

# **RAJALAKSHMI ENGINEERING COLLEGE**

**RAJALAKSHMI NAGAR, THANDALAM - 602 105**



**RAJALAKSHMI  
ENGINEERING COLLEGE**

**CS23432**

**SOFTWARE CONSTRUCTION**

**Laboratory Record Note Book**

Name : ..... **SUMANTH S** .....

Year / Branch / Section : ..... **II / B.Tech IT / AE** .....

Register No. : ..... **231001224** .....

Semester : ..... **IV** .....

Academic Year : ..... **2024-2025** .....



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

**BONAFIDE CERTIFICATE**

NAME SUMANTH S REGISTER NO. 2116231001224

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

Technology [AE] . 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 Examiner

**LAB PLAN**  
**CS23432-SOFTWARE CONSTRUCTION LAB**

<b>Ex No</b>	<b>Date</b>	<b>Topic</b>	<b>Page No</b>	<b>Sign</b>
1	21/01/2025	Study of Azure DevOps		
2	28/01/2025	Problem Statement		
3	04/02/2025	Agile Planning		
4	18/02/2025	Create User stories with Acceptance Criteria		
5	25/02/2025	Designing Sequence Diagrams using Azure DevOps-WIKI		
6	04/03/2025	Designing Class Diagram using Azure DevOps-WIKI		
7	11/03/2025	Designing Use case Diagram using Azure DevOps-WIKI		
8	18/03/2025	Designing Activity Diagrams using Azure DevOps-WIKI		
9	25/03/2025	Designing Architecture Diagram Using Star UML		
10	01/04/2025	Design User Interface		
11	08/04/2025	Implementation – Design a Web Page based on Scrum Methodology		
12	15/04/2025	Testing-Test Plan, Test Case and Load Testing		

## **Course Outcomes (COs)**

**Course Name: Software Engineering**

**Course Code: CS23432**

<b>CO 1</b>	Understand the software development process models.
<b>CO 2</b>	Determine the requirements to develop software
<b>CO 3</b>	Apply modeling and modeling languages to design software products
<b>CO 4</b>	Apply various testing techniques and to build a robust software products
<b>CO 5</b>	Manage Software Projects and to understand advanced engineering concepts

### **CO - PO – PSO matrices of course**

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>CS23432.1</b>	2	2	3	2	2	2	2	2	2	2	3	2	1	3	-
<b>CS23432.2</b>	2	3	1	2	2	1	-	1	1	1	2	-	1	2	-
<b>CS23432.3</b>	2	2	1	1	1	1	1	1	1	1	1	1	2	2	1
<b>CS23432.4</b>	2	2	3	2	2	2	1	0	2	2	2	1	1	2	1
<b>CS23432.5</b>	2	2	2	1	1	1	1	0	2	1	1	1	2	1	-
<b>Average</b>	<b>2.0</b>	<b>2.2</b>	<b>2.0</b>	<b>1.6</b>	<b>1.6</b>	<b>1.4</b>	<b>1.3</b>	<b>1.3</b>	<b>1.6</b>	<b>1.4</b>	<b>1.8</b>	<b>1.3</b>	<b>1.4</b>	<b>2.0</b>	<b>1.0</b>

Correlation levels 1, 2 or 3 are as defined below:

1: Slight (Low)    2: Moderate (Medium)    3: Substantial (High)    No correlation: “-“

**EX NO: 1**

**DATE:21/01/2025**

## **STUDY OF AZURE DEVOPS**

### **AIM:**

To study how to create an agile project in Azure DevOps environment.

### **STUDY:**

Azure DevOps is a cloud-based platform by Microsoft that provides tools for DevOps practices, including CI/CD pipelines, version control, agile planning, testing, and monitoring. It supports teams in automating software development and deployment.

#### **1. Understanding Azure DevOps**

Azure DevOps consists of five key services:

##### **1.1 Azure Repos (Version Control)**

Supports Git repositories and Team Foundation Version Control (TFVC).  
Provides features like branching, pull requests, and code reviews.

##### **1.2 Azure Pipelines (CI/CD)**

Automates build, test, and deployment processes.

Supports multi-platform builds (Windows, Linux, macOS).

Works with Docker, Kubernetes, Terraform, and cloud providers (Azure, AWS, GCP).

##### **1.3 Azure Boards (Agile Project Management)**

Manages work using Kanban boards, Scrum boards, and dashboards. Tracks user stories, tasks, bugs, sprints, and releases.

##### **1.4 Azure Test Plans (Testing)**

Provides manual, exploratory, and automated testing. Supports test case management and tracking.

##### **1.5 Azure Artifacts (Package Management)**

Stores and manages NuGet, npm, Maven, and Python packages. Enables versioning and secure access to dependencies.

### **Getting Started with Azure DevOps**

Step 1: Create an Azure DevOps Account

Visit Azure DevOps.

Sign in with a Microsoft Account.

Create an Organization and a Project.

## Step 2: Set Up a Repository (Azure Repos)

    Navigate to Repos.

    Choose Git or TFVC for version control.

    Clone the repository and push your code.

## Step 3: Configure a CI/CD Pipeline (Azure Pipelines)

    Go to Pipelines → New Pipeline.

    Select a source code repository (Azure Repos, GitHub, etc.).

    Define the pipeline using YAML or the Classic Editor.

    Run the pipeline to build and deploy the application.

## Step 4: Manage Work with Azure Boards

    Navigate to Boards.

    Create work items, user stories, and tasks.

    Organize sprints and track progress.

## Step 5: Implement Testing (Azure Test Plans)

    Go to Test Plans.

    Create and run test cases.

    View test results and track bugs.

## **RESULT:**

The study was successfully completed.

**EX NO: 2**

**DATE:28/01/2025**

### **PROBLEM STATEMENT**

#### **AIM:**

To prepare Problem Statement for your given project.

#### **PROBLEM STATEMENT:**

Educational institutions and organizations need a flexible, scalable solution to deliver high-quality learning experiences beyond the limitations of traditional classrooms. An E-Learning Platform will provide users with access to a variety of courses, quizzes, and certifications anytime and anywhere, enabling self-paced learning. The platform will allow students to track their progress, identify strengths and weaknesses, and receive personalized course recommendations to improve performance. Instructors will be able to create and manage course content easily, while administrators can monitor user activities and system performance, ensuring a smooth, effective, and data-driven learning environment that supports career and academic growth.

#### **RESULT:**

The problem statement was written successfully.

**EX NO: 3**

**DATE:04/02/2025**

## **AGILE PLANNING**

### **AIM:**

To prepare an Agile Plan.

### **THEORY:**

#### Agile Planning for E-Learning Platform Development

Agile planning is essential to building an E-Learning Platform that is flexible, user-centered, and capable of adapting to evolving learning needs. Following the Agile methodology, we avoid rigid, upfront plans and instead use an incremental, iterative approach. Continuous feedback from students, instructors, and administrators will guide improvements throughout the project.

In Agile planning for the E-Learning Platform, the project will be broken down into smaller, manageable pieces of work (features and improvements), with a clear vision in mind. Agile planning will include:

- Roadmaps to guide the platform's feature releases and development schedule.
- Sprints to focus on building and delivering specific modules (e.g., user authentication, course catalog, quizzes, progress tracking).
- Feedback loops to stay responsive to users' needs and quickly adapt the platform.

Tasks will be framed as user stories to capture real requirements from the perspective of platform users (students, teachers, admins). For example:

"As a student, I want to track my progress so that I can stay motivated."

By thinking in terms of user stories, the team ensures that we are always focused on delivering real value to end-users.

#### Steps in Agile Planning Process for the E-Learning Platform

##### 1. Define Vision

Create a clear vision for the E-Learning Platform: to offer an engaging, interactive, accessible, and personalized learning experience to a global audience.

##### 2. Set Clear Expectations on Goals

Outline project goals, such as:

- Enable seamless course enrollment and management.
- Support multimedia content (videos, PDFs, quizzes).

- Track and display learner progress.
- Facilitate communication between students and instructors.

### 3. Define and Break Down the Product Roadmap

Develop a roadmap identifying major features (e.g., user authentication, course creation, learning analytics) and prioritize their release.

### 4. Create Tasks Based on User Stories

Identify user stories, for example:

"As an instructor, I want to create and manage courses."

"As a learner, I want to view and complete assigned lessons."

"As an admin, I want to manage user access rights."

### 5. Populate Product Backlog

Create a backlog listing all user stories, tasks, bugs, and enhancements, prioritized based on importance and user impact.

### 6. Plan Iterations and Estimate Effort

Organize work into 1–2 week sprints, estimating the effort for each task using story points or time estimates.

### 7. Conduct Daily Stand-Ups

Hold short daily meetings to update on progress, discuss challenges, and plan the day's work.

### 8. Monitor and Adapt

Continuously monitor progress, collect user feedback after each sprint, and adjust the backlog and roadmap to better meet users' needs.

## **RESULT:**

Thus, the Agile plan was completed successfully.

**EX NO: 4**

**DATE:18/02/2025**

## **CREATE USER STORIES WITH ACCEPTANCE**

### **CRITERIA**

#### **AIM:**

To create User Stories with Acceptance Criteria.

#### **THEORY:**

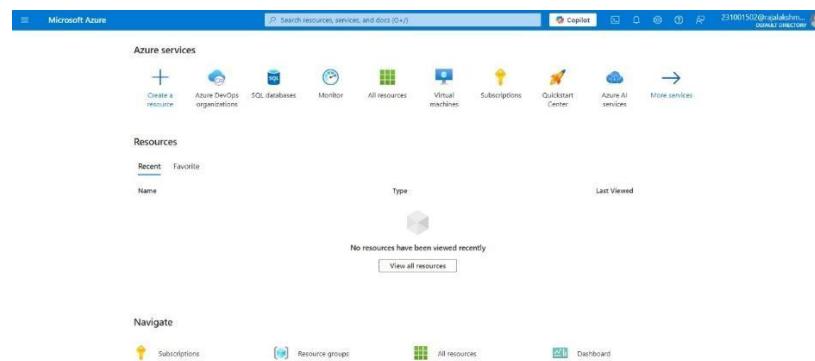
A user story is an informal, general explanation of a software feature written from the perspective of the end user. Its purpose is to articulate how a software feature will provide value to the customer.

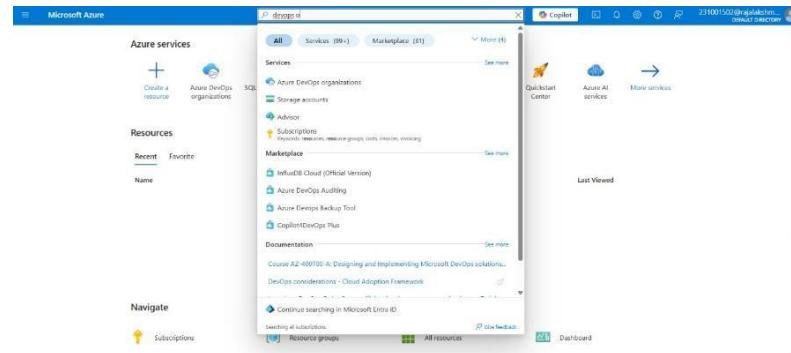
User story template

**"As a [role], I [want to], [so that]."**

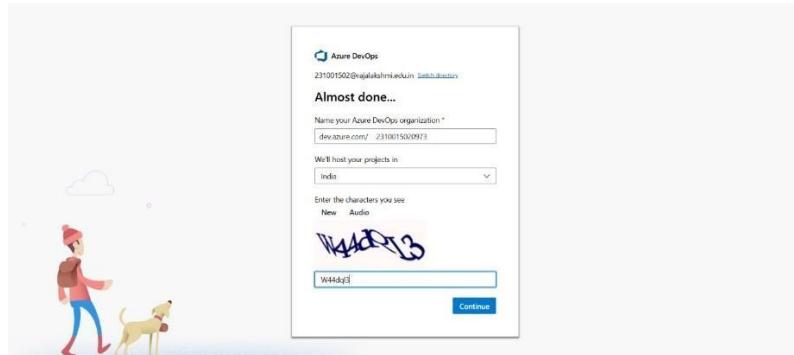
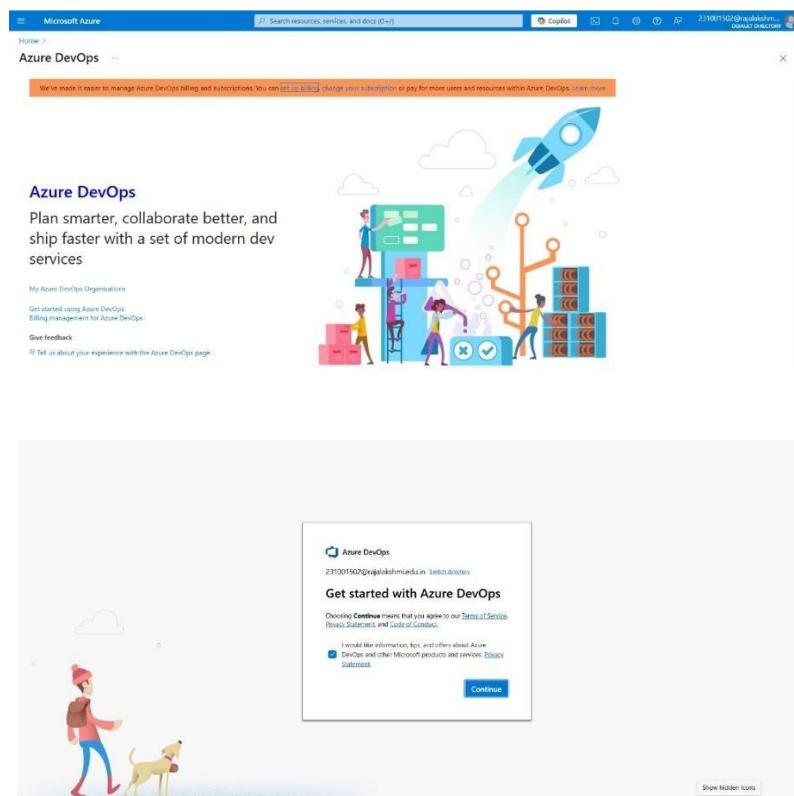
#### **PROCEDURE:**

1. Open your web browser and go to the Azure website:  
<https://azure.microsoft.com/en-in> Sign in using your Microsoft account credentials. If you don't have an account, you'll need to create one.
2. If you don't have a Microsoft account, you can sign up for  
<https://signup.live.com/?lic=1>
3. Azure home page
4. Open DevOps environment in the Azure platform by typing Azure DevOps Organizations in the search bar.





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

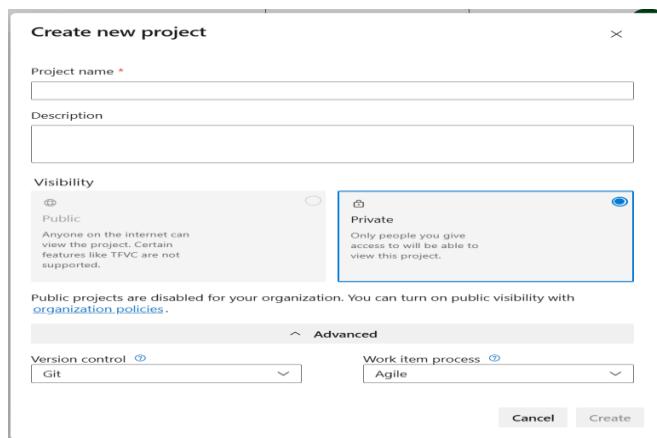


## 6. Create the First Project in Your Organization

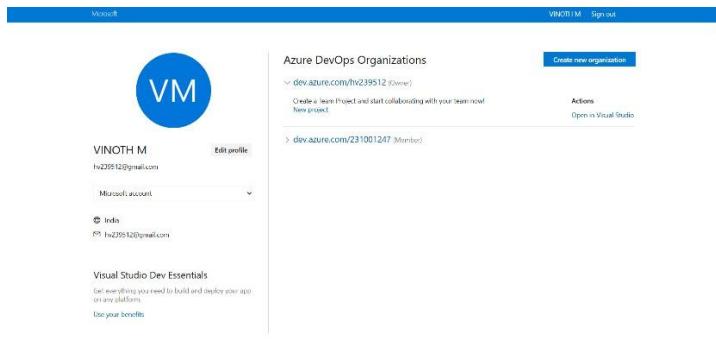
After the organization is set up, you'll need to create your first **project**.

This is where you'll begin to manage code, pipelines, work items, and more.

- i. On the organization's **Home page**, click on the **New Project** button.
- ii. 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).
- iii. Once you've filled out the details, click **Create** to set up your first project.



7. 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.



## 8. Project dashboard

The screenshot shows the Azure DevOps project dashboard for 'E-Learning Platform'. On the left, there's a navigation menu with options like Overview, Summary, Dashboards, Wiki, Boards, Repos, Pipelines, and Artifacts. The main area has a section titled 'About this project' with a placeholder for a project description and a cartoon character icon. To the right is a 'Project stats' panel showing 2 work items and 0 work items. Below that is a 'Members' section with icons for six team members. At the bottom right, there's a 'Speakers (Reverb(R) Audio): 2%' indicator.

## 9. 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.

## 10. Fill in User Story Details

The screenshot shows the details of a User Story titled 'Personal Security Guide'. The top part of the screen is the same project dashboard as in the previous screenshot. Below it, the main content area shows the User Story details. The story is identified as 'USER STORY 22'. It has a state of 'New' and is assigned to 'Crime Rate Detection'. The 'Description' field contains the text: 'As a Resident, I want easy safety ideas so I can protect myself and my stuff.' The 'Acceptance Criteria' field lists: 'App shows 5 simple tips (like "lock doors" or "watch at night").', 'Tip change based on local crimes (e.g. more theft = lock tips).', and 'Icon save tips like.' The 'Planning' section shows 'Story Points' as 2 and 'Risk' as 1. The 'Deployment' section has a note about tracking releases. The 'Development' section shows a link to an Azure Repos branch named 'Personal Security Guide'. The 'Classification' section indicates the value area is 'Business'. The 'Discussion' section is empty. At the bottom, there's a comment input field with placeholder text: 'Add a comment. Use # to link a work item, @ to mention a person, or / to link a pull request.' and a 'switch to Markdown editor' link.

**USER STORY 20**

### 20 - View Community Reports

No one selected | 0 Comments | Add Tag

State: New | Area: Crime Rate Detection | Reason: New | Iteration: Crime Rate Detection

**Description**  
As a Police Helper, I want to see community reports so I can check them out.

**Acceptance Criteria**  

- System sends new reports to police with details and pictures.
- police can mark it "Checked" or "Need More Info."
- Only police see this part.

**Discussion**  
  
[switch to Markdown editor](#)

**Planning**  
Story Points: 1  
Priority: 2  
Risk: 1

**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.

**Classification**  
Value area: Business

**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**  
Add link  
Parent: 19 Police Report Sharing Updated 31 Mar | New

---

**USER STORY 15**

### 15 - Crime-Free Path

No one selected | 0 Comments | Add Tag

State: New | Area: Crime Rate Detection | Reason: New | Iteration: Crime Rate Detection

**Description**  
As a Student, I want a safe way to walk home so I avoid crime spots.

**Acceptance Criteria**  

- App shows a map with a safe path based on recent crimes.
- Path skips places with lots of reports (like 3+ in a week).
- Updates if new crimes pop up.

**Discussion**  
  
[switch to Markdown editor](#)

**Planning**  
Story Points: 1  
Priority: 2  
Risk: 1

**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.

**Classification**  
Value area: Business

**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**  
Add link  
Parent: 14 Safe Route Finder Updated 31 Mar | New

---

**USER STORY 13**

### 13 - Crime Insights

No one selected | 0 Comments | Add Tag

State: New | Area: Crime Rate Detection | Reason: New | Iteration: Crime Rate Detection

**Description**  
As a Community Leader, I want to know what crimes happen most so I can fix big problems.

**Acceptance Criteria**  

- Shows a list of top crimes (like theft or vandalism) each week.
- Counts how many times each happens.
- Updates every day with new reports.

**Discussion**  
  
[switch to Markdown editor](#)

**Planning**  
Story Points: 1  
Priority: 2  
Risk: 1

**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.

**Classification**  
Value area: Business

**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**  
Add link  
Parent: 12 Crime Type Tracker Updated 31 Mar | New

---

**USER STORY 11**

### 11 - Crime Alerts

No one selected | 0 Comments | Add Tag

State: New | Area: Crime Rate Detection | Reason: New | Iteration: Crime Rate Detection

**Description**  
As a Resident, I want a warning if crime happens near me so I can stay safe.

**Acceptance Criteria**  

- Sends a phone alert if crime is reported within 1 mile.
- Tells me what happened (like "break-in at 5th Street").
- I can turn alerts on or off.

**Discussion**  
  
[switch to Markdown editor](#)

**Planning**  
Story Points: 1  
Priority: 2  
Risk: 1

**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.

**Classification**  
Value area: Business

**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**  
Add link  
Parent: 10 Neighborhood Warning System Updated 31 Mar | New

**USER STORY 6**

**6 Attach Evidence**

No one selected | 0 Comments | Add Tag

**Planning**  
Story Points: 1  
Priority: 2  
Risk: 1

**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.

**Description**  
As a Neighbor, I want to add a photo or video of a crime so it's clear what I'm talking about.

**Acceptance Criteria**  

- I can upload 1 picture or 1 short video (up to 30 seconds).
- System checks it's not blurry or empty before saving.
- Upload works on slow internet too.

**Classification**  
Value area: Business

**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.

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

**USER STORY 4**

**4 Crime Report**

No one selected | 0 Comments | Add Tag

**Planning**  
Story Points: 1  
Priority: 2  
Risk: 1

**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.

**Description**  
As a Neighbor, I want to report a crime I saw so the system knows what's happening around me.

**Acceptance Criteria**  

- I can type what I saw (like "bike stolen") on a phone or computer.
- I add where and when it happened (easy map or address box).
- Report saves in 5 seconds and says "Thank you!"

**Classification**  
Value area: Business

**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.

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

**USER STORY 77**

**77 Crime Data Visualization**

No one selected | 0 Comments | Add Tag

**Planning**  
Story Points: 1  
Priority: 2  
Risk: 1

**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.

**Description**  
As a safety official, I want to analyze crime reports on a dashboard so that I can identify trends.

**Acceptance Criteria**  

- 1.Citizens can submit reports with location, crime type, and evidence.
- 2.Officers receive notifications based on proximity and case urgency.
- 3.Users can track case status and receive updates.
- 4.Authorities get a dashboard with crime trends and heatmaps.

**Classification**  
Value area: Business

**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.

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

**User Story Details**

https://dev.azure.com/21001247/crimerate/\_workitems/edit/77

**Overview**  
Boards | Work items | Boards | Backlog | Sprints | Queries | Delivery Plans | Repos | Pipelines | Artifacts

**Recently updated**  
Back to Work Items

**USER STORY 72**

**72 Automatic Suspect Detection Through Criminal Database Matching**

No one selected | 0 Comments | Add Tag

**Planning**  
Story Points: 1  
Priority: 2  
Risk: 1

**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.

**Description**  
As a user, I want the system to automatically identify suspects by comparing faces to a criminal database, so that I can take immediate action.

**Acceptance Criteria**  

- 1.The system should automatically match faces detected in surveillance footage to a criminal database.
- 2 Matches should be flagged with confidence scores to indicate likelihood of identity.
- 3.The system should provide a link to the suspect's detailed profile

**Classification**  
Value area: Business

**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.

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

## RESULT:

The user story was written successfully.

**EX NO: 5**

**DATE:25/02/2025**

## **DESIGNING SEQUENCE DIAGRAMS USING AZURE DEVOPS-WIKI**

### **AIM:**

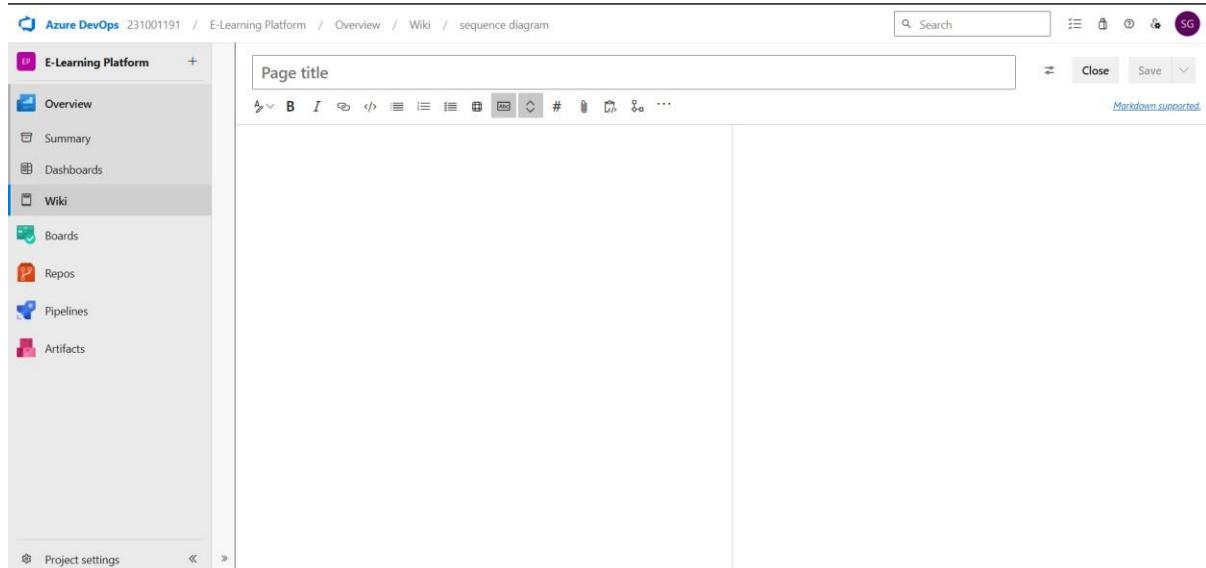
To design a Sequence Diagram by using Azure DevOps-WIKI

### **THEORY:**

A Sequence Diagram is a key component of Unified Modelling Language (UML) used to visualize the interaction between objects in a sequential order. It focuses on how objects communicate with each other over time, making it an essential tool for modelling dynamic behaviour in a system.

### **PROCEDURE:**

1. Open a project in Azure DevOps Organisations.
2. To design select wiki from menu



3. Write code for drawing sequence diagram and save the code.

```
::: mermaid
sequenceDiagram
    participant Neighbor
    participant SafetyApp
    participant Police
    participant Resident
```

participant CommunityLeader

Neighbor->>SafetyApp: reportCrime()  
SafetyApp->>Police: notify about new report  
Police->>SafetyApp: markReportStatus()  
SafetyApp->>CommunityLeader: update crime statistics  
SafetyApp->>Resident: sendAlert()

### **Explanation:**

participant defines the entities involved.

->> represents a direct message.

-->> represents a response message.

+ after ->> activates a participant.

- after -->> deactivates a participant.

alt / else for conditional flows.

loop can be used for repeated actions.

-> Solid line without arrow

--> Dotted line without arrow

->> Solid line with arrowhead

-->> Dotted line with arrowhead

<<->> Solid line with bidirectional arrowheads (v11.0.0+)

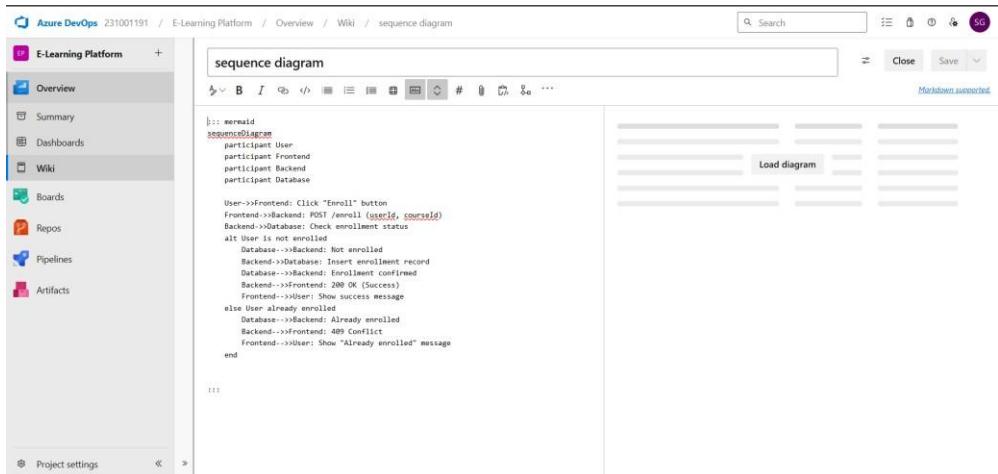
<<->> Dotted line with bidirectional arrowheads (v11.0.0+)

-x Solid line with a cross at the end

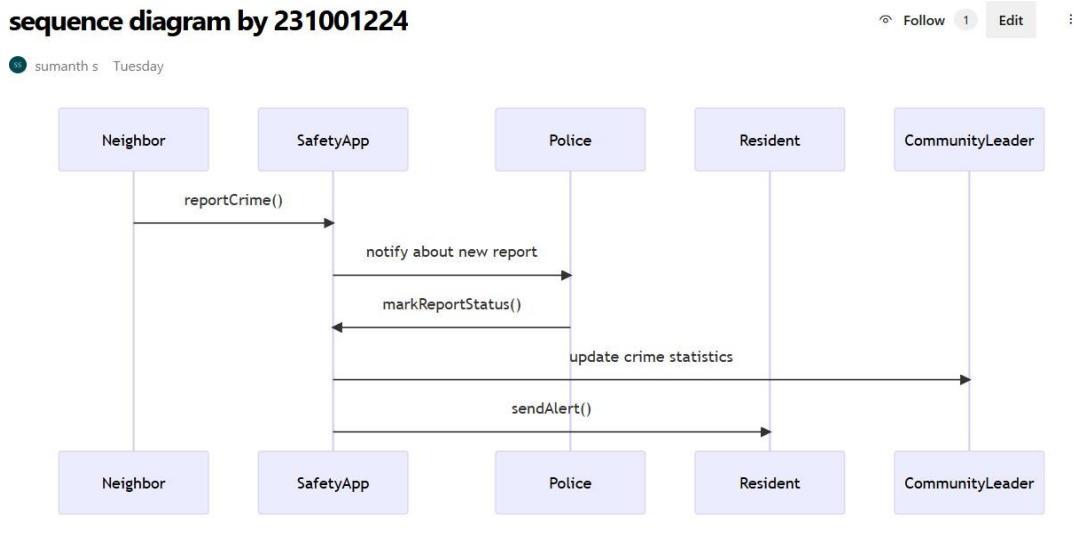
--x Dotted line with a cross at the end

-) Solid line with an open arrow at the end (async)

--) Dotted line with an open arrow at the end (async)



4. click wiki menu and select the page



## RESULT:

Thus, the sequence diagram was created successfully.

**EX NO. 6**

**DATE:04/03/2025**

## **DESIGNING CLASS DIAGRAM USING AZURE**

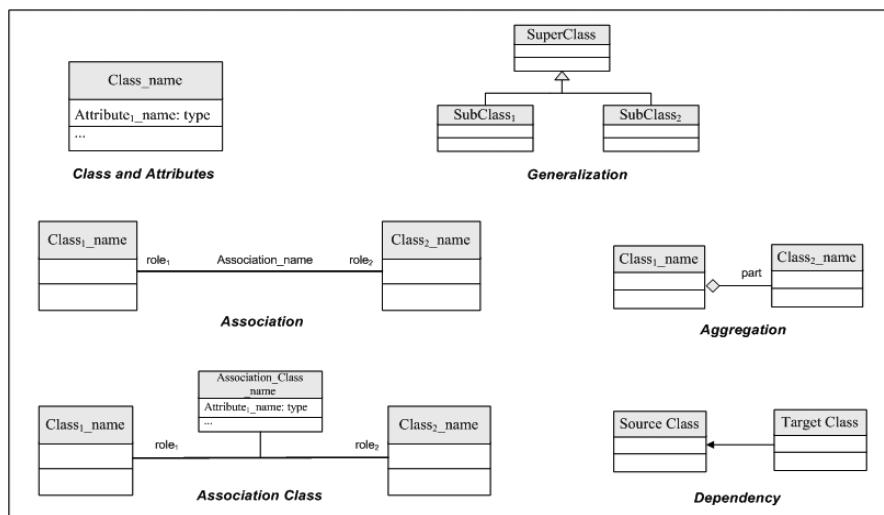
### **DEVOPS-WIKI**

#### **AIM:**

To design a Class Diagram by using Azure DevOps-WIKI

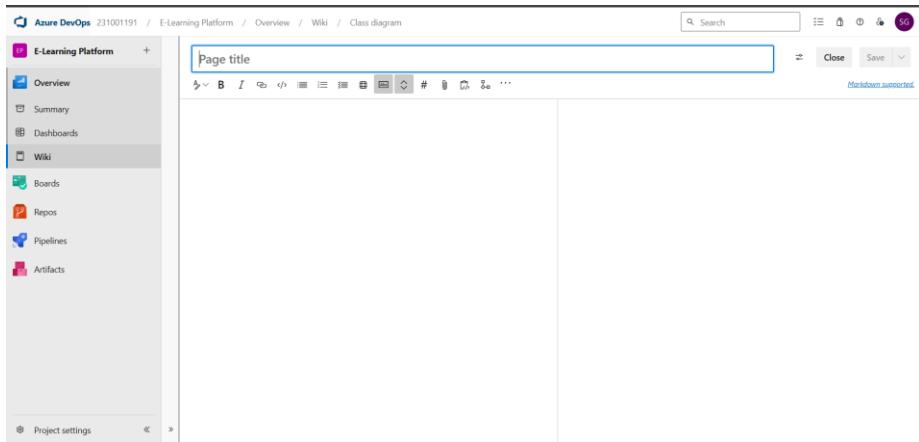
#### **THEORY:**

A UML class diagram is a visual tool that represents the structure of a system by showing its classes, attributes, methods, and the relationships between them.



#### **PROCEDURE:**

1. Open a project in Azure DevOps Organisations.
2. To design select wiki from menu



3. Write code for drawing class diagram and save the code

```
classDiagram
:::mermaid
classDiagram
    class Neighbor {
        +reportCrime()
        +uploadPhoto()
        +chooseAnonymous()
        -crimeReports: List<CrimeReport>
    }

    class CrimeReport {
        +description: String
        +location: String
        +time: Date
        +isAnonymous: Boolean
        +media: File
        +saveReport()
    }

    class Resident {
        +receiveAlert()
        +viewSafeRoute()
    }

    class Police {
        +checkReports()
```

```

+markReportStatus()
}

class CommunityLeader {
    +viewCrimeStatistics()
}

class SafetyApp {
    +sendAlert()
    +trackCrime()
    +provideSafetyTips()
    +generateSafeRoute()
}

Neighbor "1" -- "*" CrimeReport : reports >
CrimeReport "1" -- "0..1" File : contains media >
Resident "1" -- "*" CrimeReport : receives alerts >
SafetyApp "1" -- "*" CrimeReport : tracks >
Police "1" -- "*" CrimeReport : reviews >
CommunityLeader "1" -- "*" CrimeReport : analyzes >
SafetyApp "1" -- "*" Resident : sends alerts >

```

## Relationship Types

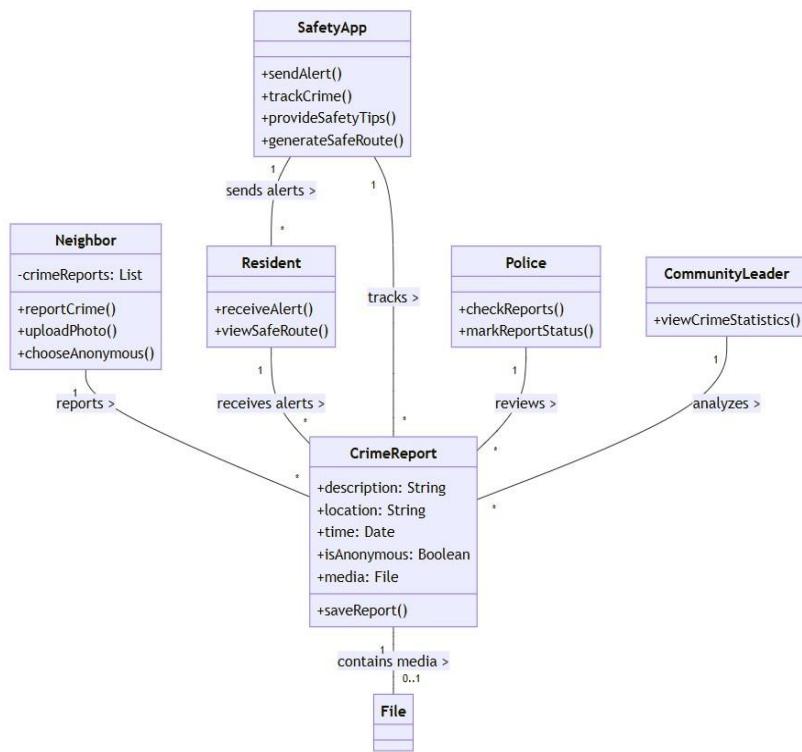
### Type Description

<	Inheritance
\*	Composition
o	Aggregation
>	Association
<	Association
>	Realization

## class diagram by 231001224

Follow 1 Edit

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## RESULT:

Thus, the class diagram was created successfully.

**EX NO: 7**

**DATE:11/03/2025**

## **DESIGNING USE CASE DIAGRAM USING AZURE**

### **DEVOPS-WIKI**

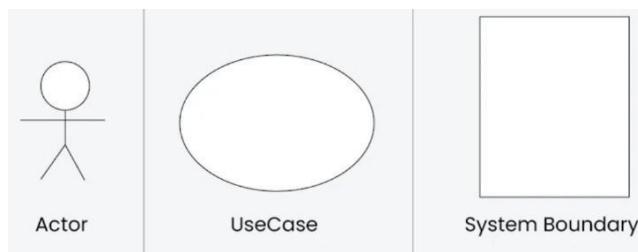
#### **AIM:**

Steps to draw the Use Case Diagram using Azure DevOps -WIKI

#### **THEORY:**

UCD shows the relationships among actors and use cases within a system which Provide an overview of all or part of the usage requirements for a system or organization in the form of an essential model or a business model and communicate the scope of a development project

- **Use Cases**
- **Actors**
- **Relationships**
- **System Boundary Boxes**



#### **PROCEDURE:**

Step 1: Open Azure DevOps Wiki

- Go to your Azure DevOps project.
- From the left sidebar, click on Wiki.

Step 2: Create or Edit a Wiki Page

- Click New Page to create a new page.
- Or, navigate to an existing page and click the Edit ( button).

Step 3: Insert a Mermaid Code Block

Use a fenced code block with the mermaid keyword:

::: mermaid

graph TD

actorUser([User])

actorInstructor([Instructor])

actorAdmin([Admin])

actorUser --> UC1[Register/Login]

actorUser --> UC2[Browse Courses]

actorUser --> UC3[Enroll in Course]

actorUser --> UC4[Attend Live Class]

actorUser --> UC5[Take Quiz]

actorUser --> UC6[Download Certificate]

actorInstructor --> UC1

actorInstructor --> UC7[Create Course]

actorInstructor --> UC8[Create Quiz]

actorAdmin --> UC1

actorAdmin --> UC9[Approve Course]

actorAdmin --> UC10[Manage Users]

⋮

### Usecase diagram by 231001224

sumanth s · Tuesday



1 visit in last 30 days

#### Comments

Add a comment...

## RESULT:

The Use Case diagram was designed successfully.

## **EX NO. 8**

**DATE:18/03/2025**

### **DESIGNING ACTIVITY DIAGRAMS USING AZURE**

### **DEVOPS-WIKI**

#### **AIM:**

To design a sample activity diagram for your project or system.

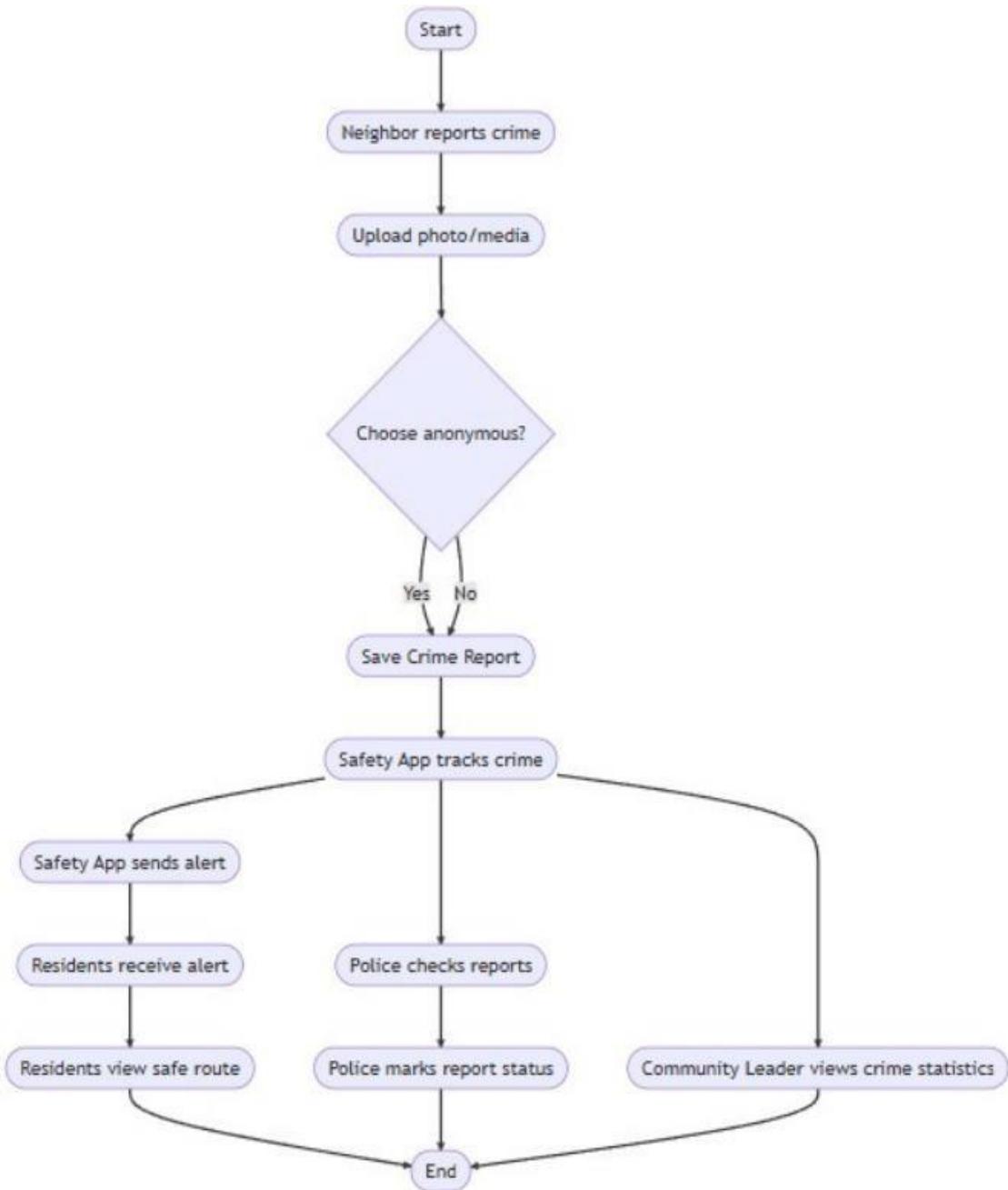
#### **THEORY:**

Activity diagrams are an essential part of the Unified Modelling Language (UML) that help visualize workflows, processes, or activities within a system. They depict how different actions are connected and how a system moves from one state to another.

Notations	Symbol	Meaning
Start	●	Shows the beginning of a process
Connector	—→	Shows the directional flow, or control flow, of the activity
Joint symbol		Combines two concurrent activities and reintroduces them to a flow where one activity occurs at a time
Decision	◇	Represents a decision
Note	□	Allows the diagram creators to communicate additional messages
Send signal	□ ↗	Show that a signal is being sent to a receiving activity
Receive signal	↗ □	Demonstrates the acceptance of an event
Flow final symbol	⊗	Represents the end of a specific process flow
Option loop	[ ]	Allows the creator to model a repetitive sequence within the option loop symbol
Shallow history pseudostate	( H )	Represents a transition that invokes the last active state.
End	○	Marks the end state of an activity and represents the completion of all flows of a process

#### **PROCEDURE:**

1. Draw diagram in draw.io
2. Upload the diagram in Azure DevOps wiki



## RESULT:

The activity diagram was designed successfully.

## **EX NO. 9**

**DATE:25/03/2025**

### **ARCHITECTURE DIAGRAM**

#### **AIM:**

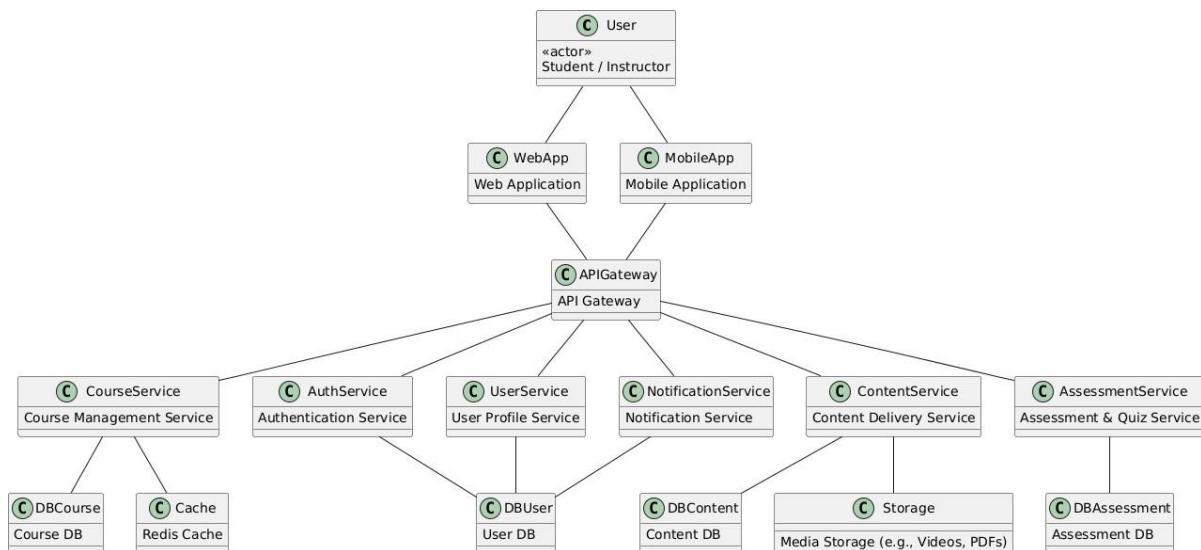
Steps to draw the Architecture Diagram using Star UML

#### **THEORY:**

An architectural diagram is a visual representation that maps out the physical implementation for components of a software system. It shows the general structure of the software system and the associations, limitations, and boundaries between each element.

#### **PROCEDURE:**

1. Draw diagram in Star UML



#### **RESULT:**

The architecture diagram was designed successfully.

## EX NO. 10

DATE:01/04/2025

### USER INTERFACE

#### AIM:

Design User Interface for the given project.

The image displays two wireframe designs for a "Crime Prediction System".

**Top Wireframe (Dashboard View):**

- Header:** CrimeAI, Crime Prediction System, Profile button.
- Left Sidebar:** Dashboard, Analytics, Alerts.
- Dashboard Content:**
  - Predicted Incidents:** 125 (+10% from last week)
  - High Risk Zones:** 8 (+20% increase)
  - Crime Rate Trend:** -12% (Compared to last month)
- Crime Hotspots Map:** Placeholder map area labeled "[Map Placeholder]".
- Recent Reports:**
  - Burglary - Downtown (2 hours ago)
  - Assault - Eastside (5 hours ago)
  - Theft - West Park (1 day ago)

**Bottom Wireframe (Risk Alerts & Prevention Tips View):**

- Header:** CrimeAI, Crime Prediction System, Profile button.
- Left Sidebar:** Dashboard, Analytics, Alerts.
- Risk Alerts & Prevention Tips Content:**
  - Downtown:** Risk Level: **High**, Suggestion: Increase patrols at night.
  - East Side:** Risk Level: **Medium**, Suggestion: Install more CCTV cameras.
  - West Park:** Risk Level: **Low**, Suggestion: Community awareness programs.

#### RESULT:

The UI was designed successfully.

**EX NO. 11**

**DATE:08/04/2025**

## **IMPLEMENTATION**

### **AIM:**

To implement the given project based on Agile Methodology.

### **PROCEDURE:**

#### Step 1: Set Up an Azure DevOps Project

- Log in to Azure DevOps.
- Click "New Project" → Enter project name → Click "Create".
- Inside the project, navigate to "Repos" to store the code.

#### Step 2: Add Your Web Application Code

- Navigate to Repos → Click "Clone" to get the Git URL.
- Open Visual Studio Code / Terminal and run:  
`git clone <repo_url>`  
`cd <repo_folder>`
- Add web application code (HTML, CSS, JavaScript, React, Angular, or backend like Node.js, .NET, Python, etc.).
- Commit & push:  
`git add .`  
`git commit -m "Initial commit"`  
`git push origin main`

#### Step 3: Set Up Build Pipeline (CI/CD - Continuous Integration)

- Navigate to Pipelines → Click "New Pipeline".
- Select Git Repository (Azure Repos, GitHub, or Bitbucket).
- Choose Starter Pipeline or a pre-configured template for your framework.
- Modify the azure-pipelines.yml file (Example for a Node.js app):

```
trigger:
  - main

pool:
  vmImage: 'ubuntu-latest'

steps:
```

```
task: UseNode@1
  inputs:
    version: '16.x'
    -script: npm install
      displayName: 'Install dependencies'
    -script: npm run build
      displayName: 'Build application'
  -task: PublishBuildArtifacts@1
    inputs:
      pathToPublish: 'dist'
      artifactName: 'drop'
```

Click "Save and Run" → The pipeline will start building app.

#### Step 4: Set Up Release Pipeline (CD - Continuous Deployment)

- Go to Releases → Click "New Release Pipeline".
- Select Azure App Service or Virtual Machines (VMs) for deployment.
- Add an artifact (from the build pipeline).
- Configure deployment stages (Dev, QA, Production).
- Click "Deploy" to push your web app to Azure.

#### **RESULT:**

Thus, the application was successfully implemented.

**EXP NO : 12**

**DATE : 15.04.2025**

## **TESTING – TEST PLAN, TEST CASE, LOAD TESTING**

### **AIM:**

To design and manage structured test plans and test cases in Azure DevOps for validating core user stories through both happy path and error scenarios and evaluate the performance of the application's endpoint by creating and executing load tests using Azure Load Testing.

### **PROCEDURE:**

#### **TEST CASE DESIGN PROCEDURE**

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

- Review requirement documents and user stories.
- Identify all main functionalities of the application.
- Ensure complete coverage of modules before test case creation.

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

- Determine common user behaviors based on application flow.
- Translate user actions into testable scenarios.
- Ensure each test case mimics a real user operation.

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

- Create test cases for expected and correct user actions.
- Ensure each functionality works under normal conditions.
- Add these cases under the relevant Test Suite in Azure DevOps.

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

- Identify edge cases, invalid inputs, and system failures.
- Test how the system handles incorrect or unexpected behavior.
- Add these test cases to the same or a separate Test Suite in Azure DevOps.

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

- Write step-by-step instructions in the "Steps" section of the test case.
- Provide expected results for each action.
- Ensure clarity for both manual execution and automation mapping.

##### **6. Use Clear Naming and IDs**

- Name test cases clearly using a defined naming convention (e.g., TC01, TC02, etc.).
- Ensure titles reflect the purpose of the test case.

- Azure DevOps auto-generates test case IDs for tracking.

## 7. Separate Test Suites

- Group test cases based on functionality (e.g., Login, Playlist, Recommendations).
- Use Static, Requirement-based, or Query-based suites in Azure DevOps.
- Improves traceability and execution flow.

## 8. Prioritize and Review

- Mark test cases with priority (High, Medium, Low).
- Review test cases for completeness and correctness.
- Ensure alignment with associated user stories or features.

## 1. New test plan

The screenshot shows the Azure DevOps interface for 'Crime detection rate'. On the left, the 'Test Plans' section is selected, showing a list of plans like 'Overview', 'Boards', 'Repos', 'Pipelines', 'Test Plans', 'Test plans', 'Progress report', 'Parameters', 'Configurations', 'Runs', and 'Artifacts'. A 'Project settings' link is at the bottom. In the center, a 'Crime Rate Detect...' card is open, showing a 'Test Suites' section with a single item 'Crime Rate Detection (1)'. Below it is a 'Test Points (1 item)' table:

Title	Outcome	Order	Test Case Id
Validate system response for crime data input and crime rate classification	In Progress	1	3

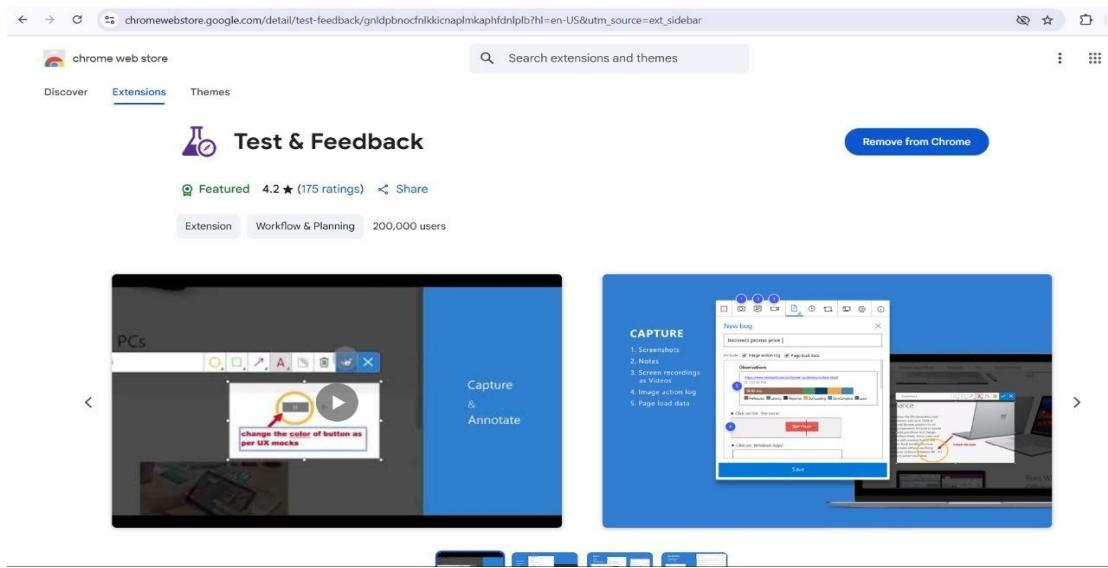
## 2. Test case

The screenshot shows the Azure DevOps interface for a specific test case. The left sidebar shows 'Crimes', 'Overview', 'Boards', 'Repos', 'Pipelines', 'Test', 'Programs', 'Parameters', 'Configurations', 'Runs', and 'Artifacts'. The main area displays a 'TEST CASE 3' card with the title '3. Validate system response for crime data input and crime rate classification'. It includes details like 'HARISHKUMAR M' assigned, 0 comments, and 'Add Tag'. Fields for 'Status' (Design), 'Area' (Crime detection rate), and 'Iteration' (Crime detection rate) are shown. The 'Steps' section lists five actions with their expected results:

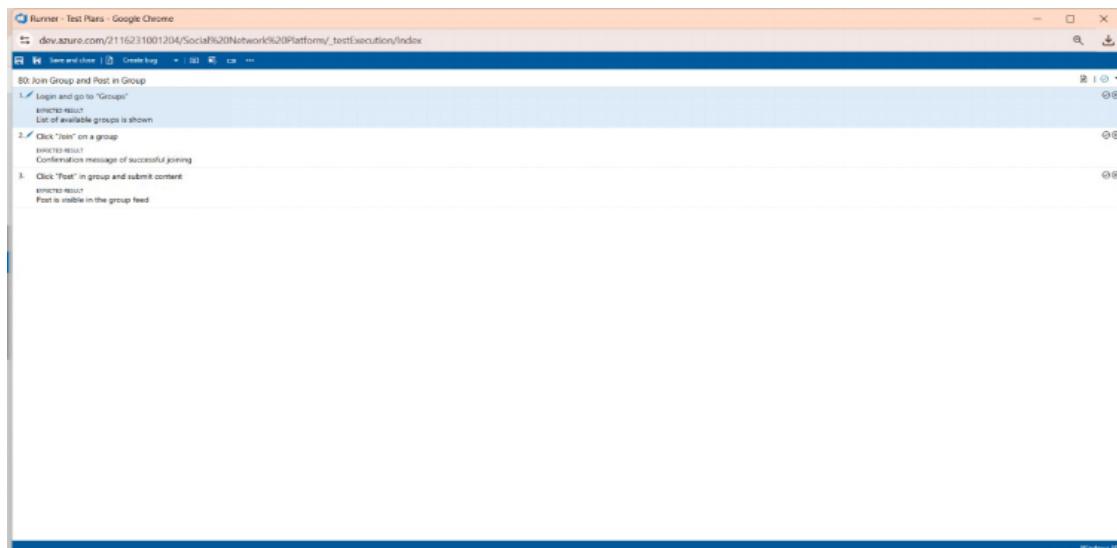
Step	Action	Expected result
1.	Login to the Crime Detection web portal as an authenticated user	Dashboard loads with "Upload Crime Data" option visible
2.	Navigate to "Upload Crime Data" and upload a valid CSV crime dataset	System accepts the file and displays upload success message
3.	Click on "Analyze" to trigger crime rate detection	System processes the data and displays crime rate classification per region
4.	Select a specific region from the map	Crime trends and rates for the selected region are displayed in a chart/graph
5.	Parameter values	Each region is color-coded and tagged with a

Below the steps are sections for 'Deployment', 'Development', and 'Related Work'.

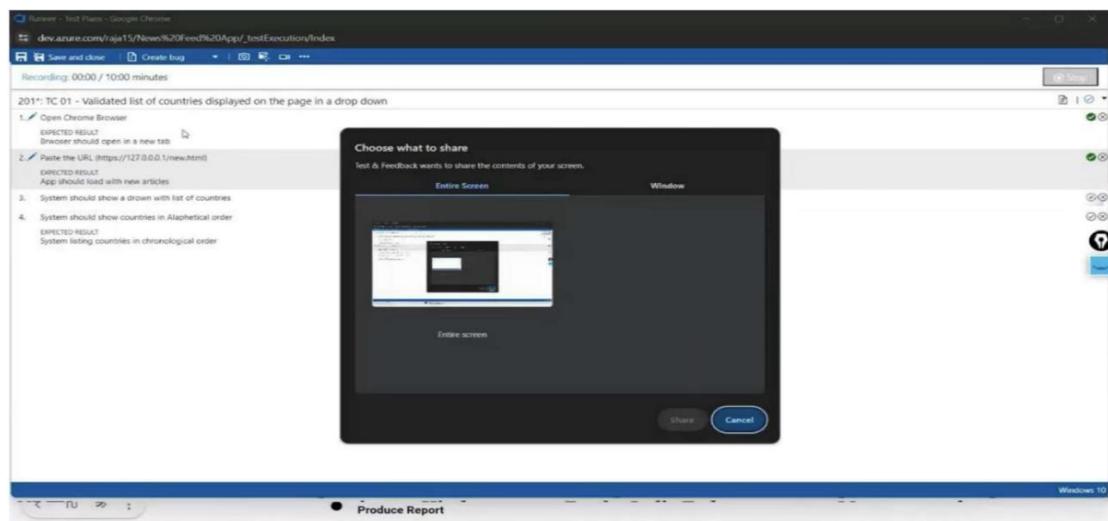
### 3. Installation of Test



### 4. Running the Test Cases



### 5. Recording the Test Cases



## 6. Creating Bugs

The screenshot shows the Microsoft Azure DevOps interface. On the left, there's a sidebar with navigation links: Overview, Boards, Work items, Backlog, Stories, Queries, Delivery Plans, Analytics, Reports, Pipelines, Test Plans, and Artifacts. The 'Work items' link is selected. In the center, a grid of work items is displayed. One work item, 'TC05 - View Playlist Page', is highlighted and expanded. Its details pane shows it was created by 'Karthick S' on April 11 at 12:45 PM, last updated by 'Karthick S' on April 11 at 12:45 PM. It has a status of 'In Progress' and is assigned to 'Mallu karthick Balaji'. The work item itself contains several sections of text and code snippets. A tooltip on the right provides information about tracking releases and using Boards.

## 7. Test Case Results

This screenshot shows a test case results page. The title is 'TC05 – View Playlist Page'. Below it, the section title is 'Test Case Results'. A table lists test results for different configurations and timestamps. The columns are: Outcome, TimeStamp, Configuration, Run by, Tester, and Test ID. The data includes:

Outcome	TimeStamp	Configuration	Run by	Tester	Test ID
Passed	4m ago	Windows: 10	Karthick S	Mallu karthick Balaji	... MMusic
Passed	12m ago	Windows: 10	Karthick S	Mallu karthick Balaji	... MMusic
Not Applicable	12m ago	Windows: 10	Karthick S	Mallu karthick Balaji	... MMusic
Passed	14m ago	Windows: 10	Karthick S	Mallu karthick Balaji	... MMusic
Passed	Tuesday	Windows: 10	Karthikkeyan Senthil	Mallu karthick Balaji	... Music
Passed	Saturday	Windows: 10	Mallu karthick Balaji	Mallu karthick Balaji	... Music
Failed	Saturday	Windows: 10	Mallu karthick Balaji	Mallu karthick Balaji	... Music
Passed	Apr 11	Windows: 10	Karthick S	Mallu karthick Balaji	... Music
Passed	Apr 11	Windows: 10	Karthick S	Mallu karthick Balaji	... Music

At the bottom, there's a link 'Open execution history for current test point'.

## 6. Progress Report

This screenshot shows a progress report page. The title is 'Progress Report'. The sidebar on the left includes links for Overview, Boards, Work items, Backlog, Stories, Queries, Delivery Plans, Analytics, Reports, Pipelines, Test Plans, Test plans, Parameters, Configuration, and Artifacts. The 'Test plans' link is selected. The main area displays a grid of tasks. Two specific tasks are circled in green: one in the top row and another in the middle row. The grid columns include 'Task ID', 'Title', 'Status', 'Last 24 Days', and 'Last 7 Days'. The 'Last 24 Days' column shows a timeline from April 11 to April 13. The 'Last 7 Days' column shows a timeline from April 11 to April 17. The bottom of the screen shows a navigation bar with links for 'Resource', 'Test Plan', 'Test Suite', 'Test Case', 'Test Step', and 'Execution'.

## **LOAD TESTING PROCEDURE :**

### **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**

- Go to Create a resource — Search for “Azure Load Testing”.
- Select Azure Load Testing and click Create.

#### **3. Fill in the Configuration Details**

- Subscription: Choose your Azure subscription.
- Resource Group: Create new or select an existing one.
- Name: Provide a unique name (no special characters).
- 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**

- Test Name: Provide a unique name.
- Description: (Optional) Add test purpose.
- Run After Creation: Keep checked.

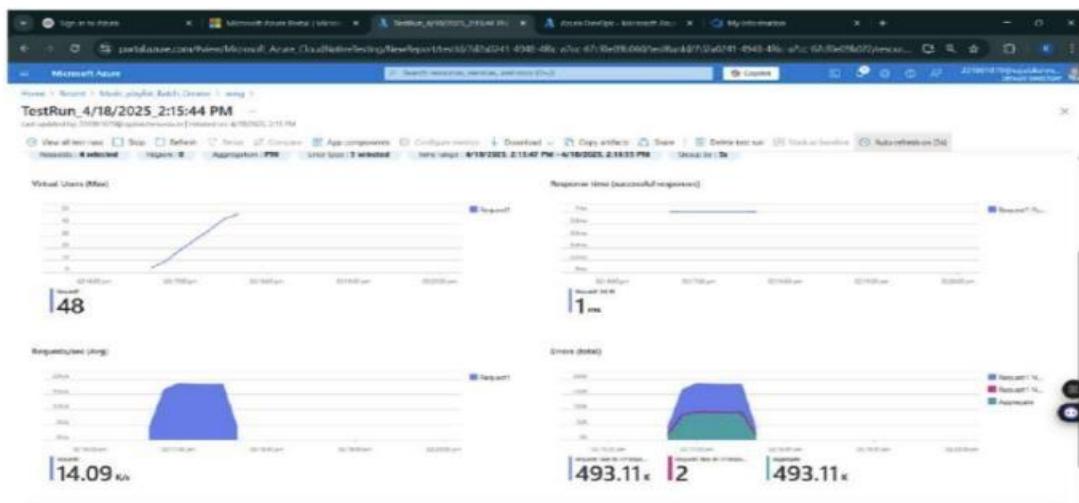
#### **3. Load Settings**

- Test URL: Enter the target endpoint (e.g., <https://yourapi.com/products>).

#### **4. Click Review + Create — Create to start the test.**

## **Load Testing**





## RESULT:

Test plans and test cases for selected user stories were created in Azure DevOps, covering both happy and error paths and an Azure Load Testing resource was also set up, and a load test was successfully run to evaluate the performance of the target endpoint.



