



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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

ACADEMIC YEAR 2024-2025

EVEN SEMESTER



CS23432 SOFTWARE ENGINEERING LAB

LAB MANUAL

SECOND YEAR

FOURTH SEMESTER

2024- 2025

EVEN SEMESTER

ExNo.	List of Experiments
1	Study of Azure DevOps
2	Designing Project using AGILE-SCRUM Methodology.
3	Agile Planning
4	User stories – Creation
5	Architecture Diagram Using AZURE
6	Designing Usecase and Class Diagram
7	Designing Interaction Diagrams
8	Design Interface
9	Implementation – Design a Web Page based on Scrum Methodology
10	Testing using Azure.
11	Deployment

Requirements	
Hardware	Intel i3, CPU @ 1.20GHz 1.19 GHz, 4 GB RAM, 32 Bit Operating System
Software	StarUML , Azure

LAB PLAN

CS19442-SOFTWARE ENGINEERING LAB

Ex No	Date	Topic	Page No	Sign
1		Study of Azure DevOps		
2		Writing Problem Statement		
3		Agile Planning		
4		User stories – Creation		
5		Designing Sequence Diagrams using StarUML		
6		Design Class Diagram		
7		Designing Use Case Diagram using StarUML		
8		Designing Activity Diagrams using StarUML		
9		Architecture Diagram Using AZURE		
10		Design User Interface		
11		Implementation – Design a Web Page based on Scrum Methodology		
12		Implement CI/CD Pipeline		
12		Testing		
13		Deployment		

Course Outcomes (COs)

Course Name: Software Engineering Course Code: CS23432

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

EX NO: 1

Study of Azure DevOps

AIM:

To study how to create an agile project in the 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**PROBLEM STATEMENT****AIM:**

To prepare PROBLEM STATEMENT for your given project.

PROBLEM STATEMENT:**BATCH DATA ANALYSIS AND VISUALIZATION:**

Manual analysis of diverse CSV datasets is inefficient, error-prone, and lacks scalability, leading to delayed insights, poor decision-making, and limited accessibility for non-technical users.

There is a need for an automated, user-friendly system to upload, process, analyze, and visualize multiple datasets accurately, ensuring transparency, efficiency, and better data-driven decision-making.

RESULT:

The problem statement was written successfully.

EX NO: 3

AGILE PLANNING

AIM:

To prepare an Agile Plan.

THEORY

Agile planning is a part of the Agile methodology, which is a project management style with an incremental, iterative approach. Instead of using an in-depth plan from the start of the project—which is typically product-related—Agile leaves room for requirement changes throughout and relies on constant feedback from end users.

With Agile planning, a project is broken down into smaller, more manageable tasks with the ultimate goal of having a defined image of a project's vision. Agile planning involves looking at different aspects of a project's tasks and how they'll be achieved, for example:

- Roadmaps to guide a product's release ad schedule
- Sprints to work on one specific group of tasks at a time
- A feedback plan to allow teams to stay flexible and easily adapt to change

User stories, or the tasks in a project, capture user requirements from the end user's perspective. Essentially, with Agile planning, a team would decide on a set of user stories to action at any given time, using them as a guide to implement new features or functionalities in a tool. Looking at tasks as user stories is a helpful way to imagine how a customer may use a feature and helps teams prioritize work and focus on delivering value first.

· Steps in Agile planning process

1. Define vision
2. Set clear expectations on goals
3. Define and break down the product roadmap
4. Create tasks based on user stories
5. Populate product backlog
6. Plan iterations and estimate effort
7. Conduct daily stand-ups
8. Monitor and adapt

RESULT:

Thus, the Agile plan was completed successfully.

EX NO : 4

CREATE USER STORIES

AIM:

To create User Stories.

THEORY

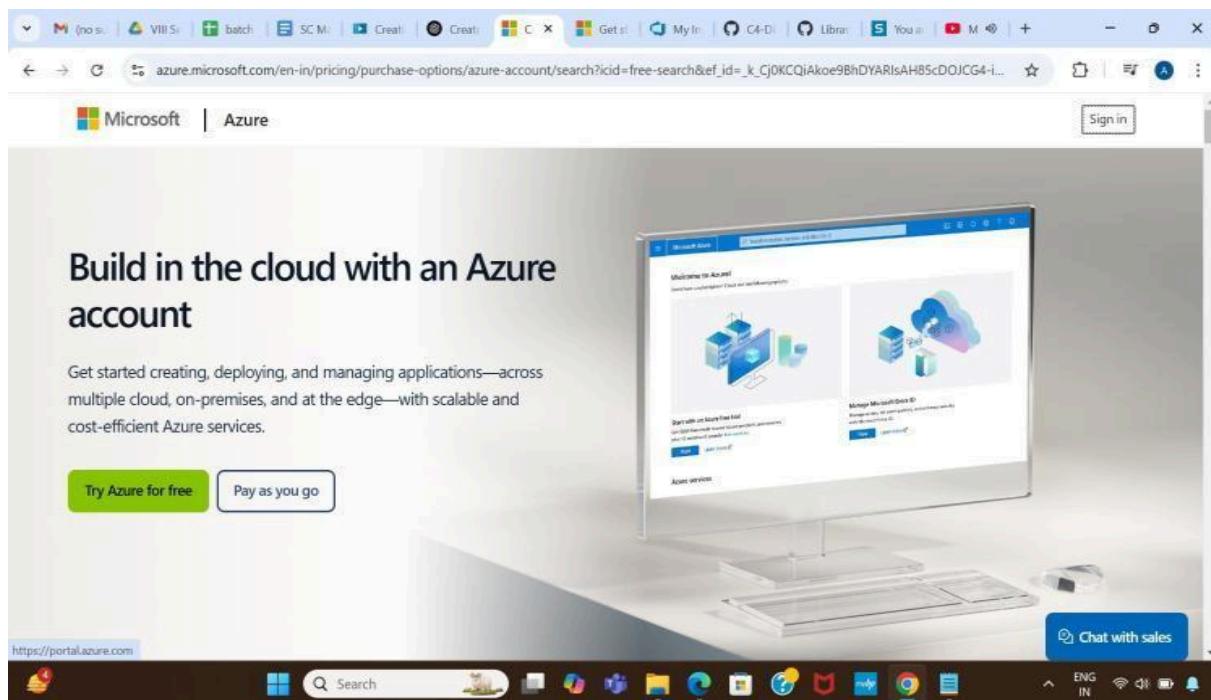
A user story is an informal, general explanation of a software feature written from the perspective of the end user. Its purpose is to articulate how a software feature will provide value to the customer.

User story template

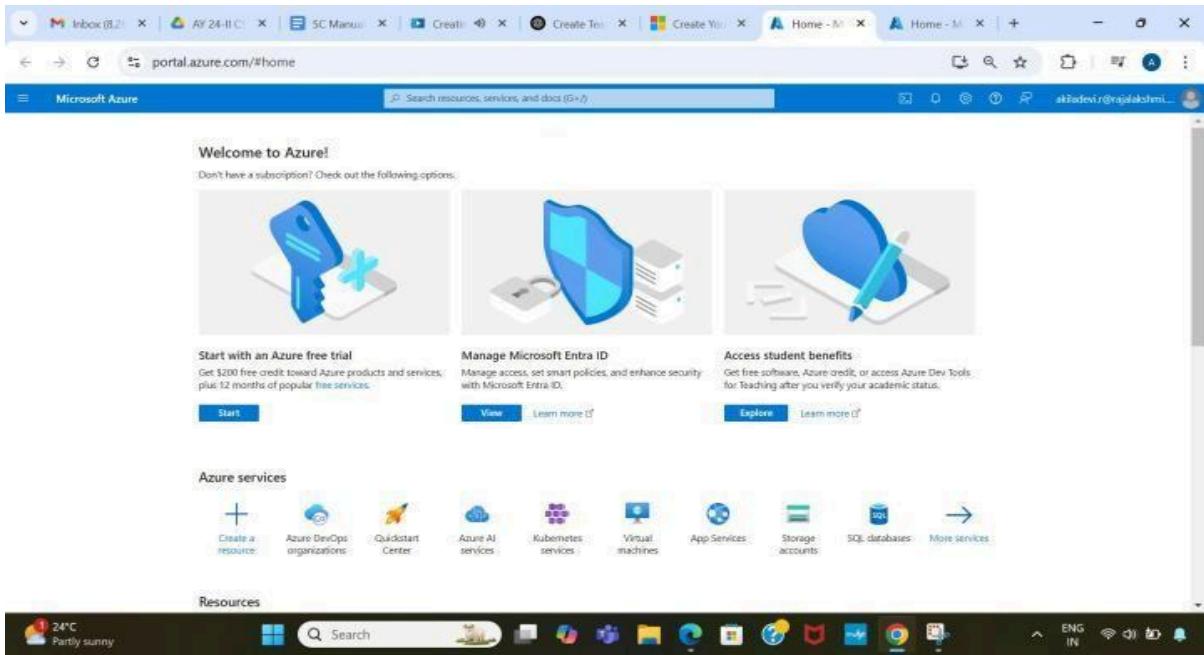
"As a [role], I [want to], [so that]."

PROCEDURE:

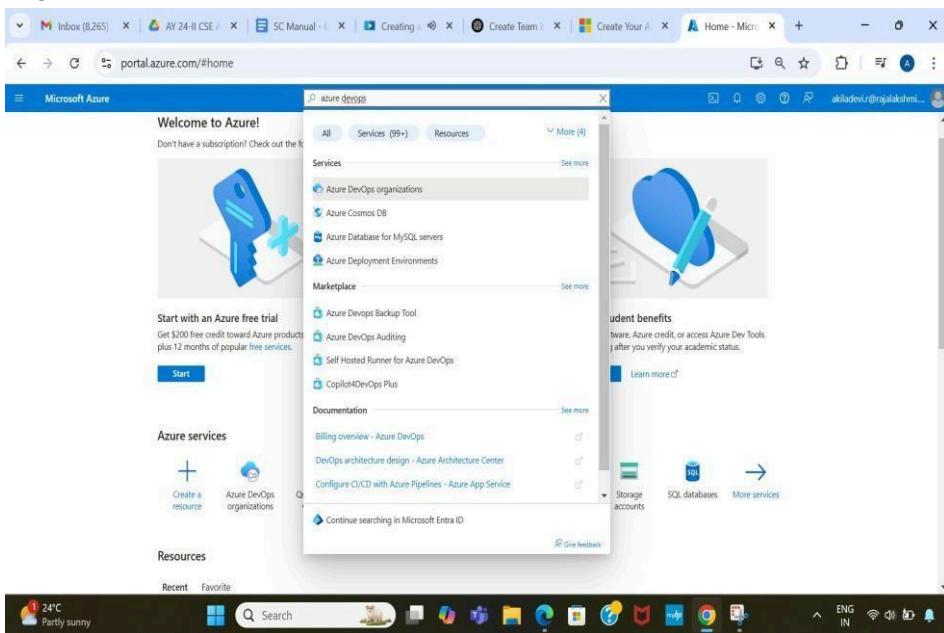
1. Open your web browser and go to the Azure website: <https://azure.microsoft.com/en-in>
Sign in using your Microsoft account credentials. If you don't have an account, you'll need to create one.
2. If you don't have a Microsoft account, you can sign up for <https://signup.live.com/?lic=1>



3. Azure home page



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.

Inbox (8,265) | AY 24-II CSE | SC Manual - | Creating... | Create Team... | Create Your... | Azure DevOps | +

portal.azure.com/#view/AzureTfExtension/OrganizationsTemplateBlade

Microsoft Azure Search resources, services, and docs (G+)

Home > Azure DevOps

We've made it easier to manage Azure DevOps billing and subscriptions. You can set up billing, change your subscription or pay for more users and resources within Azure DevOps. Learn more

Azure DevOps

Plan smarter, collaborate better, and ship faster with a set of modern dev services

My Azure DevOps Organizations

Get started using Azure DevOps
Billing management for Azure DevOps

Give feedback
Tell us about your experience with the Azure DevOps page

24°C Partly sunny Search ENG IN



Inbox | AY 24-II | SC Mail | User | Create | Azure | My Info | Signup | +

aex.dev.azure.com/signup/?acquisitionId=be1dfffa-718b-4dad-a0d2-93ea5a276ad2&campaign=o-msft-profile-service_attach&mkt=en-GB

Azure DevOps

akiladevi.r@rajalakshmi.edu.in

Get started with Azure DevOps

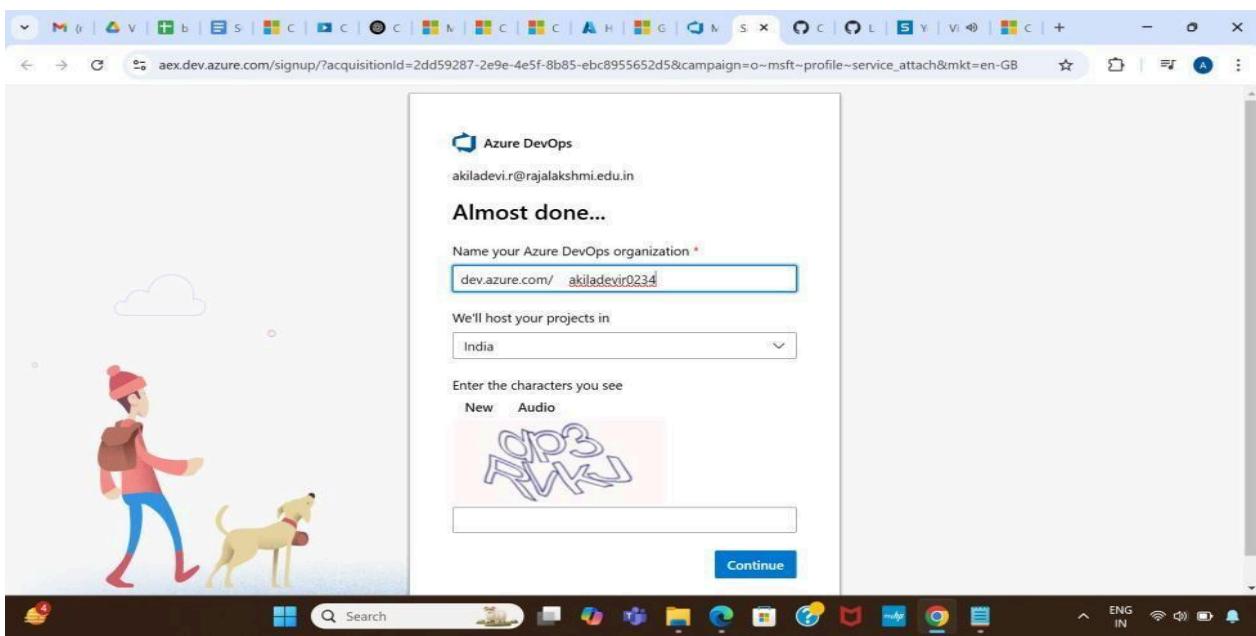
Choosing Continue means that you agree to our Terms of Service, Privacy Statement, and Code of Conduct.

I would like information, tips, and offers about Azure DevOps and other Microsoft products and services. [Privacy Statement](#).

Continue

24°C Partly sunny Search ENG IN





5. 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.

A screenshot of the 'Create new project' dialog box. It includes fields for 'Project name' (with a required asterisk), 'Description', and 'Visibility'. The 'Visibility' section shows two options: 'Public' (disabled by organization policy) and 'Private' (selected, described as 'Only people you give access to will be able to view this project'). Below this, a note states 'Public projects are disabled for your organization. You can turn on public visibility with [organization policies](#)'. Advanced settings for 'Version control' (Git) and 'Work item process' (Agile) are shown at the bottom, along with 'Cancel' and 'Create' buttons.

- ## 6. 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.

The screenshot shows the Azure DevOps project dashboard for project 230701306. The left sidebar lists projects 230701306 and 2307013060997, along with links for 'New organization' and 'Organization settings'. The main content area displays the 'Batch Data Analysis and Visualisation' project, which has a placeholder image and five small circular icons below it. The top navigation bar includes a search bar, a 'New project' button, and a 'Filter projects' dropdown.

7. Project dashboard

The screenshot shows the project summary page for 'Batch Data Analysis and Visualisation'. The left sidebar includes links for Overview, Summary, Dashboards, Wiki, Boards, Repos, Pipelines, Test Plans, and Artifacts, with 'Summary' currently selected. The main area features a 'About this project' section with a placeholder for a project description and a 'Help others get on board!' section. To the right is a 'Project stats' panel showing data for Boards, Repos, Pipelines, and Members over the last 7 days. The 'Boards' section shows 0 work items created and 0 completed. The 'Repos' section shows 3 pull requests opened and 43 commits by 2 authors. The 'Pipelines' section shows 4% builds succeeded. The 'Members' section lists four team members with their initials: S, T, M, and SM.

8. 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 'Work items' page for the 'Batch Data Analysis and Visual...' project. The left sidebar is collapsed, and the main area displays a grid of work items. The first item, 'Data Upload and Management', is selected and expanded. The grid columns include ID, Title, Assigned To, State, Area Path, Tags, and Comments. The 'Assigned To' column shows 'Shankaranarayanan' for most items, except for item 31 which is assigned to 'Sheryl Katrina M'. The 'Area Path' column consistently shows 'Batch Data Analysis and Visual...'. The 'Tags' column shows various tags like 'Data Preprocessing', 'Integrity Checks', 'Validation', etc.

9. Fill in User Story Details

The screenshot shows the detailed view of a user story titled 'USER STORY 33'. The story description is: 'As a user, I want to compute summary statistics for my dataset to understand key insights.' It is assigned to 'Sheryl Katrina M' and has 0 comments and 0 tags. The 'Details' tab is selected, showing the following information:

- Description:** Click to add Description.
- Planning:**
 - Story Points: 5
 - Priority: 4
 - Risk: 3 - Low
- 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
 - Branch: main (Latest commit 11h ago) [Create a pull request](#)
- Related Work:**
 - Add link
 - Parent: 32 Basic Statistical Analysis (Updated 12h ago, New)

OUTPUT

Azure DevOps 230701306 / Batch Data Analysis and Vis... / Boards / Work items

Batch Data Analysis an...

Work items

Recently updated | + New Work Item | Open in Queries | Column Options | Import Work Items | Recycle Bin

Filter by keyword

ID	Title	Assigned To	State	Area Path	Tags	Comments
29	As a user, I want to validate my dataset before analysis to avoid incor	Shankaranarayanan	New	Batch Data Analysis and Visual...		
30	As a user, I want to clean my dataset by removing duplicates and fixin	Shankaranarayanan	New	Batch Data Analysis and Visual...		
31	Data Analysis and Statistical Computation	Sheryl Katrina M	New	Batch Data Analysis and Visual...		
32	Basic Statistical Analysis	Sheryl Katrina M	New	Batch Data Analysis and Visual...		
33	As a user, I want to compute summary statistics for my dataset to iden	Sheryl Katrina M	New	Batch Data Analysis and Visual...		
34	As a user, I want to compare statistics across multiple datasets to iden	Sheryl Katrina M	New	Batch Data Analysis and Visual...		
35	Correlation and Data Relationships	Sheryl Katrina M	New	Batch Data Analysis and Visual...		
36	As a user, I want to generate a correlation matrix to understand relativ	Sheryl Katrina M	New	Batch Data Analysis and Visual...		
37	As a user, I want to detect outliers to identify anomalies in my dataset	Sheryl Katrina M	New	Batch Data Analysis and Visual...		
38	Data Visualization and Reporting	230701309	New	Batch Data Analysis and Visual...		
39	Graphical Representation of Data	230701309	New	Batch Data Analysis and Visual...		
40	As a user, I want to generate histograms and scatter plots for numeric	230701309	New	Batch Data Analysis and Visual...		
41	As a user, I want to generate bar charts and pie charts for categorica	230701309	New	Batch Data Analysis and Visual...		
42	User Authentication and Access Control	230701200	New	Batch Data Analysis and Visual...		

RESULT:

The user story was written successfully.

EX NO: 5

SEQUENCE DIAGRAM

AIM:

To design a Sequence Diagram by using Mermaid.js

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 User
    participant UserInterface
    participant FileUploader
    participant DataProcessor
    participant Visualization
    User ->> UserInterface: Upload CSV files
    UserInterface ->> FileUploader: Validate and store files
    FileUploader ->> DataProcessor: Process data (Mean, Median, Std Dev)
    DataProcessor ->> Visualization: Generate charts (Histograms, Scatter, Bar, Pie)
    Visualization ->> UserInterface: Display visualizations
    UserInterface ->> User: Show results
    :::
```

EXPLANATION:

participant defines the entities involved.

->> represents a direct message.

-->> represents a response message.

+ after ->> activates a participant.

- after -->> deactivates a participant.

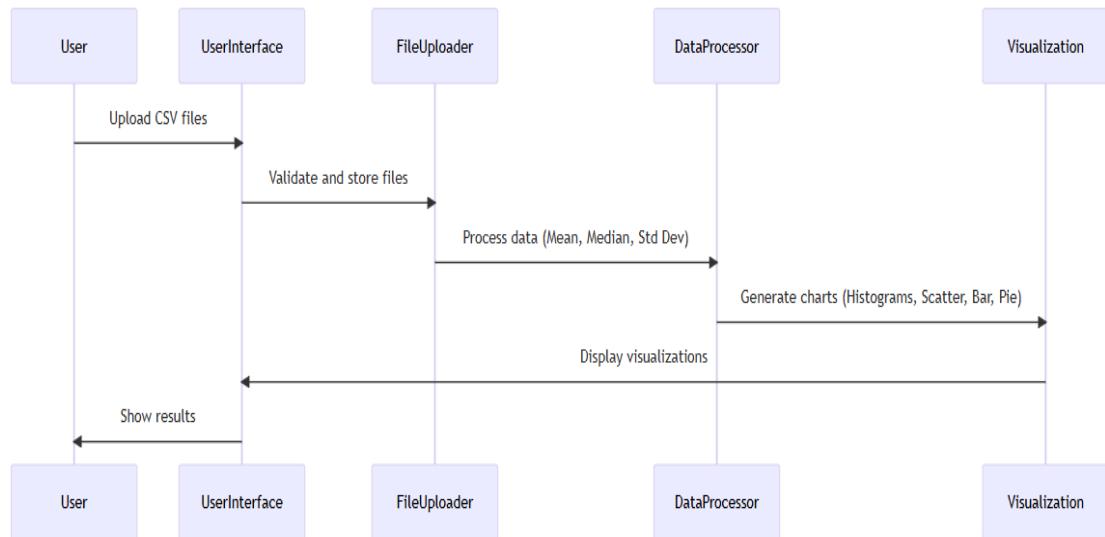
alt / else for conditional flows. loop can be used for repeated actions.

->	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

OUTPUT:

SEQUENCE DIAGRAM



RESULT:

The Sequence diagram was designed successfully.

EX NO. 6

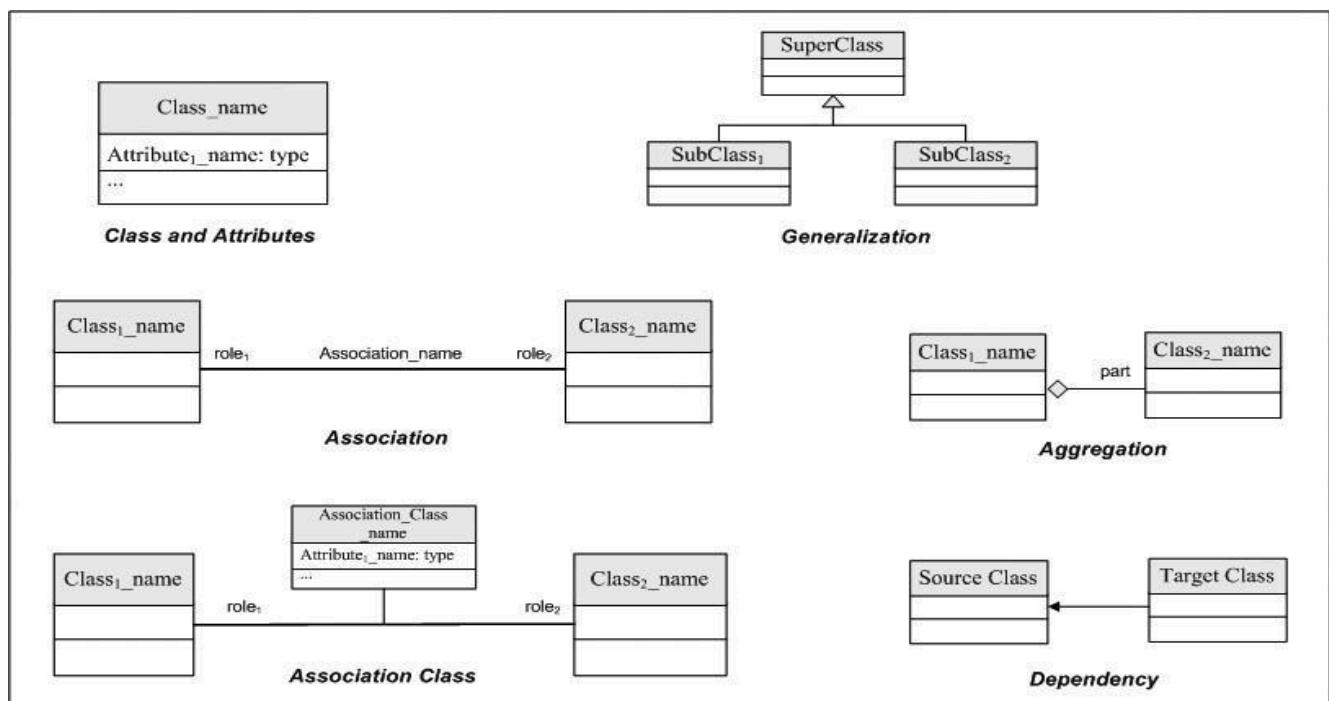
CLASS DIAGRAM

AIM :-

To draw a sample class diagram for your project or system.

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.



Notations in class diagram

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

```
:::mermaid
classDiagram
    class UserInterface {
        +uploadFiles()
        +displayResults()
        +selectVisualizationType()
    }
```

```

class FileUploader {
    +uploadFiles(files: List)
    +validateFiles() : Boolean
}

class DataProcessor {
    +calculateMean() : Float
    +calculateMedian() : Float
    +calculateStdDev() : Float
    +generateHistogram() : void
    +generateScatterPlot() : void
    +generateBarChart() : void
    +generatePieChart() : void
}

class Visualization {
    +plotHistogram(data: List) : void
    +plotScatterPlot(xData: List, yData: List) : void
    +plotBarChart(labels: List, values: List) : void
    +plotPieChart(labels: List, values: List) : void
}

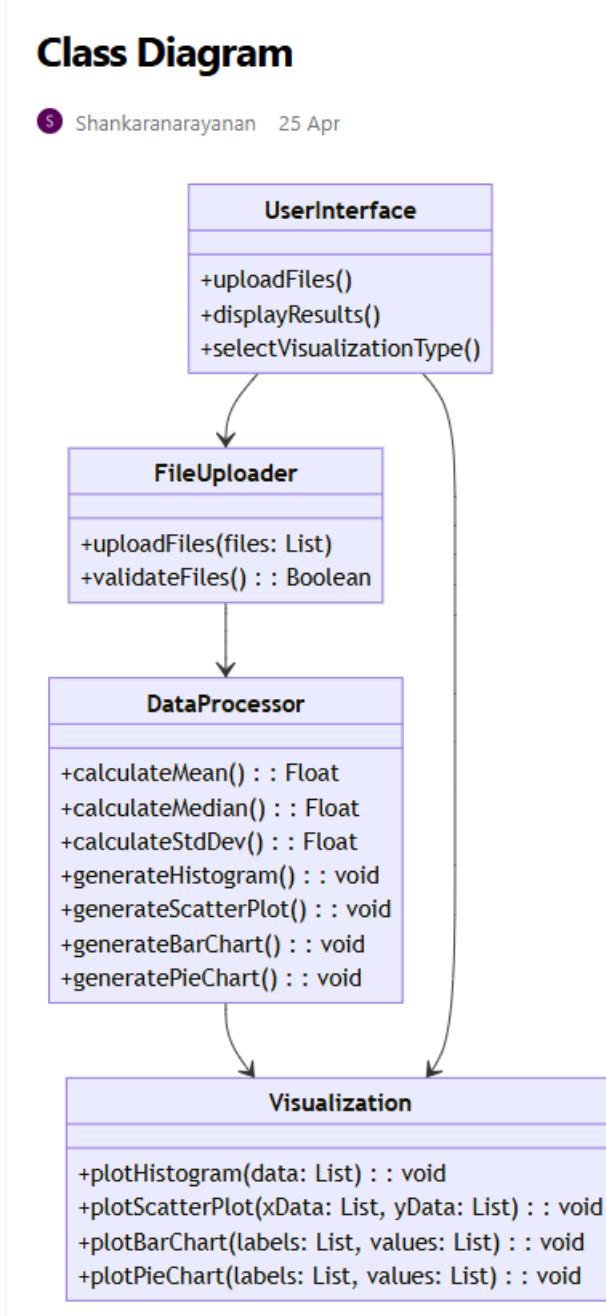
```

UserInterface --> FileUploader
FileUploader --> DataProcessor
DataProcessor --> Visualization
UserInterface --> Visualization

Relationship Types

Type	Description
<	Inheritance
*	Composition
o	Aggregation
>	Association
<	Association
>	Realization

CLASS DIAGRAM:



RESULT:

The Class diagram was designed successfully.

EX NO: 7

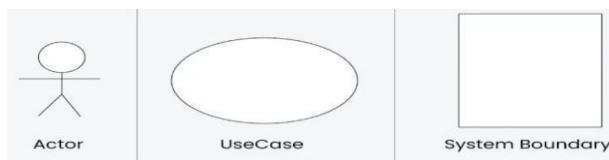
USE CASE DIAGRAM

AIM:

Steps to draw the Use Case Diagram using draw.io

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: Create the Use Case Diagram in Draw.io

- Open Draw.io (diagrams.net).
- Click "Create New Diagram" and select "Blank" or "UML Use Case" template.
- Add Actors (Users, Admins, External Systems) from the UML section.
- Add Use Cases (Functionalities) using ellipses.
- Connect Actors to Use Cases with lines (solid for direct interaction, dashed for <<include>> and <<extend>>).
- Save the diagram as .drawio or export as PNG/JPG/SVG.

Step 2: Upload the Diagram to Azure DevOps

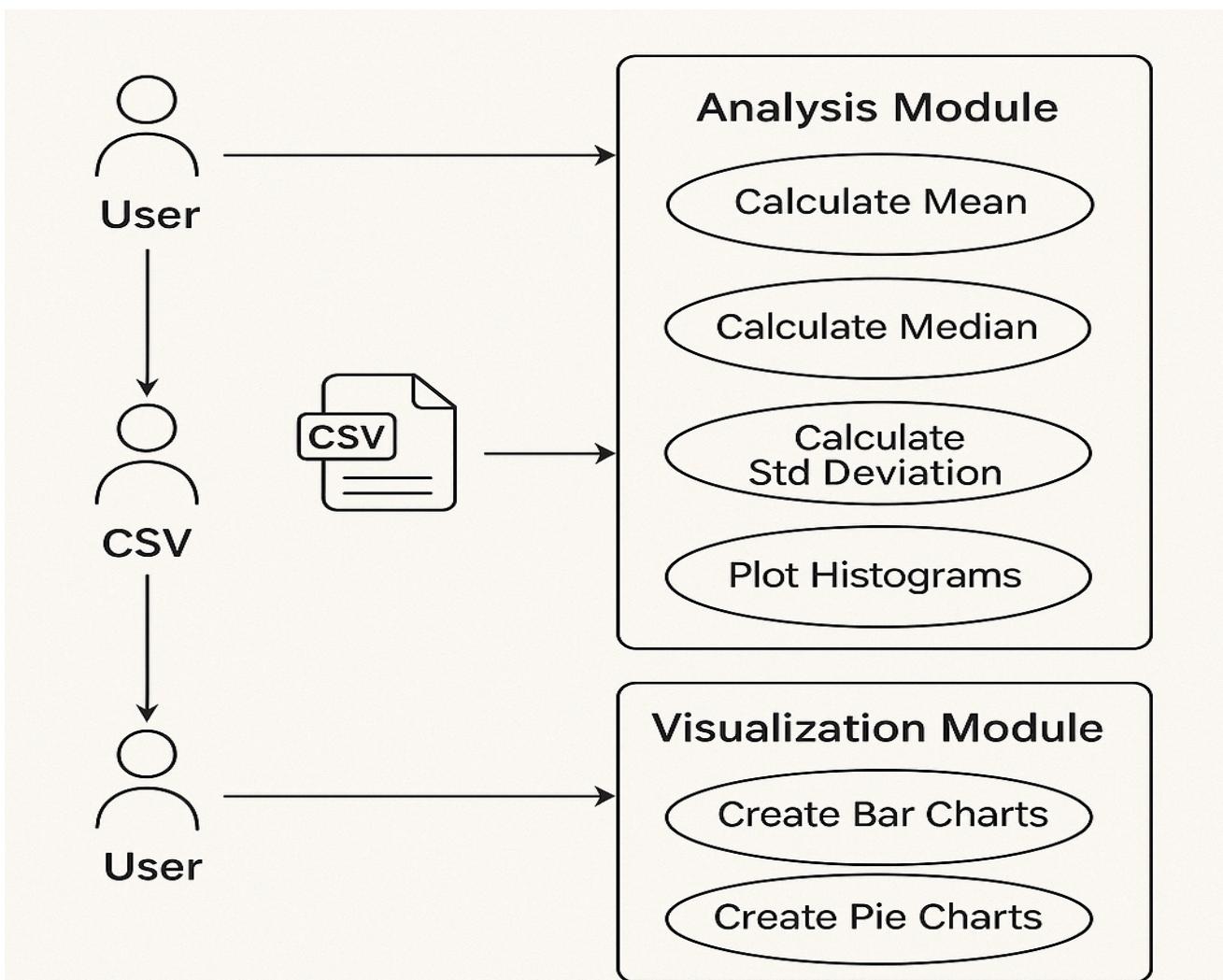
Option 1: Add to Azure DevOps Wiki

- Open Azure DevOps and go to your project.
- Navigate to Wiki (Project > Wiki).
- Click "Edit Page" or create a new page.
- Drag & Drop the exported PNG/JPG image.
- Use Markdown to embed the diagram:
! [Use Case Diagram](attachments/use_case_diagram.png)

Option 2: Attach to Work Items in Azure Boards

- Open Azure DevOps → Navigate to Boards (Project > Boards).
- Select a User Story, Task, or Feature.
- Click "Attachments" → Upload your Use Case Diagram. • Add comments or descriptions to explain the use case.

USE CASE DIAGRAM:



RESULT:

The use case diagram was designed successfully

EX NO. 8

ACTIVITY DIAGRAM

AIM :-

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

THEORY

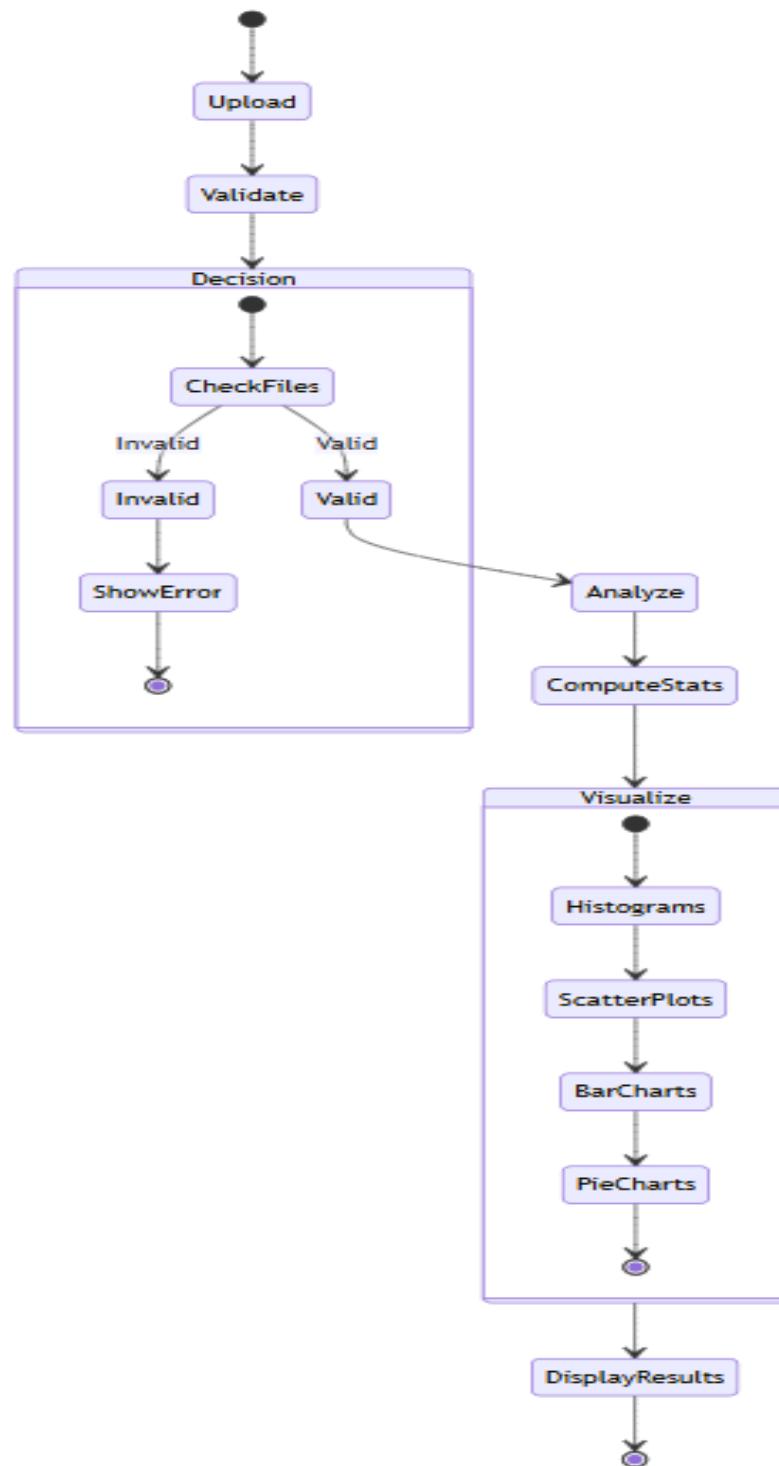
Activity diagrams are an essential part of the Unified Modelling Language (UML) that help visualize workflows, processes, or activities within a system. They depict how different actions are connected and how a system moves from one state to another.

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 re-introduces 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		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

ACTIVITY DIAGRAM



RESULT:

The activity diagram was designed successfully

EX NO. 9

ARCHITECTURE DIAGRAM

AIM:

Steps to draw the Architecture Diagram using draw.io.

THEORY:

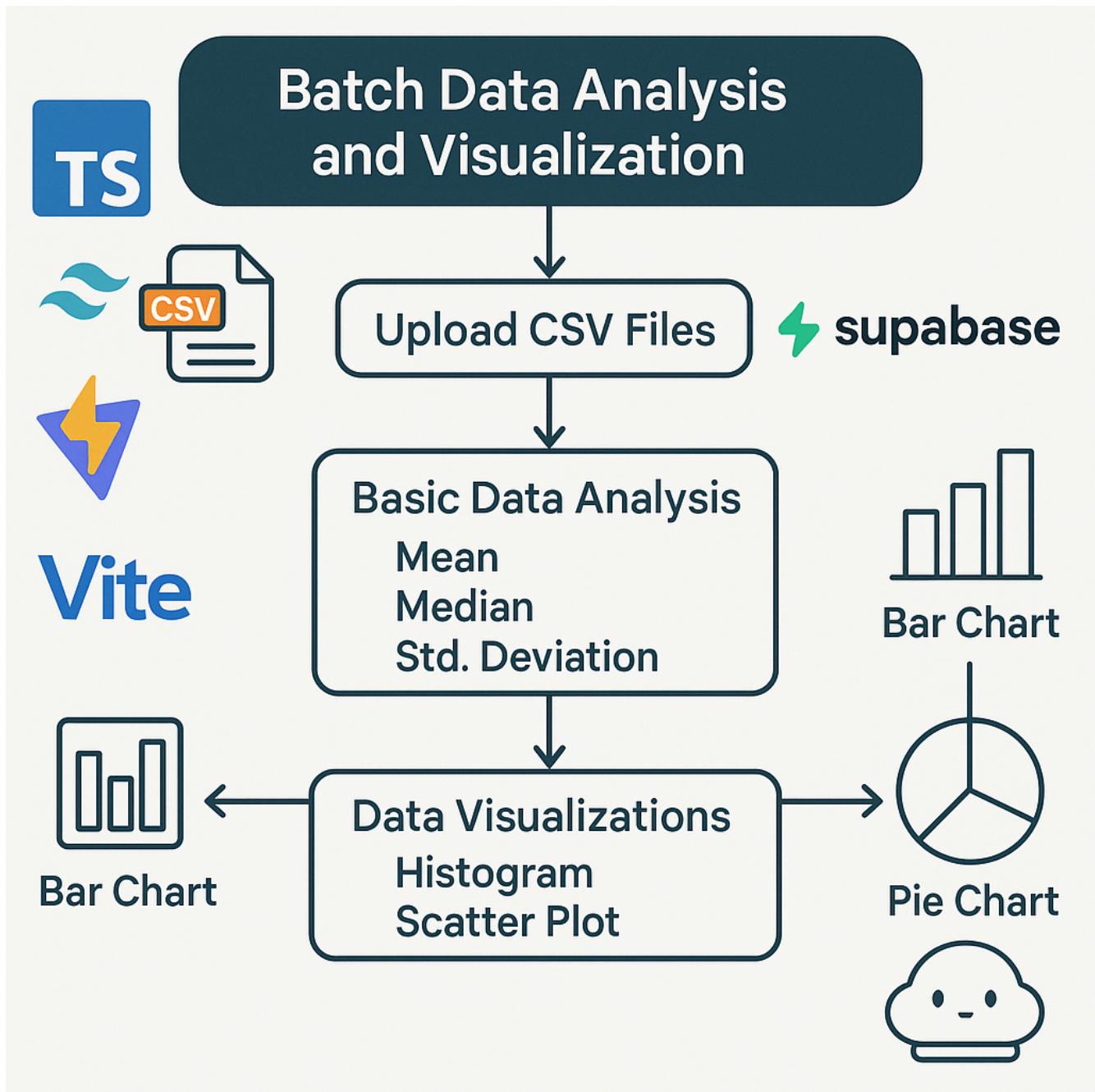
An architectural diagram is a visual representation that maps out the physical implementation for components of a software system. It shows the general structure of the software system and the associations, limitations, and boundaries between each element.



PROCEDURE:

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

ARCHITECTURE DIAGRAM:



RESULT:

The architecture diagram was designed successfully.

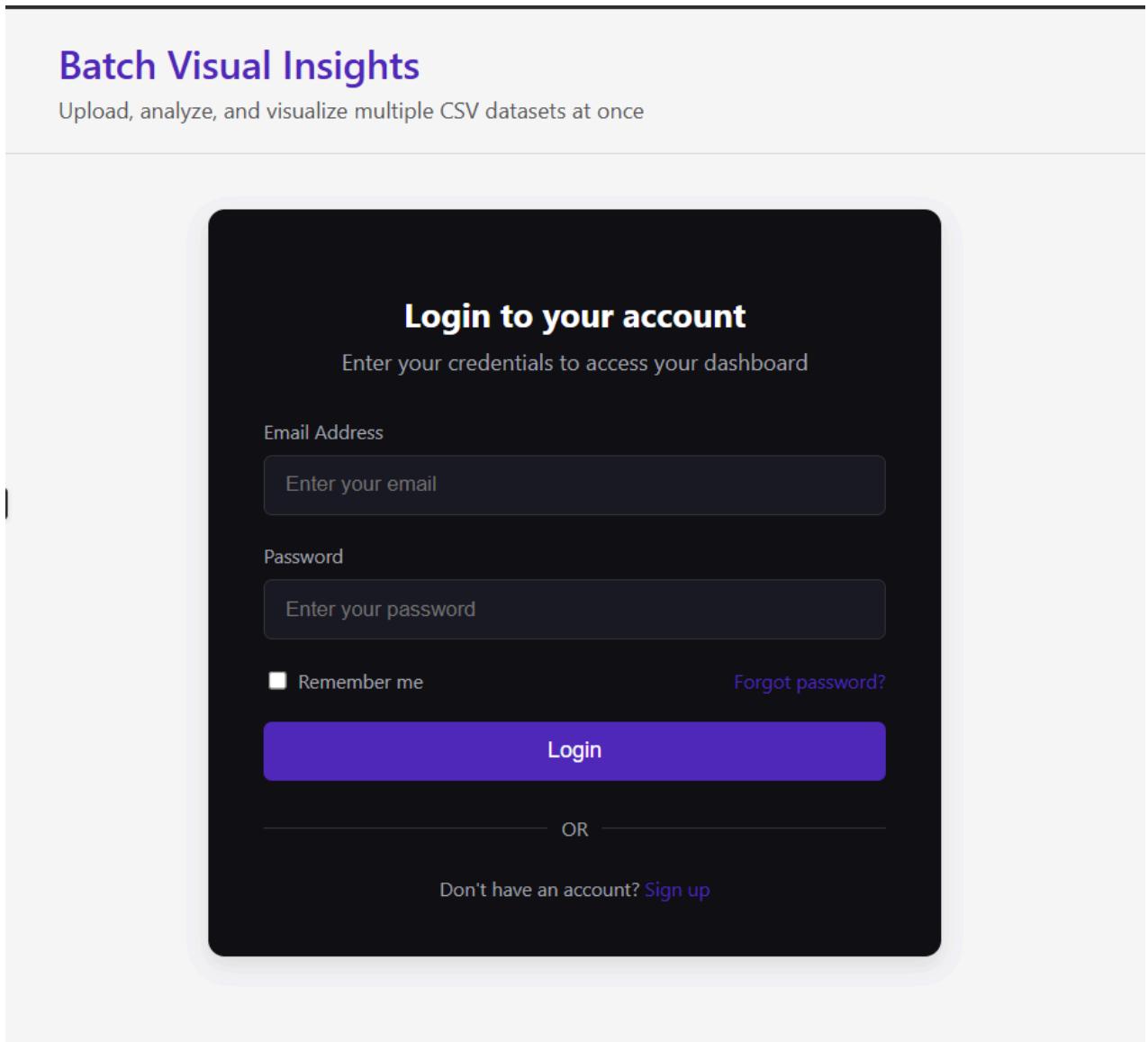
EX NO. 10

USER INTERFACE

AIM:

Design User Interface for the given project

Login Page:

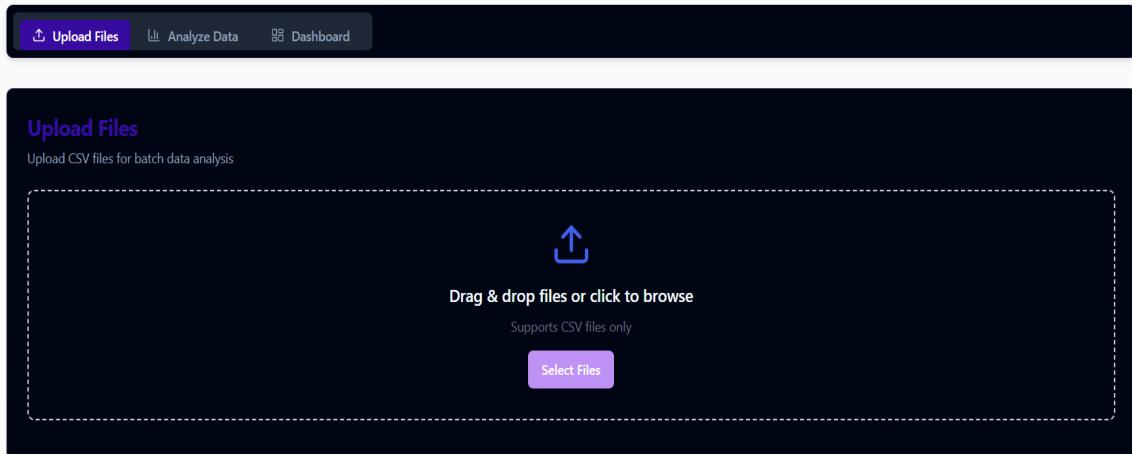


The image shows a login page for a service called "Batch Visual Insights". At the top, there's a header with the service name and a sub-instruction: "Upload, analyze, and visualize multiple CSV datasets at once". Below this is a large central form area with a dark background. The title "Login to your account" is centered at the top of the form. Below it is a subtitle: "Enter your credentials to access your dashboard". There are two input fields: one for "Email Address" containing the placeholder "Enter your email", and another for "Password" containing the placeholder "Enter your password". To the left of the "Password" field is a checkbox labeled "Remember me". To the right of the "Password" field is a link "Forgot password?". A large purple button at the bottom of the form is labeled "Login". Below the form, a horizontal line with the word "OR" in the center separates it from a link "Don't have an account? [Sign up](#)".

Home Page:

Batch Visual Insights

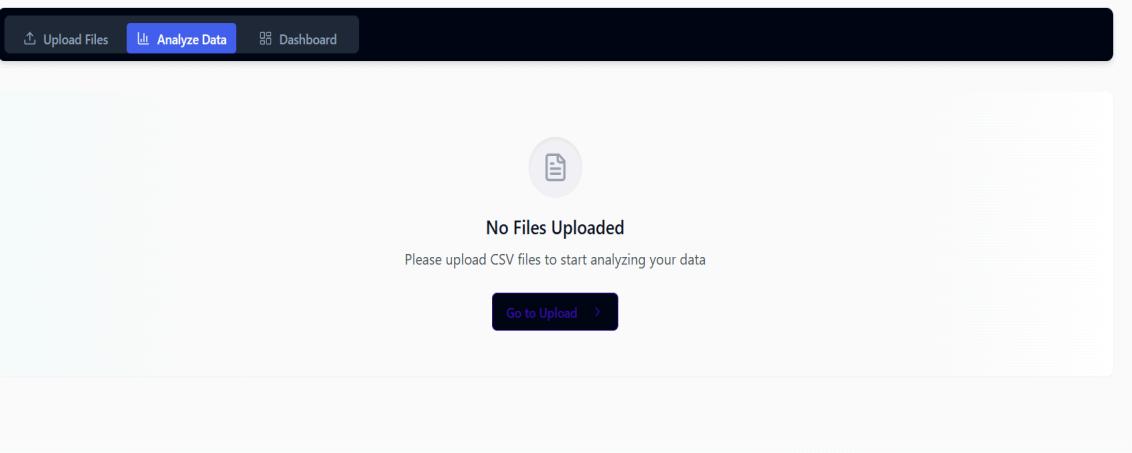
Upload, analyze, and visualize multiple CSV datasets at once



Dashboard before uploading CSV file:

Batch Visual Insights

Upload, analyze, and visualize multiple CSV datasets at once



Batch Visual Insights

Upload, analyze, and visualize multiple CSV datasets at once

The screenshot shows the main dashboard interface. At the top, there is a dark header bar with three items: 'Upload Files' (with an upward arrow icon), 'Analyze Data' (with a bar chart icon), and 'Dashboard' (which is highlighted with a purple background). Below the header is a large white area containing a circular icon with four squares inside. Centered below the icon is the text 'No Data Available'. Underneath this, it says 'Upload CSV files to view your data dashboard'. At the bottom of this section is a dark button labeled 'Go to Upload >'. The footer of the page contains the copyright notice '© 2025 Batch Visual Insights | A Data Analysis Tool'.

Uploading the csv file:

Batch Visual Insights

Upload, analyze, and visualize multiple CSV datasets at once

This screenshot focuses on the 'Upload Files' section of the tool. It features a dark header bar with 'Upload Files' (purple background), 'Analyze Data' (gray background), and 'Dashboard' (light blue background). Below the header is a large white area with a dashed border. Inside this area, there is a file icon with a plus sign and the word 'Copy'. To its right is a large blue upward arrow icon. Below these icons is the text 'Drop your files here'. Underneath that, it says 'Supports CSV files only'. At the bottom of this section is a purple button labeled 'Select Files'.

Confirming the upload of csv file by user:

Batch Visual Insights

Upload, analyze, and visualize multiple CSV datasets at once

The screenshot shows the 'Batch Visual Insights' application interface. At the top, there is a navigation bar with three buttons: 'Upload Files' (disabled), 'Analyze Data' (highlighted in blue), and 'Dashboard'. Below the navigation bar is a secondary row of buttons: 'Select a column to analyze' (with a dropdown arrow), 'Analyze Data' (disabled), and 'Export Results'. The main content area has a dark background with a central circular icon containing a bar chart. Below the icon, the text 'Ready for Analysis' is displayed. A descriptive message follows: 'Select columns from your uploaded CSV files and click "Analyze Data" to generate statistics and visualizations.' A prominent blue button labeled 'Start Analysis' is centered below the message. In the bottom right corner of the main area, a success message box appears with the title 'Files Processed Successfully' and the subtext '1 file ready for analysis'.

User selecting the columns for Visualization:

Batch Visual Insights

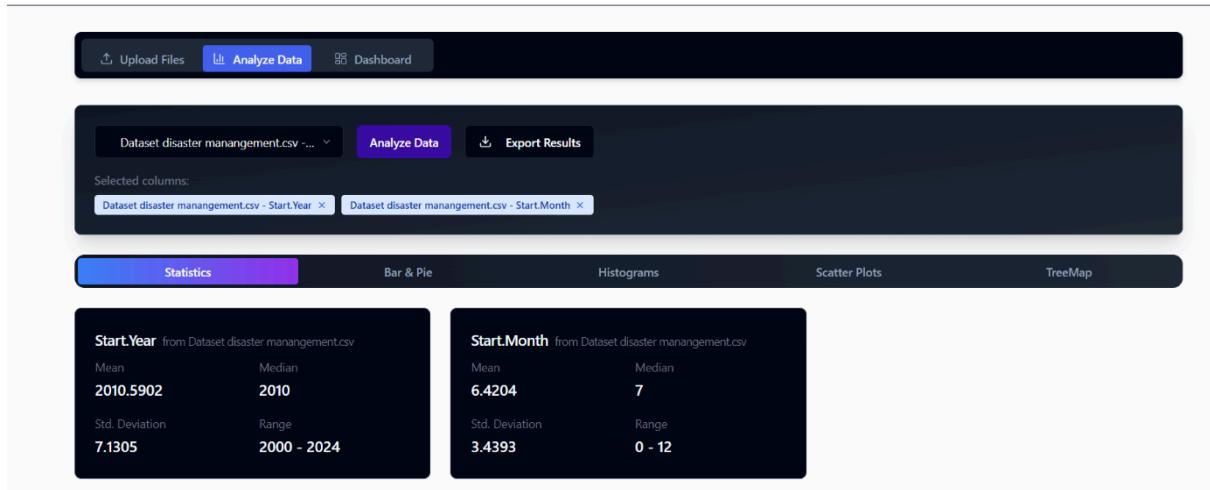
Upload, analyze, and visualize multiple CSV datasets at once

This screenshot shows the same 'Batch Visual Insights' interface as the previous one, but with a visible list of available columns on the left side. The 'Available Columns' section is titled 'Available Columns' and lists ten items from a single CSV file: 'Dataset disaster manangement.csv - Column 1', 'Dataset disaster manangement.csv - Magnitude', 'Dataset disaster manangement.csv - Latitude', 'Dataset disaster manangement.csv - Longitude', 'Dataset disaster manangement.csv - Start.Year', 'Dataset disaster manangement.csv - Start.Month', 'Dataset disaster manangement.csv - Start.Day', 'Dataset disaster manangement.csv - End.Year', 'Dataset disaster manangement.csv - End.Month', and 'Dataset disaster manangement.csv - End.Day'. The first item in the list is highlighted with a pink background. The rest of the interface is identical to the first screenshot, including the 'Ready for Analysis' message, the 'Start Analysis' button, and the success message in the bottom right corner.

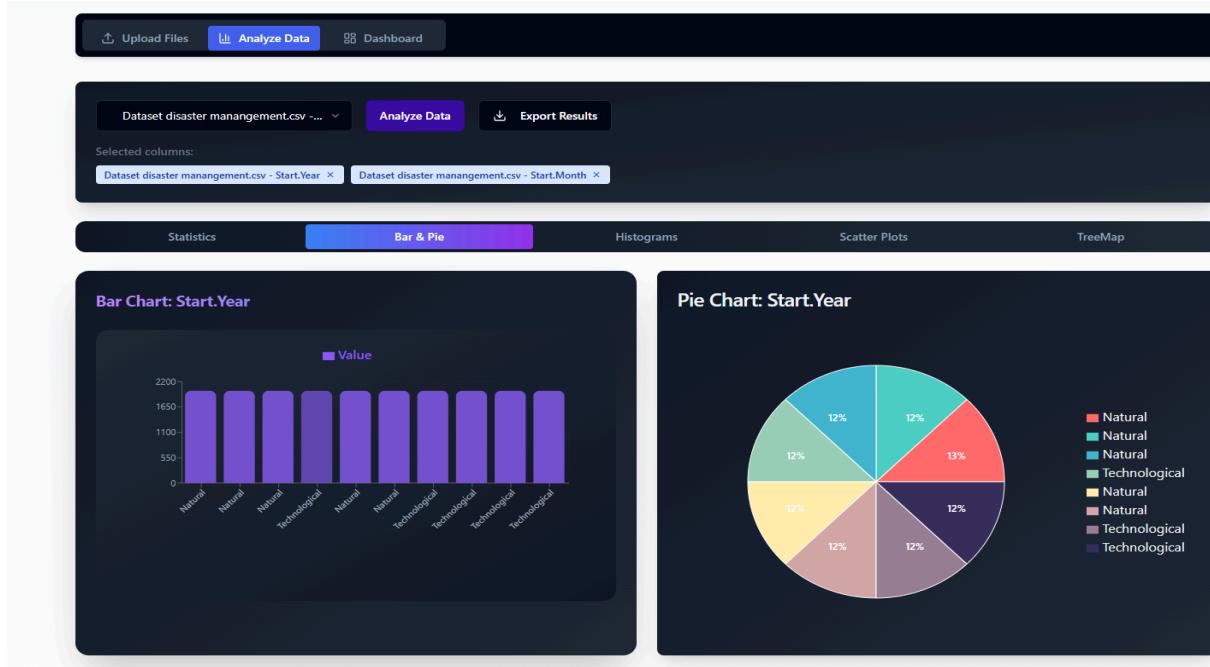
Displaying the Statistics:

Batch Visual Insights

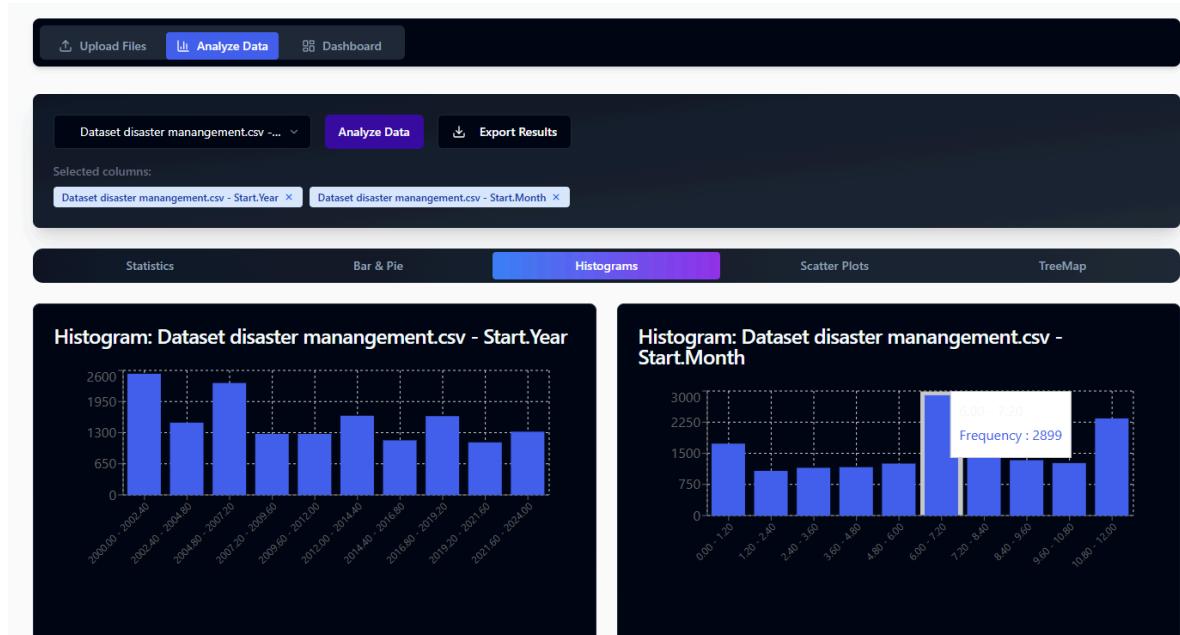
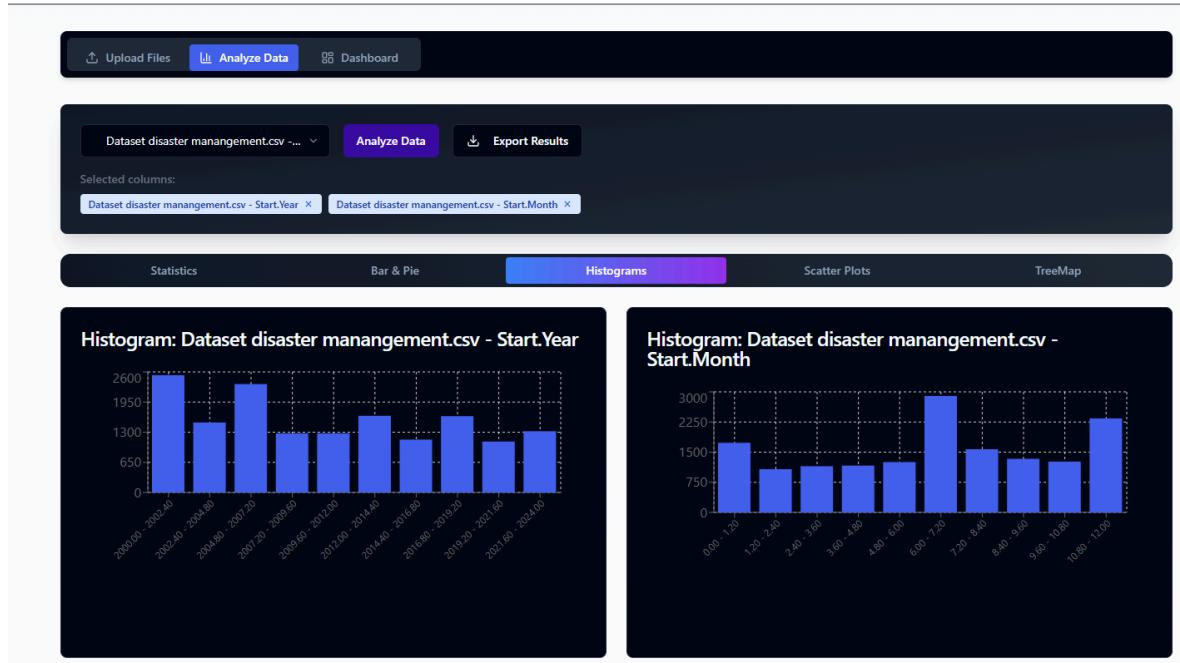
Upload, analyze, and visualize multiple CSV datasets at once



Displaying the Bar and Pie Chart:



Displaying Histograms:



Scatter Plots:

Batch Visual Insights

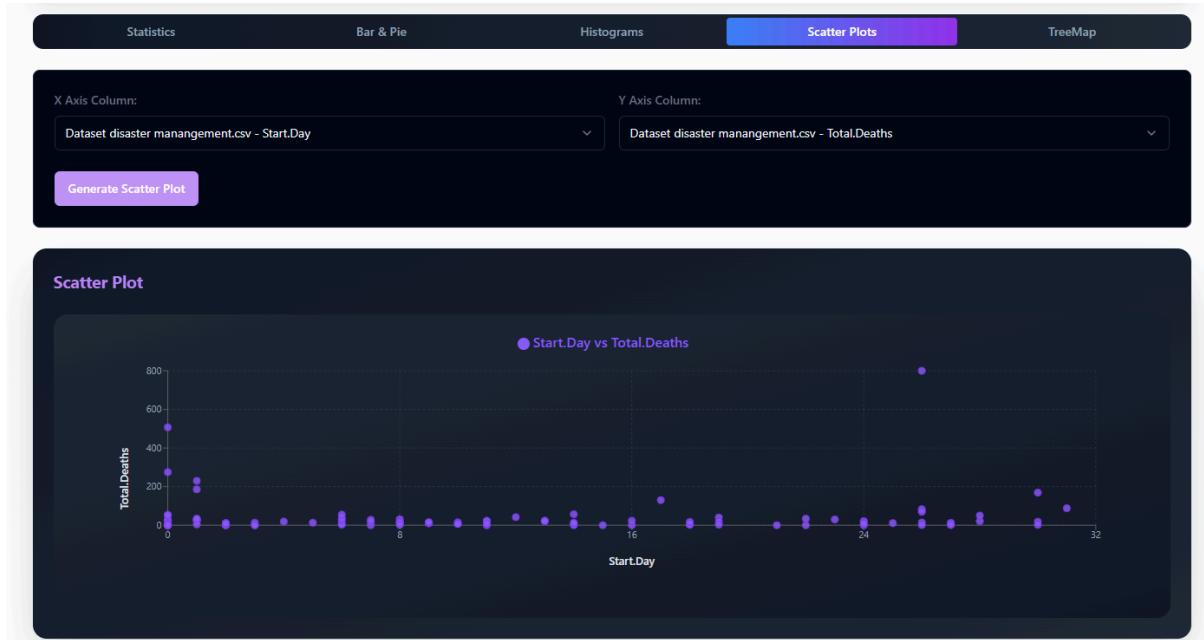
Upload, analyze, and visualize multiple CSV datasets at once

The screenshot shows the 'Scatter Plots' tab selected in the navigation bar. The 'X Axis Column:' dropdown is set to 'Select X axis column' and the 'Y Axis Column:' dropdown is also set to 'Select Y axis column'. A central message reads: 'Select X and Y axis columns and generate a scatter plot.'

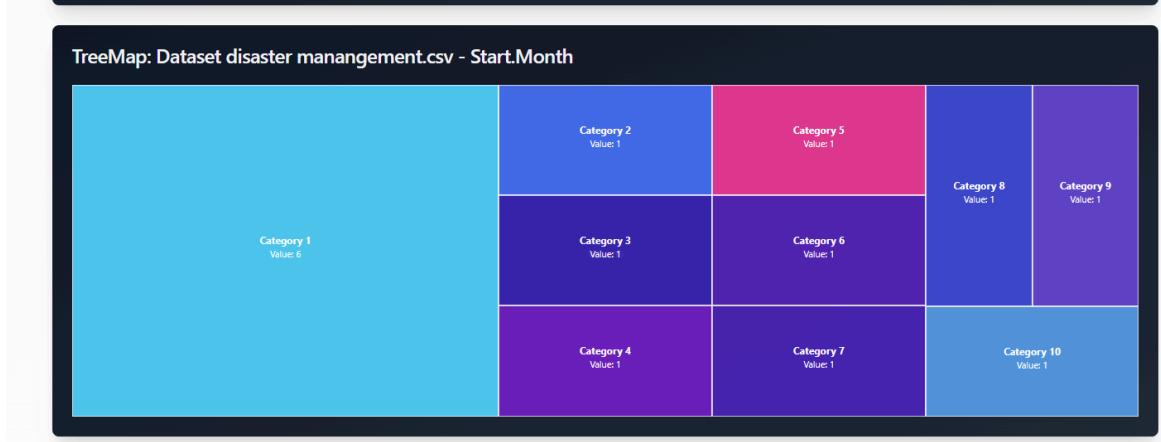
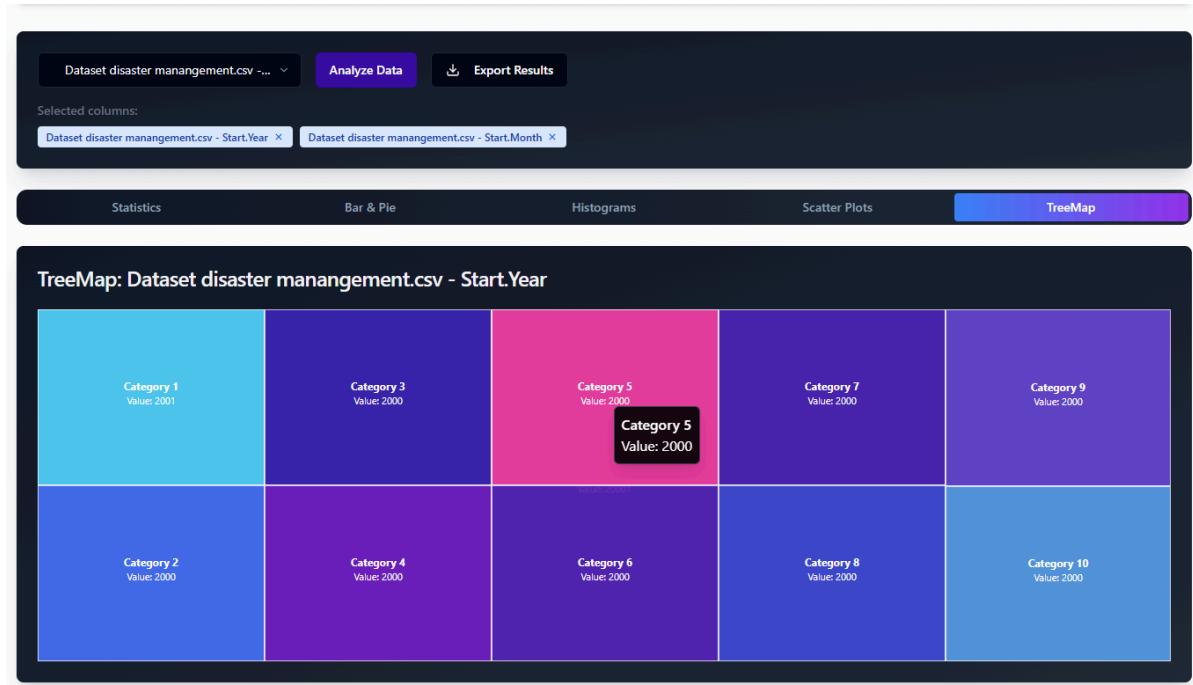
Batch Visual Insights

Upload, analyze, and visualize multiple CSV datasets at once

A dropdown menu is open over the 'Select X axis column' dropdown, listing various dataset columns: 'Dataset disaster management.csv - Column 1', 'Dataset disaster management.csv - Magnitude', 'Dataset disaster management.csv - Latitude', 'Dataset disaster management.csv - Longitude', 'Dataset disaster management.csv - StartYear', 'Dataset disaster management.csv - StartMonth', 'Dataset disaster management.csv - StartDay', 'Dataset disaster management.csv - EndYear', 'Dataset disaster management.csv - EndMonth', 'Dataset disaster management.csv - EndDay', and 'Dataset disaster management.csv - TotalDeaths'. The 'Scatter Plots' tab is selected in the navigation bar. A central message reads: 'Select X and Y axis columns and generate a scatter plot.'



Treemaps:



RESULT:

The UI was designed successfully.

EX NO. 11

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 the 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.

EX NO. 12

CI-CD PIPELINE

AIM:

To implement the CI/CD pipeline in azure.

PROCEDURE:

Define CD Pipeline (Release Pipeline)

You can use either:

- Classic Releases (GUI-based)
- YAML-based Continuous Delivery

GUI-based Example:

1. Go to Pipelines > Releases
2. Create a new release pipeline
3. Artifact: Link to the CI build artifact
4. Stage: Add tasks for Azure App Service, VM, or AKS deployment

Task Example (App Service Deploy):

- task: AzureWebApp@1

inputs:

```
azureSubscription: '<your-azure-connection>'  
appType: 'webApp'  
appName: '<your-app-name>'  
package: '$(System.DefaultWorkingDirectory)/**/*.zip'
```

Connect Azure Subscription

- From Project Settings > Service Connections
- Add a new Azure Resource Manager (ARM) connection

Enable Continuous Deployment Trigger

- For Release Pipelines: Enable CD trigger to auto-deploy on new build artifacts.

Azure DevOps 230701306 / Batch Data Analysis and Vis... / Pipelines / batch-visual-insights.git (8) / 20250518.1

#20250518.1 • Set up CI with Azure Pipelines
batch-visual-insights.git (8)

This run is being retained as one of 3 recent runs by main (Branch).

Run new View retention leases

Summary Code Coverage

Individual CI by Shankaranarayanan

Repository and version: batch-visual-insights.git (8)
main 4ee28b83

Time started and elapsed: Sun at 9:56 PM 1m 39s

Related: 0 work items 0 artifacts

Tests and coverage: Get started

View 33 changes

Jobs

Name	Status	Duration
Job	Success	1m 30s

Azure DevOps 230701306 / Batch Data Analysis and Vis... / Pipelines / batch-visual-insights.git (9) / 20250519.2

#20250519.2 • Update azure-pipelines-4.yml for Azure Pipelines
batch-visual-insights.git (9)

Cancel

Summary Code Coverage

Individual CI by Shankaranarayanan

Repository and version: batch-visual-insights.git (9)
main 0afa7e58

Time started and elapsed: Yesterday at 11:56 AM -

Related: 0 work items 0 artifacts

Tests and coverage: Get started

View 37 changes

Jobs

Name	Status	Duration
Job Python38	Queued	
Job Python39	Queued	
Job Python310	Queued	

Azure DevOps 230701306 / Batch Data Analysis and Vis... / Pipelines / batch-visual-insights.git (8) / 20250518.1

Jobs in run #20250518.1
batch-visual-insights.git (8)

Job

View raw log

Jobs

Job	Duration
Job	1m 30s
Initialize job	18s
Checkout batch-visual-i...	4s
Install Node.js	36s
npm install and build	30s
Post-job: Checkout ba...	<1s
Finalize Job	<1s
Report build status	<1s

1 Pool: Default
2 Agent: DESKTOP-F9V7GFD
3 Started: Sun at 9:57 PM
4 Duration: 1m 30s
5
6 * Job preparation parameters

The screenshot shows the Azure DevOps interface for a project named "Batch Data Analysis an...". The left sidebar is open, showing various options like Overview, Boards, Repos, Pipelines, Environments, Library, Test Plans, and Artifacts. The "Pipelines" option is selected. On the right, a detailed view of a build run is displayed. The title is "Jobs in run #20250518.1" and the subtitle is "batch-visual-insights.git (8)". A green checkmark icon indicates the status of the "npm install and build" job. The log output for this job is as follows:

```
npm install and build

1 Starting: npm install and build
2 -----
3 Task : Command line
4 Description : Run a command line script using Bash on Linux and macOS and cmd.exe on Windows
5 Version : 2.250.1
6 Author : Microsoft Corporation
7 Help : https://docs.microsoft.com/azure/devops/pipelines/tasks/utility/command-line
8 -----
9 Generating script.
10 ----- Starting Command Output -----
11 "C:\Windows\system32\cmd.exe" /D /E:ON /V:OFF /S /C "CALL "C:\Users\Catriona\Documents\��\scl\vsts-agent-win-x86-4.255.0\_work\_temp\d957bb1-d958-4a91-9819-7db7b9a
12
13 added 414 packages, and audited 415 packages in 27s
14
15 73 packages are looking for funding
16   run "npm fund" for details
17
18 4 moderate severity vulnerabilities
19
20  To address all issues, run:
21    npm audit fix
22
23 Run "npm audit" for details.
24 Finishing: npm install and build
```

RESULT:

Thus the CI/CD pipeline was successfully implemented.