

**RAJALAKSHMI ENGINEERING COLLEGE**  
**RAJALAKSHMI NAGAR, THANDALAM - 602 105**



**RAJALAKSHMI  
ENGINEERING COLLEGE**  
An AUTONOMOUS Institution  
Affiliated to ANNA UNIVERSITY, Chennai

(REGULATION 2023)

**CS23432  
Software Construction**

**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING  
LABORATORY RECORD NOTEBOOK**

Name : .MANI...SHANKAR...RAJU..R.....

Year / Branch / Section : .....  
2/AIML/FA

Register No. : .....  
2116-231501094

Semester : .....  
4

Academic Year : .....  
2024-2025



**RAJALAKSHMI ENGINEERING COLLEGE (AUTONOMOUS)**  
**RAJALAKSHMI NAGAR, THANDALAM – 602 105**

**BONAFIDE CERTIFICATE**

NAME MANI SHANKAR RAJU · R REGISTER NO. 2116-231501094

ACADEMIC YEAR 2024-25 SEMESTER- IV BRANCH: AIML-B.Tech

This Certification is the Bonafide record of work done by the above student

in the **CS23432- Software Construction** Laboratory during

the year 2024 – 2025.



Signature of Faculty -in- Charge

Submitted for the Practical Examination held on \_\_\_\_\_

Internal Examiner

External Exam

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Name: MANI SHANKAR RATU.R Branch: AIML Sec: FA Roll no: 2116231501D94

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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/get-started/azure-portal>.

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>

The screenshot shows the Microsoft Azure portal homepage. The URL in the address bar is <https://azure.microsoft.com/en-us/get-started/azure-portal>. The page features a dark header with the Microsoft logo, a search bar, and navigation links for Explore, Products, Solutions, Pricing, Partners, and Resources. Below the header, a large banner reads "Microsoft Azure portal" and "Build, manage, and monitor everything from simple web apps to complex cloud applications in a single, unified console". It includes two buttons: "Sign in" and "New to Azure? Get started >". A blue call-to-action bar at the bottom encourages users to "Check out the how-to video series for tips on deploying your cloud workloads from the Azure portal. >".

The screenshot shows the Azure mobile app interface running on an iPhone. The app displays a virtual machine named "azmobile" which is "Running". It shows activity logs with 2 Errors and 2 Warnings. The phone's status bar indicates the time is 3:03 AM, the date is 5/26/2025, and the battery level is 85%. The background of the phone screen shows a blurred view of the Azure portal. At the bottom of the phone screen, there is a taskbar with various app icons. The overall desktop environment includes a weather widget showing "Hot days ahead 29°C", a search bar, and a system tray with icons for volume, battery, and connectivity.

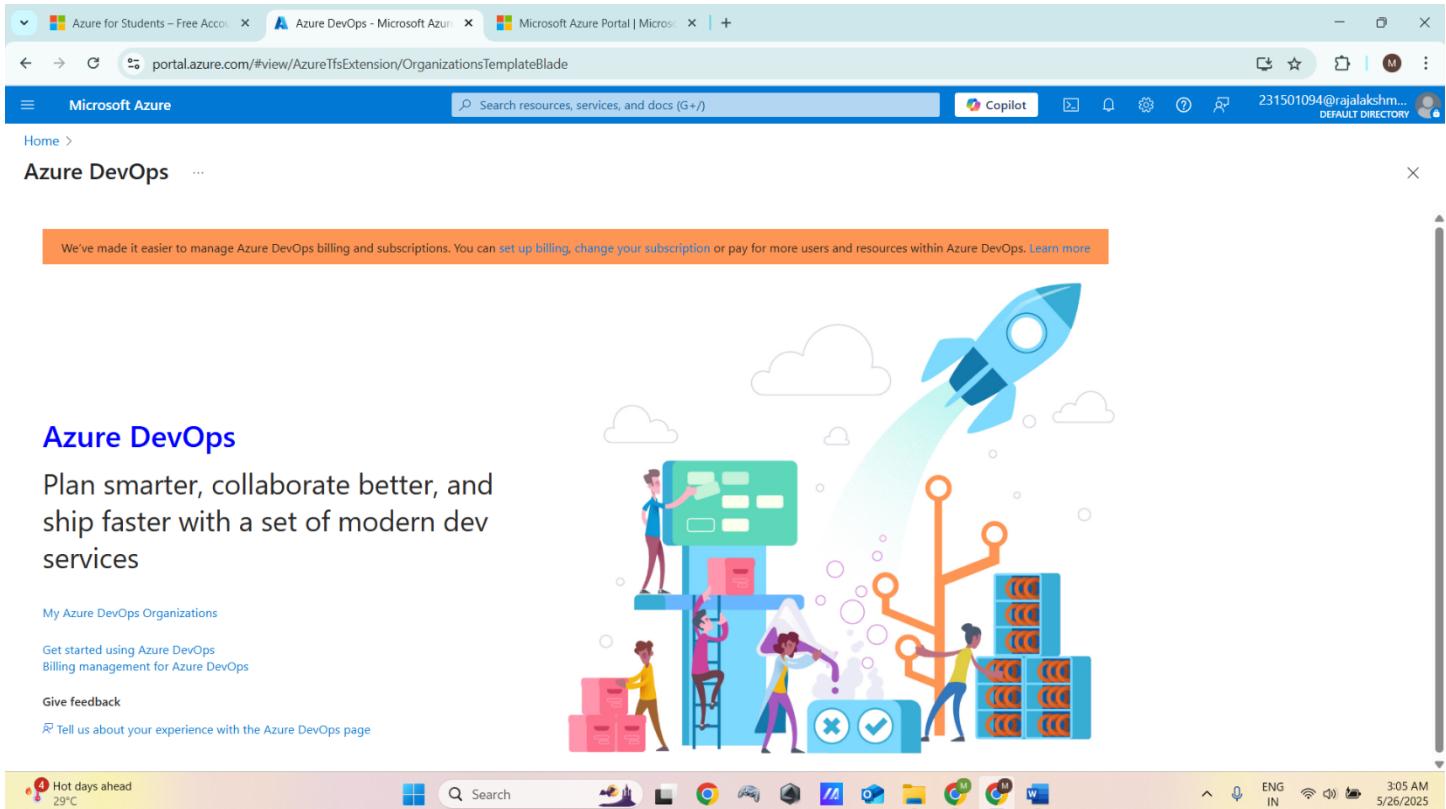
## 2. Azure home page

The screenshot shows the Microsoft Azure home page. At the top, there are links for 'Azure for Students – Free Account', 'Home - Microsoft Azure', and 'Microsoft Azure Portal | Microsoft'. The main header bar includes a search bar ('Search resources, services, and docs (G+/)'), a Copilot icon, and user information ('231501094@rajalakshm... DEFAULT DIRECTORY'). Below the header, the 'Azure services' section features a grid of icons for 'Create a resource', 'Azure DevOps organizations', 'Quickstart Center', 'Azure AI Foundry', 'Kubernetes services', 'Virtual machines', 'App Services', 'Storage accounts', 'SQL databases', and 'More services'. The 'Resources' section shows a table with columns for 'Name', 'Type', and 'Last Viewed', but it displays a message: 'No resources have been viewed recently' with a 'View all resources' button. The 'Navigate' section includes links for 'Subscriptions', 'Resource groups', 'All resources', and 'Dashboard'. A taskbar at the bottom shows various pinned applications like Microsoft Word, Excel, and Edge.

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

The screenshot shows the Microsoft Azure home page again, but with a search query 'azure devops' entered into the search bar. The search results are displayed in a sidebar on the right, under categories like 'Services', 'Marketplace', and 'Documentation'. The 'Services' category lists 'Azure DevOps organizations', 'Azure Cosmos DB', 'Azure Database for MySQL servers', and 'Azure Deployment Environments'. The 'Marketplace' category lists 'Build Agents for Azure DevOps', 'Azure DevOps Auditing', 'Azure DevOps Backup Tool', and 'Self Hosted Runner for Azure DevOps'. The 'Documentation' category lists 'Billing overview - Azure DevOps', 'Deploy applications with Azure DevOps learning path - Training', and 'Deploying to Azure VMs using deployment groups in Azure Pipelines - Azure Pi...'. Other sections like 'Azure services', 'Resources', 'Navigate', and 'Tools' are visible on the left and bottom of the page.

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.

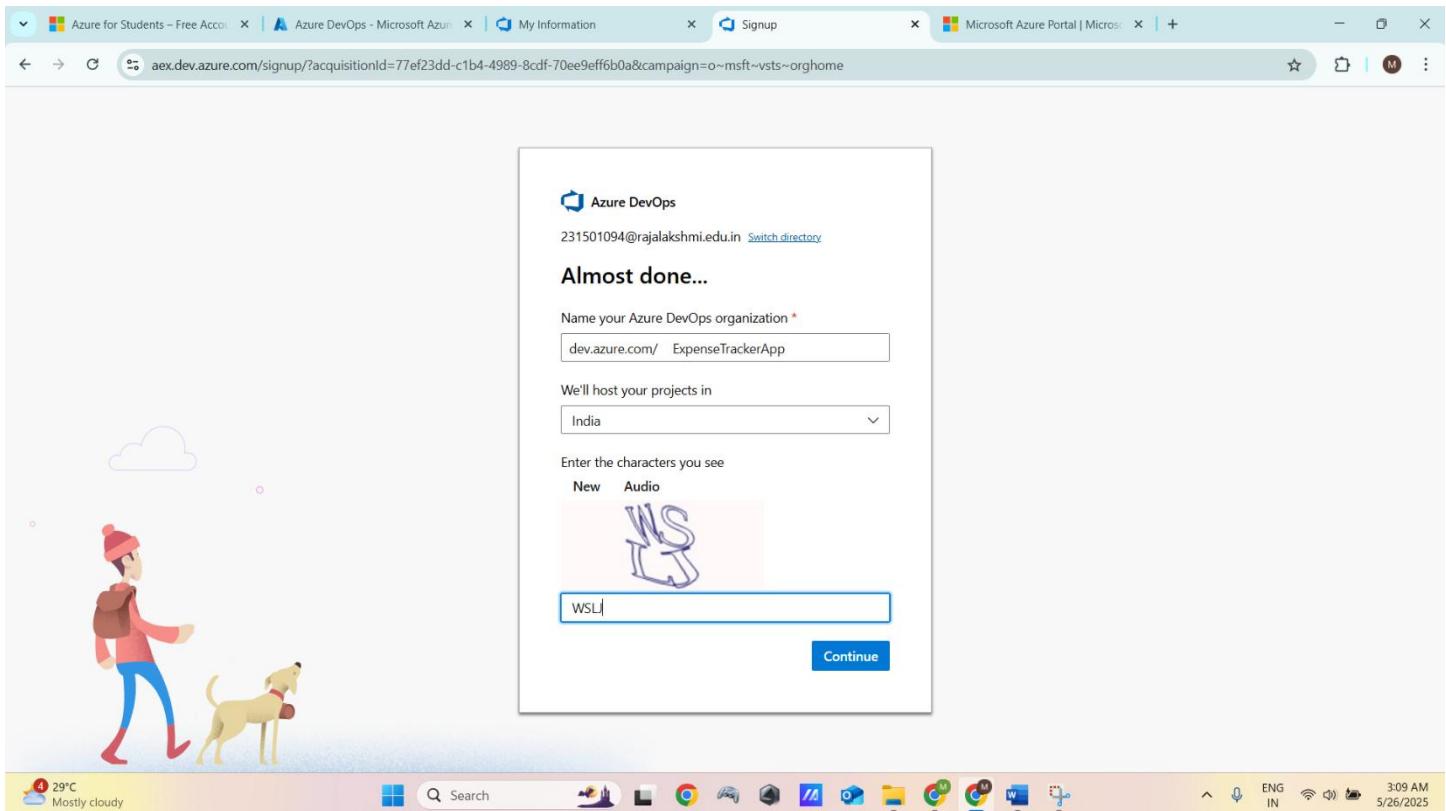
**EXP NO: 2**

## **AZURE DEVOPS PROJECT SETUP AND USER STORY MANAGEMENT**

### **Aim:**

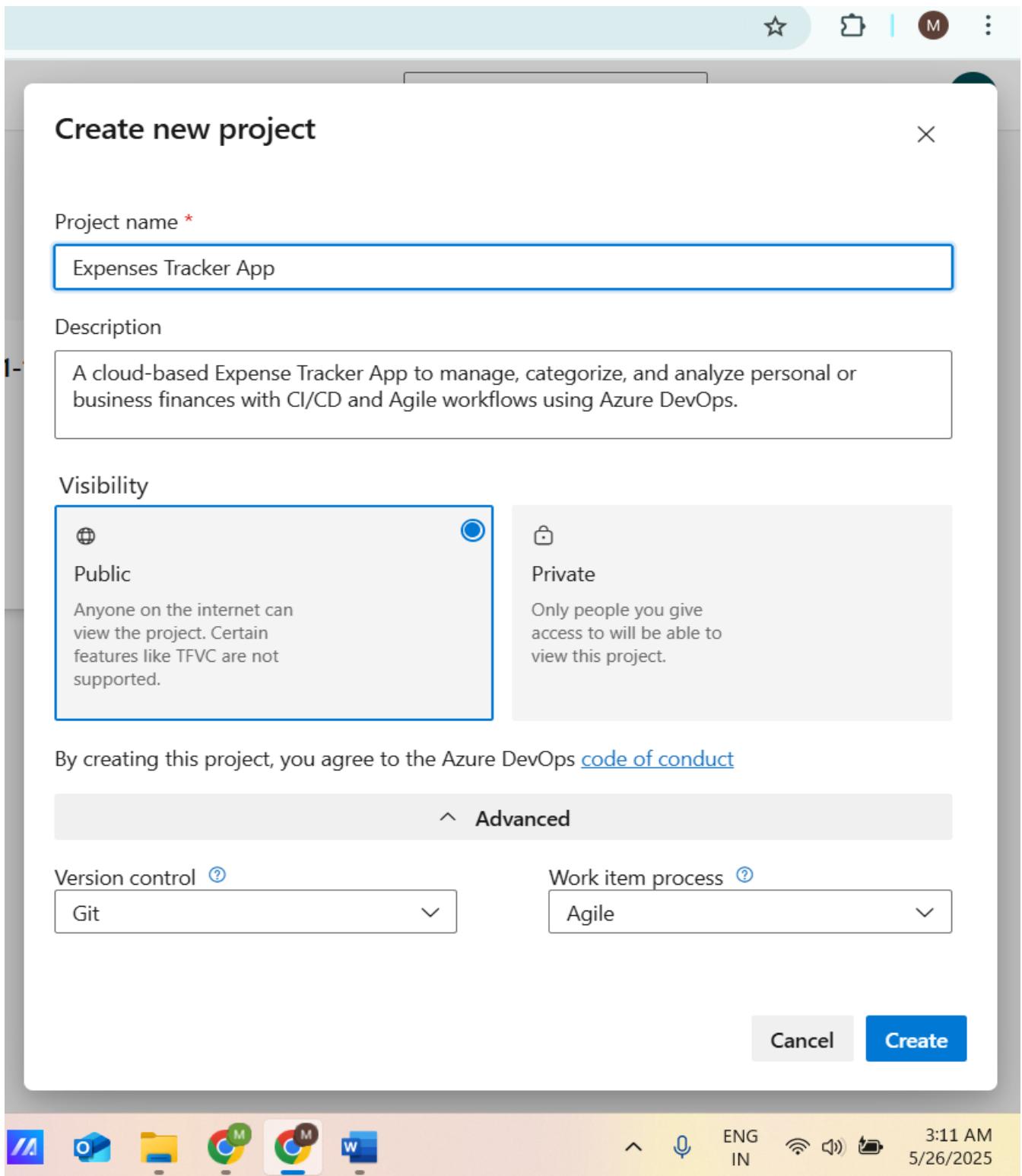
To set up an Azure DevOps project for efficient collaboration and agile work management.

#### **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.



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.

Azure DevOps Organizations

Create new organization

Projects

- Expense Tracker App
- PROJECT 1-1
- PROJECT 1

Actions

Open in Visual Studio

New project

Mani Shankar Raju R

Edit profile

231501094@rajalakshmi.edu.in

Microsoft account

India

231501094@rajalakshmi.edu.in

Visual Studio Dev Essentials

Get everything you need to build and deploy your app on any platform.

Use your benefits

https://dev.azure.com/231501094/Expense%20Tracker%20App

29°C Mostly cloudy

Search

ENG IN

3:12 AM 5/26/2025

#### 4. Project dashboard

Search

Microsoft

Sign out

Mani Shankar Raju R

231501094@rajalakshmi.edu.in

[My Microsoft account](#)

[Switch directory](#)

Import Work Items

Recycle Bin

Types

Assigned to

Assigned To

State

Sign in with a different account

Assigned To	State	Type
Unassigned	New	Expense Tracker App
Unassigned	New	Expense Tracker App
Unassigned	New	Expense Tracker App
Unassigned	New	Expense Tracker App

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5. To manage user stories:

- 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.
- 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.

The screenshot shows the Azure DevOps interface for the 'Expense Tracker App' project. The left sidebar is collapsed, and the main area displays the 'Work items' board. The board header includes a message about the new look of Azure Boards, a search bar, and various filter and export options. The table below lists 14 user stories, each with a title, ID, assignee, state, area path, and tags. The first story, 'Categorization & Budgeting', is selected. The table has columns for ID, Title, Assigned To, State, Area Path, and Tags. The 'Assigned To' column shows 'Mani Shankar Raju R' for most stories, while some are 'Unassigned'. The 'Area Path' column shows 'Expense Tracker App' for all stories. The 'Tags' column is empty for all stories.

ID	Title	Assigned To	State	Area Path	Tags
39	Categorization & Budgeting	Mani Shankar Raju R	New	Expense Tracker App	
46	Reporting & Analytics	Mani Shankar Raju R	New	Expense Tracker App	
53	DevOps & Deployment	Mani Shankar Raju R	New	Expense Tracker App	
32	Expense & Income Management	Mani Shankar Raju R	New	Expense Tracker App	
25	User Management	Mani Shankar Raju R	New	Expense Tracker App	
51	As a user, I want to see charts of my income and expenses so that I can...	Unassigned	New	Expense Tracker App	
50	As a user, I want to generate reports of my expenses over time so that I...	Unassigned	New	Expense Tracker App	
45	As a user, I want to receive alerts when my spending nears or exceeds...	Unassigned	New	Expense Tracker App	
44	As a user, I want to set spending limits for each category so that I can...	Unassigned	New	Expense Tracker App	
62	As a user, I want to update my profile details such as name, email, and...	Unassigned	New	Expense Tracker App	

**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:**

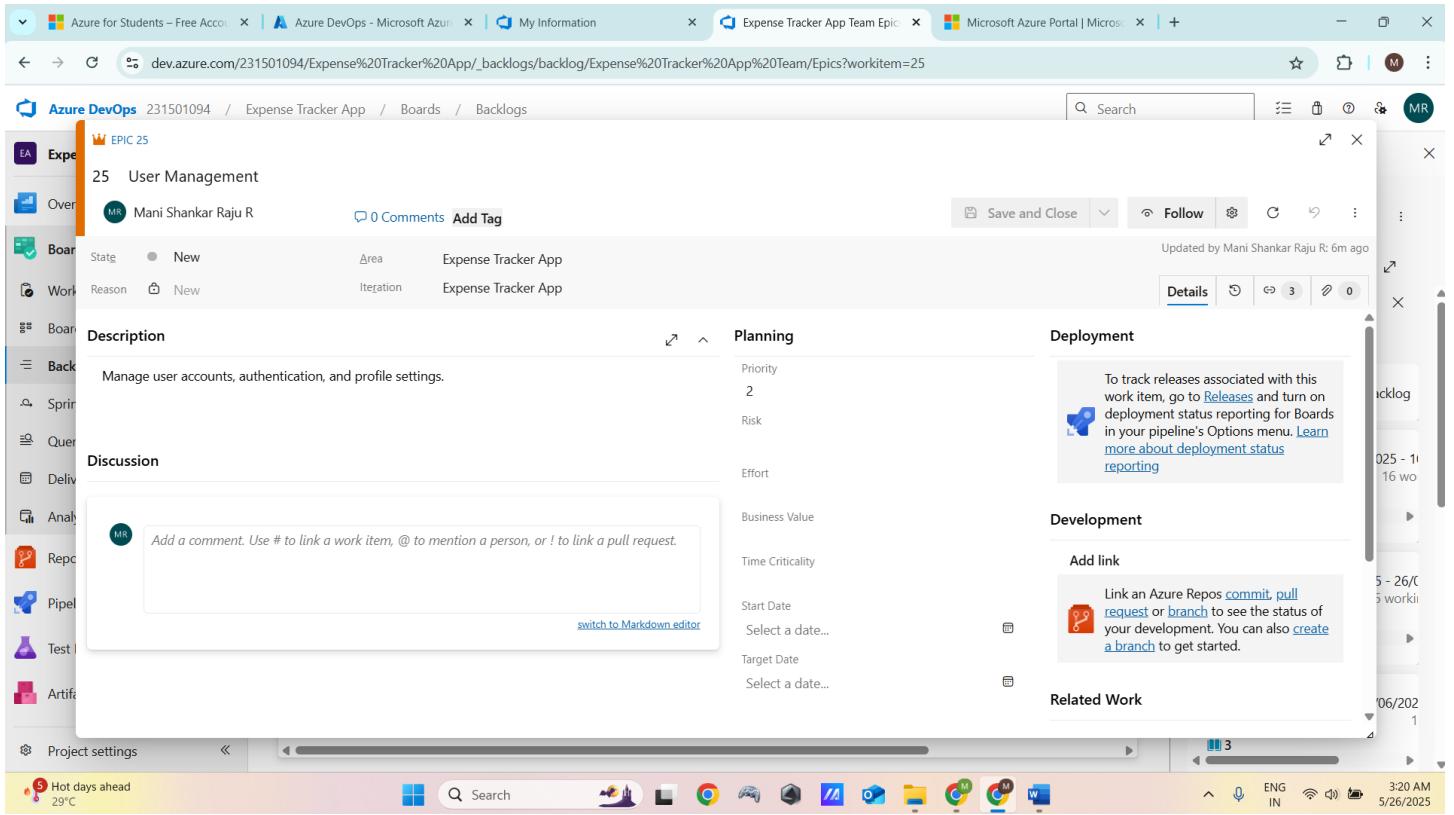
To learn about how to create epics, user story, features, backlogs for your assigned project.

### **Create Epic, Features, User Stories, Task**

The screenshot shows the Azure DevOps interface for the 'Expense Tracker App Team' backlog. The left sidebar includes options like Overview, Boards, Work items, Boards, Backlogs, Sprints, Queries, Delivery Plans, Analytics views, Repos, Pipelines, Test Plans, Artifacts, and Project settings. The main area displays a table of work items categorized by type (Epic, Feature, User Story) and state (New). To the right, there's a 'Planning' section with a backlog list and progress bars for tasks like 'User Management', 'Expense & Income Management', 'Categorization & Budgeting', 'Reporting & Analytics', and 'DevOps & Deployment'. The bottom of the screen shows a taskbar with various icons and system status.

Order	Work Item Type	Title	State	Effort	Business Value	
1	Epic	User Management	New		Business	
	Feature	User Registration	New		Business	
	User Story	As a new user, I want to register with my email and pa...	New		Business	
2	Feature	User Login & Authentication	New		Business	
	User Story	As a registered user, I want to securely log in using my...	New		Business	
	Feature	Profile Management	New		Business	
3	Epic	Expense & Income Management	New		Business	
	4	Epic	Categorization & Budgeting	New		Business
		Epic	Reporting & Analytics	New		Business
5	Epic	DevOps & Deployment	New		Business	

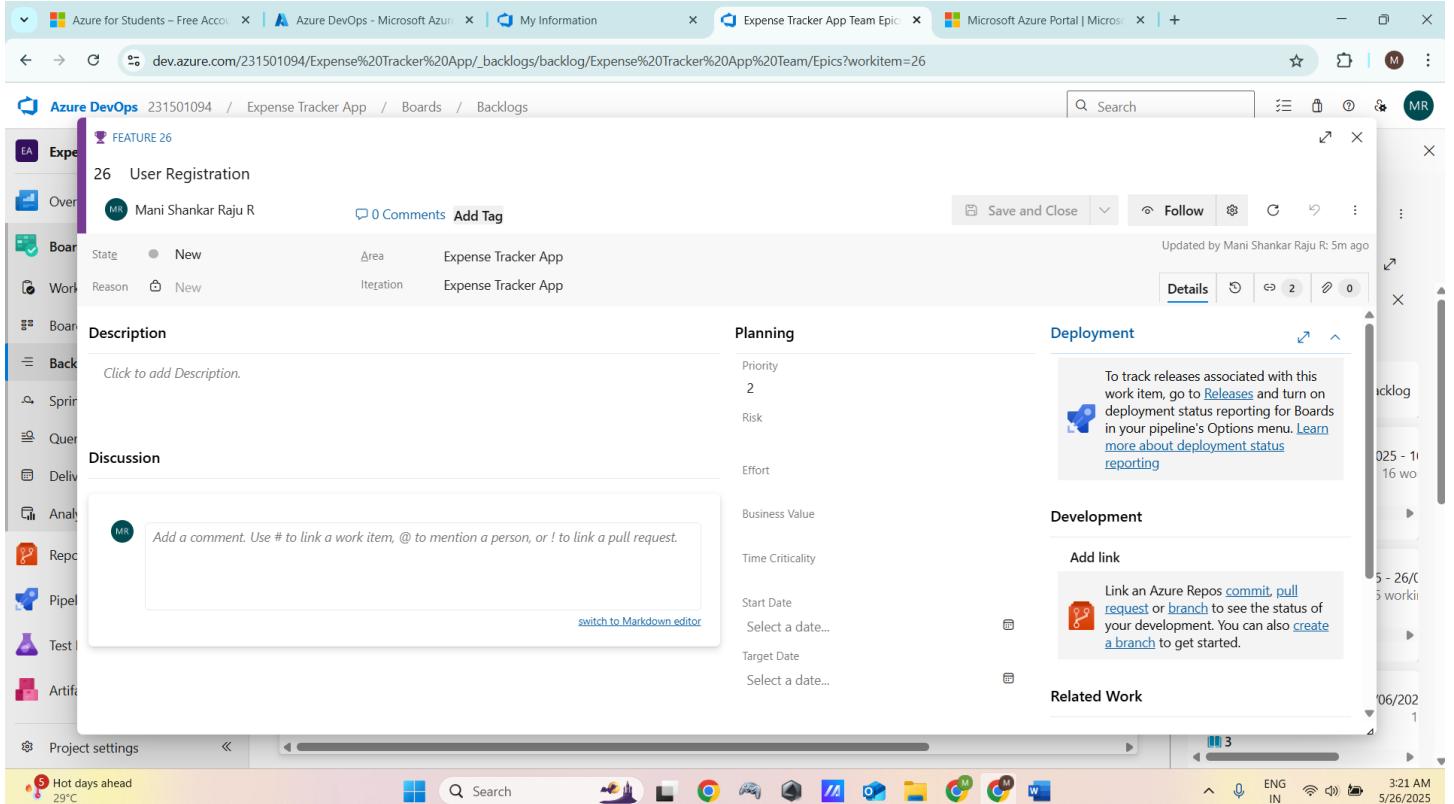
## 1. Fill in Epics



A screenshot of the Azure DevOps interface showing the details of an Epic. The Epic is titled "25 User Management". The "Planning" section shows a priority of 2. The "Deployment" section includes a note about tracking releases and a link to learn more about deployment status reporting. The "Development" section has a placeholder for linking an Azure Repo. The "Related Work" section shows a list of items.

**Epic Details:**  
Title: 25 User Management  
Owner: Mani Shankar Raju R  
Comments: 0  
Tags: Add Tag  
State: New  
Reason: New  
Area: Expense Tracker App  
Iteration: Expense Tracker App  
  
**Description:**  
Manage user accounts, authentication, and profile settings.  
  
**Discussion:**  
Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.  
  
**Planning:**  
Priority: 2  
Risk:  
Effort:  
Business Value:  
Time Criticality:  
Start Date: Select a date...  
Target Date: Select a date...  
  
**Deployment:**  
To track releases associated with this work item, go to [Releases](#) and turn on deployment status reporting for Boards in your pipeline's Options menu. [Learn more about deployment status reporting](#)  
  
**Development:**  
Add link  
Link an Azure Repos [commit](#), [pull request](#) or [branch](#) to see the status of your development. You can also [create a branch](#) to get started.  
  
**Related Work:**  
06/2025 1

## 2. Fill in Features



A screenshot of the Azure DevOps interface showing the details of a Feature. The Feature is titled "26 User Registration". The "Planning" section shows a priority of 2. The "Deployment" section includes a note about tracking releases and a link to learn more about deployment status reporting. The "Development" section has a placeholder for linking an Azure Repo. The "Related Work" section shows a list of items.

**Feature Details:**  
Title: 26 User Registration  
Owner: Mani Shankar Raju R  
Comments: 0  
Tags: Add Tag  
State: New  
Reason: New  
Area: Expense Tracker App  
Iteration: Expense Tracker App  
  
**Description:**  
Click to add Description.  
  
**Discussion:**  
Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.  
  
**Planning:**  
Priority: 2  
Risk:  
Effort:  
Business Value:  
Time Criticality:  
Start Date: Select a date...  
Target Date: Select a date...  
  
**Deployment:**  
To track releases associated with this work item, go to [Releases](#) and turn on deployment status reporting for Boards in your pipeline's Options menu. [Learn more about deployment status reporting](#)  
  
**Development:**  
Add link  
Link an Azure Repos [commit](#), [pull request](#) or [branch](#) to see the status of your development. You can also [create a branch](#) to get started.  
  
**Related Work:**  
06/2025 1

### 3.Fill in User Story details

60 As a new user, I want to register with my email and password so that I can create an account and access the app.

Mani Shankar Raju R 0 Comments Add Tag

State: New Area: Expense Tracker App  
Reason: New Iteration: Expense Tracker App/User Management

Description: Click to add Description.

Acceptance Criteria: Click to add Acceptance Criteria.

Discussion: Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.

Planning: Story Points, Priority (2), Risk

Classification: Value area (Business)

Deployment: To track releases associated with this work item, go to [Releases](#) and turn on deployment status reporting for Boards in your pipeline's Options menu. [Learn more about deployment status reporting](#)

Development: Add link: Link an Azure Repos [commit](#), [pull request](#) or [branch](#) to see the status of your development. You can also [create a branch](#) to get started.

Related Work: 3 items

#### Result:

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

**EXP NO: 4**

# SPRINT PLANNING

## Aim:

To assign user story to specific sprint for the Project Online Quiz System.

## Sprint Planning

### Sprint 1

The screenshot shows the Azure DevOps Taskboard for the Expense Tracker App Team. The board is set up for the 'Transaction Handling' sprint, which is currently active from May 26 to June 10, with 16 work days remaining. The board has four columns: New, Active, Resolved, and Closed. There are three user stories listed under the New column:

- Story 36: As a user, I want to add a new expense with details like amount, category, and date so that I can track my spending.
  - Status: New
  - Assigned to: Mani Shankar Raju R
- Story 37: As a user, I want to record income sources and amounts so that I can monitor my earnings.
  - Status: New
  - Assigned to: Mani Shankar Raju R
- Story 38: As a user, I want to edit or delete a transaction so that I can correct mistakes.
  - Status: New
  - Assigned to: Mani Shankar Raju R

## Sprint 2

The screenshot shows the Azure DevOps Boards interface for the Expense Tracker App. The left sidebar is collapsed, and the main area displays the Taskboard for the Expense Tracker App Team. The board has four columns: New, Active, Resolved, and Closed. Three user stories are visible in the New column:

- 60 As a new user, I want to register with my email and password so that I can create an account and access the app.  
New  
Mani Shankar Raju R
- 61 As a registered user, I want to securely log in using my credentials so that I can access my personal dashboard.  
New  
Mani Shankar Raju R
- 62 As a user, I want to update my profile details such as name, email, and  
New  
Mani Shankar Raju R

The top navigation bar includes links for Azure for Students, Azure DevOps, My Information, Expense Tracker App Team User, Microsoft Azure Portal, and a search bar. The bottom taskbar shows various pinned application icons.

## Sprint 3

The screenshot shows the Azure DevOps Boards interface for the Expense Tracker App. The left sidebar is collapsed, and the main area displays the Taskboard for the Expense Tracker App Team Insights. The board has four columns: New, Active, Resolved, and Closed. Three user stories are visible in the New column:

- 50 As a user, I want to generate reports of my expenses over time so that I can analyze spending trends.  
New  
Mani Shankar Raju R
- 51 As a user, I want to see charts of my income and expenses so that I can quickly understand my financial status.  
New  
Mani Shankar Raju R
- 52 As a user, I want to export my financial data as CSV or PDF so that I can keep track of my expenses.  
New  
Mani Shankar Raju R

The top navigation bar includes links for Azure for Students, Azure DevOps, My Information, Expense Tracker App Team Insights, Microsoft Azure Portal, and a search bar. The bottom taskbar shows various pinned application icons.

## Result:

The Sprints are created for the Project Expense Tracker App.

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**EXP NO: 5**

# **POKER ESTIMATION**

## **Aim:**

Create Poker Estimation for the user stories – Online Quiz System Project.

## **Poker Estimation**

The screenshot shows a User Story card in Azure DevOps. The story is titled "60 As a new user, I want to register with my email and password so that I can create an account and access the app." It is assigned to Mani Shankar Raju R. The card includes the following details:

- Description:** Click to add Description.
- Acceptance Criteria:** Click to add Acceptance Criteria.
- Planning:**
  - Story Points: 2
  - Priority: 2
  - Risk: 1 - High
- Deployment:** To track releases associated with this work item, go to Releases and turn on deployment status reporting for Boards in your pipeline's Options menu. Learn more about deployment status reporting.
- Development:** Add link
- Classification:** Value area: Business
- Discussion:** Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.

## **Result:**

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

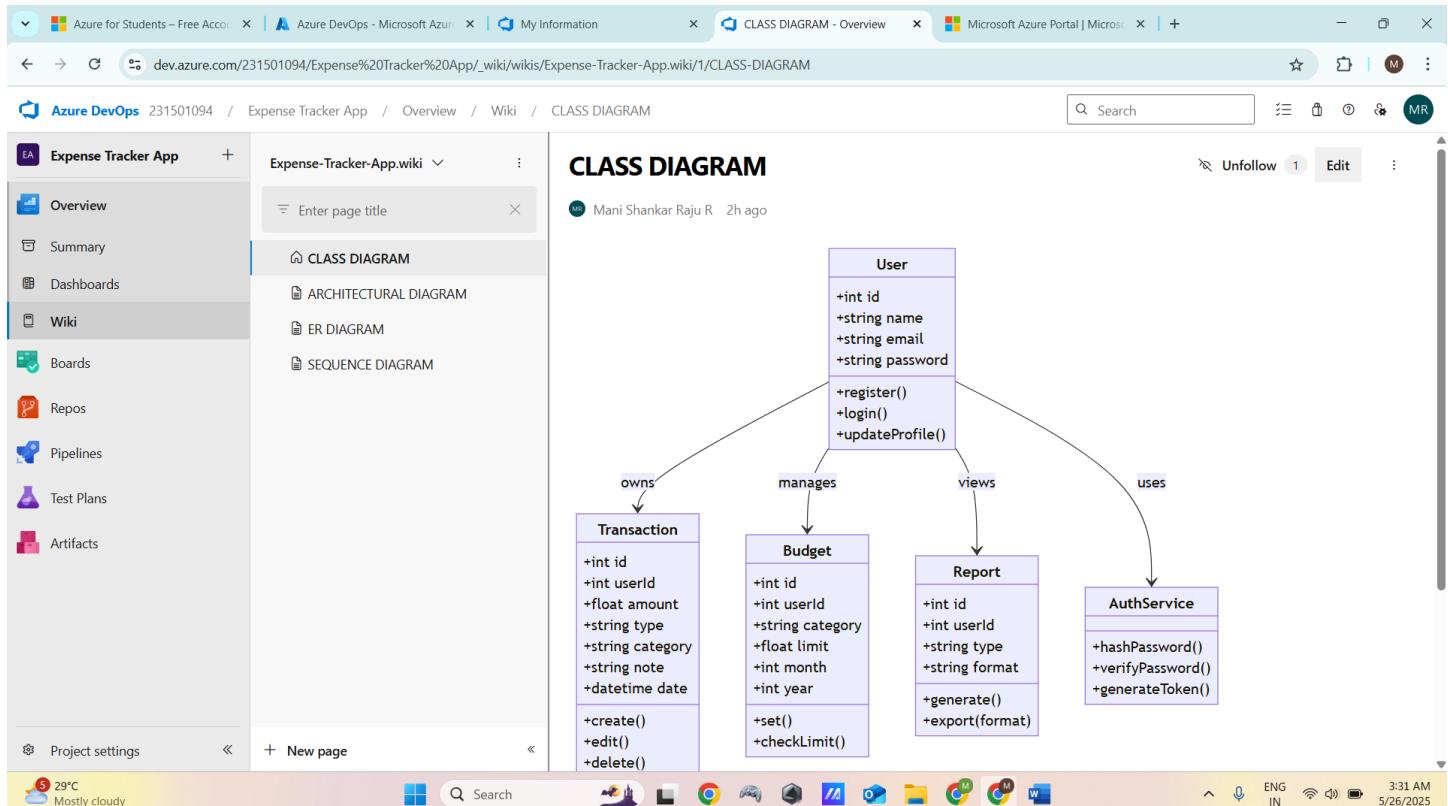
**EXP NO: 6**

## **DESIGNING CLASS AND SEQUENCE DIAGRAMS FOR PROJECT ARCHITECTURE**

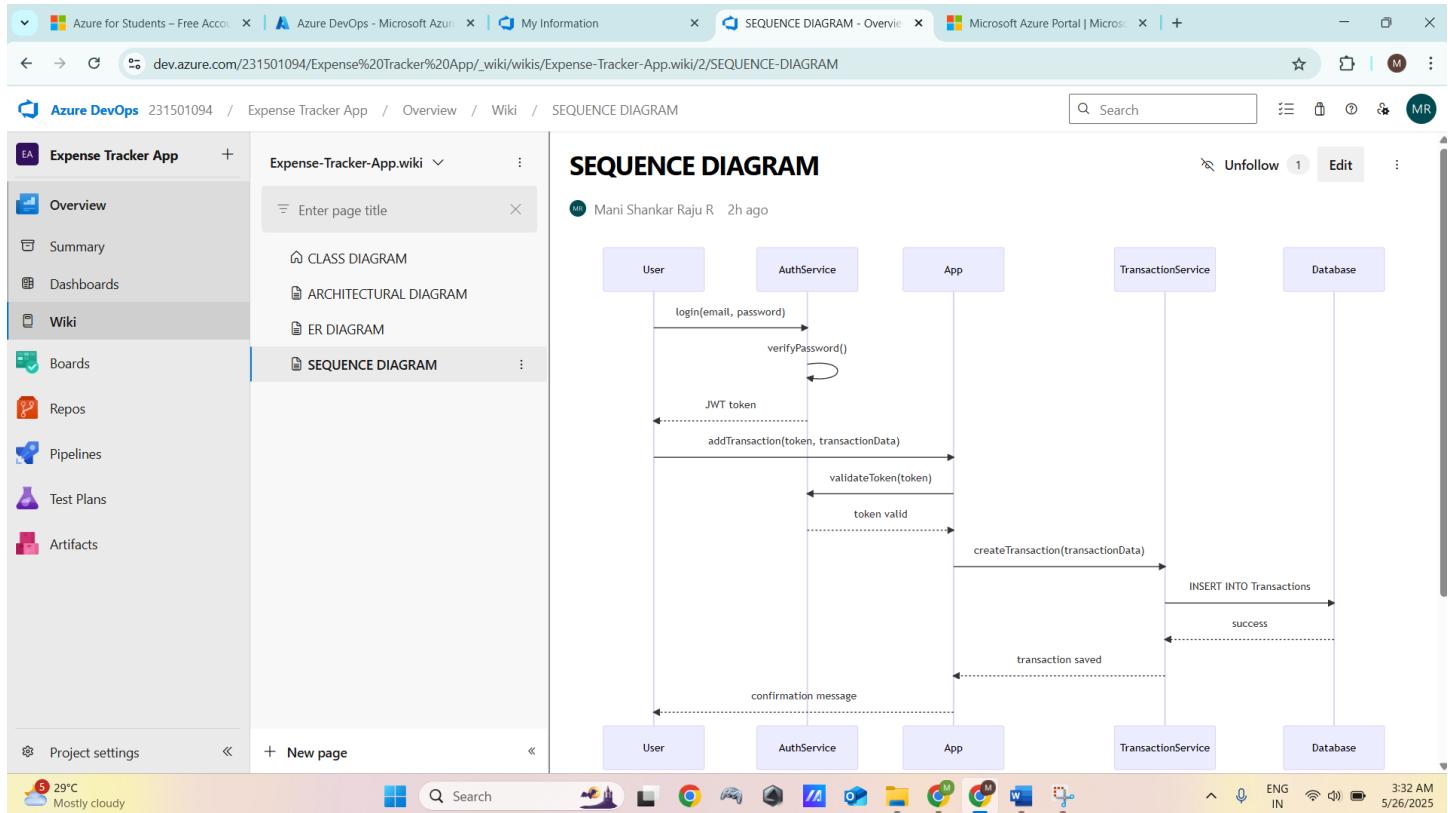
### **Aim:**

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 Project Online Quiz System.

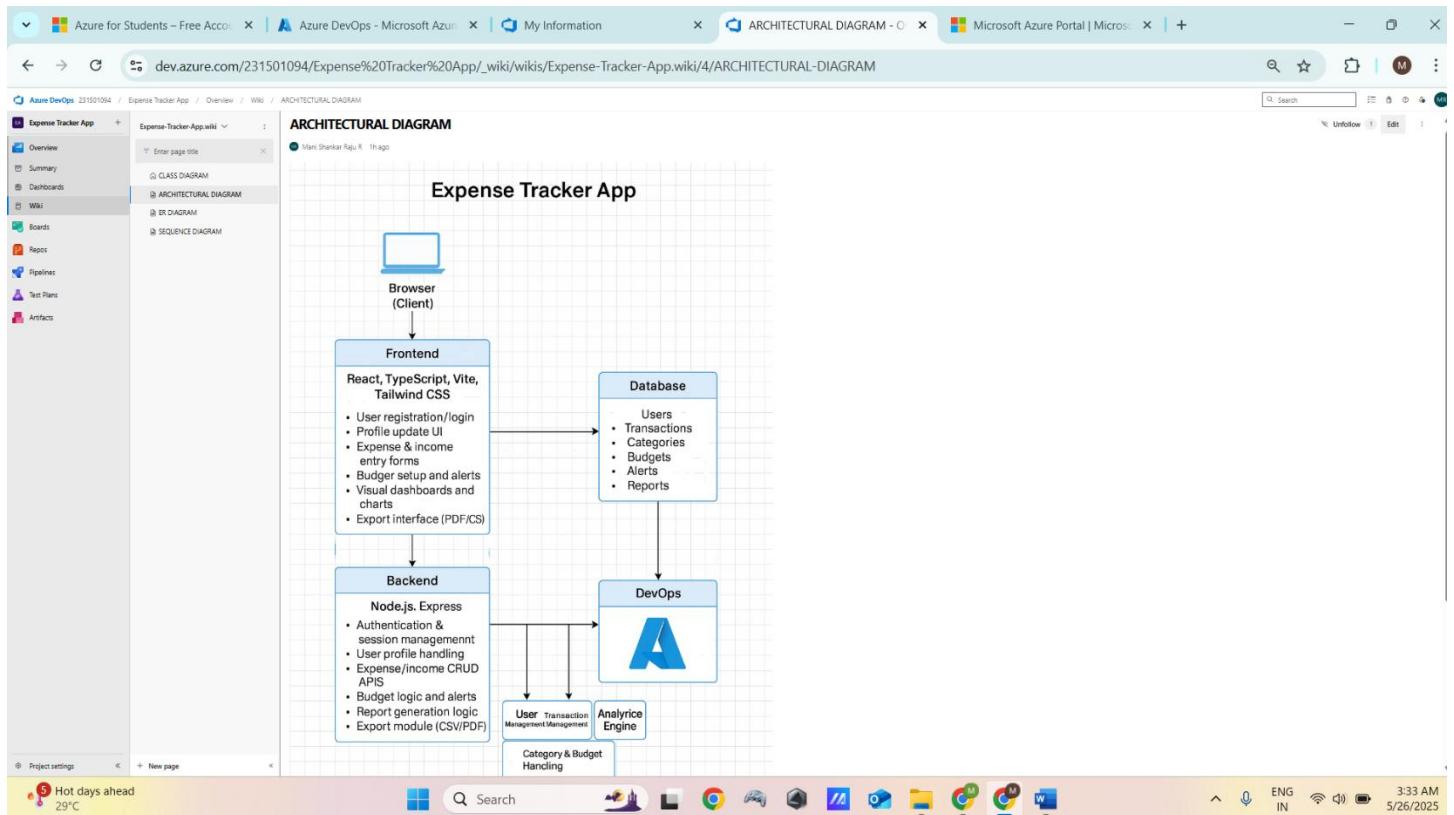
**EXP NO: 7**

## **DESIGNING ARCHITECTURAL AND ER DIAGRAMS FOR PROJECT STRUCTURE**

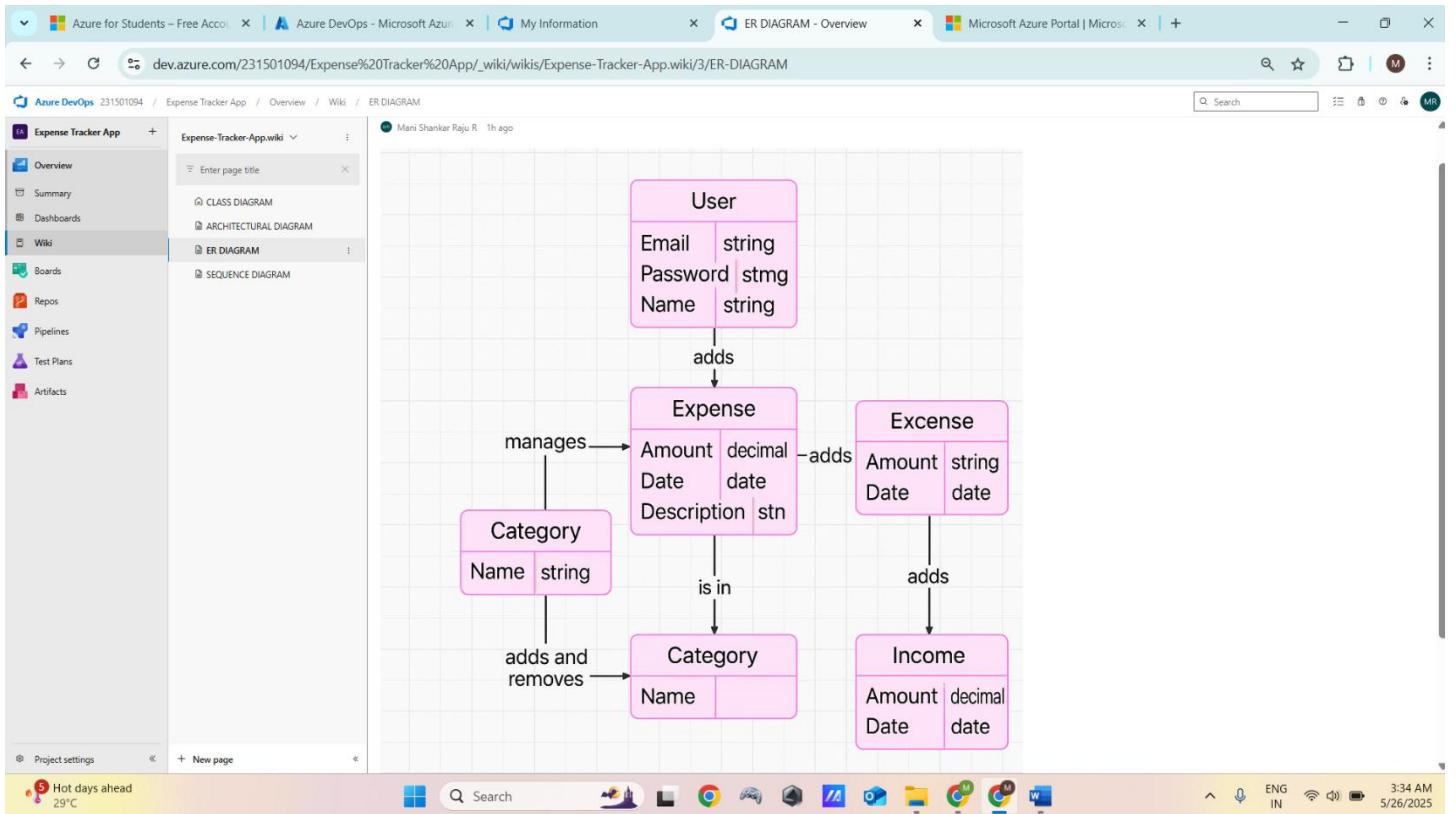
### **Aim:**

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 Online Quiz System.

**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**

##### **1. Understand Core Features of the Application**

- User Signup & Login
- Viewing and Managing Playlists
- Fetching Real-time Metadata
- Editing playlists (rename, reorder, record)
- Creating smart audio playlists based on categories (mood, genre, artist, etc.)

##### **2. Define User Interactions**

- Each test case simulates a real user behaviour (e.g., logging in, renaming a playlist, adding a song).

##### **3. Design Happy Path Test Cases**

- Focused on validating that all features function as expected under normal conditions.
- Example: User logs in successfully, adds item to playlist, or creates a category-based playlist.

##### **4. Design Error Path Test Cases**

- Simulate negative or unexpected scenarios to test robustness and error handling.
- Example: Login fails with invalid credentials, save fails when offline, no recommendations found.

##### **5. Break Down Steps and Expected Results**

- Each test case contains step-by-step actions and a corresponding expected outcome.
- 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).
- 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).

- Improves organization and test execution flow in Azure DevOps.

## 8. Prioritize and Review

- Critical user actions are marked high-priority.
- Reviewed for completeness and traceability against feature requirements.

### 1. New test plan

The screenshot shows the Azure DevOps interface for the 'Online Quiz System'. The left sidebar includes 'Boards', 'Work items', 'Repos', 'Pipelines', and 'Artifacts'. The main area displays a work item titled 'test 1' (ID 83). The work item details include:

- Description:** Click to add Description.
- Planning:** Priority: 2, Activity:
- Deployment:** To track releases associated with this work item, go to [Releases](#) and turn on deployment status reporting for Boards in your pipeline's Options menu. [Learn more about deployment status reporting](#)
- Effort (Hours):** Original Estimate: , Remaining: , Completed:
- Development:** Link a GitHub [commit](#), [pull request](#) or [branch](#) to see the status of your development. You can also [create a branch](#) to get started. [Learn more](#)

### 2. Test suite

The screenshot shows the Azure DevOps interface for 'Test Plans'. The left sidebar includes 'Test Plans', 'Test plans', and 'Runs'. The main area displays a test point for scenario 31:

**31 : As a user, I want to sign up using my email and password so that I can access the quiz system. (ID: 75) [Help](#)**

**Execute** Chart

Title	Outcome	Order	Test Case Id
Test1	Passed	1	72
te	Failed	2	78

**Test Points (2 items)**

31 : As a user, I want to sign up using my email and password so that I can access the quiz system. (2)

## User Story 1: Secure Sign-Up and Login (ID: 101)

### Test Plan: Test 1 – User Authentication

#### TC01 – Successful Sign Up

Type: Happy Path

Action:

Navigate to the Sign-Up page

Enter valid name, email, and password

Click "Sign Up"

Expected Result:

Fields accept values

Account is created

User is redirected to the dashboard

#### TC02 – Secure Login

Type: Happy Path

Action:

Go to Login page

Enter valid credentials

Click "Login"

Expected Result:

Login is successful

User lands on the dashboard

#### TC03 – Sign Up with Existing Email

Type: Error Path

Action:

Use an already registered email

Click "Sign Up"

Expected Result:

Error: "Email already registered"

#### TC04 – Login with Wrong Password

Type: Error Path

Action:

Enter valid email and wrong password

**Click "Login"**

**Expected Result:**

**Error: "Invalid username or password"**

---

**User Story 2: Add and View Expenses (ID: 102)**

**Test Plan: Test 2 – Expense Entry and Listing**

**TC05 – Add Expense Successfully**

**Type: Happy Path**

**Action:**

**Login**

**Navigate to "Add Expense"**

**Enter valid details (amount, category, date)**

**Click "Save"**

**Expected Result:**

**Expense is added and shown in the expense list**

**TC06 – View All Expenses**

**Type: Happy Path**

**Action:**

**Login**

**Navigate to "Expense List"**

**Expected Result:**

**All entered expenses are displayed with correct details**

**TC07 – Add Expense with Missing Fields**

**Type: Error Path**

**Action:**

**Leave required fields blank**

**Click "Save"**

**Expected Result:**

**Error: "All fields are required"**

---

**User Story 3: Generate Monthly Report (ID: 103)**

**Test Plan: Test 3 – Reports and Analysis**

**TC08 – Generate Report for Selected Month**

**Type: Happy Path**

**Action:**

**Login**

**Select a month from report filters**

**Click "Generate Report"**

**Expected Result:**

**Monthly summary is displayed with category-wise breakdown**

**TC09 – Report Generation Without Selection**

**Type: Error Path**

**Action:**

**Click "Generate Report" without selecting a time range**

**Expected Result:**

**Error: "Please select a date or range to generate report"**

---

**User Story 4: Edit or Delete Expenses (ID: 104)**

**Test Plan: Test 4 – Modify Existing Data**

**TC10 – Edit Expense Successfully**

**Type: Happy Path**

**Action:**

**Navigate to expense list**

**Click "Edit" on an expense**

**Modify details and click "Save"**

**Expected Result:**

**Expense is updated with new information**

**TC11 – Delete Expense Successfully**

**Type: Happy Path**

**Action:**

**Navigate to expense list**

**Click "Delete" on an expense**

**Confirm deletion**

**Expected Result:**

**Expense is removed from the list**

**TC12 – Edit with Invalid Data**

**Type:** Error Path

**Action:**

**Click "Edit"**

**Enter invalid data (e.g., negative amount)**

**Click "Save"**

**Expected Result:**

**Error: “Amount must be a positive number”**

---

**User Story 5: Offline Entry and Sync (ID: 105)**

**Test Plan: Test 5 – Offline Support**

**TC13 – Add Expense Offline**

**Type:** Happy Path

**Action:**

**Disconnect from the internet**

**Add a new expense**

**Expected Result:**

**Expense saved locally**

**Success message: “Saved offline. Will sync when online.”**

**TC14 – Sync After Reconnection**

**Type:** Happy Path

**Action:**

**Reconnect to internet**

**Open the app**

**Expected Result:**

**Offline expenses sync to the server automatically**

## Test Case

The screenshot shows the Azure DevOps interface for a work item titled "TC89 Instructor Registration Separate from Students". The work item is assigned to Mervin Anto Santhosh A and is currently in the "Design" state. The "Steps" tab is selected, displaying the following test steps:

Steps	Action	Expected result
1.	Navigate to the <b>Sign Up</b> page of the quiz system.	Page displays options to choose between <b>Student</b> and <b>Instructor</b> registration.
2.	Select the <b>Instructor</b> option.	Instructor-specific registration form is displayed with relevant fields (e.g., name, email, pass department).
3.	Fill in valid details in all required fields and click <b>Register</b> .	The form is validated, and no errors are shown.
4.	After submission, the system registers the instructor and redirects to the <b>instructor dashboard</b> or shows a success message.	Instructor account is created successfully and can be used to manage quizzes.

Below the steps, there are sections for "Deployment" and "Development". The deployment section provides instructions on tracking releases associated with the work item. The development section allows linking to GitHub commits, pull requests, or branches. The bottom of the screen shows the Windows taskbar with various pinned icons and the date/time (5/26/2025, 2:22 AM).

The screenshot shows the Azure DevOps interface for a project named "Online Quiz System". The main view is a "Work items" board. A specific work item, "TC91 Instructor Exclusive Access to Quiz Creation Pages", is selected. This is a "Test Case" work item, indicated by the "TC" prefix in the ID. The details pane shows the following information:

- Summary:** TC91 Instructor Exclusive Access to Quiz Creation Pages
- Assignee:** Mervin Anto Santhosh A
- Comments:** 0
- Add Tag:** (button)
- State:** Design
- Area:** Online Quiz System
- Reason:** New
- Iteration:** Online Quiz System/User and Quiz Setup
- Updated:** Just now (by Mervin Anto Santhosh A)

The "Steps" section contains three test steps:

- Log in using valid **instructor credentials**. Expected result: Instructor is successfully logged in and red to the instructor dashboard.
- Navigate to the **Quiz Creation** page from the dashboard menu. Expected result: The Quiz Creation page loads successfully options to create and manage quizzes.
- Log out and attempt to access the **Quiz Creation** page using a **student account** or **without logging in**. Expected result: Access is denied with an error message (e.g., "Unauthorized access" or "Access restricted instructors only").

On the right side of the screen, there are sections for "Deployment" and "Development". The "Deployment" section provides instructions to track releases associated with this work item. The "Development" section includes an "Add link" button and a note about linking GitHub commits or pull requests.

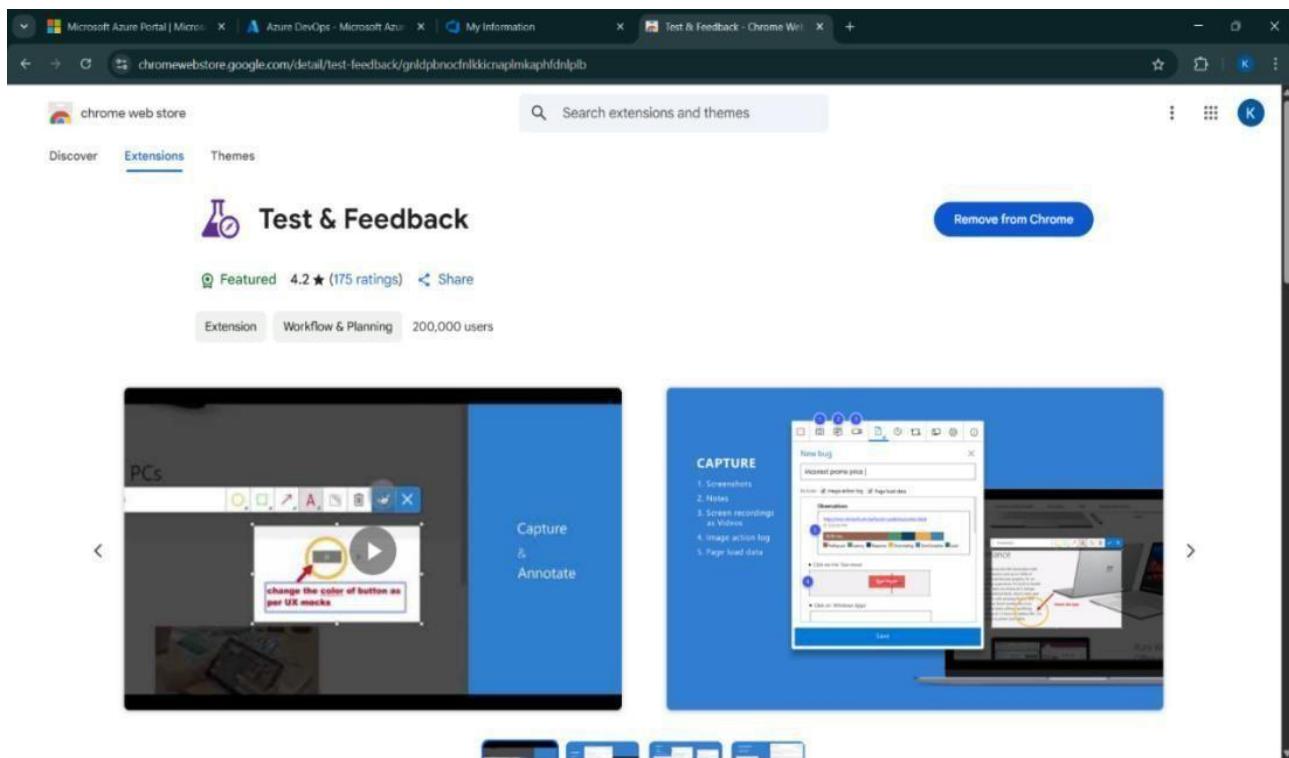
### 3. Installation of test

The screenshot shows the Chrome Web Store page for the "Test & Feedback" extension. The extension has a rating of 4.2 stars based on 175 ratings and over 200,000 users. It is categorized under "Workflow & Planning".

The extension's interface is demonstrated through two screenshots:

- PCs:** Shows a screenshot of a computer monitor displaying a user interface with a play button and some text. A red arrow points to the play button with the annotation: "change the color of button as per UX mockups".
- Capture & Annotate:** Shows a screenshot of a computer monitor displaying a "CAPTURE" interface with various options like "Screenshots", "Notes", "Screen recordings as Videos", "Image action log", and "Page load data". Below it, another screenshot shows a laptop screen with a red annotation pointing to a button.

A prominent "Add to Chrome" button is located in the top right corner of the extension's page.



## Test and feedback

Showing it as an extension

A screenshot of the Azure DevOps Test Plans interface for the Online Quiz System project. The left sidebar shows navigation options like Overview, Boards, Repos, Pipelines, Test Plans, Test plans, Progress report, Runs, and Artifacts. The 'Test plans' option is selected. In the center, a test plan named '40 : As an instructor, I want to select question types while creating a quiz. (ID: 97)' is displayed. The 'Execute' tab is selected, showing a table for 'Test Points (1 item)'. The table has columns for Title, Outcome, Order, and Test Case Id. One row is shown: 'test 10' with Outcome 'Passed', Order '1', and Test Case Id '96'. A green checkmark icon is next to the 'Passed' status.

## 4. Running the test cases

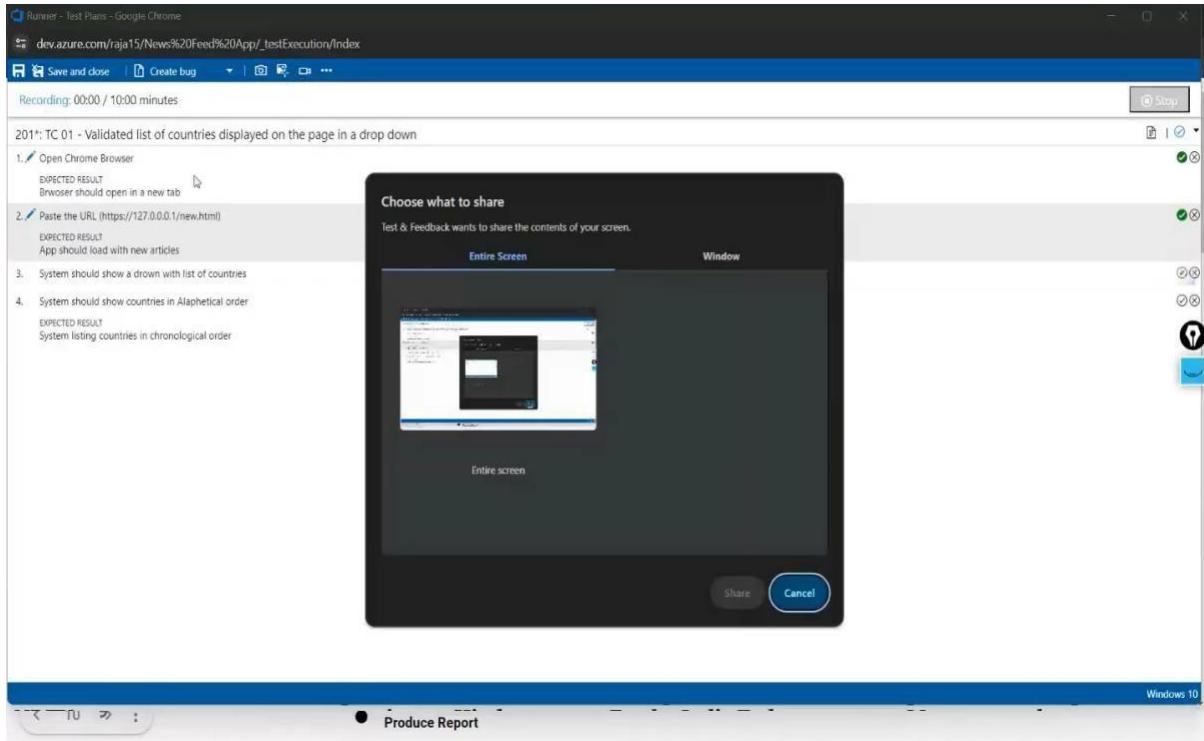
The screenshot shows the Azure DevOps Test Plans interface. On the left, the navigation bar includes 'Online Quiz System' (selected), 'Overview', 'Boards', 'Repos', 'Pipelines', 'Test Plans' (selected), 'Test plans', 'Progress report', 'Runs', and 'Artifacts'. Under 'Test Plans', there is a dropdown menu for 'Online Quiz System Team\_Stories\_User and...'. A specific test plan titled '36 : As an instructor, I want to be redirected to my dashboard after login. (ID: 87)' is selected. The 'Execute' tab is active, showing 'Test Points (1 item)'. The table contains one row:

Title	Outcome	Order	Test Case Id
test 6	Passed	1	86

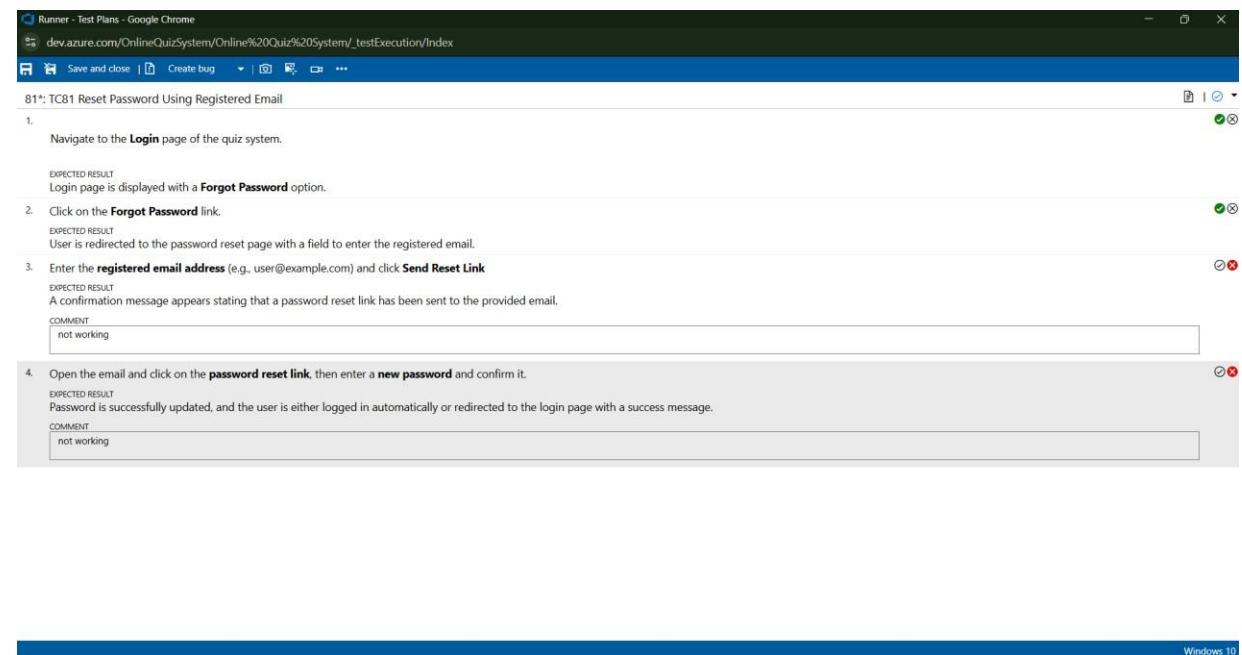
The screenshot shows the 'Runner - Test Plans - Google Chrome' window. The URL is 'dev.azure.com/OnlineQuizSystem/Online%20Quiz%20System/\_testExecution/Index'. The page displays a test case titled '84\*: TC77 Password Reset Link via Email'. The steps are:

1. Navigate to the **Login** page of the quiz system.  
EXPECTED RESULT: quiz system. Login page is displayed with a "Forgot Password" link.
2. Click on the **Forgot Password** link.  
EXPECTED RESULT: User is redirected to the password reset page with an input field to enter the email address.
3. Enter a valid **registered email address** (e.g., user@example.com) and click the **Send Reset Link** button.  
EXPECTED RESULT: A confirmation message is shown (e.g., "Password reset link has been sent to your email").
4. Open the registered email inbox and check for the reset email.  
EXPECTED RESULT: The user receives an email with a working password reset link.

## 5. Recording the test case



## 6. Creating the bug



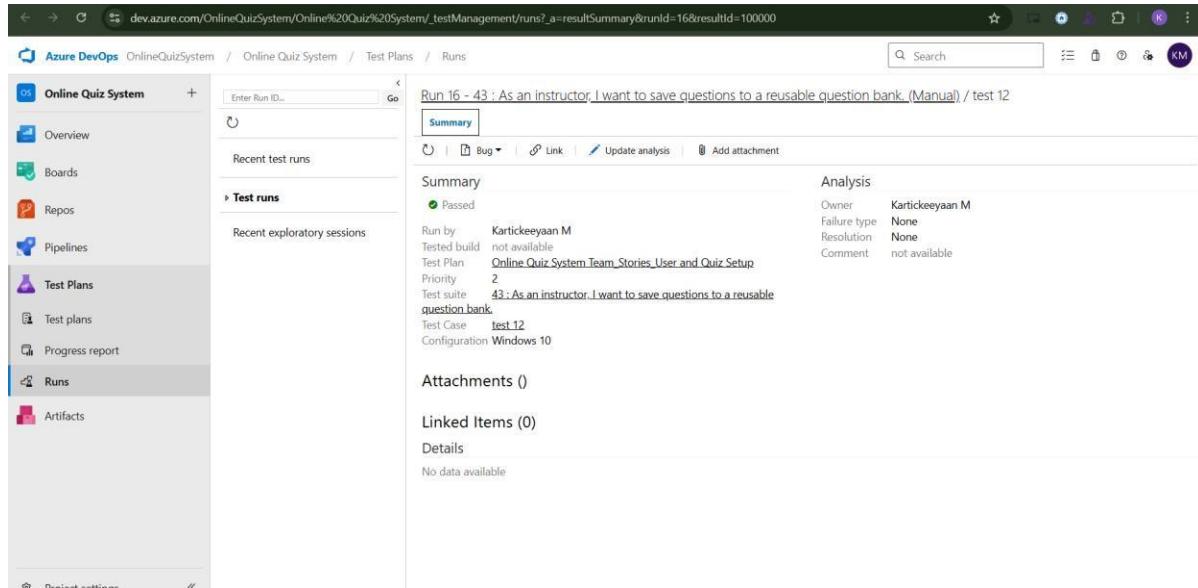
## 7. Test case results

The screenshot shows the Azure DevOps interface for a project named "Online Quiz System". The left sidebar includes options like Overview, Boards, Repos, Pipelines, Test Plans, Test plans, Progress report, Runs, and Artifacts. The "Test Plans" section is selected. The main area displays a "Test Suites" list with various test cases. One specific test case, "40 : As an instructor, I want to select question types while creating a quiz", is highlighted. To the right, a "Test Case Results" card provides a summary of the test run. It lists five test points: "Title" (Passed), "TC97 Instructor Select Question Types" (Passed), and three others (Paused, Failed, Passed). The "Failed" entry details a failure where the system did not display a dropdown menu.

## 8. Test report summary

The screenshot shows the Azure DevOps interface for a project named "raja15". The left sidebar includes News Feed App, Overview, Boards, Work items, Backlogs, Sprints, Queries, Delivery Plans, Analytics views, Repos, Pipelines, Test Plans, Artifacts, and Project settings. The "Work items" section is selected. A specific bug report titled "BUG 203 BG 01 - Countries Drop down Not Available on the page" is displayed. The report details a step where the user expected the browser to open a new tab but instead saw a validation message. The status is "Closed" and the reason is "Validated list of countries displayed on the page". The report includes sections for Planning (Resolved Reason, Story Points, Priority, Severity, Activity, Effort (Hours)), Deployment (Release status), Development (Link to Azure Repos), and Related Work.

- Assigning bug to the developer and changing state

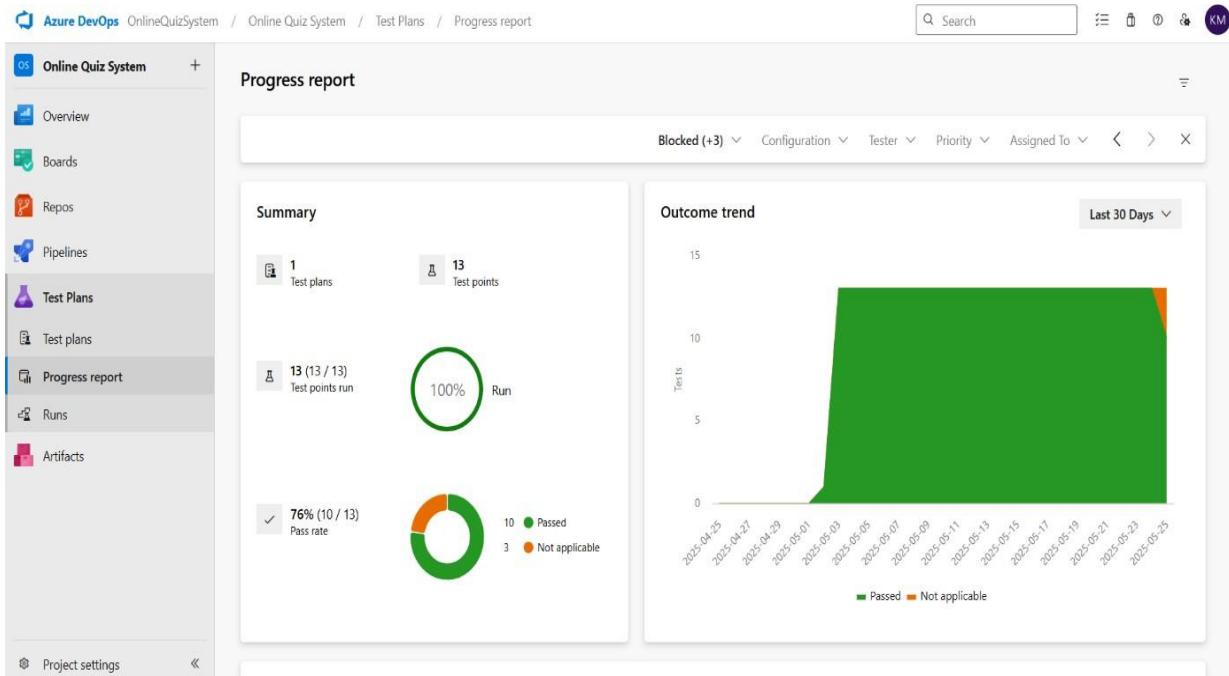


A screenshot of the Azure DevOps interface showing a test run summary. The URL is dev.azure.com/OnlineQuizSystem/Online%20Quiz%20System/\_testManagement/runs? a=resultSummary&runtId=16&resultId=100000. The left sidebar shows 'Test Plans' selected. The main area displays a 'Summary' card for 'Run 16 - 43'. The summary includes:

- Summary**: Passed.
- Run by**: Kartickeeyaan M.
- Tested build**: not available.
- Test Plan**: Online Quiz System Team\_Stories\_User and Quiz Setup.
- Priority**: 2.
- Test suite**: 43 : As an instructor, I want to save questions to a reusable question bank.
- Test Case**: test 12.
- Configuration**: Windows 10.

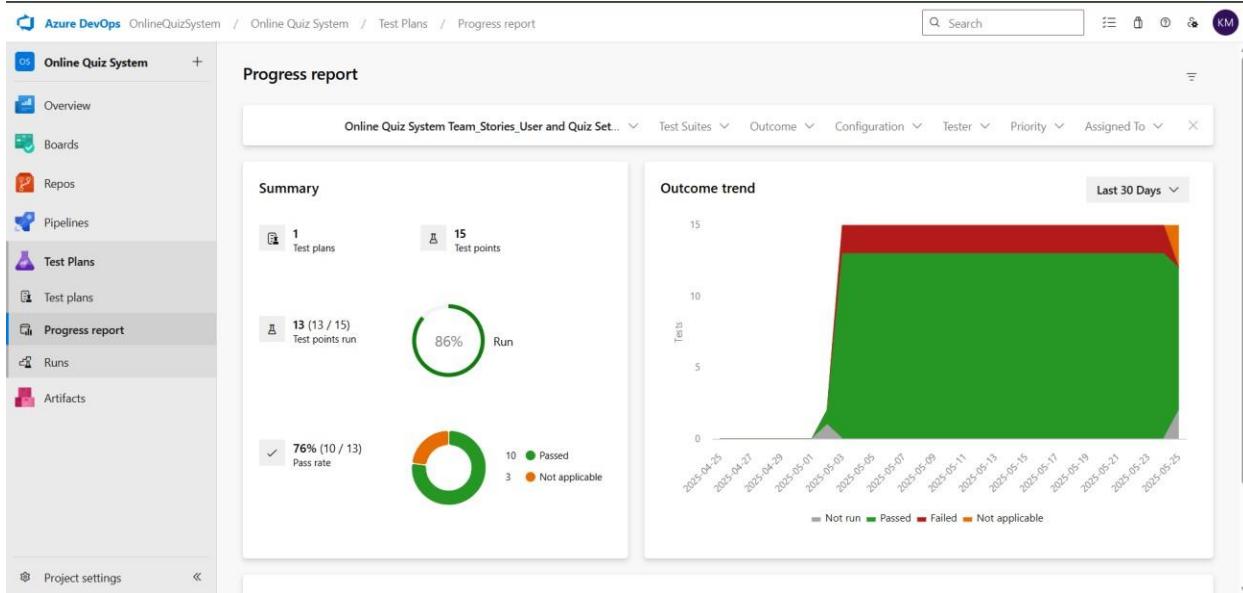
There are sections for 'Attachments (0)', 'Linked Items (0)', and 'Details' (No data available).

## 9. Progress report



A screenshot of the Azure DevOps interface showing a progress report. The URL is dev.azure.com/OnlineQuizSystem/Online Quiz System/\_testManagement/testPlans/Progress report. The left sidebar shows 'Test Plans' selected. The main area displays a 'Progress report' card with two main sections:

- Summary**: Shows 1 test plan, 13 test points, and a 100% pass rate (10 Passed, 3 Not applicable).
- Outcome trend**: A chart titled 'Last 30 Days' showing the number of tests over time. The chart shows a sharp increase from May 1st to May 13th, with most tests being 'Passed' (green) and a few 'Not applicable' (orange).



## 10. Changing the test template

Organization Settings 231801095

All processes

Name	Description	Team projects
Basic	This template is flexible for any process and great for teams getting started with Azure DevOps.	0
Agile	This template is flexible and will work great for most teams using Agile planning methods, including those pract...	0
Scrum	This template is for teams who follow the Scrum framework.	0
CMMI	This template is for more formal projects requiring a framework for process improvement and an auditable reco...	0

The screenshot shows the 'All processes' list in the Azure DevOps Settings - Process page. The 'Processes' tab is selected. The list includes:

Name	Description	Team projects
Basic	This template is flexible for any process and great for teams getting started with Azure DevOps.	0
Agile	This template is flexible and will work great for most teams using Agile planning methods, including those pract...	0
Scrum	This template is for teams who follow the Scrum framework.	0
CMMI	This template is for more formal projects requiring a framework for process improvement and an auditable reco...	0

The screenshot shows the 'All processes' list in the Azure DevOps Settings - Process page. The 'Processes' tab is selected. A new entry, '231801095 Agile (default)', has been added under the Agile category. The list now includes:

Name	Description	Team projects
Basic	This template is flexible for any process and great for teams getting started with Azure DevOps.	0
Agile	This template is flexible and will work great for most teams using Agile planning methods, including those pract...	0
231801095 Agile (default)		1
Agile Plus		0
Scrum	This template is for teams who follow the Scrum framework.	0
CMMI	This template is for more formal projects requiring a framework for process improvement and an auditable reco...	0

## 11. View the new test case template

The screenshot shows the 'Add a field to Test Case' dialog box overlaid on the Azure DevOps settings interface. The dialog has a 'Definition' tab selected, showing the option to 'Create a field'. The 'Name' field is set to 'Type' and the 'Type' field is set to 'Text (single line)'. A 'Description' field is present but empty. At the bottom are 'Add field' and 'Cancel' buttons.

The screenshot shows the 'Work item types' section of the Azure DevOps settings. It lists a single work item type named 'Music Playlist Batch Creator'. The 'Description' column contains a detailed description of the solution. The 'Name' column shows the name of the work item type.

The screenshot shows the Azure DevOps Settings - Process page. The URL in the address bar is [dev.azure.com/231801095/\\_settings/process?type\\_id=231801095Agile.TestCase&process-name=231801095%20Agile&\\_a=layout](https://dev.azure.com/231801095/_settings/process?type_id=231801095Agile.TestCase&process-name=231801095%20Agile&_a=layout). The page title is "All processes > 231801095 Agile > Test Case". The left sidebar is titled "Organization Settings" and includes sections for General, Security, Boards, Pipelines, and Process. The "Process" section is currently selected. The main content area shows a "Steps" field with the placeholder "Text (multiple lines)". To the right, there are sections for "Custom" fields (Recent test results, Deployment, Development, Related Work, Status), and a "Add a field ..." button.

### 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	<b>LOAD TESTING AND PERFORMANCE TESTING</b>
-----------	---

**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:

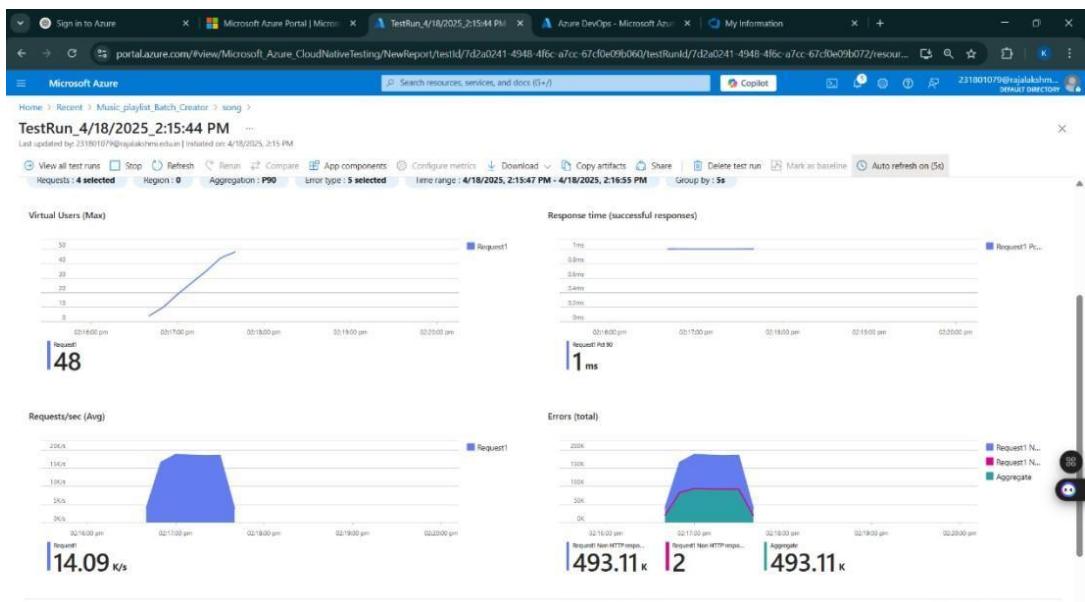
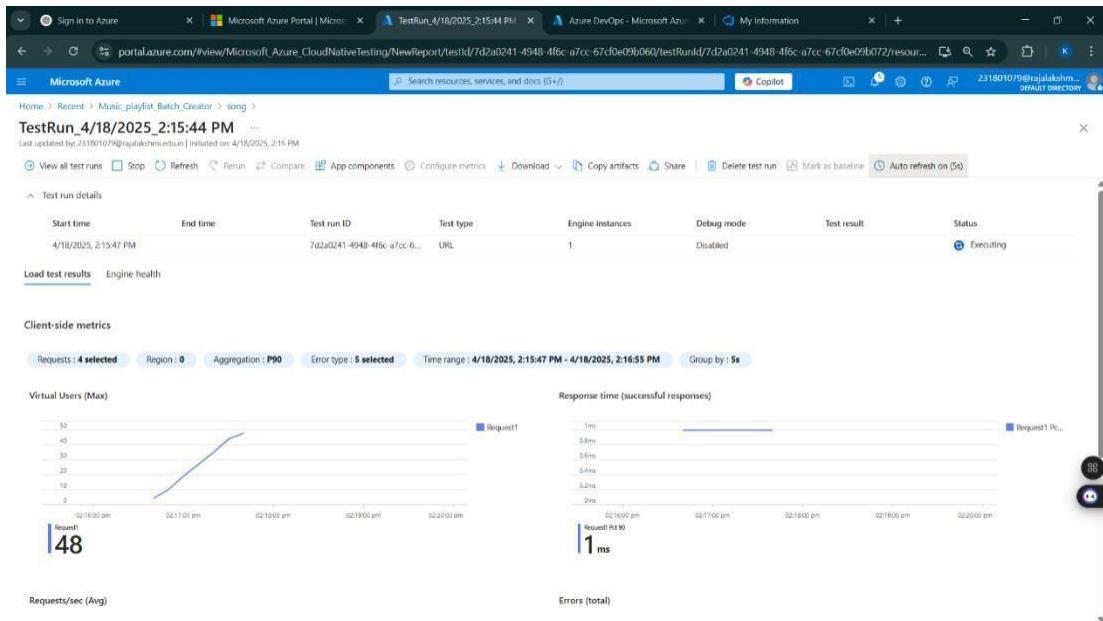
1. Sign in to Azure Portal  
Go to <https://portal.azure.com> and log in.
2. Create the Resource
  - o Go to *Create a resource* → Search for “Azure Load Testing”.
  - o Select Azure Load Testing and click Create.
3. Fill in the Configuration Details
  - o *Subscription*: Choose your Azure subscription.
  - 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 → Create to start the test.

## Load Testing



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### Take control of your money

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Easily record and categorize your expenses



#### Smart Budgeting

Create budgets that help you achieve your financial goals



#### Insightful Reports

Gain insights with reports and helpful charts

## Track expenses. Achieve goals.



#### Custom Categories

Organize expenses by customizable categories



#### Expense Tracking

Record daily expenses quickly and easily



#### Budgeting

Set monthly budgets and monitor progress



#### Secure & Private

Keep your data safe with security features



#### Insights & Reports

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Sync your data across all your devices

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## Available Categories

### Housing

Rent, mortgage, utilities

[View Expenses](#)

### Food

Groceries, dining out

[View Expenses](#)

### Transportation

Gas, public transit

[View Expenses](#)

[⟨ Housing](#)

## Add Expense

Enter the details about the new expense

Amount

Category



Date

[Back](#)[Add](#)**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**

The screenshot shows a GitHub repository page for 'Software-Construction-' (Public). The repository has 1 branch and 0 tags. The main branch contains several files and folders added via upload, all updated 1 minute ago. The files include a 'src' folder, 'README.md', 'azure-pipelines.yml', 'eslint.config.js', 'index.html', 'package-lock.json', 'package.json', 'postcss.config.js', 'tailwind.config.js', 'tsconfig.app.json', and 'tsconfig.json'. On the right side, there are sections for 'About' (no description, website, or topics provided), 'Releases' (no releases published), and 'Packages' (no packages published). The bottom of the screen shows a taskbar with various icons and system status information.

File/Folder	Action	Last Updated
src	Add files via upload	1 minute ago
README.md	Add files via upload	1 minute ago
azure-pipelines.yml	Add files via upload	1 minute ago
eslint.config.js	Add files via upload	1 minute ago
index.html	Add files via upload	1 minute ago
package-lock.json	Add files via upload	1 minute ago
package.json	Add files via upload	1 minute ago
postcss.config.js	Add files via upload	1 minute ago
tailwind.config.js	Add files via upload	1 minute ago
tsconfig.app.json	Add files via upload	1 minute ago
tsconfig.json	Add files via upload	1 minute ago

### **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.