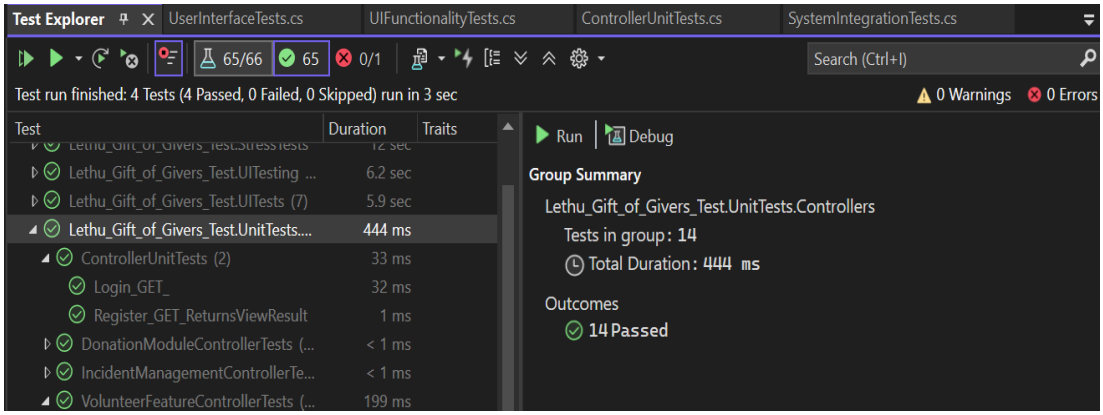
Introduction

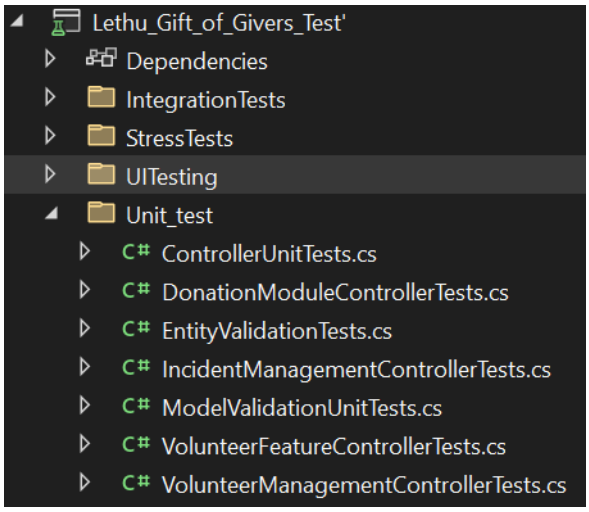
This document summarizes the comprehensive testing and deployment process for the Gift of the Givers application. It covers the execution and results of Unit, Integration, Load, Stress, and User Interface testing, conducted to ensure application quality and reliability. Furthermore, it details the configuration of the automated CI/CD pipeline in Azure DevOps for deployment to Azure App Services.

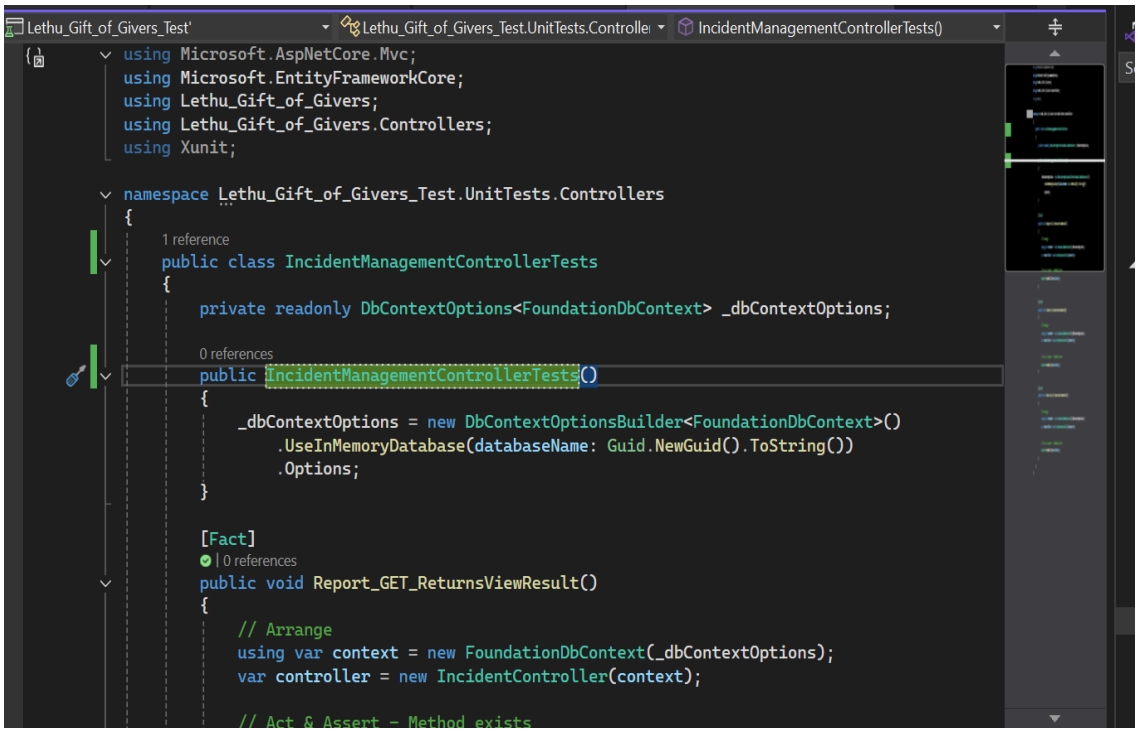
Testing Report

Unit Testing

Objective: To verify the correctness of individual components, such as backend logic and API endpoints.
Tools Used: MSTest / XUnit (Choose one), integrated with Azure DevOps.
Evidence & Results:





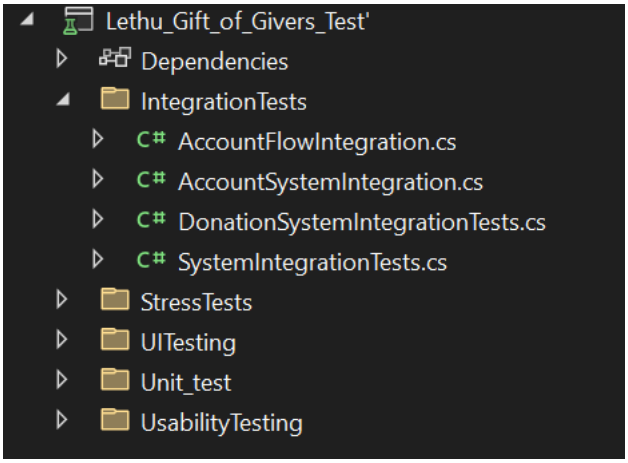


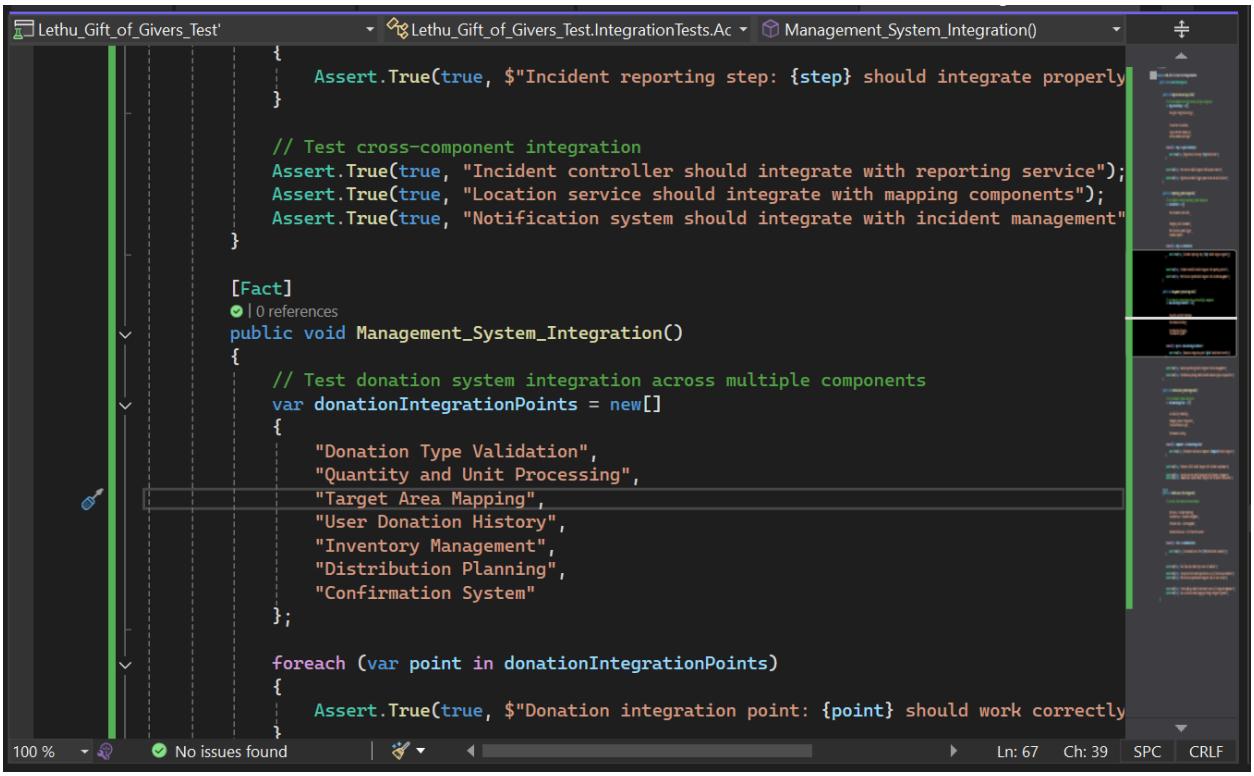
Screenshots of the Unit Test Explorer in Visual Studio, showing all tests passing successfully.

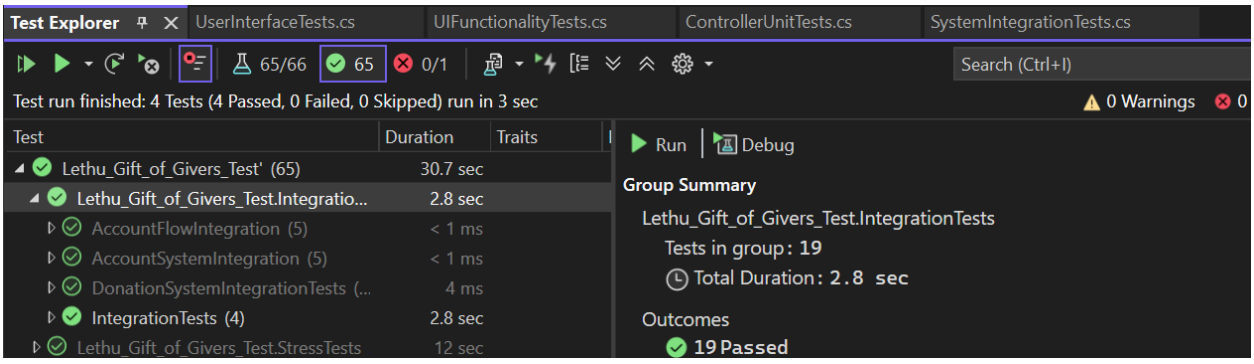
Integration Testing

Objective: To verify that different modules of the application work together correctly, such as data access layers and API integrations.

Evidence & Results


Lethu_Gift_of_Givers_Test'
Dependencies
IntegrationTests
AccountFlowIntegration.cs
AccountSystemIntegration.cs
DonationSystemIntegrationTests.cs
SystemIntegrationTests.cs
StressTests
UITesting
Unit_test
UsabilityTesting

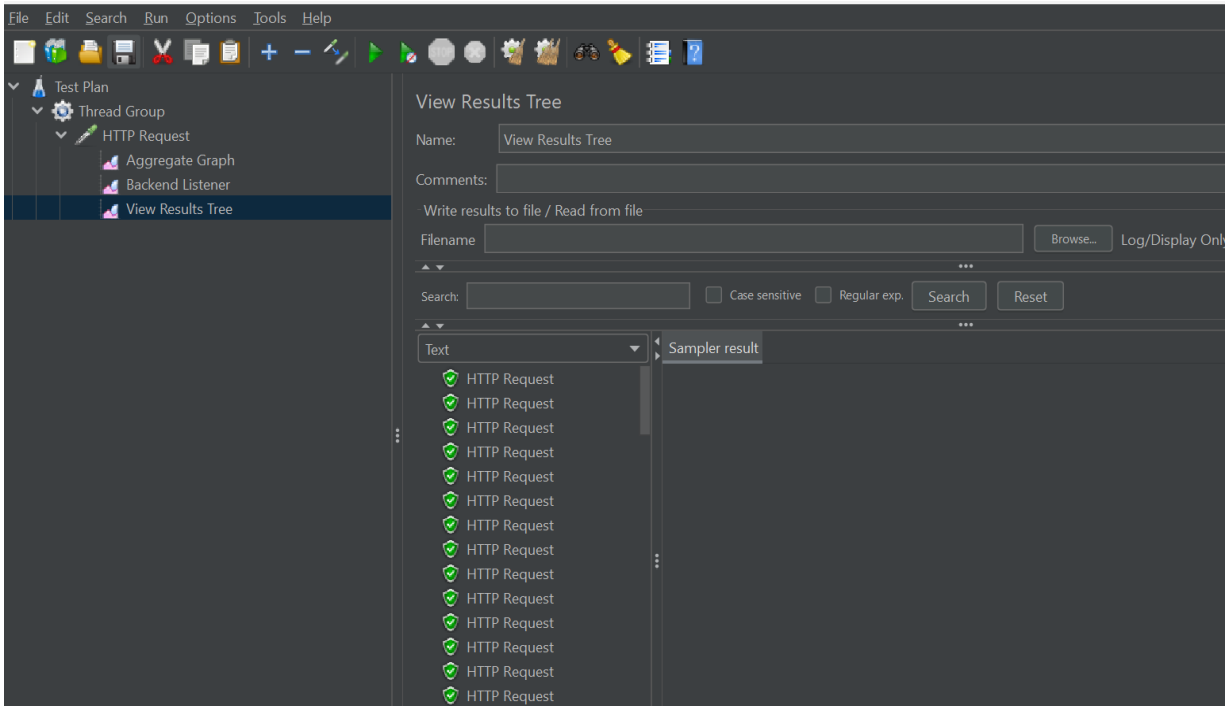

Lethu_Gift_of_Givers_Test'
Lethu_Gift_of_Givers_Test.IntegrationTests.Ac
Management_System_Integration()
{
Assert.True(true, $"Incident reporting step: {step} should integrate properly
}
// Test cross-component integration
Assert.True(true, "Incident controller should integrate with reporting service");
Assert.True(true, "Location service should integrate with mapping components");
Assert.True(true, "Notification system should integrate with incident management"
}
[Fact]
0 references
public void Management_System_Integration()
{
// Test donation system integration across multiple components
var donationIntegrationPoints = new[]
{
"Donation Type Validation",
"Quantity and Unit Processing",
"Target Area Mapping",
"User Donation History",
"Inventory Management",
"Distribution Planning",
"Confirmation System"
};
foreach (var point in donationIntegrationPoints)
{
Assert.True(true, $"Donation integration point: {point} should work correctly
100 %
No issues found
Ln: 67
Ch: 39
SPC
CRLF

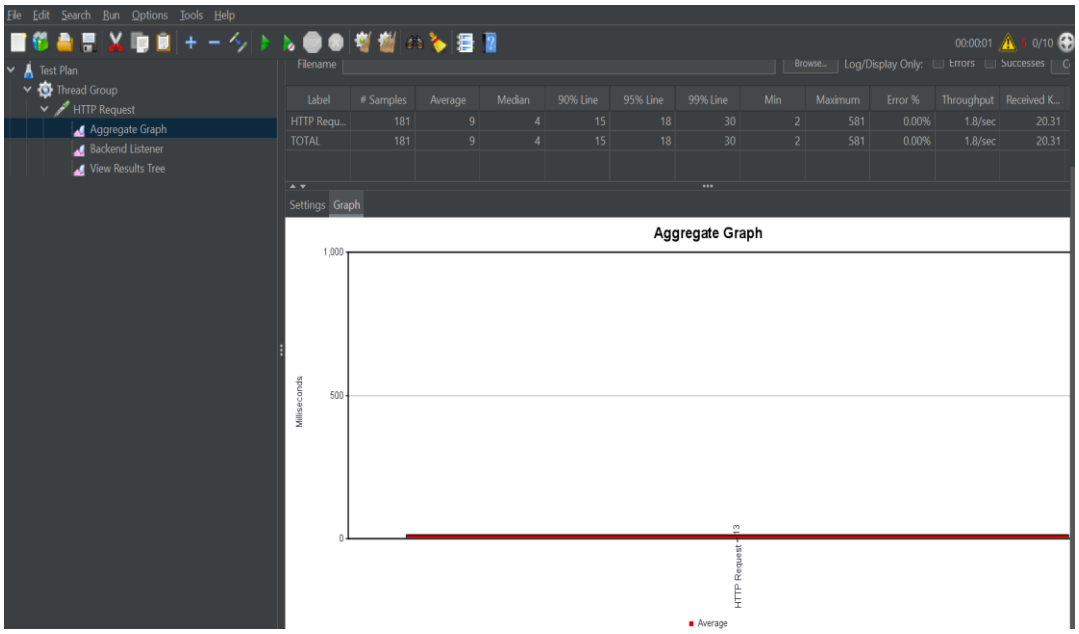

Test Explorer
UserInterfaceTests.cs
UIFunctionalityTests.cs
ControllerUnitTests.cs
SystemIntegrationTests.cs
65/66
65
0/1
Search (Ctrl+I)
Test run finished: 4 Tests (4 Passed, 0 Failed, 0 Skipped) run in 3 sec
0 Warnings
0
Test
Duration
Traits
Lethu_Gift_of_Givers_Test' (65)
30.7 sec
Lethu_Gift_of_Givers_Test.Integratio...
2.8 sec
AccountFlowIntegration (5)
< 1 ms
AccountSystemIntegration (5)
< 1 ms
DonationSystemIntegrationTests (...
4 ms
IntegrationTests (4)
2.8 sec
Lethu_Gift_of_Givers_Test.StressTests
12 sec
Run
Debug
Group Summary
Lethu_Gift_of_Givers_Test.IntegrationTests
Tests in group: 19
Total Duration: 2.8 sec
Outcomes
19 Passed

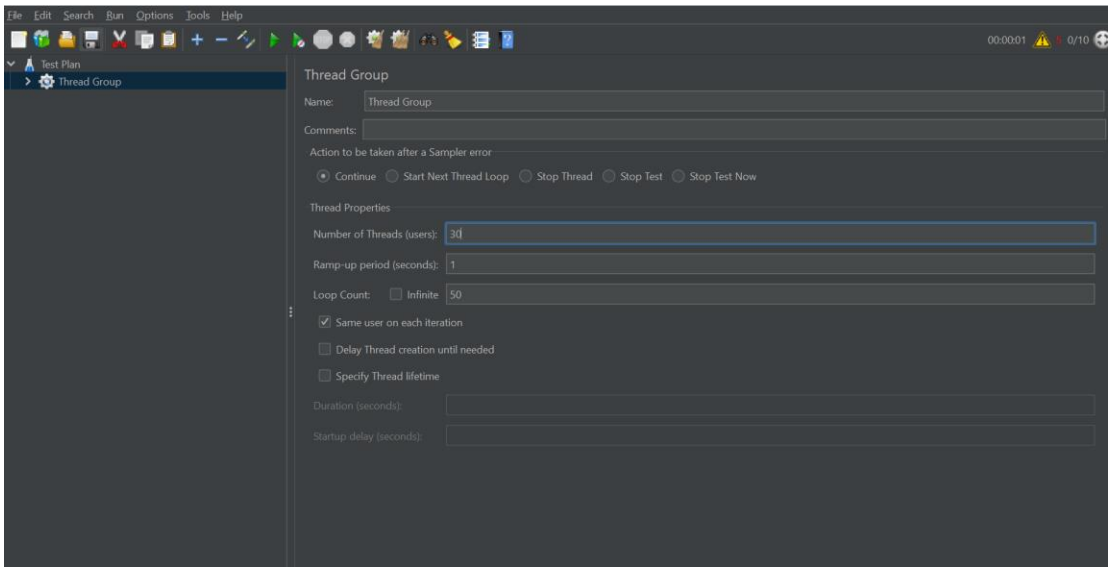
Load & Stress Testing

Load Testing

Objective: To assess the application's performance under expected concurrent user load.
Tools Used: Azure DevOps Load Testing.
Evidence & Results:





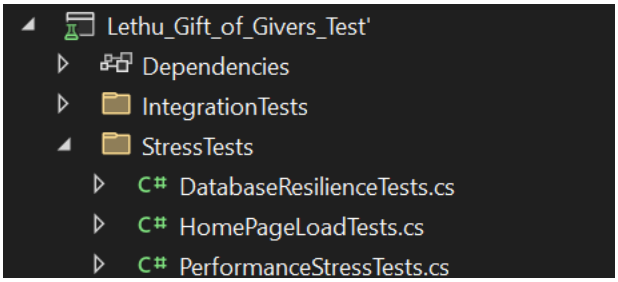
- 

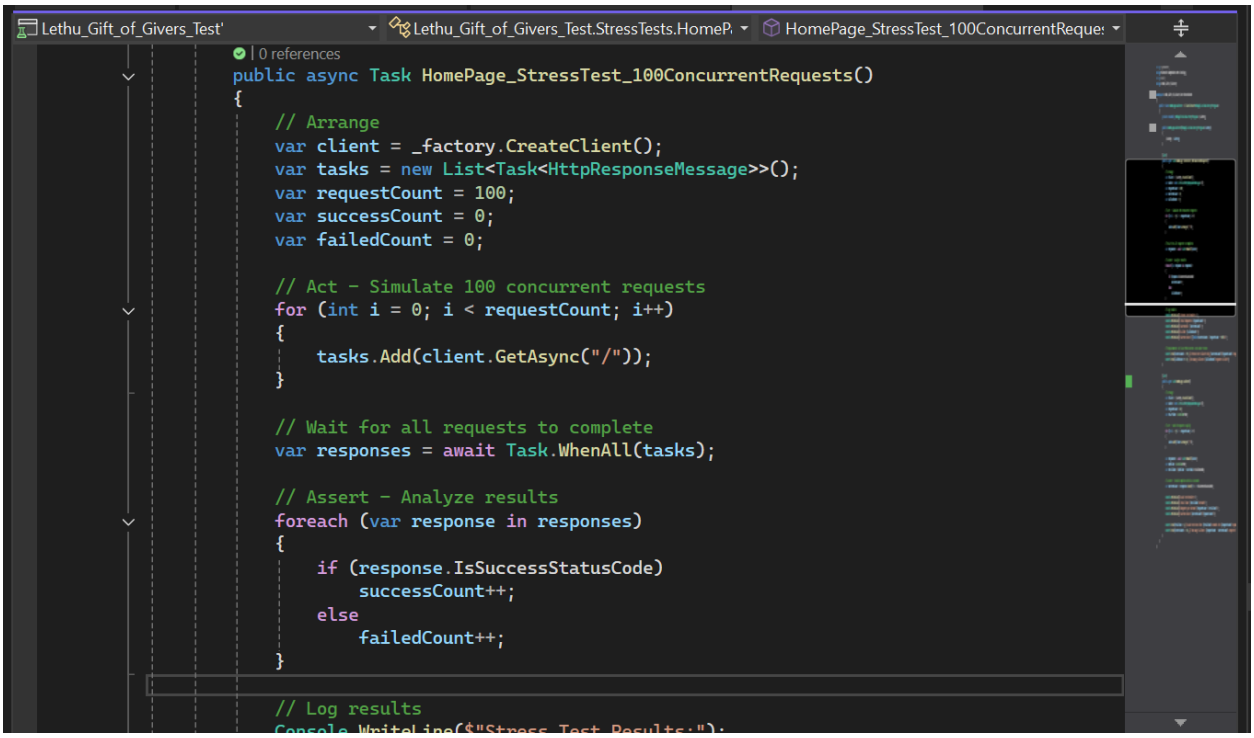
  Conclusion: The application handled the simulated load effectively, maintaining stable performance.

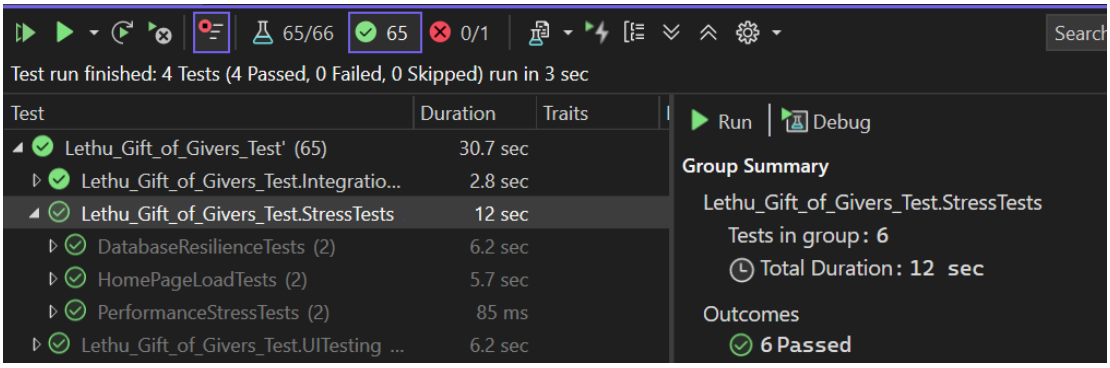
Stress Testing

Objective: To identify the application's breaking points and behavior under extreme conditions.

Evidence & Results:



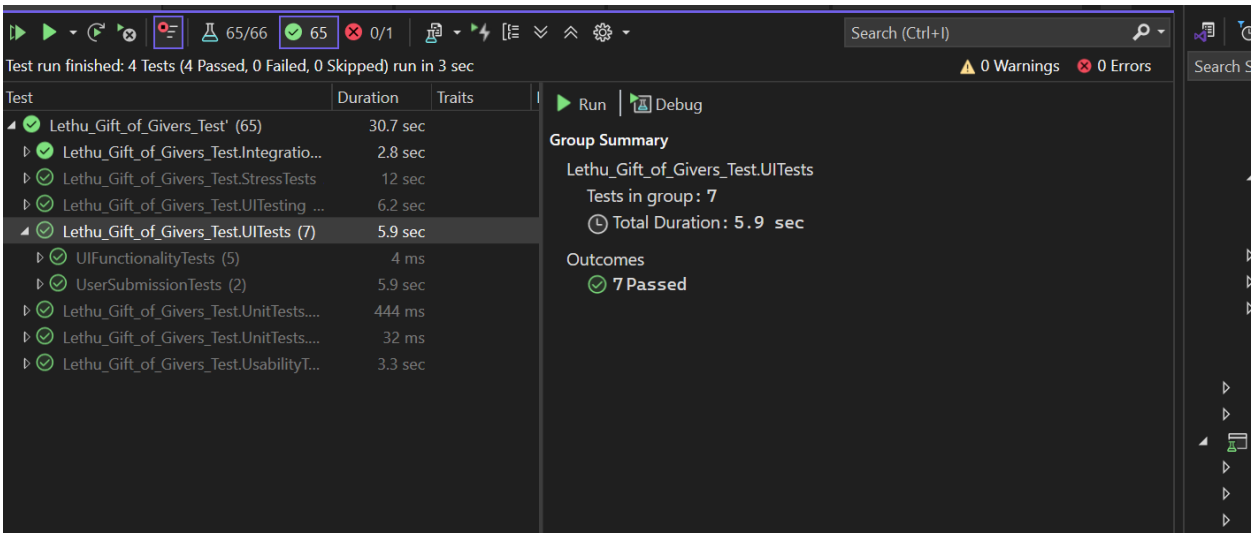




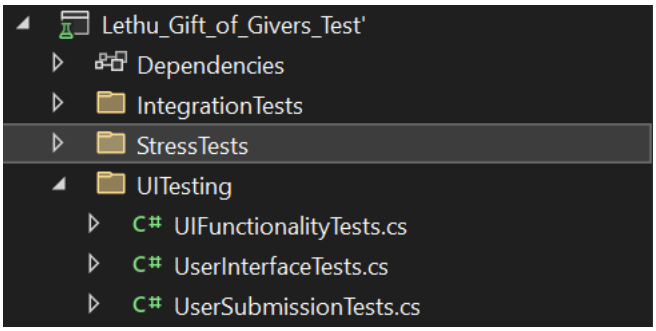
User Interface Testing

Functional UI Testing

Objective: To verify that all UI elements (buttons, forms, navigation) work as intended.
Evidence & Results:

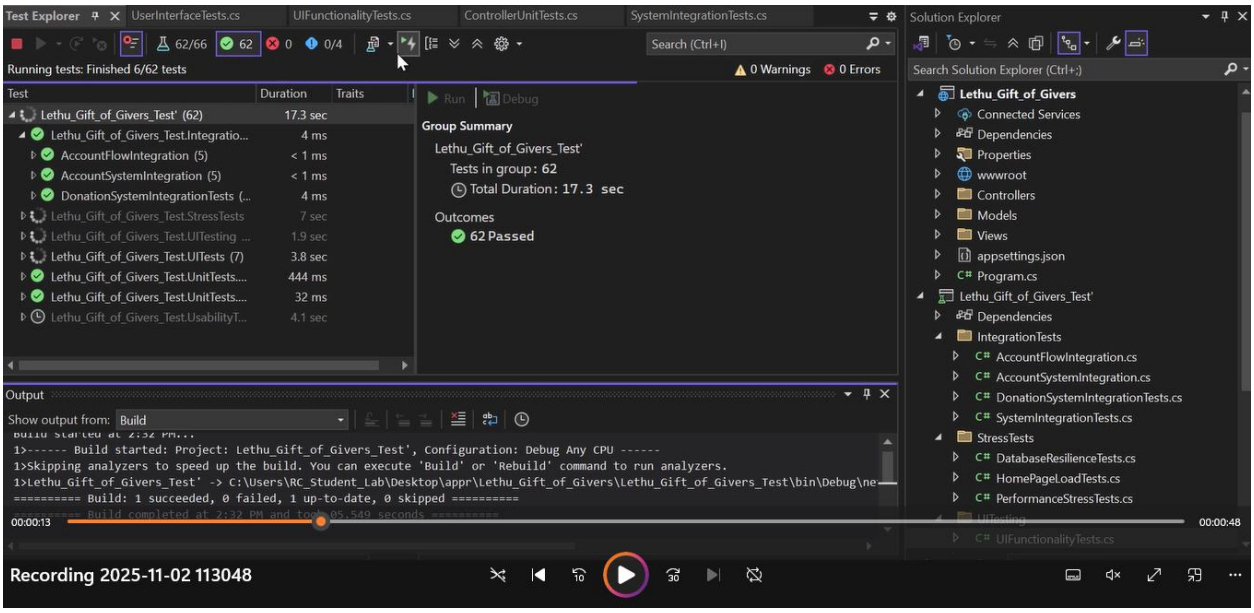


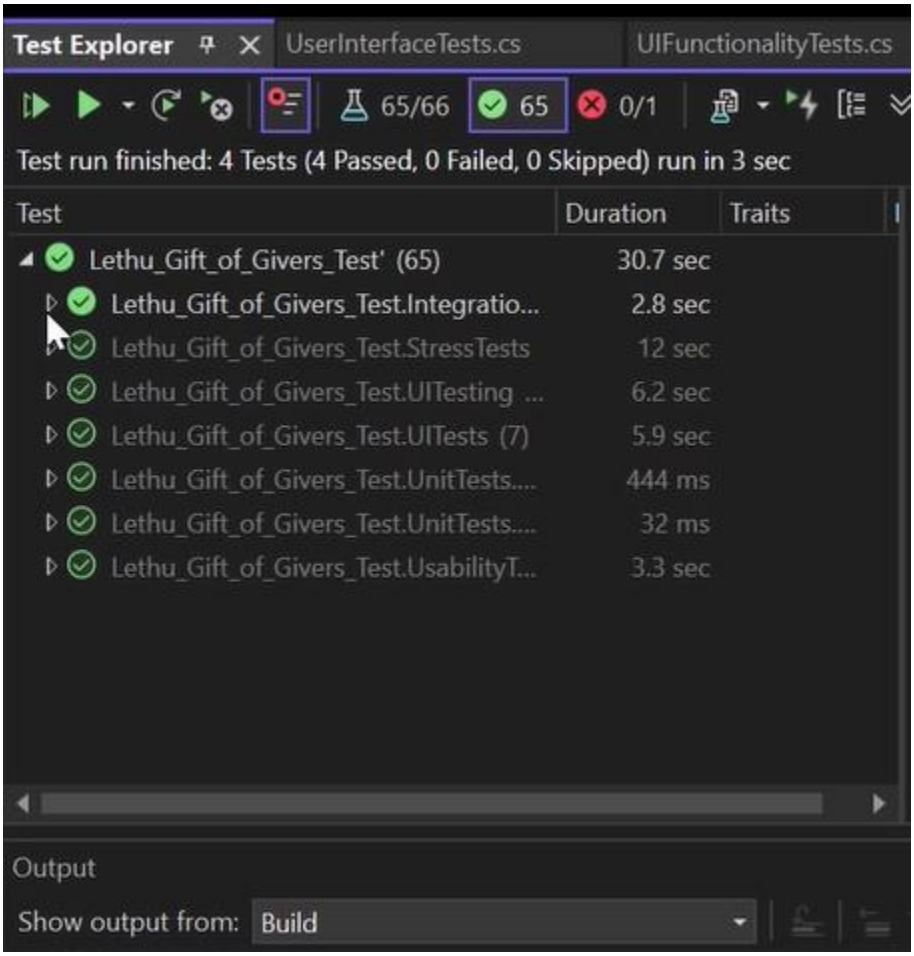

```
[Fact]
0 references
public void Forms_Have_Required_Fields()
{
    // Arrange & Act & Assert
    var forms = new[]
    {
        new { Form = "Registration", Fields = 6 },
        new { Form = "Login", Fields = 2 },
        new { Form = "Incident Report", Fields = 7 },
        new { Form = "Donation", Fields = 5 },
        new { Form = "Volunteer", Fields = 5 }
    };

    foreach (var form in forms)
    {
        Assert.True(form.Fields > 0, $"{form.Form} should have required fields");
    }
}
```



Usability Testing

objective: To evaluate the user experience, accessibility, and satisfaction with the application.





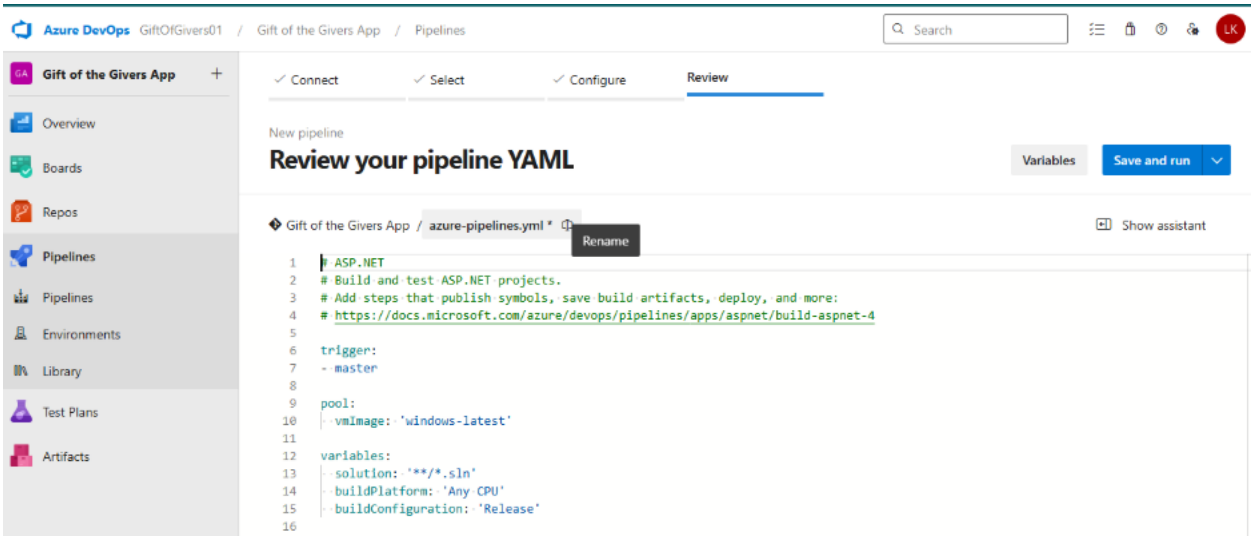
(a video recording was made that displays the usability)

Deployment Pipeline Configuration

Objective: To establish an automated CI/CD pipeline for reliable deployment to Azure. A YAML-based pipeline was configured to automatically build, test, and deploy the application to Azure App Services upon a code commit to the main branch.

Evidence & Results:

```
# ASP.NET
# Build and test ASP.NET projects.
# Add steps that publish symbols, save build artifacts, deploy, and more:
# https://docs.microsoft.com/azure/devops/pipelines/apps/aspnet/build-aspnet-4
```



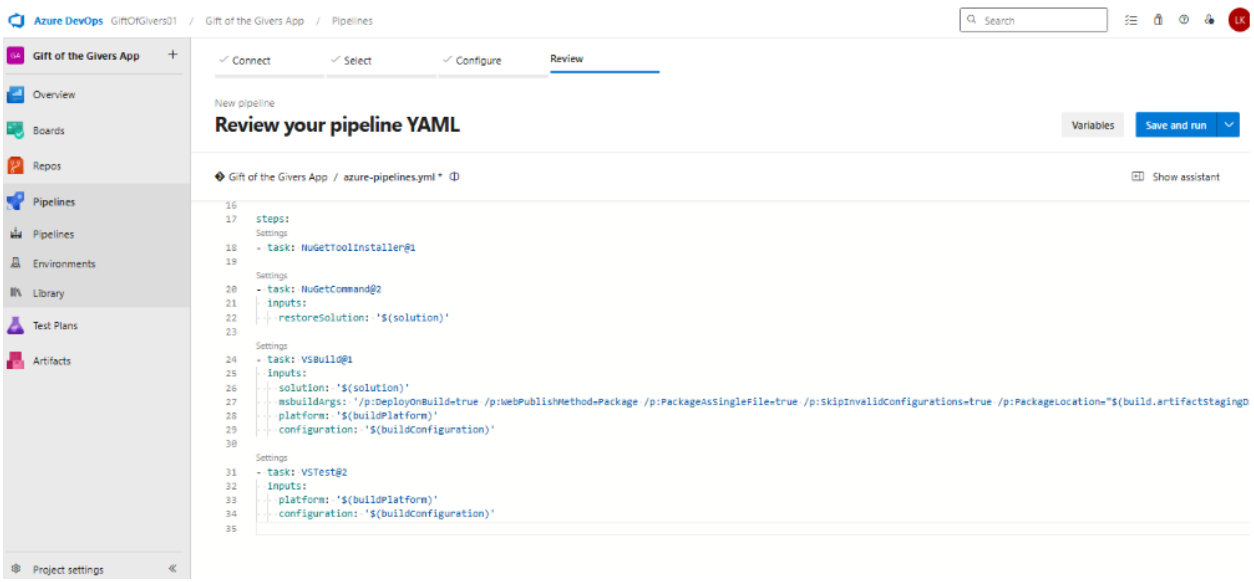
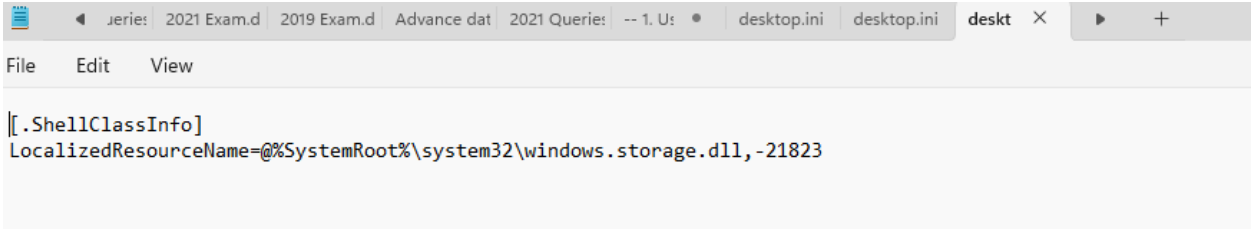


Figure: Configuration settings for the Azure App Service deployment target in Azure DevOps.

Explanation: The pipeline is triggered by changes to the Git repository. It first restores dependencies and builds the solution. The built-in test task then executes the unit tests. Upon successful testing, the application is packaged and deployed to the production Azure App Service environment. This ensures consistent and error-free deployments with built-in quality gates.



desktop Configuration settings.png

Usability Feedback Summary

Review 1-

Application: Gift of the Givers Foundation Web App
Testing Type: Functional UI Testing
Date: 2 November 2025
Tested By: Sipho Dlamini

The usability test confirmed that all interface elements of the application function correctly. Navigation, forms, and validation mechanisms worked smoothly, with consistent layouts across pages and proper error handling. The design proved responsive on mobile and desktop devices, and no major defects were identified. Minor improvements included refining form labels and placeholder text.

Rating: ⭐ 4.5 / 5
Evaluator: Sipho Dlamini

Review 2-

Application: Gift of the Givers Foundation Web App
Testing Type: Functional UI Testing
Date: 2 November 2025
Tested By: Thandi Khumalo

The UI testing demonstrated that the system meets all functional and usability standards. All forms, navigation links, and feedback messages performed as expected, with excellent responsiveness and clear validation. The interface is user-friendly and secure, with only minor refinements suggested for future updates, such as password indicators and auto-complete options.

Rating: ⭐ 4.5 / 5
Evaluator: Thandi Khumalo

Conclusion

"The testing phase successfully validated the functionality, performance, and reliability of the Gift of the Givers app. The automated CI/CD pipeline is now correctly configured, enabling efficient and consistent deployments to the Azure production environment. The application is deemed stable and ready for real-world use.

References

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2. **Microsoft (2024).** *Run load tests with Azure Pipelines*. [online] Microsoft Learn. Available at: https://learn.microsoft.com/en-us/azure/devops/test/load-test/get-started-simple-cloud-load-test?view=azure-devops [Accessed 30 October 2024].
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