

DEPARTMENT OF INFORMATION TECHNOLOGY

LAB MANUAL

CS23432 – Software Construction

(REGULATION 2023)

RAJALAKSHMI ENGINEERING COLLEGE Thandalam, Chennai-602015

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Year / Branch / Section: 2nd /IT/ FA

Semester: IV

Academic Year: 2024 - 2025

S.No.	Date	Title
1.	22/01/25	Azure Devops Environment Setup.
2.	07/02/25	Azure Devops Project Setup and User Story Management.
3.	14/02/25	Setting Up Epics, Features, And User Stories for Project Planning.
4.	20/03/25	Sprint Planning.
5.	28/03/25	Poker Estimation.
6.	04/04/25	Designing Class and Sequence Diagrams for Project Architecture.
7.	16/04/25	Designing Architectural and ER Diagrams for Project Structure.
8.	18/04/25	Testing – Test Plans and Test Cases.
9.	25/04/25	Load Testing and Pipelines.
10.	02/05/25	GitHub: Project Structure & Naming Conventions.

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EXP NO: 1

AZURE DEVOPS ENVIRONMENT SETUP

Aim:

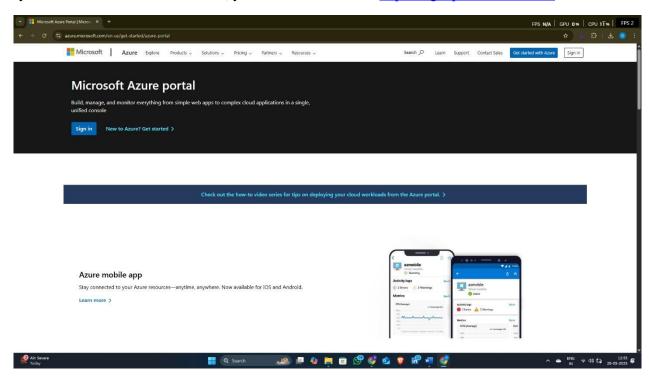
To set up and access the Azure DevOps environment by creating an organization through the Azure portal.

INSTALLATION

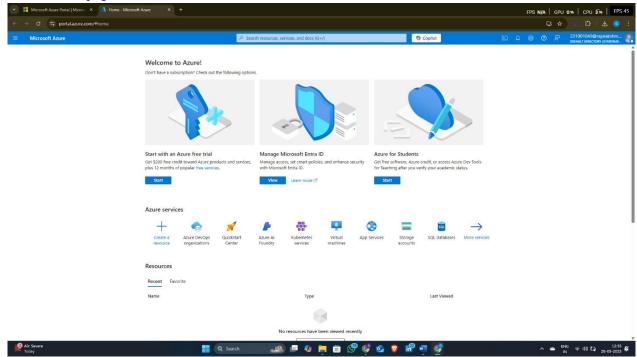
1. Open your web browser and go to the Azure website: https://azure.microsoft.com/en-us/getstarted/azureportal.

Sign in using your Microsoft account credentials.

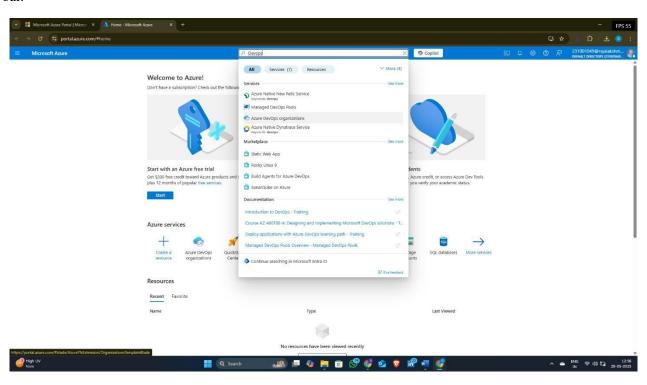
If you don't have a Microsoft account, you can create one here: https://signup.live.com/?lic=1



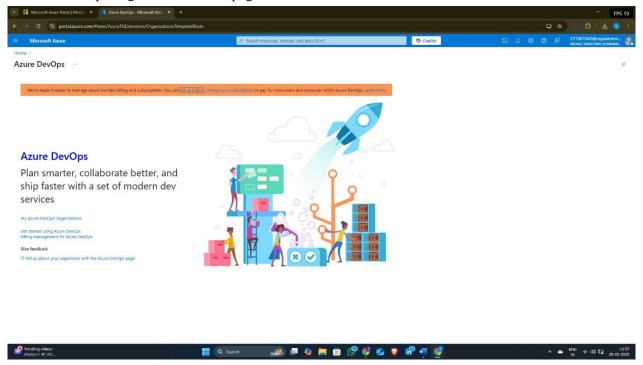
2. Azure home page



3. Open DevOps environment in the Azure platform by typing *Azure DevOps Organizations* in the search bar.



4.Click on the *My Azure DevOps Organization* link and create an organization and you should be taken to the Azure DevOps Organization Home page.



Result:

Successfully accessed the Azure DevOps environment and created a new organization through the Azure portal.

EXP NO: 2

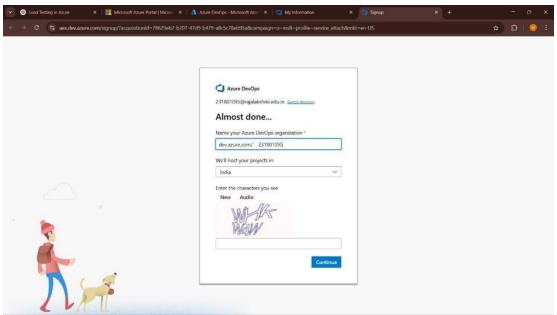
AZURE DEVOPS PROJECT SETUP AND USER STORY

MANAGEMENT

Aim:

To set up an Azure DevOps project for efficient collaboration and agile work management.

1.Create An Azure Account



2. Create the First Project in Your Organization

- a. After the organization is set up, you'll need to create your first **project**. This is where you'll begin to manage code, pipelines, work items, and more.
 - b. On the organization's **Home page**, click on the **New Project** button.
 - c. Enter the project name, description, and visibility options:

Name: Choose a name for the project (e.g., LMS).

Description: Optionally, add a description to provide more context about the project. **Visibility**: Choose whether you want the project to be **Private** (accessible only to those invited) or **Public** (accessible to anyone).

d. Once you've filled out the details, click Create to set up your first project.

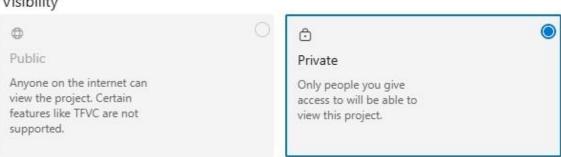
Create new project



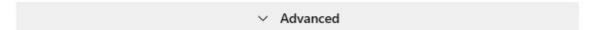
Visibility

Project name *

Description



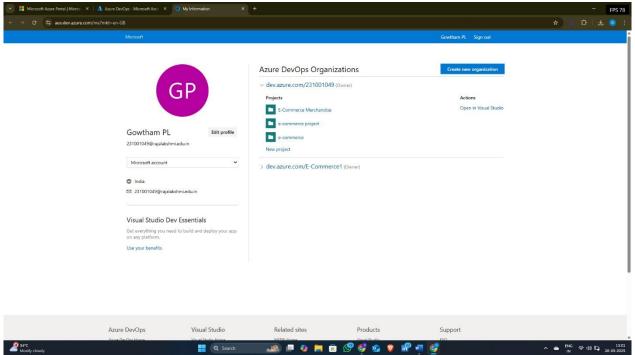
Public projects are disabled for your organization. You can turn on public visibility with organization policies.



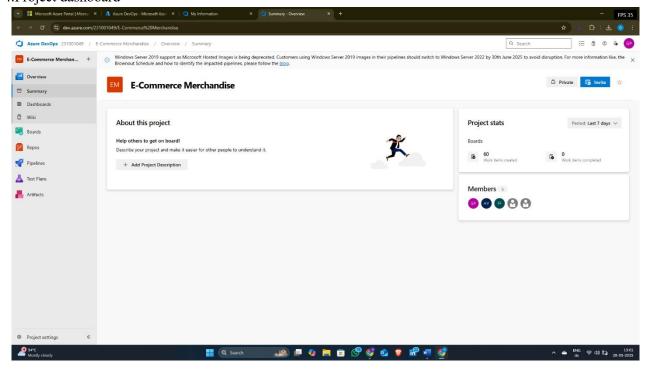
Cancel Create

X

3.Once logged in, ensure you are in the correct organization. If you're part of multiple organizations, you can switch between them from the top left corner (next to your user profile). Click on the Organization name, and you should be taken to the Azure DevOps Organization Home page.

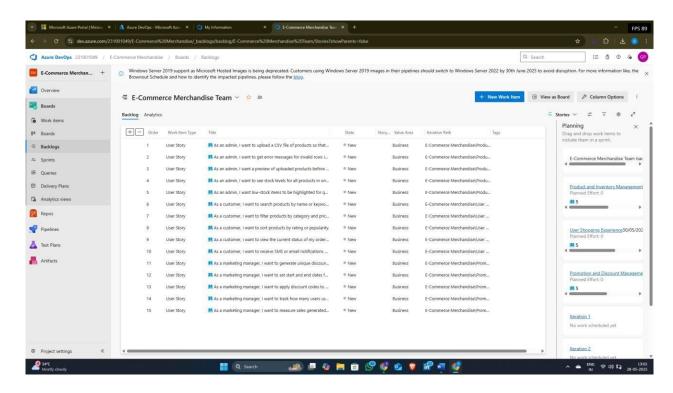


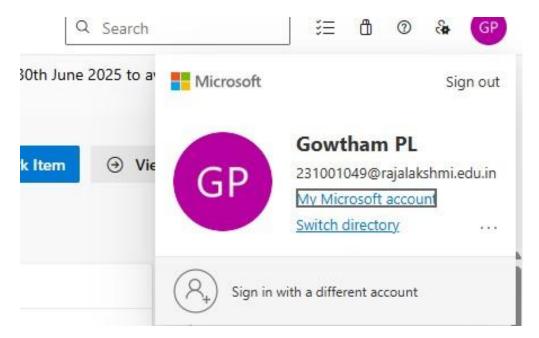
4. Project dashboard



5.To manage user stories:

- a. From the **left-hand navigation menu**, click on **Boards**. This will take you to the main **Boards** page, where you can manage work items, backlogs, and sprints.
- b. On the **work items** page, you'll see the option to **Add a work item** at the top. Alternatively, you can find a + button or **Add New Work Item** depending on the view you're in. From the **Add a work item** dropdown, select **User Story**. This will open a form to enter details for the new User Story.





Result:	
Result:	

Successfully created an Azure DevOps project with user story management and agile workflow setup.

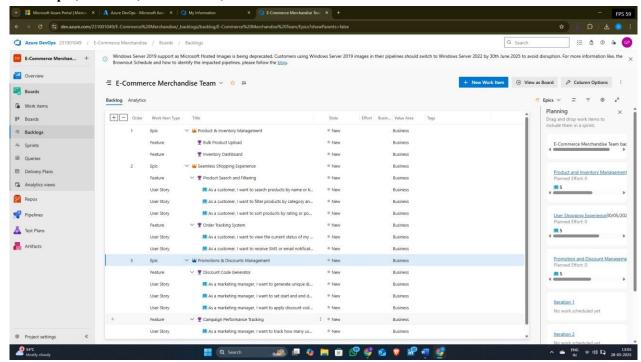
EXP NO: 3

SETTING UP EPICS, FEATURES, AND USER STORIES FOR PROJECT PLANNING

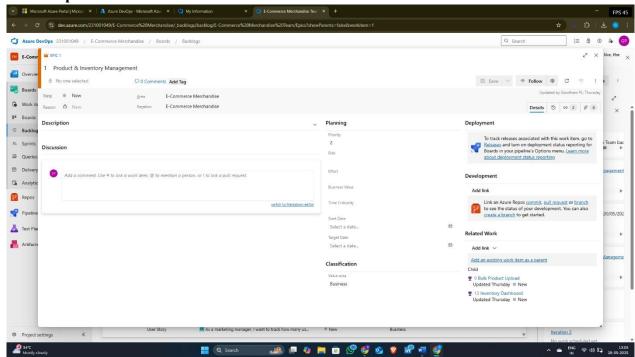
Aim:

To learn about how to create epics, user story, features, backlogs for your assigned project.

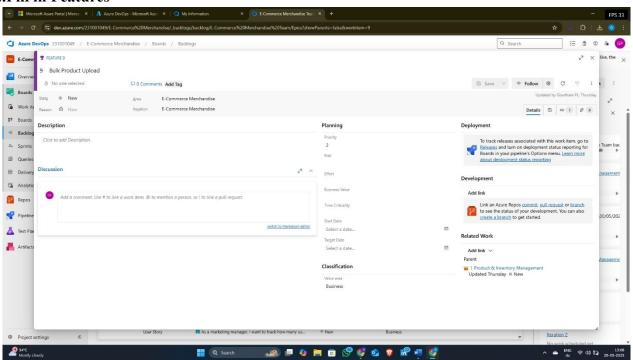
Create Epic, Features, User Stories, Task



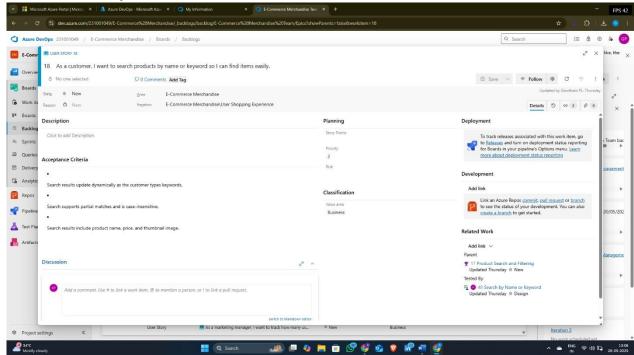
1. Fill in Epics



2. Fill in Features



3.Fill in User Story Details



Result:

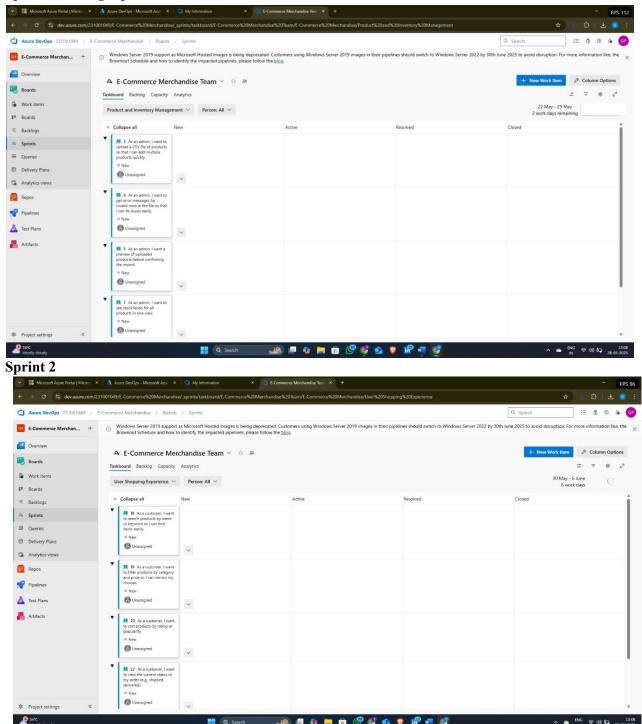
Thus, the creation of epics, features, user story and task has been created successfully.

	SPRINT PLANNING
EXP NO: 4	

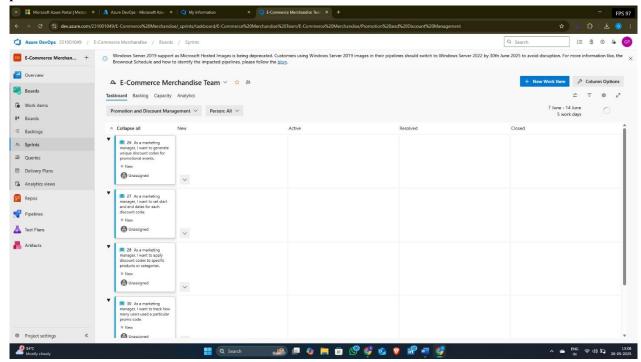
Aim:

To assign user story to specific sprint for the Music Playlist Batch Creator Project.

Sprint Planning Sprint 1

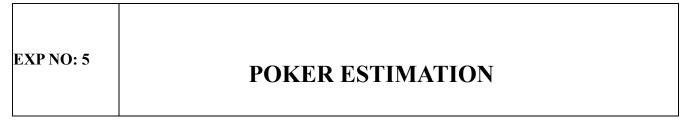


Sprint 3



Result:

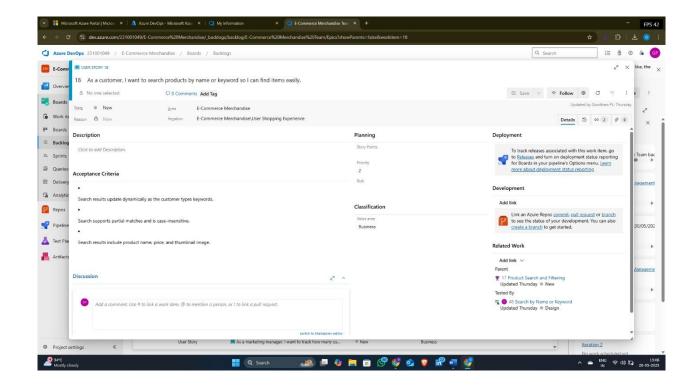
The Sprints are created for the Music Playlist Batch Creator Project.



Aim:

Create Poker Estimation for the user stories - Music Playlist Batch Creator Project.

Poker Estimation



Result:

The Estimation/Story Points is created for the project using Poker Estimation.

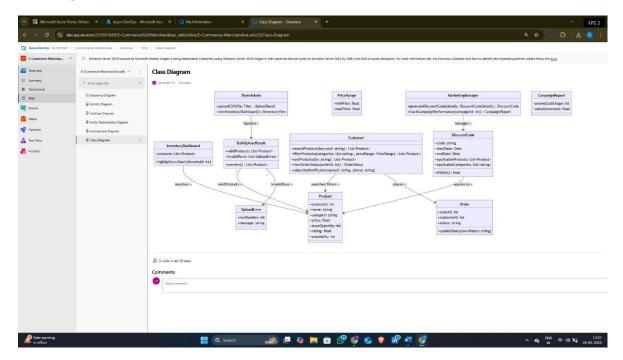
DESIGNING CLASS AND SEQUENCE DIAGRAMS FOR
EXP NO: 6

PROJECT ARCHITECTURE

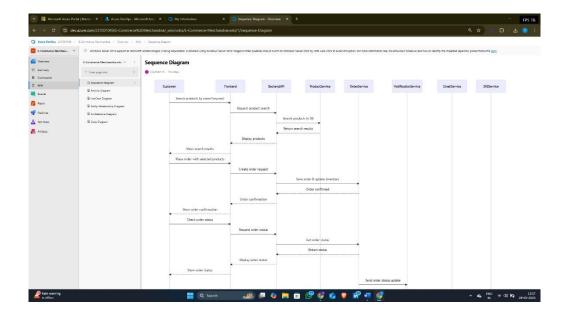
Aim:

To Design a Class Diagram and Sequence Diagram for the given Project. 6A.

Class Diagram



6B. Sequence Diagram



Result:

The Class Diagram and Sequence Diagram is designed Successfully for the Music Playlist Batch Creator.

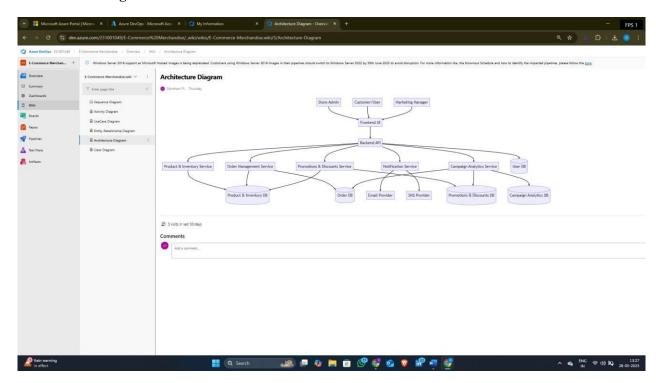
EXP NO: 7

DESIGNING ARCHITECTURAL AND ER DIAGRAMS FOR PROJECT STRUCTURE

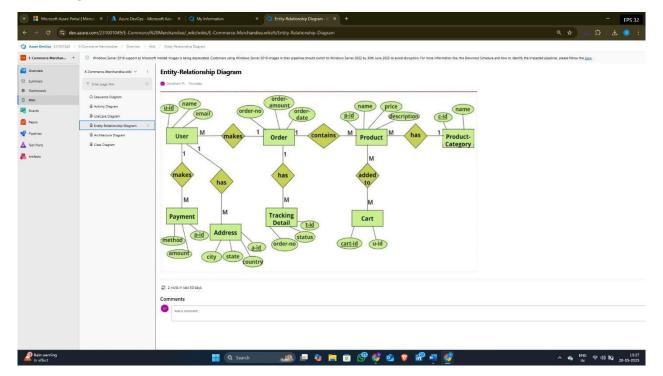
Aim:

To Design an Architectural Diagram and ER Diagram for the given Project. 7A.

Architectural Diagram



7B.ER Diagram



Result:

The Architecture Diagram and ER Diagram is designed Successfully for the Music Playlist Batch Creator

EXP NO: 8

TESTING – TEST PLANS AND TEST CASES

Aim:

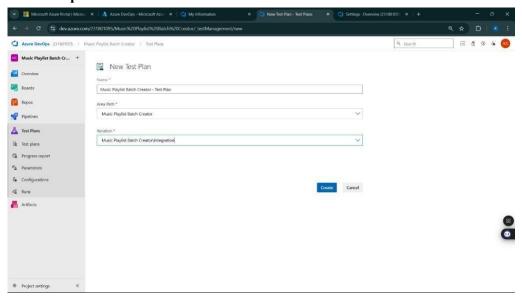
Test Plans and Test Case and write two test cases for at least five user stories showcasing the happy path and error scenarios in azure DevOps platform.

Test Planning and Test Case Test Case Design Procedure

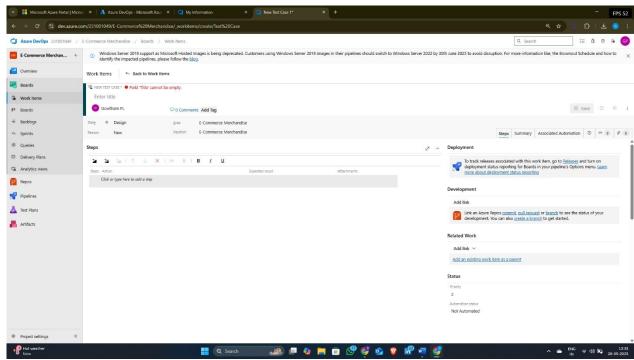
- Understand Core Features of the Application
 Our Signup & Login
 Viewing and Managing Playlists
 Fetching Real-time Metadata
 Editing playlists (rename, reorder, record)
- o Creating smart audio playlists based on categories (mood, genre, artist, etc.)
- 2. **Define User Interactions** o Each test case simulates a real user behaviour (e.g., logging in, renaming a playlist, adding a song).
- **3. Design Happy Path Test Cases** o Focused on validating that all features function as expected under normal conditions.
- o Example: User logs in successfully, adds item to playlist, or creates a category-based playlist.
- **4. Design Error Path Test Cases** o Simulate negative or unexpected scenarios to test robustness and error handling.
- o Example: Login fails with invalid credentials, save fails when offline, no recommendations found.
- **5. Break Down Steps and Expected Results** o Each test case contains step-by-step actions and a corresponding expected outcome.
- o Ensures clarity for both testers and automation scripts.
- 6. Use Clear Naming and IDs Test cases are named clearly (e.g., TC01 Successful Login, TC10 Save Playlist Fails).
- o Helps in quick identification and linking to user stories or features.
- 7. **Separate Test Suites** Grouped test cases based on functionality (e.g., Login, Playlist Editing, Recommendation System).

- o Improves organization and test execution flow in Azure DevOps.
- **8. Prioritize and Review** Critical user actions are marked high-priority.
- o Reviewed for completeness and traceability against feature requirements.

1.New test plan



2.Test suite



3.Test case

Give two test cases for at least five user stories showcasing the happy path and error scenarios in azure DevOps platform.

Music Playlist Batch Creator – Test Plans

USER STORIES

- As a marketing manager, I want to generate unique discount codes for promotional events.
- As a customer, I want to filter products by category and price so I can narrow my choices.
- As a customer, I want to sort products by rating or popularity.
- As an admin, I want low-stock items to be highlighted for quicker restocking.

Test Suites

Test Suite: TS01 – Bulk Product Upload (Admin)

Feature: Bulk Product Upload

User Story 1: Upload CSV file of products

User Story 2: Show errors for invalid rows User

Story 3: Preview before confirming import

TC01 - Successful Bulk Upload

- Action:
 - o Go to Bulk Upload page
 - Upload a valid CSV file with product details o

Click "Upload"

- Expected Result:
 - Preview of valid rows is shown o No error messages appear o "Confirm Import" button is enabled
- Type: Happy Path

TC02 – Upload With Invalid Rows

- Action:
 - o Upload a CSV file with missing product names/prices
- Expected Result:
 - o Valid rows previewed o Invalid rows are highlighted
 - o Error message: "Row 2: Product Name is required"
- Type: Error Path

TC03 – Confirm and Import Products

- Action:
 - o After previewing valid data, click "Confirm Import"
- Expected Result:
 - Products are saved in the database o Confirmation message is shown
- · Type: Happy Path

Test Suite: TS02 - Inventory Dashboard (Admin) Feature: Inventory Dashboard

User Story 1: View stock levels User

Story 2: Highlight low-stock items

TC04 – View All Inventory

- Action:
 - o Go to Inventory Dashboard
- Expected Result:
 - o List of all products with current stock quantity
- Type: Happy Path

TC05 - Highlight Low-Stock Items

- Action:
 - Set a product stock to below threshold

 $(e.g., < 5) \circ$ Refresh dashboard

- Expected Result:
 - \circ Item row is highlighted (e.g., red) \circ

Alert icon displayed

• Type: Happy Path

Test Suite: TS03 – Product Search & Filtering (Customer) Feature: Product Search & Filtering

User Story 1: Search by name/keyword

User Story 2: Filter by category/price

User Story 3: Sort by rating/popularity

TC06 – Search by Name

- Action:
 - o Enter "T-shirt" in search bar and press Enter
- Expected Result: 0 All matching T-shirt products displayed

Type: Happy Path

TC07 – Filter by Category and Price

- Action:
 - Select "Hoodies" category Set price range: ₹500 –
 ₹1500
- Expected Result:
 - o Products filtered accurately
- Type: Happy Path

TC08 – Sort by Popularity

- Action: o Click on "Sort by Popularity"
- Expected Result:
 - o Products rearranged by most purchased or liked
- · Type: Happy Path

Test Suite: TS04 - Order Tracking (Customer) Feature: Order Tracking

User Story 1: View order status User

Story 2: Get SMS/email updates

TC09 - View Order Status

- Action:
 - o Go to "My Orders" o Click on an order
- Expected Result:
 - o Status shown (e.g., "Shipped", "Delivered")
- Type: Happy Path

TC10 - Receive Notification on Status Change

- Action: o Order is marked "Out for Delivery" by system
- Expected Result:
 - o Email and SMS sent to customer
- Type: Happy Path

Test Suite: TS05 - Discount Code Management (Marketing) Feature: Discount Code Generator

User Story 1: Generate discount codes

User Story 2: Set validity

User Story 3: Apply to categories/products

TC11 – Generate Discount Code

- Action:
 - o Go to "Promo Tools"
 - o Click "Generate Code", set value (e.g., 15% OFF)

- Expected Result:
 - o Unique code created and listed
- Type: Happy Path

TC12 – Apply Code to Product

- Action:
 - o Choose products or categories and apply code
- Expected Result:
 - o Code applied successfully and shown in frontend offers
- Type: Happy Path

Test Suite: TS06 - Campaign Tracking (Marketing) Feature: Campaign Performance Tracking

User Story 1: Track promo code usage User

Story 2: Track sales from campaigns

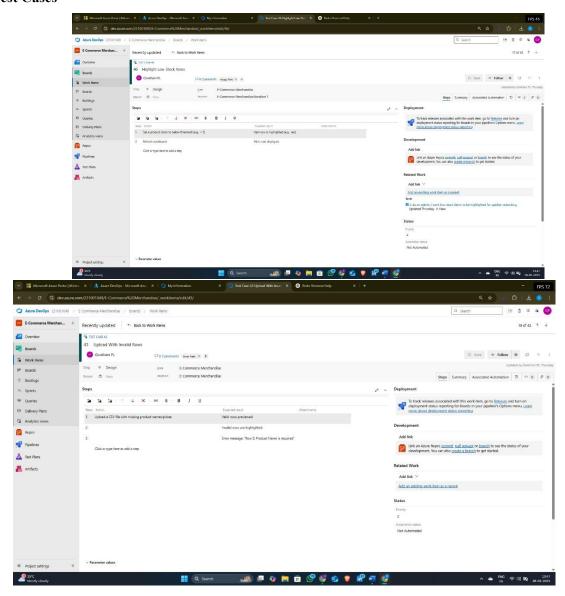
TC13 - Track Promo Code Usage

- Action:
 - o View analytics for a promo code
- Expected Result:
 - o Number of redemptions and users shown
- Type: Happy Path

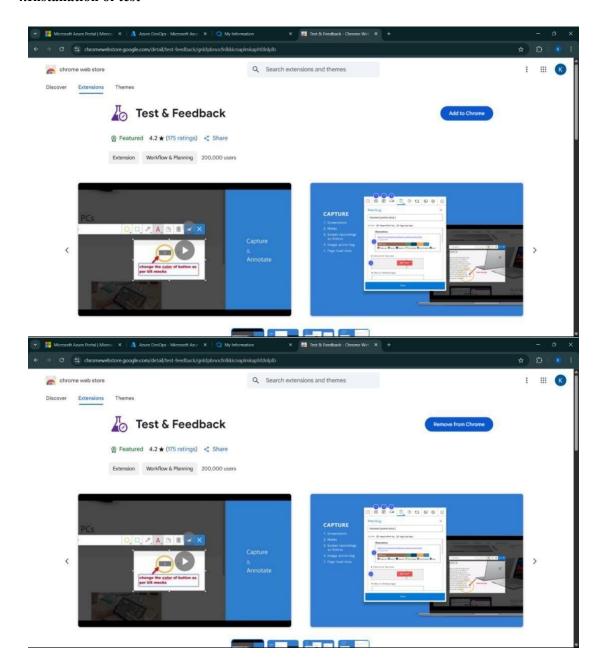
TC14 - Track Campaign Sales

- Action:
 - Open campaign dashboard
- Expected Result:
 - o Sales, revenue, and engagement metrics shown
- Type: Happy Path

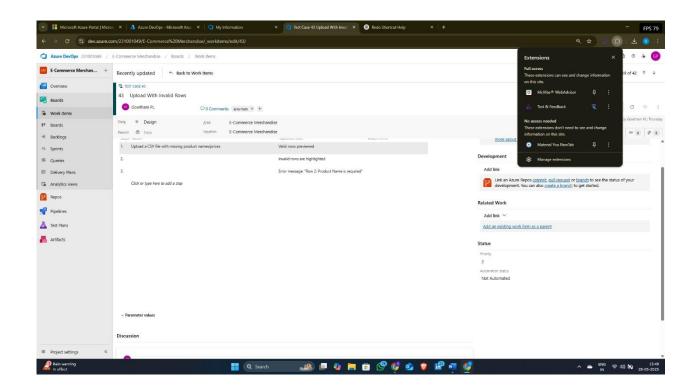
Test Cases



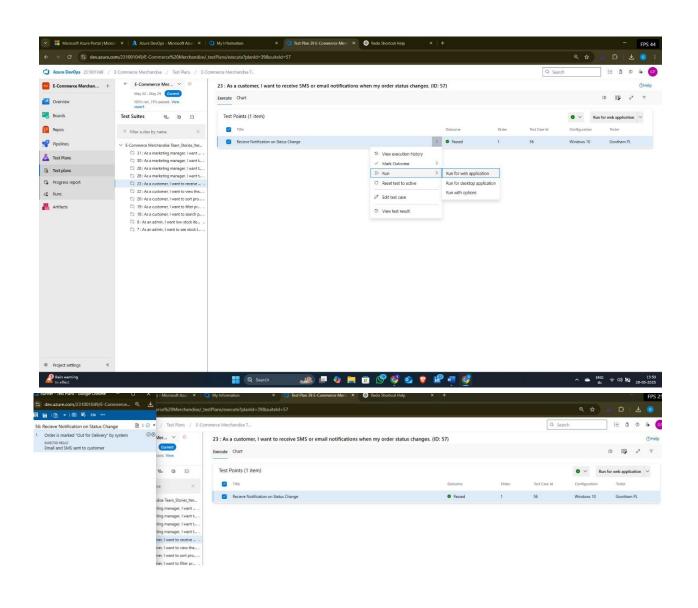
4.Installation of test



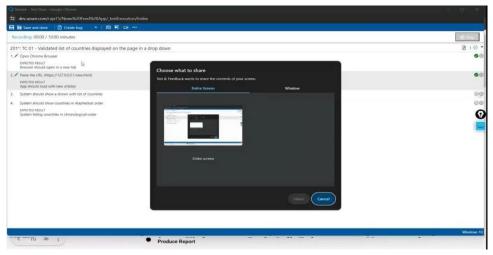
Test and feedback Showing it as an extension



5.Running the test cases

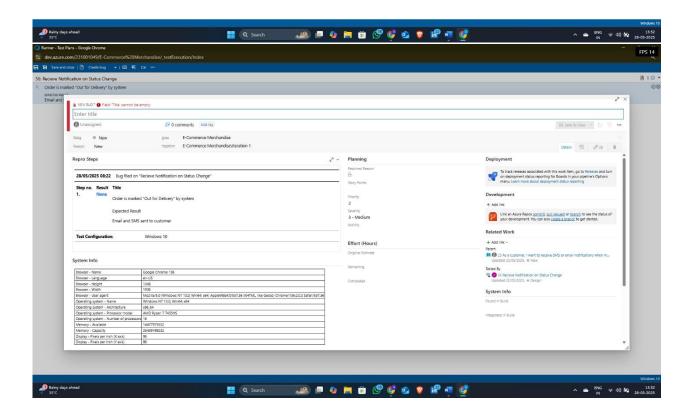


6.Recording the test case

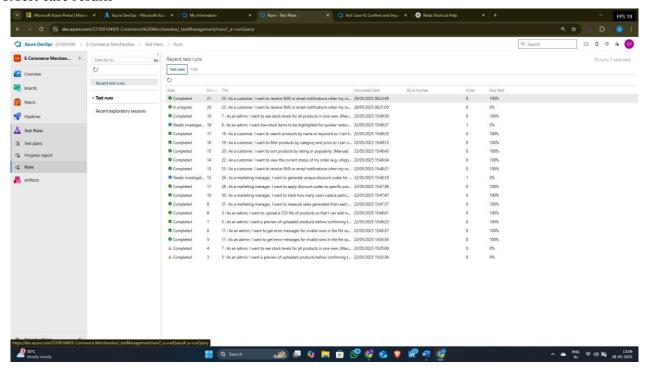


7. Creating the bug

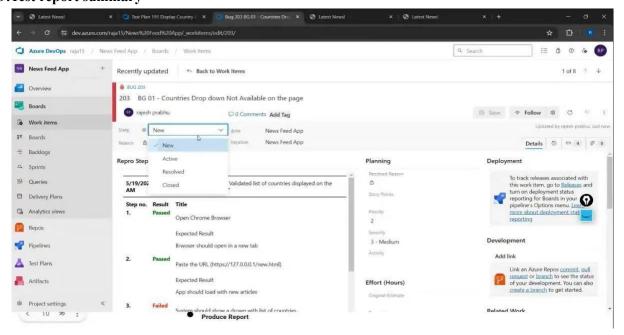




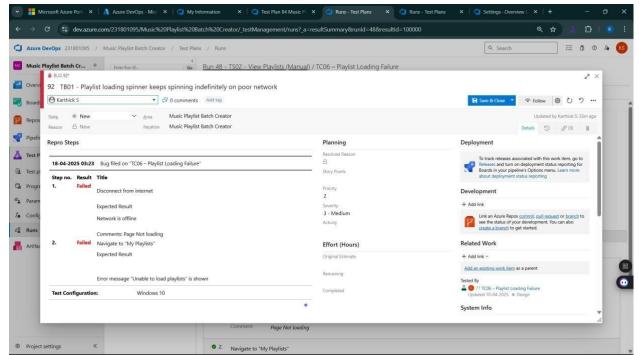
8. Test case results



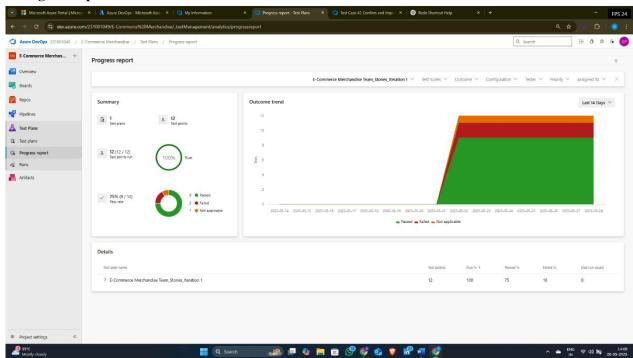
9.Test report summary



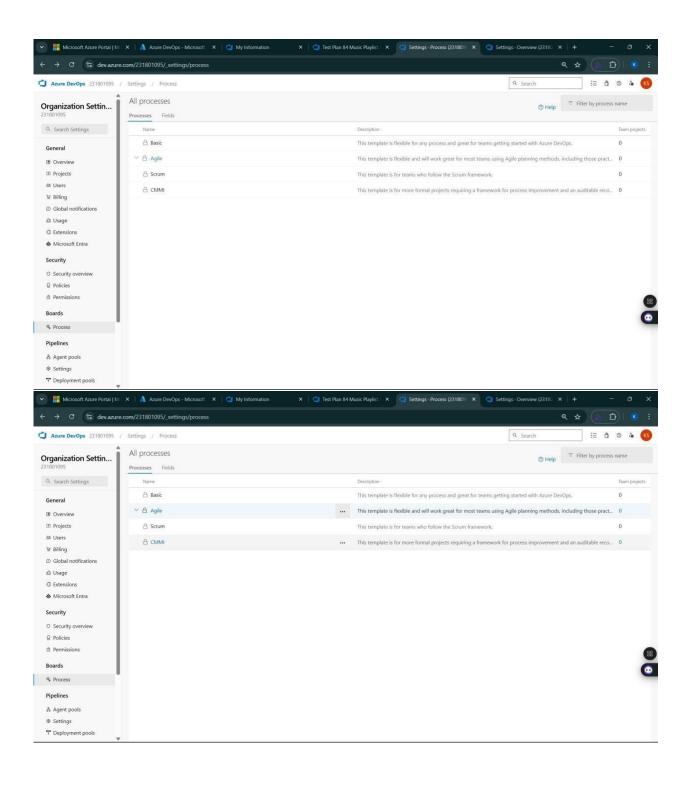
• Assigning bug to the developer and changing state

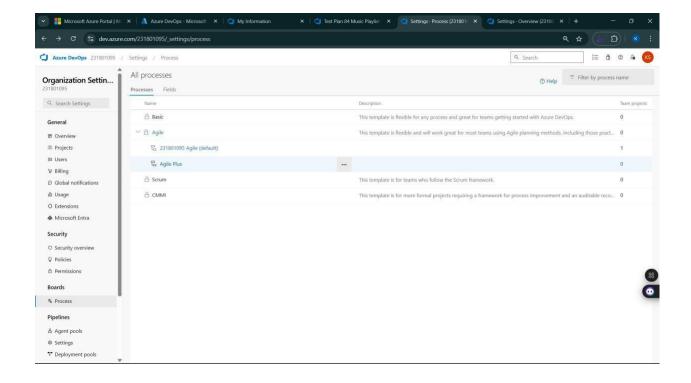


10.Progress report

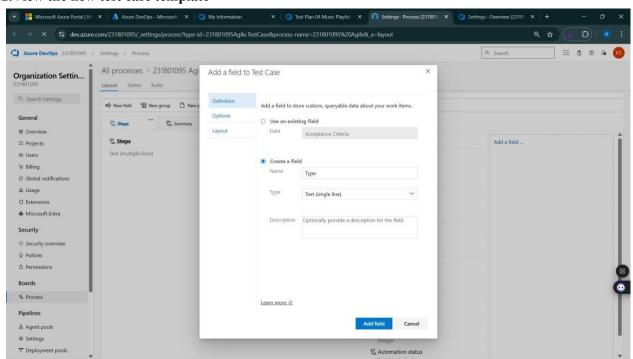


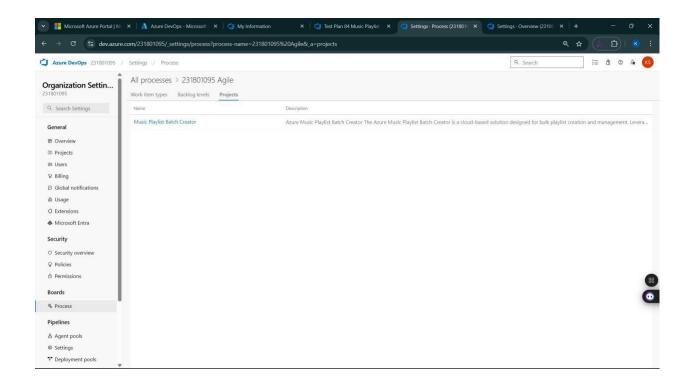
11. Changing the test template

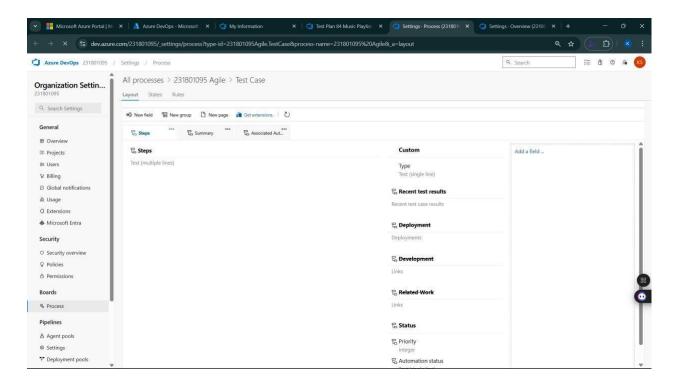




12. View the new test case template







Result:

The test plans and test cases for the user stories is created in Azure DevOps with Happy Path and Error Path

EXP NO: 9

LOAD TESTING AND PERFORMANCE TESTING

Aim:

To create an Azure Load Testing resource and run a load test to evaluate the performance of a target endpoint.

Load Testing

Steps to Create an Azure Load Testing Resource:

Before you run your first test, you need to create the Azure Load Testing resource:

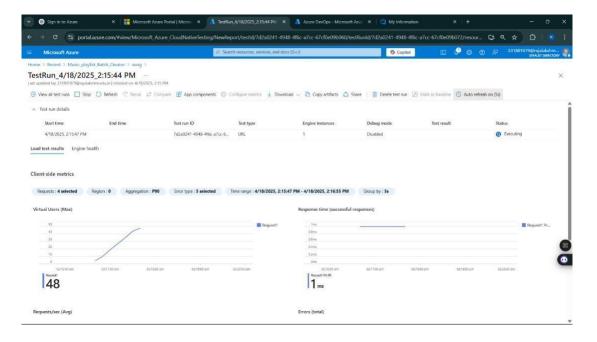
- Sign in to Azure Portal
 Go to https://portal.azure.com and log in.
- 2. Create the Resource ∘ Go to *Create a resource* → Search for "Azure Load Testing".
 - Select Azure Load Testing and click Create.
- 3. Fill in the Configuration Details o Subscription: Choose your Azure subscription. o Resource Group: Create new or select an existing one. o Name: Provide a unique name (no special characters).
 - o Location: Choose the region for hosting the resource.
- 4. (Optional) Configure tags for categorization and billing.
- 5. Click Review + Create, then Create.
- 6. Once deployment is complete, click Go to resource.

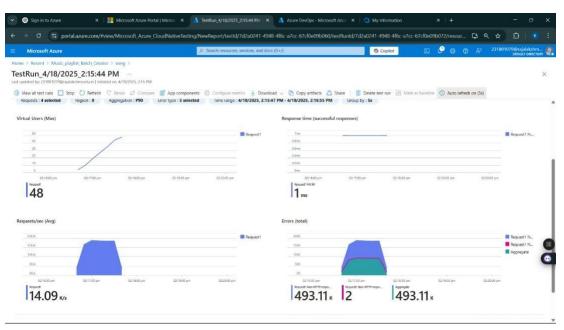
Steps to Create and Run a Load Test:

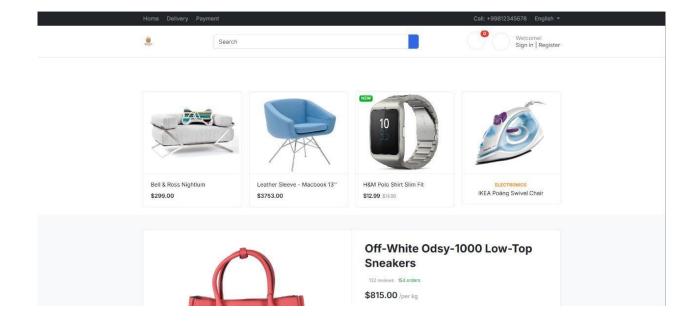
Once your resource is ready:

- 1. Go to your Azure Load Testing resource and click Add HTTP requests > Create.
- 2. Basics Tab o *Test Name:* Provide a unique name.
 - o Description: (Optional) Add test purpose.
 - o Run After Creation: Keep checked.
- 3. Load Settings o *Test URL:* Enter the target endpoint (e.g., https://yourapi.com/products).
- 4. Click Review + Create \rightarrow Create to start the test.

Load Testing







Result:

Successfully created the Azure Load Testing resource and executed a load test to assess the performance of the specified endpoint.

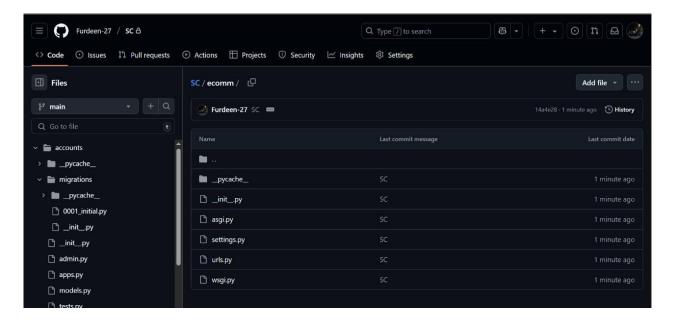
EXP NO: 10

GITHUB: PROJECT STRUCTURE & NAMING CONVENTIONS

Aim:

To provide a clear and organized view of the project's folder structure and file naming conventions, helping contributors and users easily understand, navigate, and extend the Music Playlist Batch Creator project.

GitHub Project Structure



Result:

The GitHub repository clearly displays the organized project structure and consistent naming conventions, making it easy for users and contributors to understand and navigate the codebase.