

**RAJALAKSHMI ENGINEERING COLLEGE**  
**[AUTONOMOUS]**

**RAJALAKSHMI NAGAR, THANDALAM – 602 105**



**CS23432 – SOFTWARE CONSTRUCTION**

**LABORATORY RECORD NOTEBOOK**

**Name : SONIA JS. ....**

**Year / Branch / Section : II- AIML-B**

**Register No. : .2116231501157 .....**

**Semester : IV**

**Academic Year : 2024-2025**

**RAJALAKSHMI ENGINEERING COLLEGE**  
**[AUTONOMOUS]**

**RAJALAKSHMI NAGAR, THANDALAM – 602 105**

**BONAFIDE CERTIFICATE**

Name : . . . **SONIA JS.** . . . . .

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

Semester : 04

Branch : AIML

**Register No.**

**2116231501157**

Certified that this is the bonafide record of work done by the above student in the  
**CS23432 – SOFTWARE CONSTRUCTION** during the year 2024 - 2025.

**Signature of Faculty in-charge**

Submitted for the Practical Examination held on . . . . .

**Internal Examiner**

**External Examiner**

**RAJALAKSHMI ENGINEERING COLLEGE**  
**(An Autonomous Institution affiliated to Anna University)**  
**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**  
**Subject: CS23432 – SOFTWARE CONSTRUCTION**

**Reg No:2116231501157**

**Name: SONIA JS**

**Class & Section : AIML-B**

**INDEX Page**

<b>S.NO</b>	<b>Project Title</b>	<b>QR Code</b>	<b>Signature</b>
<b>1</b>	<b>CRIME RATE DETECTOR APP</b>		

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7.	04/3/25	Designing Use-Case and Activity Diagrams for Project Architecture
8.	25/3/25	Testing – Test Plans and Test Cases
9.	15/4/25	CI/CD Pipelines in Azure
10.	22/4/25	GitHub: Project Structure & Naming Convention

EXP NO: 1

## AZURE DEVOPS ENVIRONMENT SETUP

### Aim:

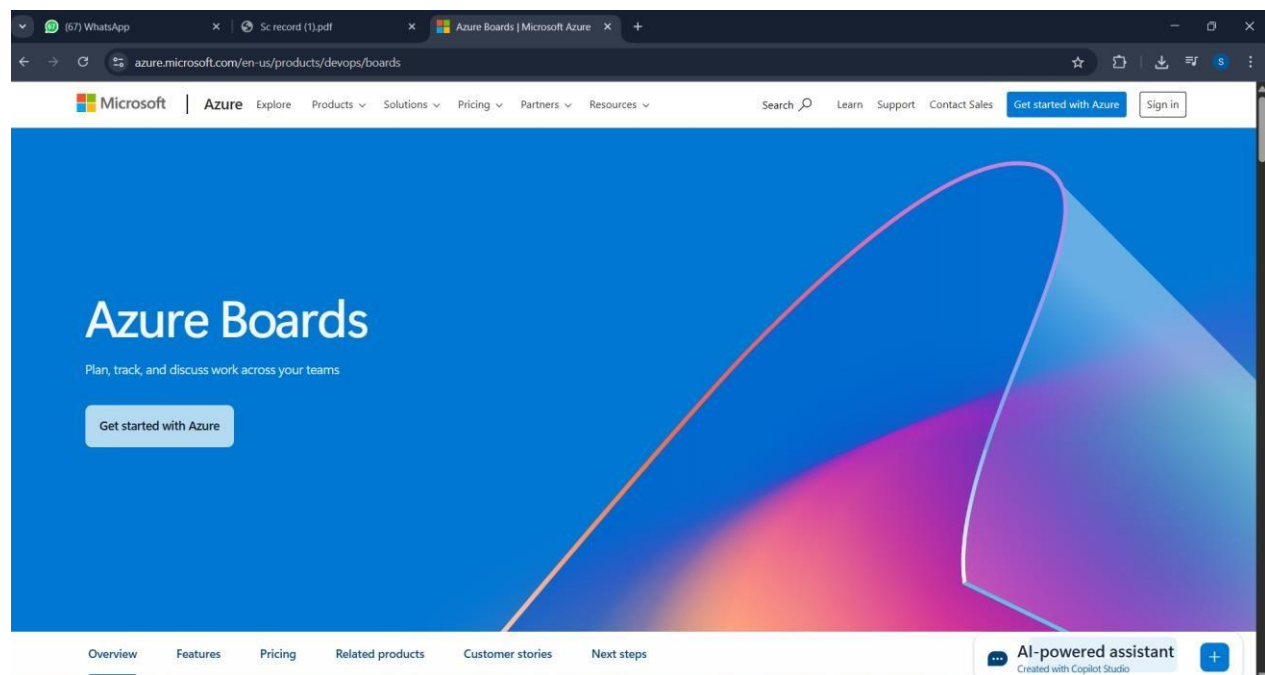
To set up and access the Azure DevOps environment by creating an organization through the Azure portal.

### INSTALLATION

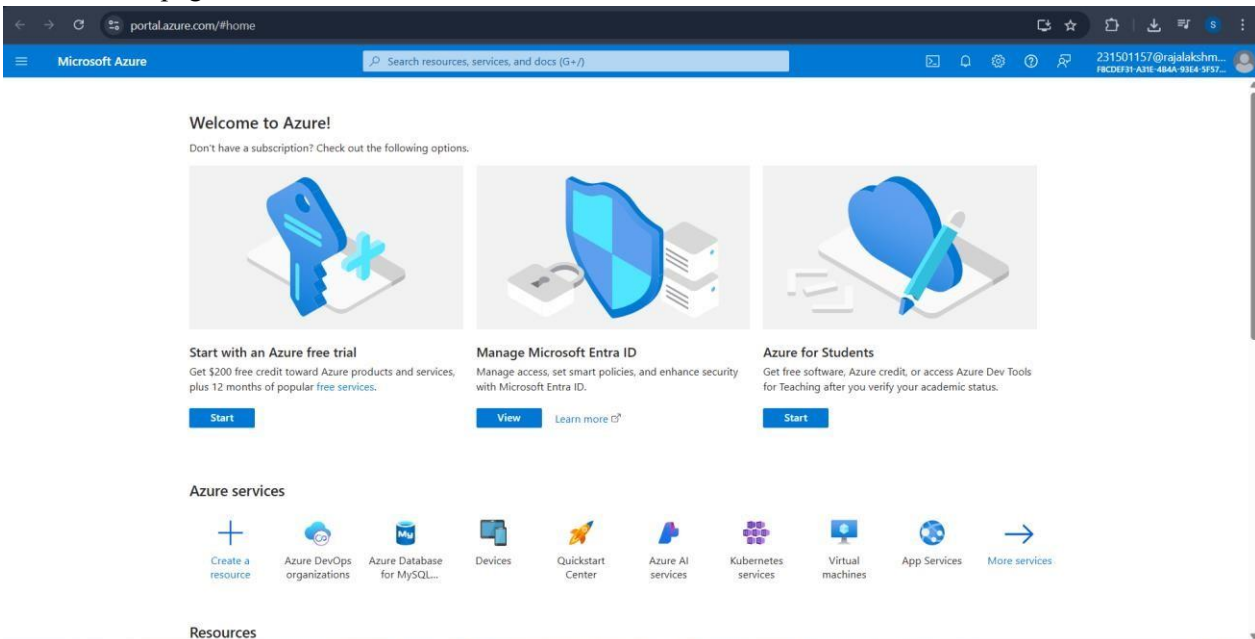
1. Open your web browser and go to the Azure website: <https://azure.microsoft.com/en-us/getstarted/azureportal>.

Sign in using your Microsoft account credentials.

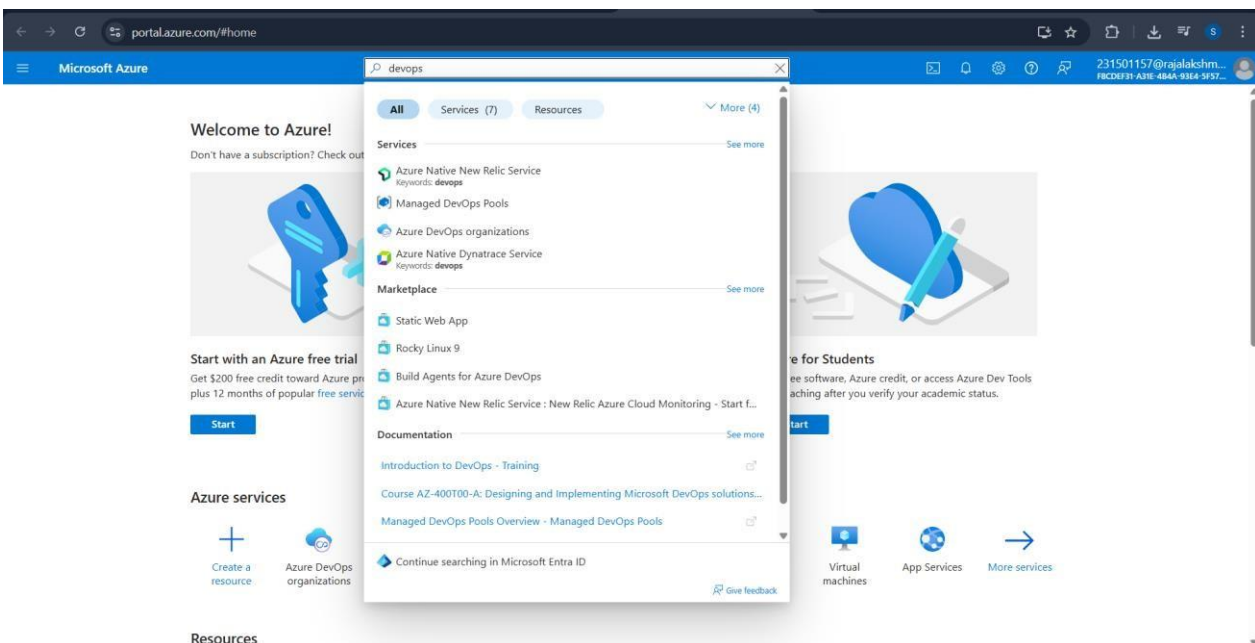
If you don't have a Microsoft account, you can create one here: <https://signup.live.com/?lic=1>



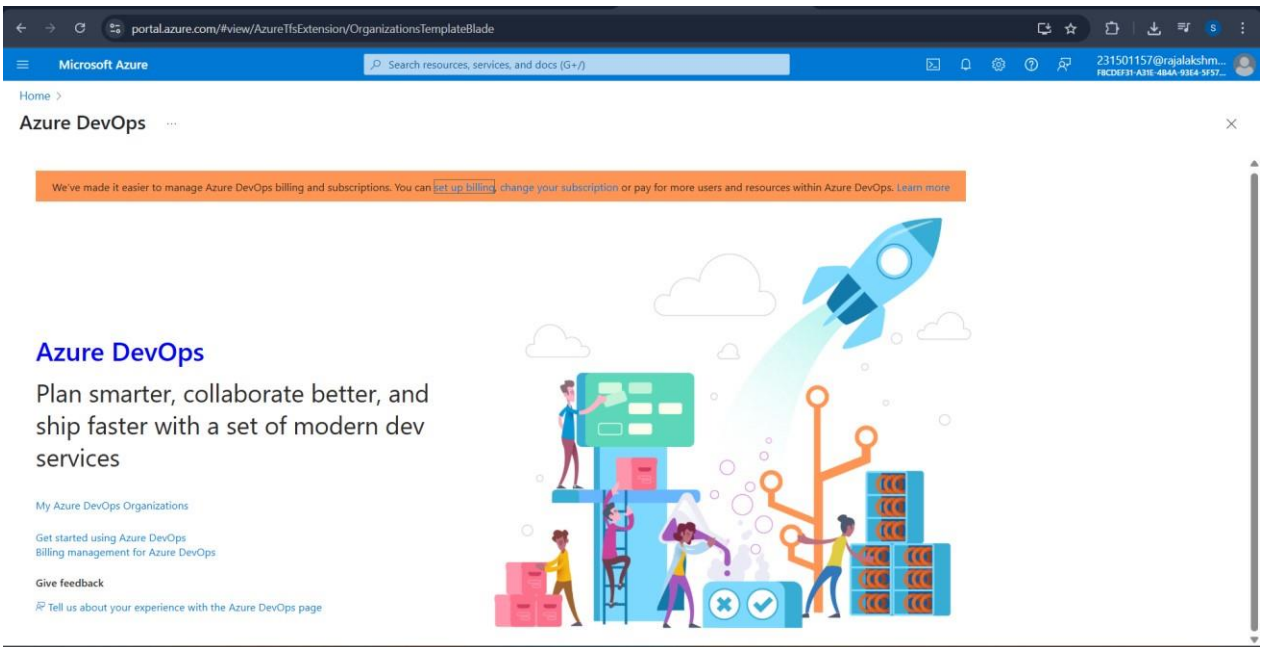
## 2. Azure home page



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



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



**Result:**

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

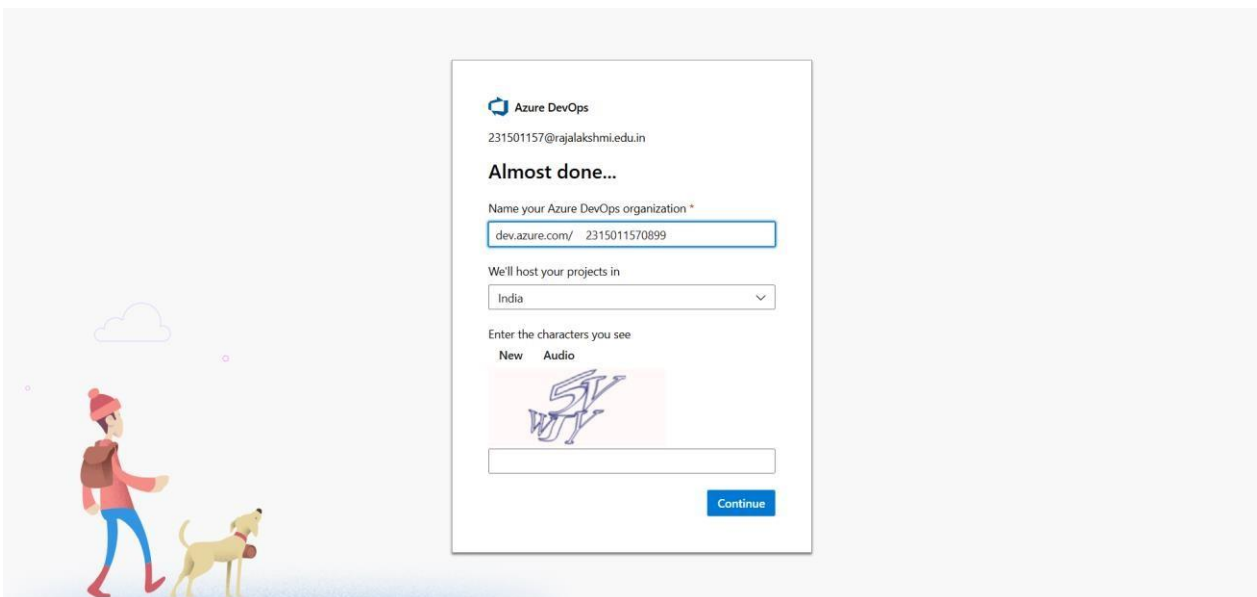
EXP NO: 2

## AZURE DEVOPS PROJECT SETUP AND USER STORY MANAGEMENT

### Aim:

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

#### 1. Create An Azure Account



#### 2. Create the First Project in Your Organization

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



Public

Anyone on the internet can view the project. Certain features like TFVC are not supported.

Private

Only people you give access to will be able to view this project.

Public projects are disabled for your organization. You can turn on public visibility with [organization policies](#).

^ Advanced

Version control ?

Git

Work item process ?

Agile

+ Create 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.

2116231501157

CS23432

The screenshot shows the Azure DevOps user profile page for Sonia J S. The page has a blue header with the Microsoft logo and the user's name 'Sonia J S' with a 'Sign out' link. Below the header, there is a profile section on the left with a red circular avatar containing the letters 'SS'. The profile information includes the name 'Sonia J S', email '231501157@rajalakshmi.edu.in', location 'India', and another email '231501157@rajalakshmi.edu.in'. There is an 'Edit profile' button. Below the profile information is a section for 'Visual Studio Dev Essentials' with a description and a 'Use your benefits' link. To the right of the profile is a section titled 'Azure DevOps Organizations' with a 'Create new organization' button. It lists several organizations: 'dev.azure.com/231501157 (Owner)', 'dev.azure.com/2315011570466 (Owner)', 'dev.azure.com/2315011570509 (Owner)', 'dev.azure.com/2315011570575 (Owner)', and 'dev.azure.com/vishnu24priya2408 (Member)'. Under the 'dev.azure.com/2315011570509 (Owner)' organization, there is a 'Projects' section with a 'Crime Rate Detector' project and a 'New project' button. An 'Actions' section with the link 'Open in Visual Studio' is also present.

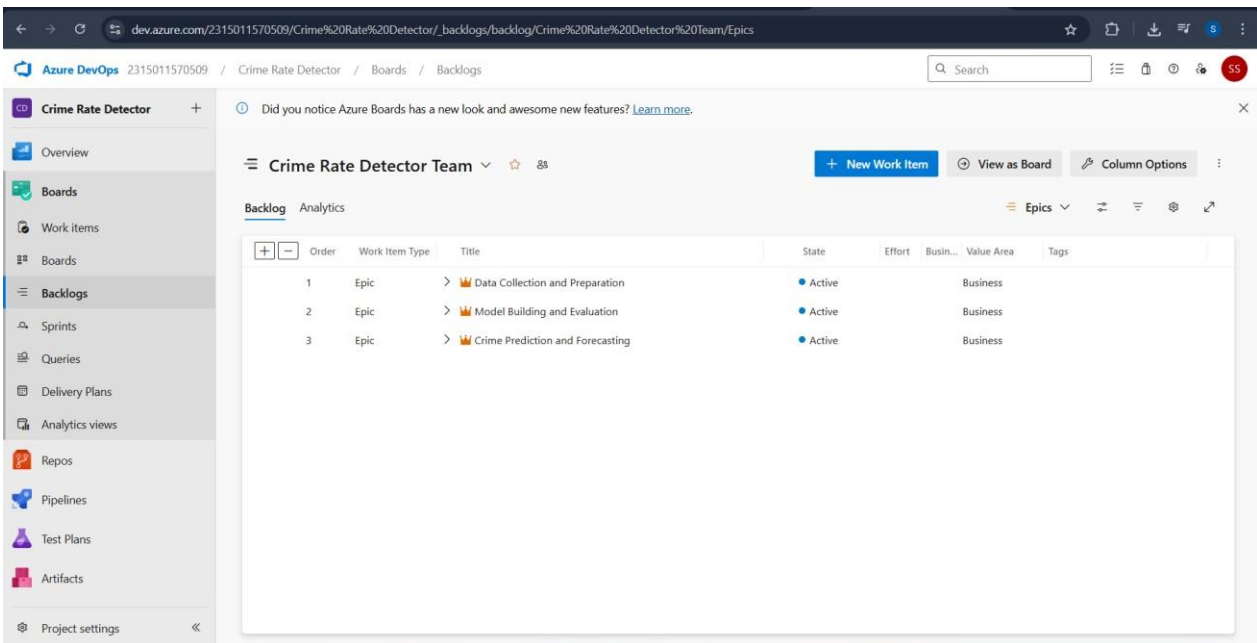
#### 4. Project dashboard

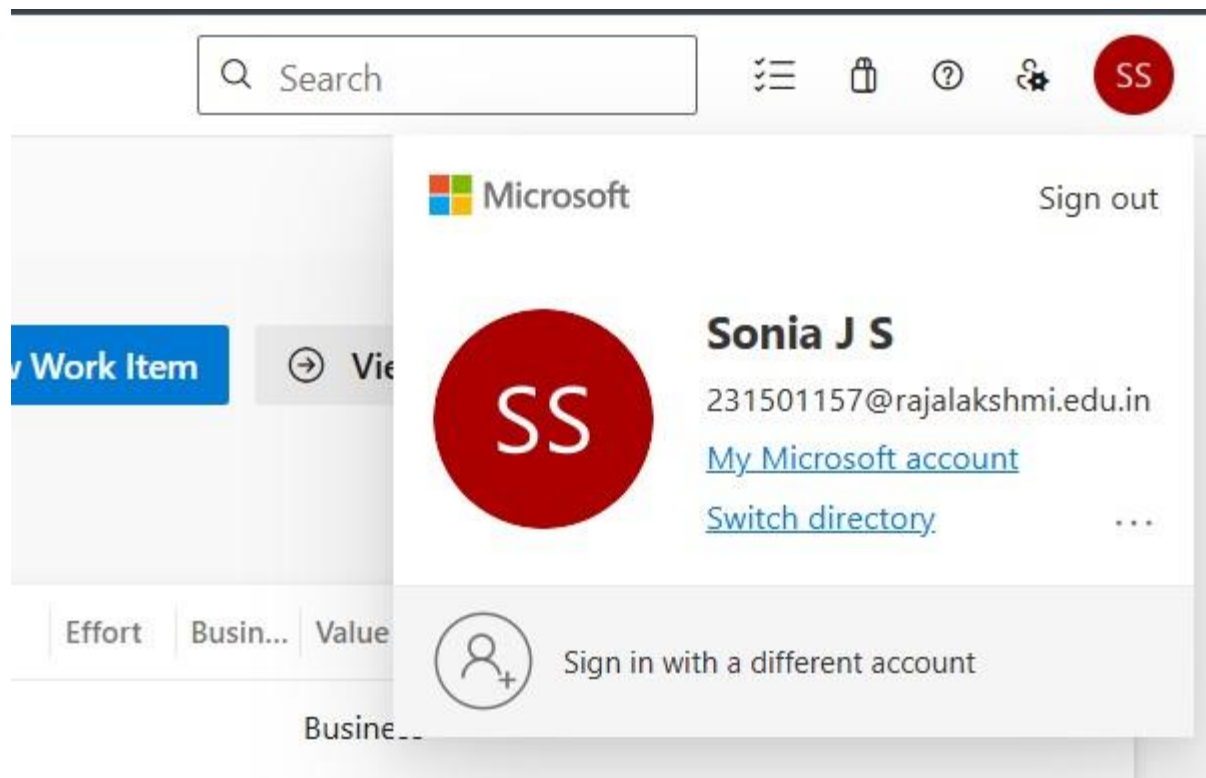
The screenshot shows the Azure DevOps project dashboard for the 'Crime Rate Detector' project. The page has a blue header with the Azure DevOps logo and the project name 'Crime Rate Detector'. Below the header, there is a left sidebar with a list of project items: 'Overview', 'Summary', 'Dashboards', 'Wiki', 'Boards', 'Repos', 'Pipelines', 'Test Plans', and 'Artifacts'. The main content area is titled 'Crime Rate Detector' and has a 'Private' status and an 'Invite' button. It features a section titled 'About this project' with a sub-section 'Help others to get on board!' and a description 'Describe your project and make it easier for other people to understand it.' There is an 'Add Project Description' button. To the right of the 'About this project' section is a 'Project stats' section with a 'Period: Last 7 days' dropdown. It shows 'Boards' with '12 Work items' and '0 Work items'. Below the 'Project stats' section is a 'Members' section with 3 members, including the user 'SS' and two other users.

5. To manage user stories:

a. From the **left-hand navigation menu**, click on **Boards**. This will take you to the main **Boards** page, where you can manage work items, backlogs, and sprints.

b. On the **work items** page, you'll see the option to **Add a work item** at the top. Alternatively, you can find a + button or **Add New Work Item** depending on the view you're in. From the **Add a work item** dropdown, select **User Story**. This will open a form to enter details for the new User Story.





**Result:**

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

<b>EXP NO: 3</b>	<b>SETTING UP EPICS, FEATURES, AND USER STORIES FOR PROJECT PLANNING</b>
------------------	--

**Aim:**

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

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

dev.azure.com/2315011570509/Crime%20Rate%20Detector/\_backlogs/backlog/Crime%20Rate%20Detector%20Team/Epics

Azure DevOps 2315011570509 / Crime Rate Detector / Boards / Backlogs

Did you notice Azure Boards has a new look and awesome new features? [Learn more.](#)

**Crime Rate Detector Team** + New Work Item View as Board Column Options

Backlog Analytics Epics

Order	Work Item Type	Title	State	Effort	Busin...	Value Area	Tags
1	Epic	Data Collection and Preparation	Active			Business	
	Feature	Crime Data Collection	New			Business	
	User Story	As a data engineer, I want to collect crime data from v...	New			Business	
	Task	Identify reliable data sources (e.g., police records, p...	New				
	Task	Automate data scraping or API integration.	New				
	User Story	As a data analyst, I want to extract time, location, and ...	New			Business	
	Task	Parse and structure the extracted data	New				
	Task	Store data in a clean and consistent format (e.g., CS...	New				
	Feature	Data Cleaning and Preprocessing	New			Business	
2	Epic	Model Building and Evaluation	Active			Business	
	Feature	Algorithm Selection and Training	New			Business	
	Feature	Ensemble and Optimization	New			Business	
3	Epic	Crime Prediction and Forecasting	Active			Business	

## 1.Fill in Epics

dev.azure.com/2315011570509/Crime%20Rate%20Detector/\_workitems/create/Epic

Azure DevOps 2315011570509 / Crime Rate Detector / Boards / Work items

Did you notice Azure Boards has a new look and awesome new features? [Learn more.](#)

**Work Items** Back to Work Items

NEW EPIC: Field 'Title' cannot be empty.

Enter title

No one selected 0 Comments Add Tag Save

State New Area Crime Rate Detector Reason New Iteration Crime Rate Detector/Sprint 1 Details

**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.  
[Switch to Markdown editor](#)

**Planning**  
Priority 2  
Risk  
Effort  
Business Value  
Time Criticality  
Start Date Select a date...  
Target 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.

## 2.Fill in Features

dev.azure.com/2315011570509/Crime%20Rate%20Detector/\_workitems/create/Feature

Azure DevOps 2315011570509 / Crime Rate Detector / Boards / Work items

Crime Rate Detector +

Overview

Boards

Work items

Boards

Backlogs

Sprints

Queries

Delivery Plans

Analytics views

Repos

Pipelines

Test Plans

Artifacts

Project settings

Work Items Back to Work Items

NEW FEATURE \* Field 'Title' cannot be empty.

Enter title

No one selected 0 Comments Add Tag

Save

State: New Area: Crime Rate Detector

Reason: New Iteration: Crime Rate Detector\Sprint 1

Details

Description

Discussion

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

switch to Markdown editor

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

## 3.Fill in User Story Details

dev.azure.com/2315011570509/Crime%20Rate%20Detector/\_workitems/create/User%20Story

Azure DevOps 2315011570509 / Crime Rate Detector / Boards / Work items

Crime Rate Detector +

Overview

Boards

Work items

Boards

Backlogs

Sprints

Queries

Delivery Plans

Analytics views

Repos

Pipelines

Test Plans

Artifacts

Project settings

Work Items Back to Work Items

NEW USER STORY \* Field 'Title' cannot be empty.

Enter title

No one selected 0 Comments Add Tag

Save

State: New Area: Crime Rate Detector

Reason: New Iteration: Crime Rate Detector\Sprint 1

Details

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

**Result:**

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

<b>EXP NO: 4</b>	<b>SPRINT PLANNING</b>
------------------	------------------------

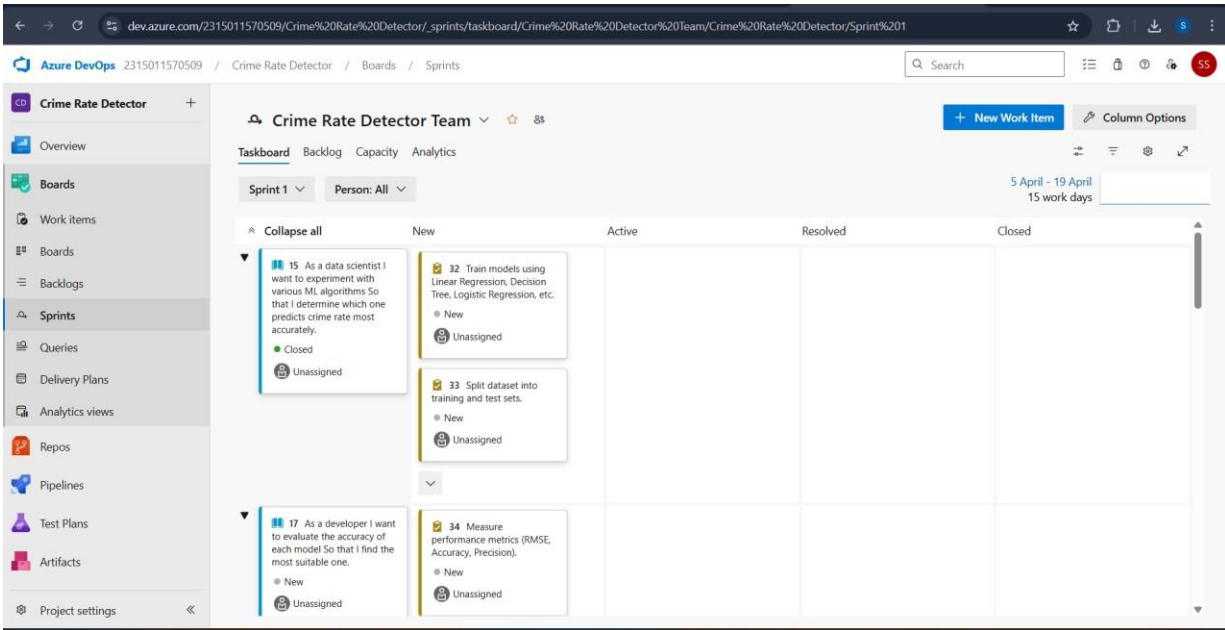
**Aim:**

To assign user story to specific sprint for the Crime Rate Detector App Project.

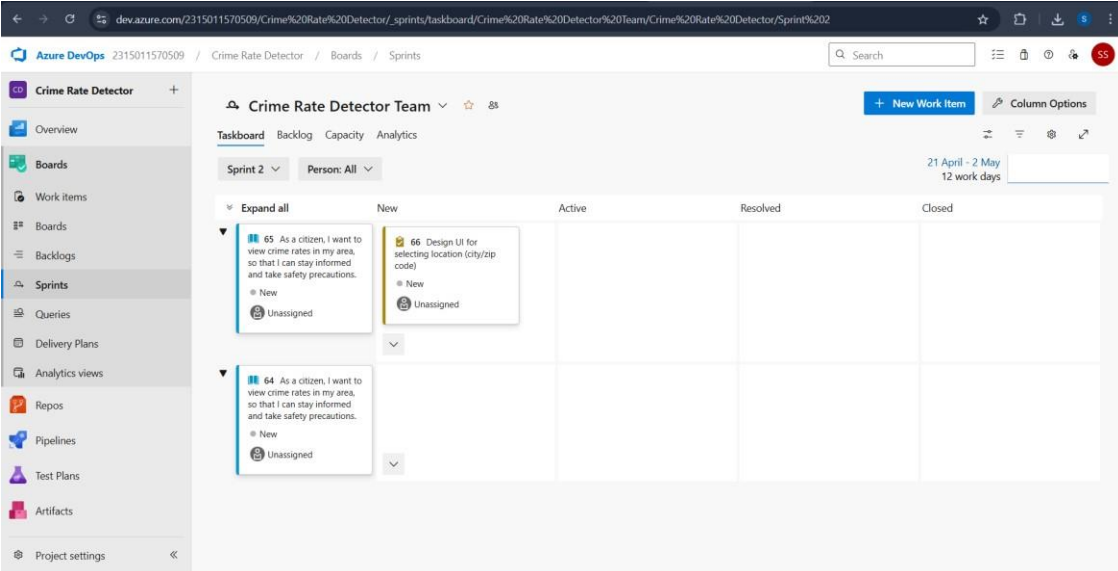
**Sprint Planning**

**Sprint 1**

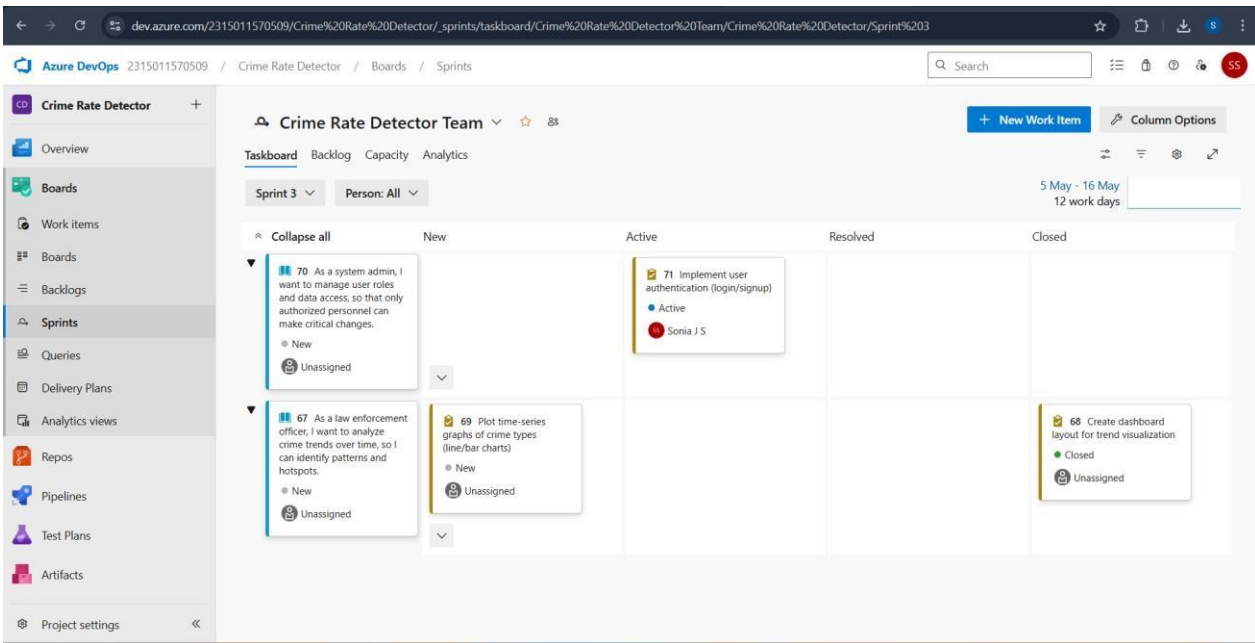




## Sprint 2



## Sprint 3



## Result:

The Sprints are created for the Crime Rate Detector App Project.

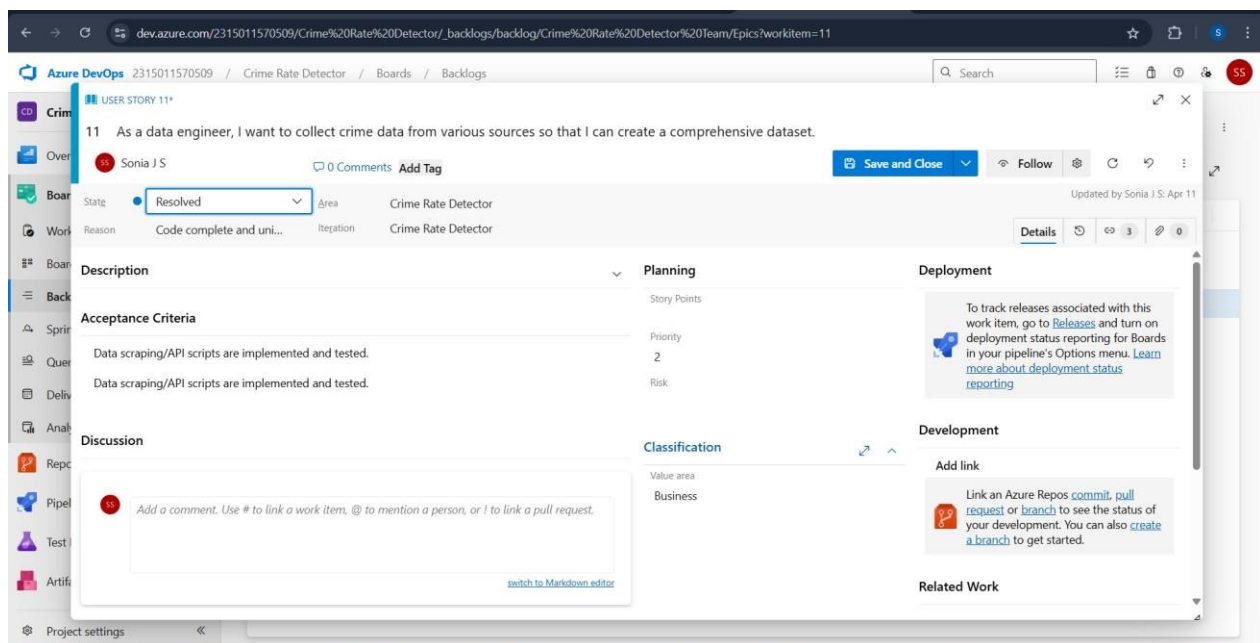
EXP NO: 5

## POKER ESTIMATION

### Aim:

Create Poker Estimation for the user stories - Crime Rate Detector App Project.

### Poker Estimation



### Result:

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

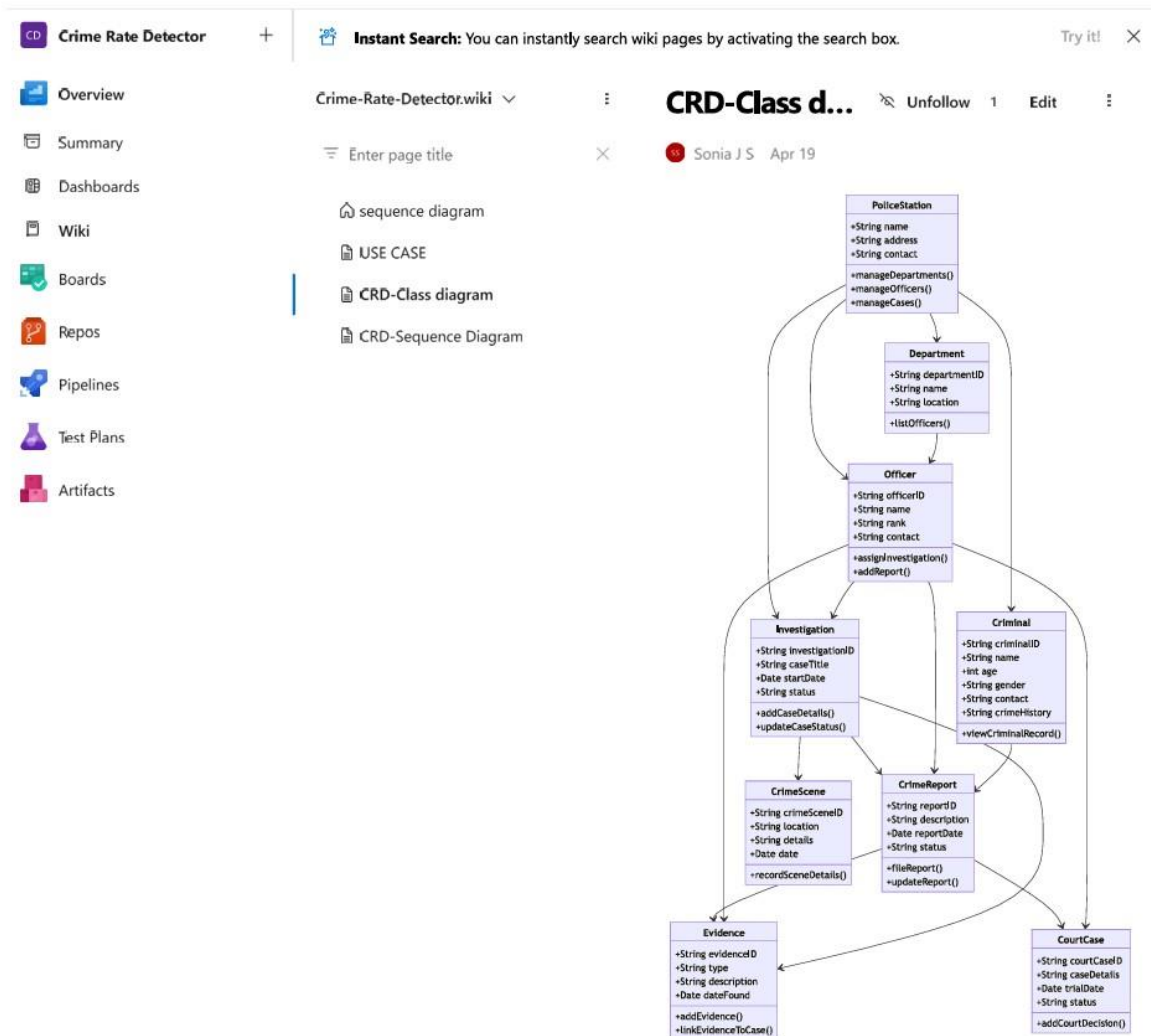
EXP NO: 6

## DESIGNING CLASS AND SEQUENCE DIAGRAMS FOR PROJECT ARCHITECTURE

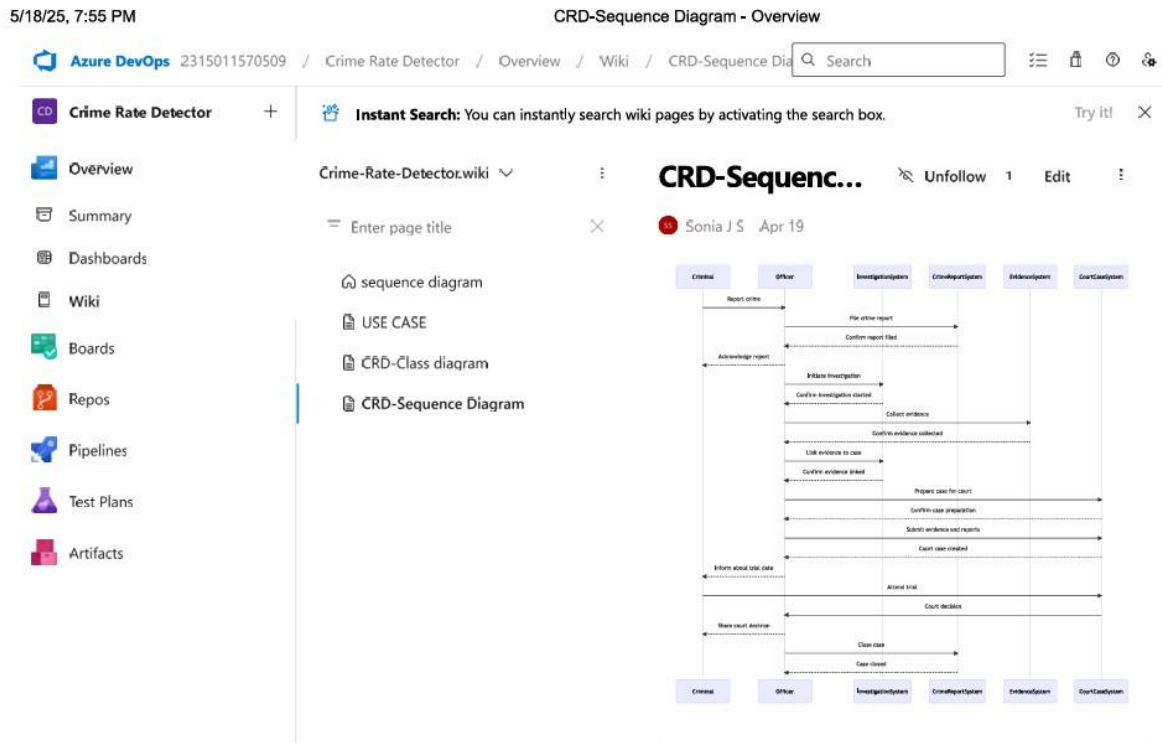
**Aim:**

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

### 6A. Class Diagram

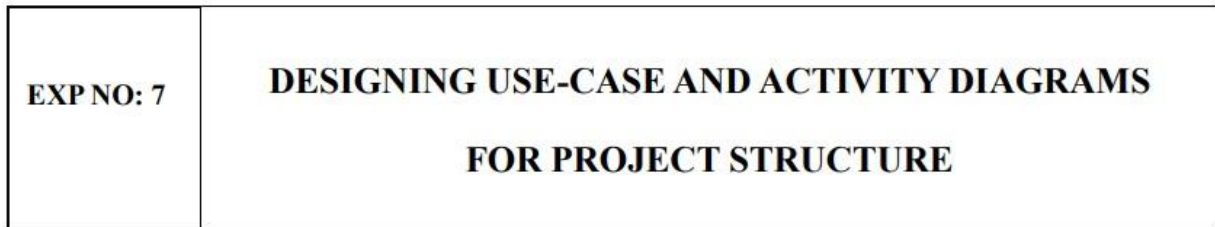


## 6B. Sequence Diagram



Result:

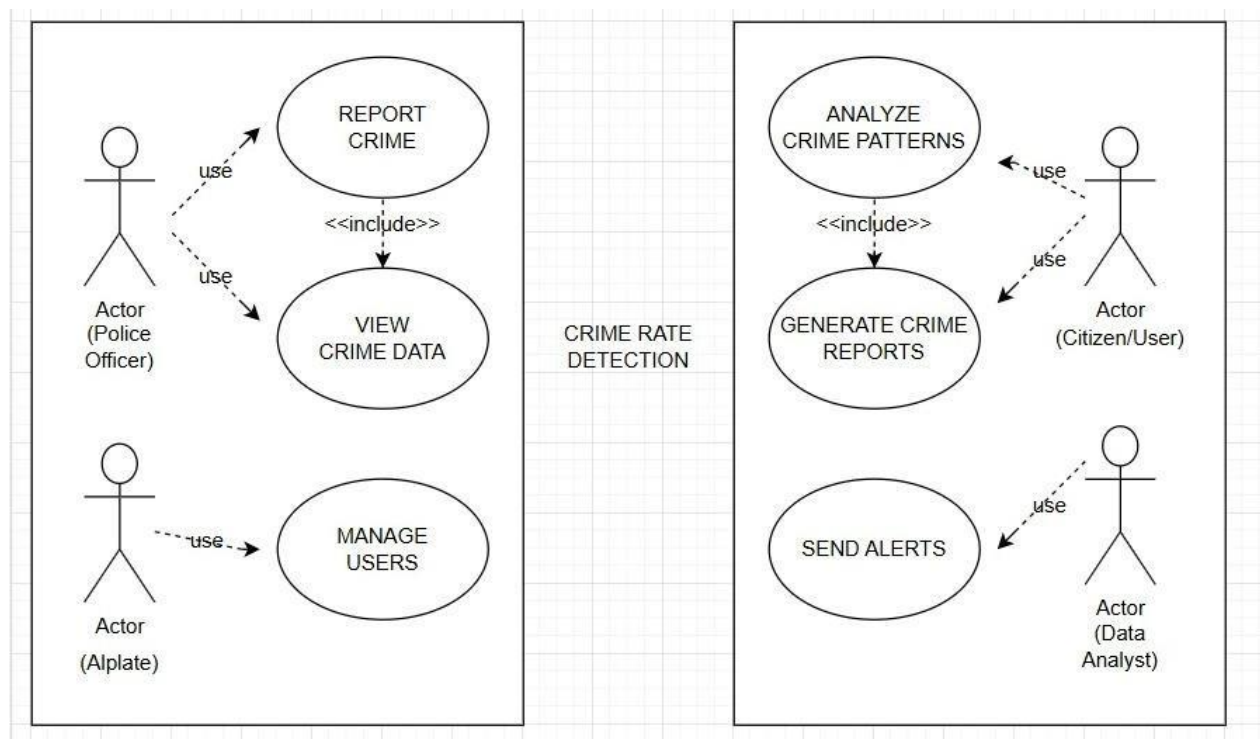
The Class Diagram and Sequence Diagram is designed Successfully for the Crime Rate Detector App



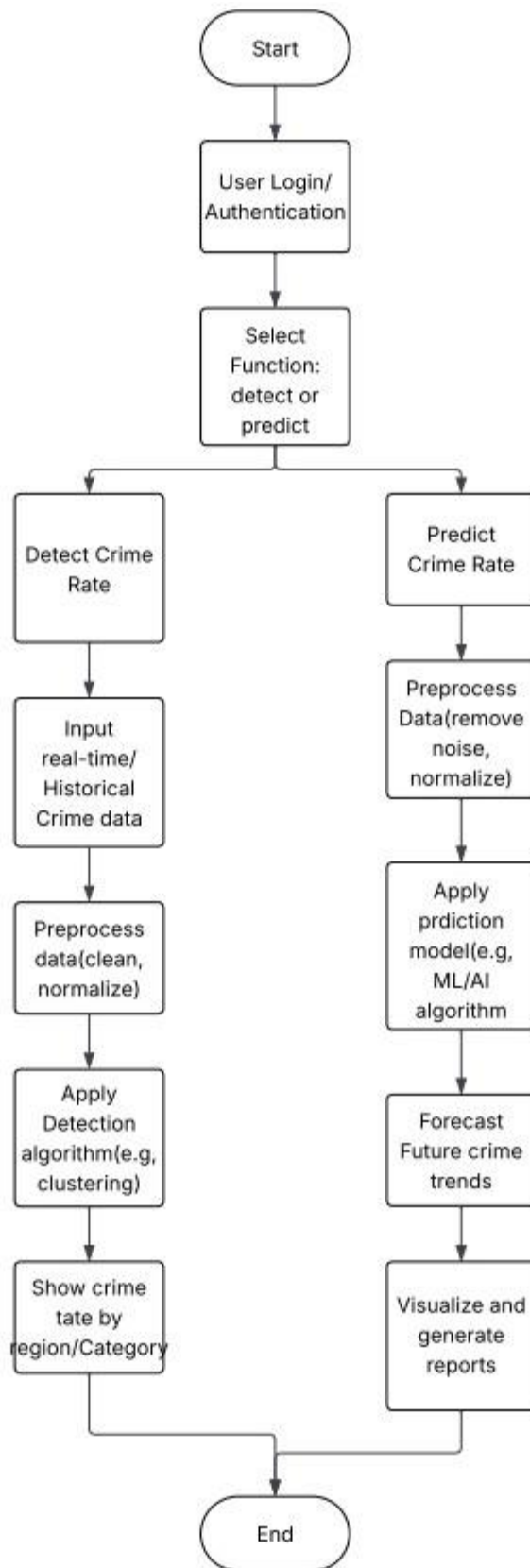
**Aim:**

To Design an Use-Case Diagram and Activity Diagram for the given Project. 7A.

**Use-Case Diagram**



**7B. Activity Diagram**



**Result:**

The Use Case and Activity is designed Successfully for the Crime Rate Detector App



**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**

- Data Collection: Collect crime data from APIs, CSVs, public records, and databases.
- Data Preprocessing: Clean, normalize, and structure data (time, location, crime type).
- Machine Learning Prediction: Predict crime probability based on inputs like location and time.
- Risk Zone Identification: Highlight high-crime zones visually using maps or heatmaps.
- Reporting and Logs: Generate reports and logs for crime trends and predictions.

##### **2. Define User Interaction**

- A data engineer collecting data from a new source.
- A user submitting a location and date for crime prediction.
- A security analyst viewing the high-risk zone dashboard.

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

- User enters valid input and receives a correct prediction.
- High-risk zones accurately visualized based on recent data.
- ML model processes cleaned and transformed data correctly.

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

- Missing input fields (e.g., location not provided).
- Invalid or corrupt data fails during preprocessing.
- System tries to predict with outdated or untrained model.

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

- **Step-by-step instructions** (e.g., "Enter location, select date, click 'Predict'").

- **Expected outcome** (e.g., "System displays crime risk level: Low/Medium/High"). This ensures clarity for manual testers and consistency in automation scripts.

## 6. Use Clear Naming and IDs

- TC01 – Successful Crime Data Collection
- TC05 – Crime Prediction with Valid Input
- TC10 – Handle Missing Location Input

This helps in mapping test cases to user stories or feature requirements.

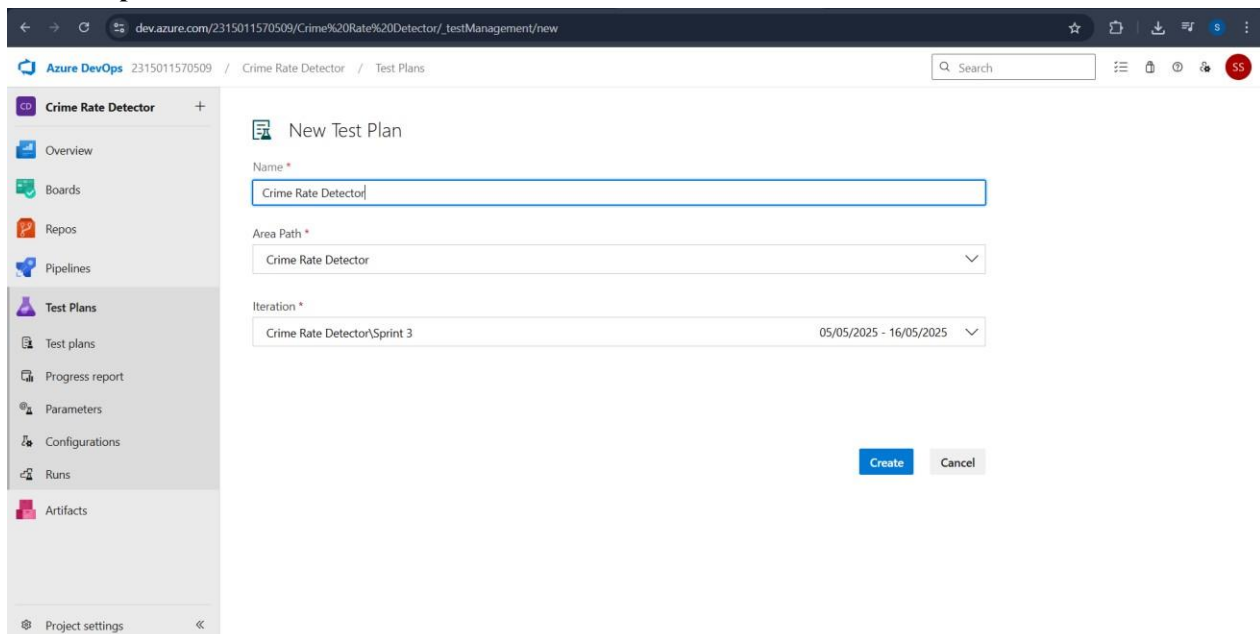
**7. Separate Test Suites** ○ Grouped test cases based on functionality (e.g., Data Collection ML Prediction Engine, Data Preprocessing).

○ Improves organization and test execution flow in Azure DevOps.

**8. Prioritize and Review** ○ Critical user actions are marked high-priority.

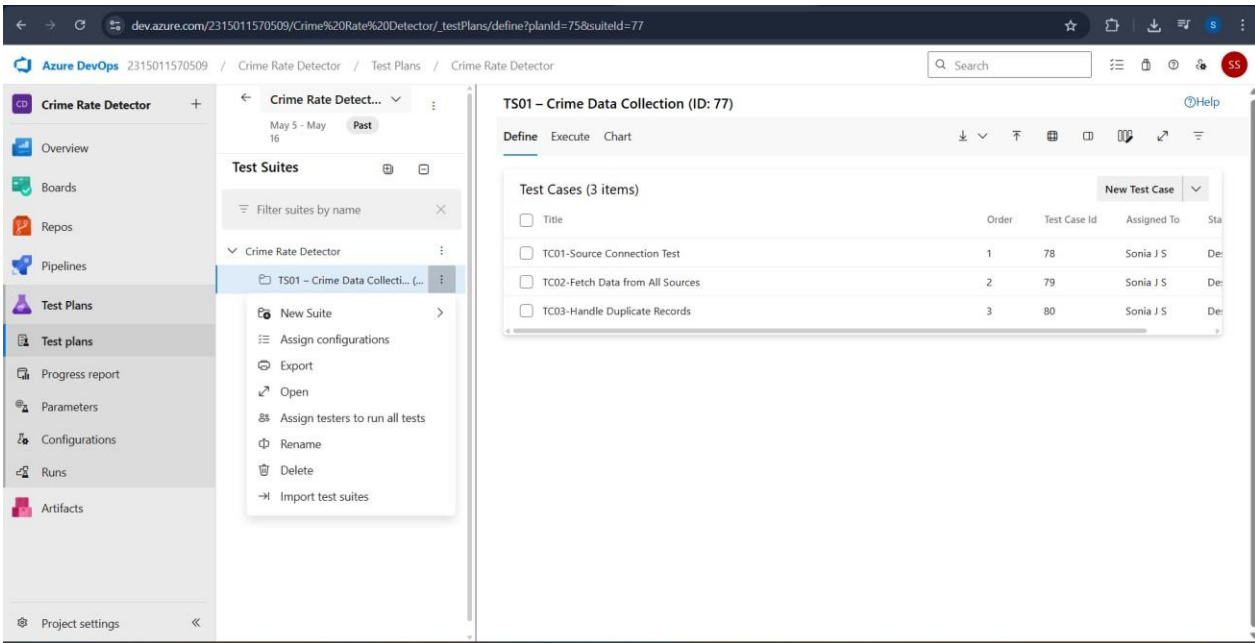
○ Reviewed for completeness and traceability against feature requirements.

## 1. New test plan



The screenshot shows the 'New Test Plan' form in Azure DevOps. The form is titled 'New Test Plan' and is located within the 'Crime Rate Detector' project. The 'Name' field is filled with 'Crime Rate Detector'. The 'Area Path' dropdown is set to 'Crime Rate Detector'. The 'Iteration' dropdown is set to 'Crime Rate Detector/Sprint 3' with a date range of '05/05/2025 - 16/05/2025'. There are 'Create' and 'Cancel' buttons at the bottom right.

## 2. Test suite



## 3. Test case

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

Crime Rate Detector App – Test Plans

### USER STORIES

1. As a data engineer, I want to collect crime data from various sources so that I can create a comprehensive dataset.
2. As a data analyst, I want to extract time, location, and crime type from raw crime data so that I can structure it properly for accurate and efficient analysis.
3. As a data scientist, I want to encode categorical data and scale numerical features to make the data ML-ready.
4. As a developer, I want to clean inconsistent or missing values in the dataset so that I can ensure high-quality inputs for the machine learning model.
5. As a security analyst I want to identify high-risk zones So that I can allocate resources effectively.

### Test Suites

**Test Suite: TS01 – Crime Data Collection (ID: 77)**

### TC01 – Source Connection Test

- **Action:**
    - Attempt connection to data source
    - Check for timeout or error
  - **Expected Results:**
    - Connection established successfully
    - No timeout or error observed
  - **Type:** Happy Path
- 

### TC02 – Fetch Data from All Sources

- **Action:**
    - Trigger data retrieval
    - Log number of records retrieved
  - **Expected Results:**
    - Data retrieval process initiates
    - Record count is logged correctly
  - **Type:** Happy Path
- 

### TC03 – Handle Duplicate Records

- **Action:**
    - Load data from multiple sources
    - Check for duplicate crime IDs or timestamps
  - **Expected Results:**
    - All sources are successfully loaded
    - Duplicates flagged or removed
  - **Type:** Happy Path
- 

### Test Suite: TS02 – Data Structuring (ID: 81)

#### TC04 – Extract Timestamps

- **Action:**
  - Upload raw data ▪  
Extract timestamp field

- **Expected Results:**
    - Data loads without errors
    - Dates standardized to YYYY-MM-DD format
  - **Type:** Error Path
- 

#### **TC05 – Parse Location Data**

- **Action:**
    - Process raw data ▪  
Extract location fields
  - **Expected Results:**
    - Data processed successfully
    - City, ZIP, and coordinates extracted correctly
  - **Type:** Happy Path
- 

#### **TC06 – Classify Crime Types**

- **Action:**
    - Analyze crime descriptions ▪ Match  
against predefined categories
  - **Expected Results:**
    - Descriptions are readable and processed
    - Each record is assigned a crime type
  - **Type:** Happy Path
- 

#### **Test Suite: TS03 – Feature Engineering (ID: 85)**

##### **TC07 – Encode Categorical Features**

- **Action:**
  - Identify categorical fields ▪  
Apply Label/One-Hot encoding
- **Expected Results:**
  - All categorical fields are found
  - Encoding completes without errors
- **Type:** Happy Path

---

### TC08 – Scale Numerical Features

- **Action:**
  - Load dataset
  - Apply MinMax or StandardScaler
- **Expected Results:**
  - Dataset loads correctly
  - Values fall within expected scaled range
- **Type:** Happy Path

---

### TC09 – Validate ML Input Schema

- **Action:**
    - Run schema validator
    - Verify dataset
  - **Expected Results:**
    - Schema is read and applied
    - Dataset contains required fields with no nulls or incorrect formats •
- Type:** Happy Path

---

### Test Suite: TS04 – Data Cleaning (ID: 89)

#### TC10 – Check for Missing Values

- **Action:**
  - Scan dataset
  - Identify null/empty fields
- **Expected Results:**
  - Scan completes
  - Missing values highlighted or flagged
- **Type:** Happy Path

---

#### TC11 – Format Consistency Check

- **Action:**

- Load data
  - Validate formats (date, address, type)
  - **Expected Results:**
    - File loads successfully
    - All fields meet format specifications
  - **Type:** Happy Path
- 

#### TC12 – Remove Outliers

- **Action:**
    - Apply outlier detection
    - Remove or normalize
  - **Expected Results:**
    - Outliers detected correctly
    - Dataset updated with outliers handled
  - **Type:** Error Path
- 

#### Test Suite: TS05 – High-Risk Zone Detection (ID: 93)

#### TC13 – Calculate Zone Risk Score

- **Action:**
    - Aggregate crimes by location ▪Compute risk using frequency/severity
  - **Expected Results:**
    - Crime counts grouped correctly
    - Risk score reflects accurate level
  - **Type:** Error Path
- 

#### TC14 – Generate Risk Heatmap

- **Action:**
  - Input data into visualization tool
  - Display heatmap
- **Expected Results:**
  - Data loads to map tool

- 
- High-risk areas colored with appropriate intensity
  - **Type:** Happy Path

---

#### **TC15 – List Top High-Risk Areas**

- **Action:**
    - Sort areas by crime score
    - Display top 5 zones
  - **Expected Results:**
    - Areas ranked correctly
    - List includes top 5 zones with scores shown
  - **Type:** Happy Path
- 

#### **Test Cases**



Azure DevOps 2315011570509 / Crime Rate Detector / Test Plans / Crime Rate Detector

TEST CASE 86

86 TC07-Encode Categorical Features

Sonia J S 0 Comments Add Tag

State Design Area Crime Rate Detector Reason New Iteration Crime Rate Detector\Sprint 3

Updated by Sonia J S: 27m ago

Steps Summary Associated Automation

Steps

Steps	Action	Expected result	Attach
1.	Identify categorical fields	All categorical fields are found	
2.	Apply Label/One-Hot encoding	Encoding completes without errors	

Click or type here to add a step

Parameter values

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

Add link

Add an existing work item as a parent

Project settings

dev.azure.com/2315011570509/Crime%20Rate%20Detector/\_testPlans/define?planId=75&suiteId=89

Azure DevOps 2315011570509 / Crime Rate Detector / Test Plans / Crime Rate Detector

TEST CASE 92

92 TC12-Remove Outliers

Sonia J S 0 Comments Add Tag

State Design Area Crime Rate Detector Reason New Iteration Crime Rate Detector\Sprint 3

Updated by Sonia J S: 17m ago

Steps Summary Associated Automation

Steps

Steps	Action	Expected result	Attach
1.	Apply outlier detection	Outliers detected correctly	
2.	Remove or normalize	Dataset updated with outliers handled	

Click or type here to add a step

Parameter values

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.

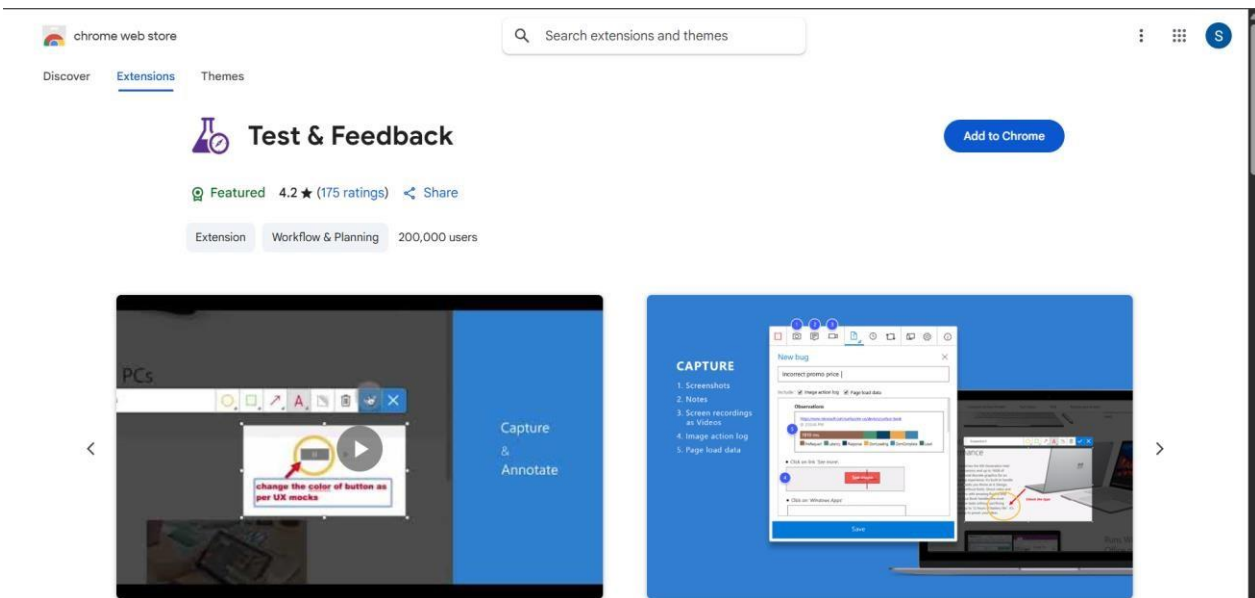
Related Work

Add link

Add an existing work item as a parent

Project settings

## 4.Installation of test



Test and feedback

Showing it as an extension

dev.azure.com/2315011570509/Crime%20Rate%20Detector/\_testPlans/define?planId=75&suiteId=77

Azure DevOps 2315011570509 / Crime Rate Detector / Test Plans / Crime Rate Detector

**Crime Rate Detector** +

- Overview
- Boards
- Repos
- Pipelines
- Test Plans**
- Test plans
- Progress report
- Parameters
- Configurations
- Runs
- Artifacts
- Project settings

**Crime Rate Detect...** ▾

May 5 - May 16 **Past**

40% run, 83% passed. [View report](#)

**Test Suites** [icon] [icon]

Filter suites by name [input]

▼ Crime Rate Detector

- TS01 – Crime Data Collecti... (selected)
- TS02 – Data Structuring (3)
- TS03 – Feature Engineering (3)
- TS04 – Data Cleaning (3)
- TS05 – High-Risk Zone De... (3)

**TS01 – Crime Data Collection (ID: 77)**

Define Execute Chart

**Test Cases (3 items)**

<input type="checkbox"/> Title	Order	Test Case Id	Assigned To	Status
<input type="checkbox"/> TC01-Source Connection Test	1	78	Sonia J S	De
<input type="checkbox"/> TC02-Fetch Data from All Sources	2	79	Sonia J S	De
<input type="checkbox"/> TC03-Handle Duplicate Records	3	80	Sonia J S	De

**Extensions** [x]

Full access  
These extensions can see and change information on this site.

- McAfee WebAdvisor [icon] [icon]
- Manage extensions [icon]

Test Case ▾

## 5. Running the test cases

dev.azure.com/2315011570509/Crime%20Rate%20Detector/\_testPlans/execute?planId=75&suiteId=77

Search

Crime Rate Detector

OverviewBoardsReposPipelinesTest PlansTest plansProgress reportParametersConfigurationsRunsArtifactsProject settings

Crime Rate Detect...  
May 5 - May 16  
40% run, 83% passed. [View report](#)

Test Suites  
Filter suites by name  
Crime Rate Detector  
TS01 - Crime Data Collecti...  
TS02 - Data Structuring (3)  
TS03 - Feature Engineering (3)  
TS04 - Data Cleaning (3)  
TS05 - High-Risk Zone De...

TS01 - Crime Data Collection (ID: 77)

DefineExecuteChart

Test Points (3 items)

Title	Outcome	Order	Test Case Id
TC01-Source Connection Test	Failed	1	78
TC02-Fetch Data from All Sources	Passed	2	79
TC03-Handle Duplicate Records	Passed	3	80

Runner - Test Plans - Google Chrome

dev.azure.com/2315011570509/Crime%20Rate%20Detector/\_testExecution/Index

Save and close | Create bug

Test 1 of 3

78: TC01-Source Connection Test

1. Attempt connection to data source

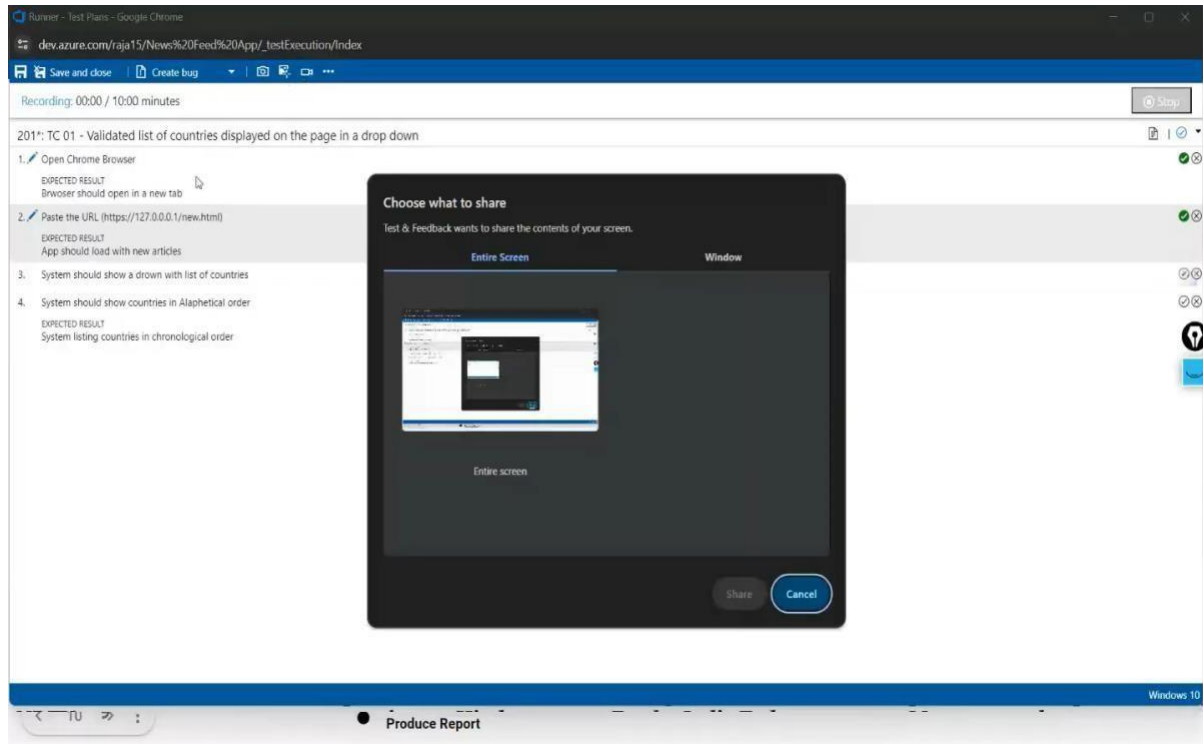
EXPECTED RESULT  
Connection established

2. Check for timeout or error

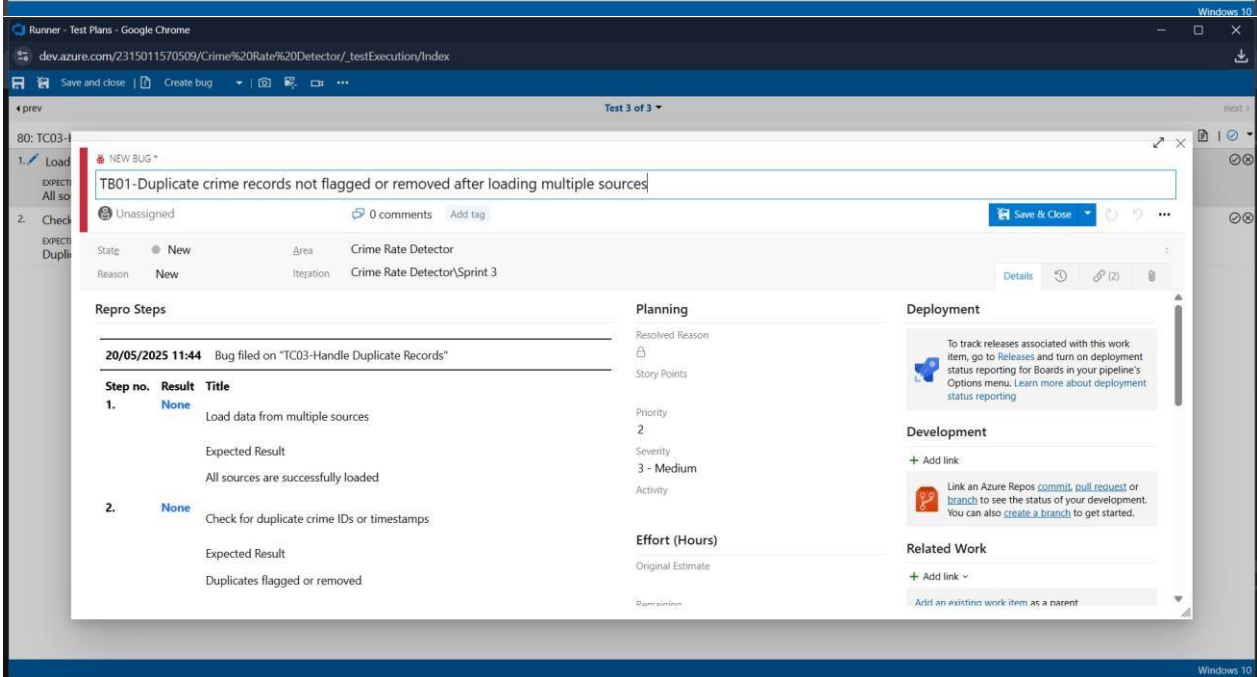
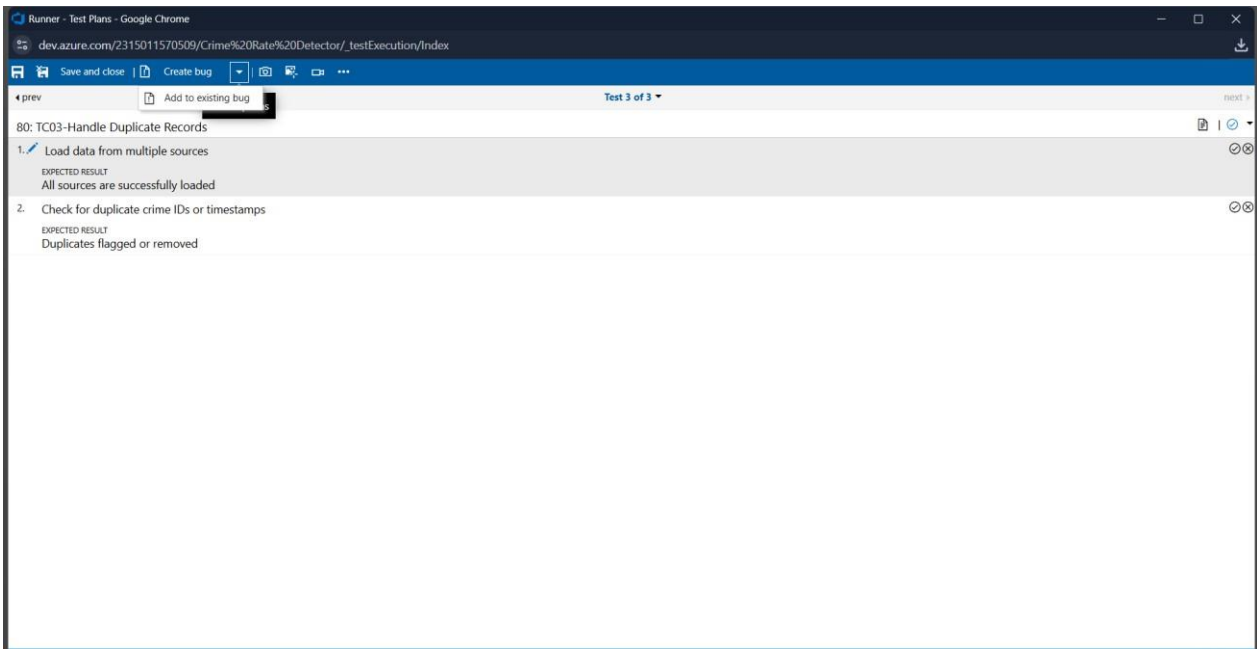
EXPECTED RESULT  
No timeout or error observed

Windows 10

## 6. Recording the test case



## 7. Creating the bug



Runner - Test Plans - Google Chrome

dev.azure.com/2315011570509/Crime%20Rate%20Detector/\_testExecution/Index

NEW BUG

TB01-Duplicate crime records not flagged or removed after loading multiple sources

Unassigned0 commentsAdd tag

Save & Close

StateNew

AreaCrime Rate Detector

ReasonNew

IterationCrime Rate Detector/Sprint 3

Details

System info

Browser - Name	Google Chrome 136
Browser - Language	en-US
Browser - Height	816
Browser - Width	1536
Browser - User agent	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/136.0.0.0 Safari/537.36
Operating system - Name	Windows NT 10.0; Win64; x64
Operating system - Architecture	x86_64
Operating system - Processor model	13th Gen Intel(R) Core(TM) i7-13650HX
Operating system - Number of processors	20
Memory - Available	8027467776
Memory - Capacity	16873545728
Display - Pixels per inch (X axis)	120
Display - Pixels per inch (Y axis)	120
Display - Device pixel ratio	1.25

Found in Build

Integrated in Build

Discussion

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

## 8. Test case results

Azure DevOps2315011570509 / Crime Rate Detector / Test Plans / Crime Rate Detector

Crime Rate Detector

OverviewBoardsReposPipelinesTest PlansTest plansProgress reportParametersConfigurationsRunsArtifactsProject settings

Crime Rate Detect...

May 5 - May 1640% run, 83% passedView report

Test Suites

Filter suites by name

Crime Rate Detector

TS01 - Crime Data Collecti... (3)

TS02 - Data Structuring (3)

TS03 - Feature Engineering (3)

TS04 - Data Cleaning (3)

TS05 - High-Risk Zone De... (3)

TS01 - Crime Data Collection (ID: 7)

DefineExecuteChart

Test Points (3 items)

Title

TC01-Source Connection Test

TC02-Fetch Data from All Sources

TC03-Handle Duplicate Records

TC01-Source Connection Test

Test Case Results

Outcome	TimeSta...	Configuration	Run by	Tester	Test Plan
Passed	11m ago	Windows 10	Sonia J S	Sonia J S	Crime F
Paused	30m ago	Windows 10	Sonia J S	Sonia J S	Crime F
Failed	4h ago	Windows 10	Sonia J S	Sonia J S	Crime F

Open execution history for current test point

## 9. Test report summary

The screenshot shows the Azure DevOps interface for a project named 'Crime Rate Detector'. The left sidebar contains navigation links for Overview, Boards, Work items, Backlogs, Sprints, Queries, Delivery Plans, Analytics views, Repos, Pipelines, Test Plans, and Artifacts. The main area displays a bug report titled 'TB01-Duplicate crime records not flagged or removed after loading multiple sources' (BUG 97). The bug is currently in the 'New' state. A dropdown menu for 'Repro Step' is open, showing options: 'Active', 'Resolved', and 'Closed'. The 'Repro Step' table lists two steps: 1. 'Load data from multiple sources' and 2. 'Check for duplicate crime IDs or timestamps'. The 'Test Configuration' is set to 'Windows 10'. The right sidebar contains sections for 'Planning' (Resolved Reason, Story Points, Priority, Severity, Activity) and 'Deployment' (Add link, Effort (Hours)).

Step no.	Result	Title
1.	None	Load data from multiple sources
		Expected Result
		All sources are successfully loaded
2.	None	Check for duplicate crime IDs or timestamps
		Expected Result
		Duplicates flagged or removed

- Assigning bug to the developer and changing state

## 10. Progress report

The screenshot shows the Azure DevOps interface for the 'Crime Rate Detector' project, specifically the 'Progress report' section. The left sidebar contains navigation links for Overview, Boards, Repos, Pipelines, Test Plans, Progress report, Parameters, Configurations, Runs, and Artifacts. The main area displays the 'Progress report' with a summary of test results and an 'Outcome trend' chart. The summary shows 1 test plan, 15 test points, 5 (5/15) test points run, and a 33% run rate. The pass rate is 80% (4/5). The 'Outcome trend' chart shows the number of tests passed, failed, and not run over time.

Summary	Outcome trend
1 Test plans	5/10/2025 - 5/20/2025
15 Test points	2025-05-19
5 (5 / 15) Test points run	Not run : 0
33% Run	Passed : 0
80% (4 / 5) Pass rate	Failed : 0
4 Passed	
1 Failed	



## 11.Changing the test template

Azure DevOps 2315011570509 / Settings / Process

Search

Organization Settings 2315011570509

Search Settings

General

- Overview
- Projects
- Users
- Billing
- Global notifications
- Usage
- Extensions
- Microsoft Entra

Security

- Security overview
- Policies
- Permissions

Boards

- Process

All processes

Processes Fields

Help Filter by process name

Name	Description	Team projects
Basic (default)	This template is flexible for any process and great for teams getting started with Az...	0
Agile	This template is flexible and will work great for most teams using Agile planning me...	1
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 improv...	0

Azure DevOps 2315011570509 / Settings / Process

Search

Organization Settings 2315011570509

Search Settings

General

- Overview
- Projects
- Users
- Billing
- Global notifications
- Usage
- Extensions
- Microsoft Entra

Security

- Security overview
- Policies
- Permissions

Boards

- Process

System processes cannot be customized. To add customization create an inherited process.

All processes > Agile

Work item types Backlog levels Projects

Help Filter by work item type n...

Name	Description
Bug	Describes a divergence between required and actual behavior, and tracks the work done to correct the defect and verify the correcti...
Epic	Epics help teams effectively manage and groom their product backlog
Feature	Tracks a feature that will be released with the product
Issue	Tracks an obstacle to progress.
Task	Tracks work that needs to be done.
Test Case	Server-side data for a set of steps to be tested.
Test Plan	Tracks test activities for a specific milestone or release.
Test Suite	Tracks test activities for a specific feature, requirement, or user story.
User Story	Tracks an activity the user will be able to perform with the product.

**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****CI/CD PIPELINES IN AZURE****AIM**

To implement a Continuous Integration and Continuous Deployment (CI/CD) pipeline in Azure DevOps for automating the build, testing, and deployment process of the Student Management System, ensuring faster delivery and improved software quality.

**PROCEDURE:****Steps to Create and implement pipelines in Azure:**

1. Sign in to Azure DevOps and Navigate to Your Project Log in to dev.azure.com, select your organization, and open the project where your Student Management System code resides.

2. Connect a Code Repository (Azure Repos or GitHub) Ensure your application code is stored in a Gitbased repository such as Azure Repos or GitHub. This will be the source for triggering builds and deployments in your pipeline.
3. Create a New Pipeline Go to the Pipelines section on the left panel and click “Create Pipeline”. Choose your source (e.g., Azure Repos Git or GitHub), and then select the repository containing your project code.
4. Choose the Pipeline Configuration You can select either the YAML-based pipeline (recommended for version control and automation) or the Classic Editor for a GUI-based setup. If using YAML, Azure DevOps will suggest a template or allow you to define your own.
5. Define Build Stage (CI - ContinuousIntegration) from YAML file.
6. Install dependencies (e.g., npm install, dotnet restore).
7. Build the application (dotnet build, npm run build).
8. Run unit tests(dotnet test, npm test).
9. Publish build artifacts to be used in the release stage.
10. Save and Run the Pipeline for the First Time Save the YAML or build definition and click “Run”. Azure will fetch the latest code and execute the defined build and test stages.
11. Configure Continuous Deployment (CD) Navigate to the Releases tab under Pipelines and click “New Release Pipeline”. Add an Artifact (from the build stage) and create a new Stage (e.g., Development, Production).
12. Configure the CD stage with deployment tasks such as deploying to Azure App Service, running database migrations or scripts, and restarting services using the Azure App Service Deploy task linked to your subscription and app details.
13. Set Triggers and Approvals Enable continuous deployment trigger so the release pipeline runs automatically after a successful build. For production environments, configure pre-deployment approvals to ensure manual verification before release.

14. **Monitor Pipelines and Manage Logs** View all pipeline runs under the Runs section. Check logs for build/test/deploy stages to debug any errors. You can also integrate email alerts or Microsoft Teams notifications for build failures.

15. **Review and Maintain Pipelines** Regularly update your pipeline tasks or YAML configurations as your application grows. Ensure pipeline runs are clean and artifacts are stored securely. Integrate quality gates and code coverage policies to maintain code quality

The screenshot displays the Azure DevOps web interface. The top navigation bar shows the project name 'Crime Rate Detection' and the pipeline 'Vishnupriya-CS.SoftwareCo...'. The left sidebar contains a navigation menu with options like Overview, Boards, Repos, Pipelines, Environments, Library, Test Plans, and Artifacts. The main content area is divided into two sections. The top section, titled 'Vishnupriya-CS.SoftwareConstruction (5)', shows a list of pipeline runs. The bottom section, titled '#20250520.1 • Set up CI with Azure Pipelines', provides detailed information about a specific run, including its status, repository, and jobs.

Description	Stages	Time
#20250520.1 • Set up CI with Azure Pipelines Manually triggered for main 5f5d82cf	✓	42m ago 11s
#20250519.1 • Set up CI with Azure Pipelines Individual CI for main 5f5d82cf	✓	Yesterday 14s

**#20250520.1 • Set up CI with Azure Pipelines**  
Vishnupriya-CS.SoftwareConstruction (5)

This run is being retained as one of 3 recent runs by pipeline. [View retention leases](#)

**Summary** Code Coverage

Manually run by Sonia J S

Repository and version  
Vishnupriya-CS/SoftwareConstruction  
main 5f5d82cf

Time started and elapsed  
Today at 5:58 PM  
11s

Related  
0 work items  
1 published

Tests and coverage  
[Get started](#)

Name	Status	Duration
Job	Success	5s

**Result:**

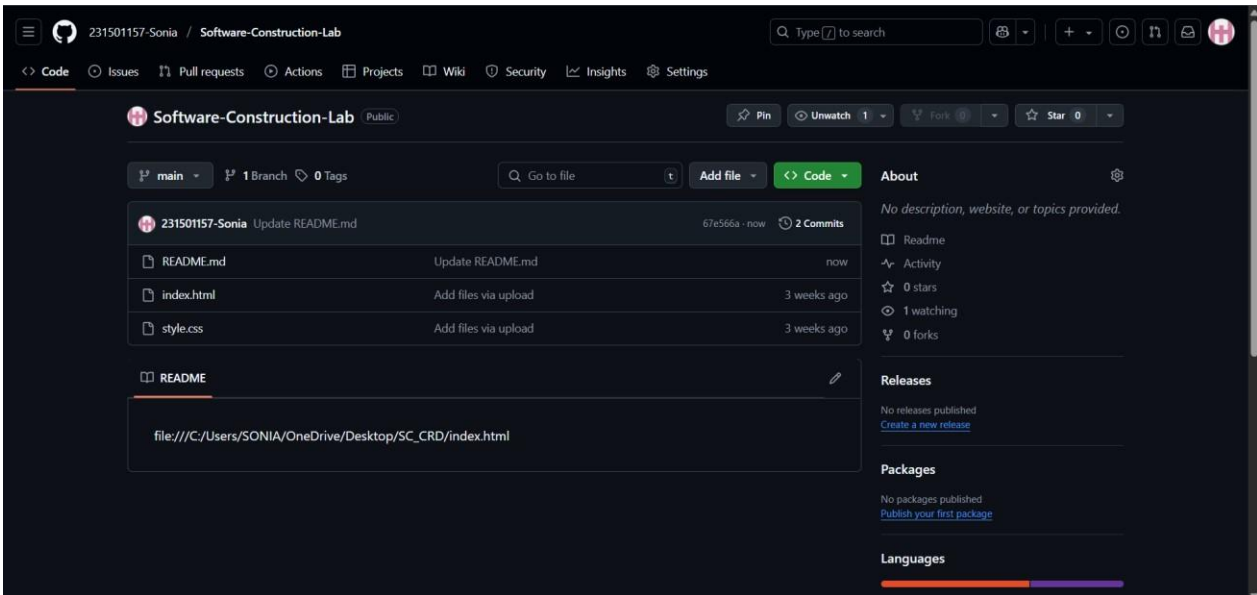
Thus the pipelines for the given project “Crime Rate Detector” has been executed successfully

<b>EXP NO:</b>	<b>10</b>	<b>GITHUB: PROJECT STRUCTURE &amp; NAMING</b>  <b>CONVENTIONS</b>
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**Aim:**

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

**GitHub Project Structure**



### Result:

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