LAB REPORT

Submitted by

P. BALAJI MURUGAN(RA2011003011404)

Under the Guidance of

Mr. N.A.S Vinoth

Assistant professor, CTech.

In partial satisfaction of the requirements for the degree of

BACHELOR OF TECHNOLOGY
in
COMPUTER SCIENCE ENGINEERING

SCHOOL OF COMPUTING

COLLEGE OF ENGINEERING AND TECHNOLOGY

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

KATTANKULATHUR - 603203

JUNE 2022

SRM INSTITUTION OF SCIENCE AND TECHNOLOGY
KATTANKULATHUR-603203

BONAFIDE CERTIFICATE

Certified that this lab report titled **"Weather Forecasting Website"** is the bonafide work done by P BALAJI MURUGAN (RA2011003011404) who carried out the lab exercises under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other work.

SIGNATURE

Mr. N.A.S Vinoth

SEPM – Course Faculty

Assistant Professor

Department of CTECH

ABSTRACT

Weather is the state of the atmosphere at a given place and time in regards to heat, cloudiness, dryness, sunshine, wind, and rain. Weather forecasting is an important application in meteorology and has been one of the most scientifically and technologically challenging problems around the world. In this paper, we investigate the use of data mining techniques in forecasting maximum temperature, rainfall, evaporation and wind speed. Weather prediction approaches are challenged by complex weather phenomena with limited observations and past data. Weather phenomena have many parameters that are impossible to enumerate and measure. Increasing development on communication systems enabled weather forecast expert systems to integrate and share resources and thus hybrid system has emerged. Even though these improvements on weather forecast, these expert systems can't be fully reliable since weather forecast is main problem. Of all the geophysical phenomena weather is the most significant one that influences us. Weather can vary greatly and largely depends on climate, seasons and various other factors. The chief goal of this work is to get the weather forecast of any city throughout the world through an application. This paper aims at creating a web application using Javascript, CSS, Html.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ABBREVATION

ERD	Entity relationship Diagram
IT	Information Technology
IDE	Integrated Development Environment
APP	Application
URL	Uniform Resource locator
Arch	Architecture
DFD	Data Flow Diagram
UI	User Interface
API	Application Programming Interface
WBS	Work Breakdown Structure
DB	Database

ONE PAGE BUSINESS CASE TEMPLATE

DATE	22-03-2022
SUBMITTED BY	BALAJI MURUGAN (404), SAI VARMA (372) , AKSHAT(407)
TITLE / ROLE	WEATHER FORECASTING WEBSITE

THE PROJECT

In bullet points, describe the problem this project aims to solve or the opportunity it aims to develop.

Weather forecasting is the application of science and technology to predict the conditions of the atmosphere for a given **location** and time.

THE HISTORY

In bullet points, describe the current situation.

Now a days its easy to forecast the weather due to improved technology, in past scenarios it was no this easy to guess the weather. With the help of weather forecasting site it is easy to plan the events according to weather.

LIMITATIONS

List what could prevent the success of the project, such as the need for expensive equipment, bad weather, lack of special training, etc.

The main limitations are longer term forecasting because as models go further into the future they tend to diverge from each other. Sometimes to the point where one model will have a high pressure overhead with dry weather where another model will have a low pressure with precipitation.

APPROACH

List what is needed to complete the project.

Html CSS JS API

BENEFITS

In bullet points, list the benefits that this project will bring to the organization.

The goal of weather prediction is to provide information people and organizations can use to reduce weather-related losses and enhance societal benefits, including **protection of life and property, public health and safety, and support of economic prosperity and quality of life**.

Department of Computing Technologies

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	**2**
Title of Experiment	**Identification of Project Methodology and Stakeholder Description**
Name of the candidate	**P. BALAJI MURUGAN**
Team Members	BALAJI MURUGAN, SAI VARMA, AKSHAT
Register Number	RA2011003011404
Date of Experiment	29-03-2022

Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Presentation	5	
2	Project Methodology	2.5	
3	Stakeholder Identification	2.5	
	Total	**10**	

Staff Signature with date

Aim

To identify the appropriate Process Model for the project and prepare Stakeholder and User Description.

Team Members:

Sl No	Register No	Name	Role
1	RA2011003011404	P BALAJI MURUGAN	**Lead**
2	RA2011003011372	SAI VARMA	**Member**
3	RA2011003011407	AKSHAT	**Member**

Project Title:

1. **Executive Summary**

1.1 Project Methodology:

1.2 Stakeholder Identification:

Internal stakeholders:

The internal stakeholders include the team members, managers, executives who are all internally related.

Project Role	Responsibilities	Team members assigned to
Project Manager	Manages and delegates tasks.	PASAPALA BHUVANESH
Technical Lead	Makes decisions about frameworks used.	SIDDU AND SARAN
Business Analyst	Analyses the probable gains and estimates losses as well as studies market response.	BHUVANESH

Developer	Works on the assigned technical tasks	SIDDU
Tester	Tests out the application at each stage	SARAN AND SIDDU

External stakeholders:

Project Role	Responsibilities	Team members assigned to
Investor	Invests in the project	BHUVANESH
Owner	Oversees the execution of the project	SIDDU
Supplier	Supplies resources as needed	SARAN

2. Stakeholder Management

2.1 Interest and Influence matrix

Interest	Influence
High	High
Low	Low
Low	High
High	Low

2.2 STAKEHOLDER INTEREST, INFLUENCE, PRIORITY IDENTIFICATION

Stakeholder	Responsibility	Interest	Influence	Estimated Priority
Owner	Bears business responsibility for the successful implementation of the project.	High	Low	High
Sponsor	Provides resources and support	High	Low	Low
Team members	Carry out the work related to the project.	High	High	High
Project Manager	Leads the team member to achieve project goals.	High	High	High
Investors	Provide funds for the project.	Low	High	High
Resource Manager	Helps project manager with resource allocation.	Low	Low	High
Suppliers	Supplies goods and services for the project execution	Low	High	High
End Users	Test out the project	Low	High	High

Reference

Result

Thus the Project Methodology was identified stakeholders were described.

Department Of Networking and Communications

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	3
Title of Experiment	System, Functional and Non-Functional Requirements of the Project
Name of the candidate	P. BALAJI MURUGAN
Team Members	BALAJI MURUGAN , SAI VARMA , AKSHAT
Register Number	RA2011003011404
Date of Experiment	31-03-2022

Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim:

To identify the system, functional and non-functional requirements for the project.

Team Members:

S No	Register No	Name	Role
1	RA2011003011404	BALAJI MURUGAN	**Rep/Member**
2	RA2011003011372	SAI VARMA	**Member**
3	RA2011003011407	AKSHAT	**Member**

Project Title: **WEATHER FORECASTING WEBSITE**

EXECUTIVE SUMMARY:

This record clarifies the scope of the project and the prerequisites of the project in detail. One of the obligations of a project manager is deciding the scope of a project and guaranteeing that every representative remaining parts inside that scope while finishing their work. Scope relies upon the assets accessible like financial plan and team members, just as the objectives of the task and the work needed to achieve those objectives. On the off chance that an assignment was excluded from the first venture plan and doesn't add to the project's objective, it is likely out of scope.

Designating errands that are out of degree to different groups and defining limits for which tasks your group is liable for are both significant pieces of venture the executives. Solution requirements describe the characteristics that a product must have to meet the needs of the stakeholders and the business itself and that include functional requirements and non-functional requirements

1. PROJECT SCOPE:

S.NO	ACTIVITIES IN THE SCOPE	ACTIVITES OUT OF SCOPE
1	Planning methods of project work	Marginal tariff setting for services
2	Constraining software is responsive	Proper client communication
4	Designing the project with best approach	
5	Performing quality tests and deploy	

1.1 IN SCOPE:

- **PLANNING METHODS OF PROJECT WORK:**

WATERFALL MODEL approach is typical for certain areas of engineering design in software development, it tends to be among the less iterative and flexible approaches, as progress flows in largely one direction ("downwards" like a waterfall) through the phases of conception, initiation, analysis, design, construction, testing, deployment and maintenance.

❖ Business Modelling

❖ Data Modelling

❖ Process/Application generation

- **CONSTRAINING SOFTWARE IS REPONSIVE:**

Responsive software is the approach that suggests that software and development should respond to the user's behaviour based on screen size and orientation.

❖ Should be easy to understand

❖ Code annotation/size

- **DESIGNING THE PROJECT WITH BEST APPROACH:**

  Building and designing the *Open weather* project with the necessities given by the customer.

  ❖ Provide data sheets

  ❖ Properly organized tabs in each webpage

- **PERFORMING QUALITY TESTS AND DEPLOY:**

  Testing the *Open weather* thoroughly to ensure no bugs and blunders happen.

  ❖ Quality factor

  ❖ Authentication/authorization

  ❖ Auditing to prevent data altering

  ❖ Hosting and deploying sites

1.1. OUT OF SCOPE:

- **MARGINAL TARIFF SETTING FOR SERVICE:**

  Use of outsourcing feature platform for globalizing the internal project

- **PROPER CILENT COMMUNICATION:**

  Our team is able to collaborate, ensure information is being exchanged and schedule when needed with the clients.

2.EPICS:

EPICS	DESCRIPTION
E1	Report -- The user gets the info regarding weather and the required conditions.

2. REQUIREMENTS:

2.1 FUNCTIONAL REQUIREMENTS:

REQUIREMENT	REQUIREMENT SPECIFICATION	DEPARTMENT	NAME OF BUSINESS USER	STATE
E1FR1	Authentication of user	Technical department	N/A	Ongoing
E2FR2	The web page must display basic information such as no of tickets available, details about location	Human Resources	N/A	Ongoing
E3FR3	The test needs to be kept regularly for new users and update the info	Technical and HR department	N/A	Ongoing
E4FR4	The webpage displays detailed description about the locations, Weather	Technical and HR department	N/A	Ongoing

2.2 NON-FUNCTIONAL REQUIREMENTS:

REQUIREMENT	CATEGORY OF NFR	REQUIREMENT SPECIFICATION	DEPARTMENT	NAME OF BUSINESS USER	STATUS
NFR1	Rapidity & Flexibility	Data should be large enough to support more recruit's profiles	Database Manager	N/A	Ongoing
NFR2	Availability	24/7 support from the system to report any problem anytime	System Administrator	N/A	Ongoing
NFR3	Performance	Site should load quick and responsive	Frontend Developer	N/A	Ongoing

2.1. INFRASTRUCTURE REQUIREMENTS:

REQUIREMENT	SPECIFICATION	DEPARTMENT	NAME OF USER	STATUS
IR1	IDE - VS code		PASAPALA BHUVANESH	-
IR2	Server Instance -Depends on scale		Team	-
IR3	Development of Web page	Tech Team	PASAPALA BHUVANESH	Lead
IR4	Repo of Code - Github(may change with cloud serive provider)		Team	

RESULT: Thus, the requirements are identified, collected and documented.

Department of Networking and Communications

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	4
Title of Experiment	Prepare Project Plan based on scope, Calculate Project effort based on resources and Job roles and responsibilities
Name of the candidate	P.BALAJI MURUGAN
Team Members	BALAJI MURUGAN , SAI VARMA , AKSHAT
Register Number	RA20011003011404
Date of Experiment	28/4/22

Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

To Prepare Project Plan based on scope, Calculate Project effort based on resources, Find Job roles and responsibilities

Team Members:

Sl No	Register No	Name	Role
1	RA20011003011404	BALAJI MURUGAN	Lead
2	RA2011003011372	SAI VARMA	Member
3	RA2001003011407	AKSHAT	Member

Requirements

<Incorporate the Project plan template>

Result:

Thus, the Project Plan was documented successfully.

1. Project Management Plan

Describe the key issues driving the project. **[Min 3 Focus Areas]**

Focus Area	Details
Integration Management	Governance Framework Project Team Structure Roles & Responsibilities of Team Change Management (Change Control, Issue Management) Project Closure
Scope Management	Scope Statement Requirement Management (Gathering, Control, Assumption, Constraint Stakeholder) Define Deliverable Requirement Change Control Activities and Sub-Tasks
Schedule Management	Define Milestones Schedule Control
Cost Management	Estimate Effort Assign Team Budget Control
Quality Management	Quality Assurance: Quality assurance will be managed including governance, roles and responsibilities, tools and techniques and reporting Quality Control: Specify the mechanisms to be used to measure and control the quality of the work products
Resource Management	Estimate and Manage the need People: People & Skills Required Finance: Budget Required Physical: Facilities, IT Infrastructure
Stakeholder	Identifying, Analyzing, Engaging Stakeholders
Communication Management	Determine communication requirements, roles and responsibilities, tools and techniques. [Type of Communication, Schedule, Mechanism Recipient]
Risk Management	Identifying, analysing, and prioritizing project risks
Procurement Management	Adhering to organization procurement process

2. Estimation

2.1. Effort and Cost Estimation

Activity Description	Sub-Task	Sub-Task Description	Effort (in hours)	Cost in INR
INTERFACE	Acquiring temperature information	Confirm the user requirements (acceptance criteria)	3	3000
Search Box		User can search the place which place temperature he needs to find	5	5000
		All the information related to that place including some pictures		

Effort (hr)	Cost (INR)
1	500

2.2. Infrastructure/Resource Cost [CapEx]

< OneTime Infra requirements >

Infrastructure Requirement	Qty	Cost per qty	Cost per item
Database	10	150000	1500000

2.3 Maintenance and Support Cost [OpEx]

Category	Details	Qty	Cost per qty per annum	Cost per item
People	Network, System, Middleware and DB admin Developer , Support Consultant	3	2,000,000	6,000,000
License	Operating System Database Middleware IDE	10	10000	100,000
Infrastructures	Server, Storage and Network	20	20000	400,000

3. Project Team Formation

3.1. Identification Team members

Name	Role	Responsibilities
SIDDU KUMAR	Key Business User (Product Owner)	Provide clear business and user requirements
BHUVANESH	Project Manager	Manage the project
SARAN TEJA	Business Analyst	Discuss and Document Requirements
SIDDU KUMAR	Technical Lead	Design the end-to-end architecture
SIDDU KUMAR	UX Designer	Design the user experience
BHUVANESH	Frontend Developer	Develop user interface
SARAN TEJA	Backend Developer	Design, Develop and Unit Test Services/API/DB

3.2. Responsibility Assignment Matrix

RACI Matrix	Team Members			
Activity	**Name (BA)**	**Name (Developer)**	**Name (Project Manager)**	**Key Business User**
User Requirement Documentation	SARAN TEJA	BHUVANESH	BHUVANESH	SIDDU KUMAR

A	Accountable
R	Responsible
C	Consult
I	Inform

Reference

1. https://www.pmi.org/
2. https://www.projectmanagement.com/
3. https://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/ti-it/ervcpgpm-dsfvpmpt-eng.html

Department of Networking and Communications

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	5
Title of Experiment	Prepare Work breakdown structure, Timeline chart, Risk identification table
Name of the candidate	P. BALAJI MURUGAN
Team Members	BALAJI MURUGAN, SAI VARMA, AKSHAT
Register Number	RA20011003011404
Date of Experiment	5-5-2022

Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

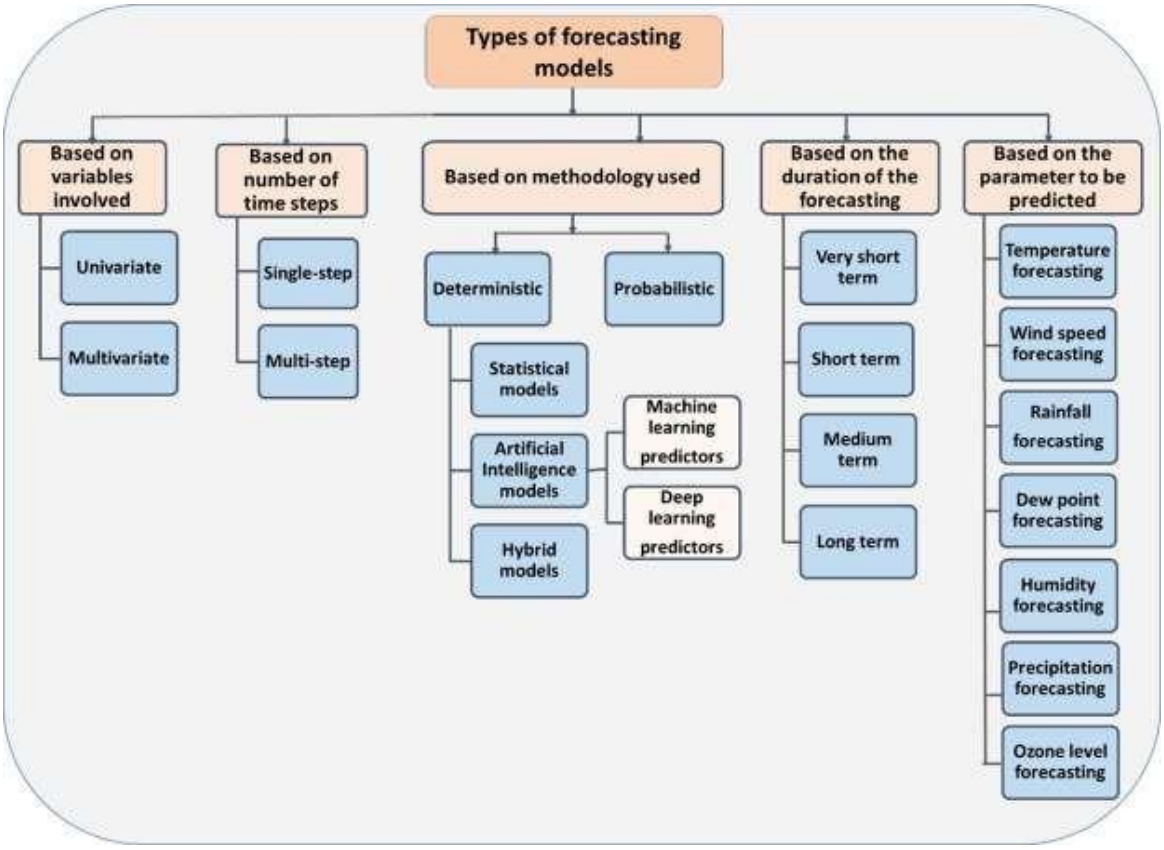
To Prepare Work breakdown structure, Timeline chart and Risk identification table

Team Members:

Sl No	Register No	Name	Role
1	RA2011003011404	BALAJI MURUGAN	Rep
2	RA2011003011372	SAI VARMA	Member
3	RA2011003011407	AKSHAT	Member

<Incorporate WBS, Timeline chart and Risk table>

WBS – Examples



- 0.0 WEATHER FORECASTING WEBSITE
- 1.0 Project Management
- 2.0 Requirements Gathering
- 3.0 Analysis & Design
- 4.0 Site Software Development
    - 4.1 HTML Design and Creation
    - 4.2 Backend Software
        - 4.2.1 Database Implementation
        - 4.2.2 Middleware Development
        - 4.2.3 Security Subsystems
        - 4.2.4 Catalog Engine
        - 4.2.5 Transaction Processing
    - 4.3 Graphics and Interface
    - 4.4 Content Creation
- 5.0 Testing and Production

TIMELINE – GANTT CHART

RISK ANALYSIS – SWOT & RMMM

RISK TABLE:

RISKS	CATEGORY	PROBABILITY - IMPACT	RMMM
TIME ESTIMATION MIGHT GO WRONG	PROJECT SIZE	60% - 3	MITIGATE
REQUIREMENTS ARE CHANGED AT A LATER STATE	PRODUCT DEFINITION	60% - 3	MITIGATE
PROJECT TEAM UNABLE TO BIND UP WITH SCHEDULE	PROJECT RISKS	55% - 2	ACCEPT
STAFF MAY BE UNEXPERIENCED	STAFF RISK	50% - 2	AVOID
LACK OF TRAINING IN PROJECT MANAGEMENT TEAM	DEVELOPMENT ENVIRONMENT	50% - 2	AVOID
STAFF SIZE MAY BE TOO SMALL	STAFF RISK	50% - 2	MITIGATE
BUDGET MAY BE TOO LOW	BUISINESS IMPACT RISK	40% - 4	ACCEPT
USERS OF APP MAY NOT HAVE TECHNICAL BACKGROUND	CUSTOMER RISK	30% - 2	ACCEPT

Result:

Thus, the work breakdown structure with timeline chart and risk table were formulated successfully.

School of Computing

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	6
Title of Experiment	Design a System Architecture, Use Case and Class Diagram
Name of the candidate	P.BALAJI MURUGAN
Team Members	BALAJI MURUGAN , SAI VARMA , AKSHAT
Register Number	RA2011003011404
Date of Experiment	29/4/22

Mark Split Up

S.No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

To Design a System Architecture, Use case and Class Diagram

Team Members:

Sl No	Register No	Name	Role
1	**RA2011003011404**	**BALAJI MURUGAN**	**Rep**
2	**RA2011003011372**	**SAI VARMA**	**Member**
3	**RA2011003011407**	**AKSHAT**	**Member**

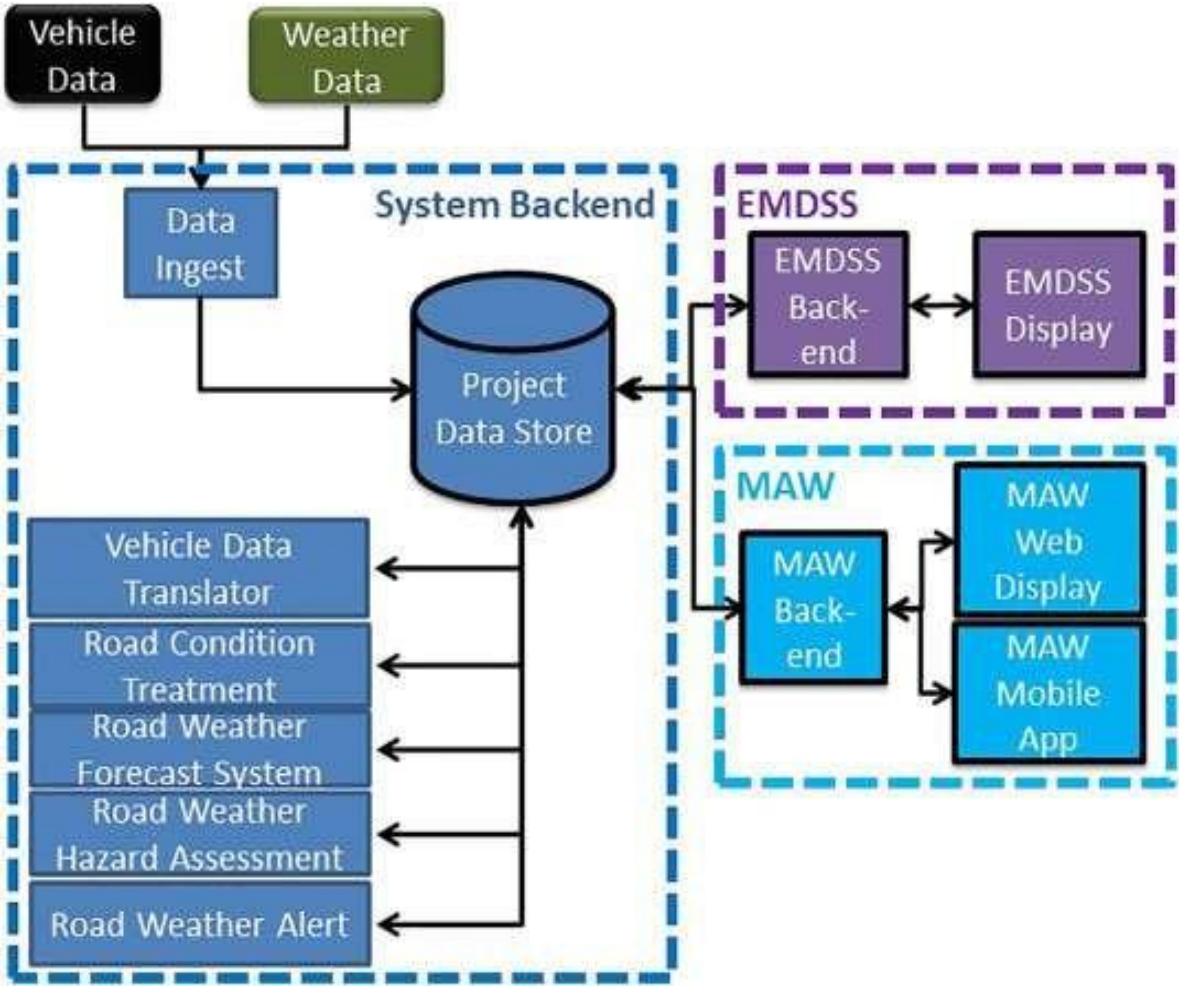
Requirements

<System Architecture, Use Case and Class Diagram>

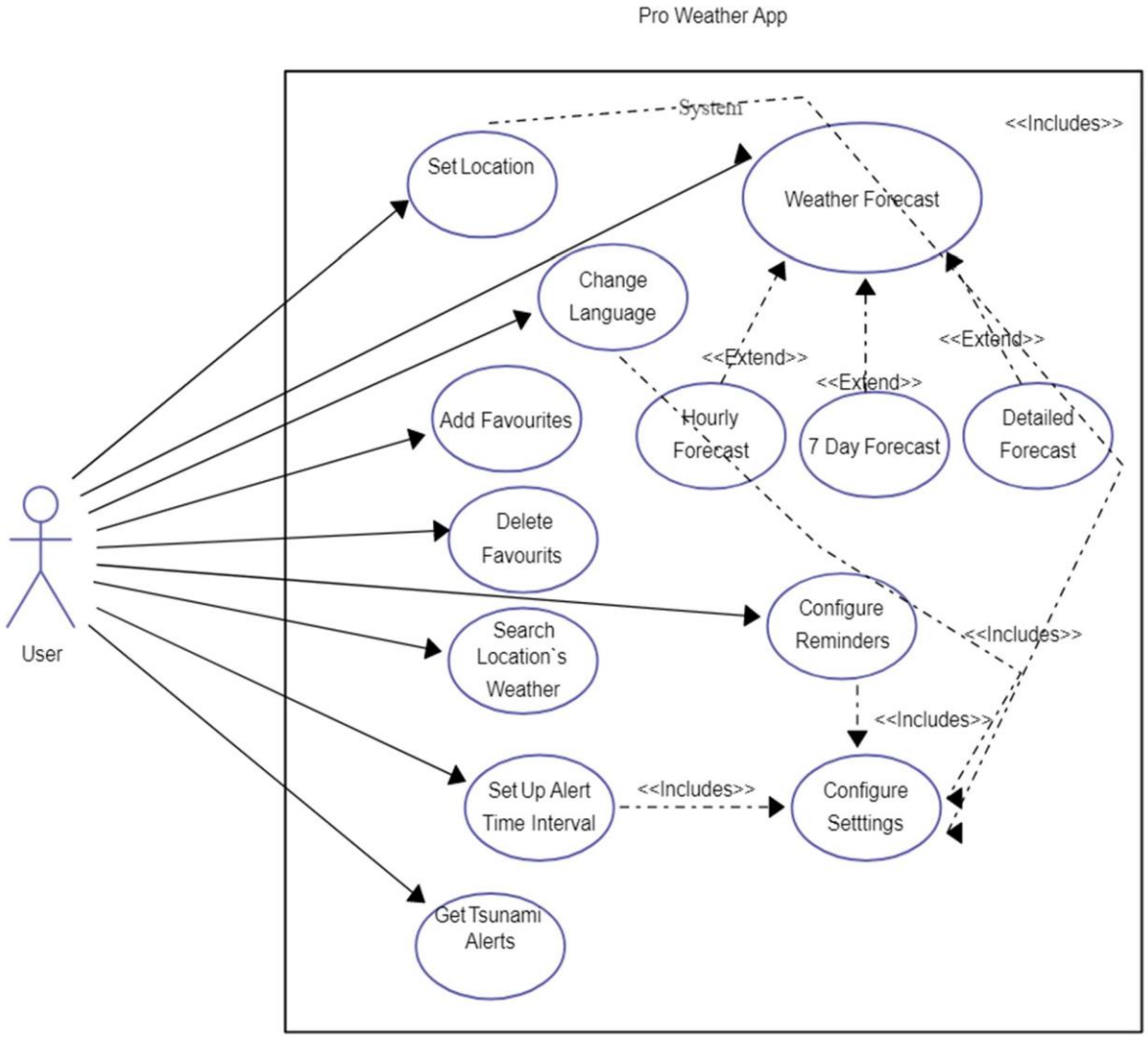
Result:

Thus, the system architecture, use case and class diagram created successfully.

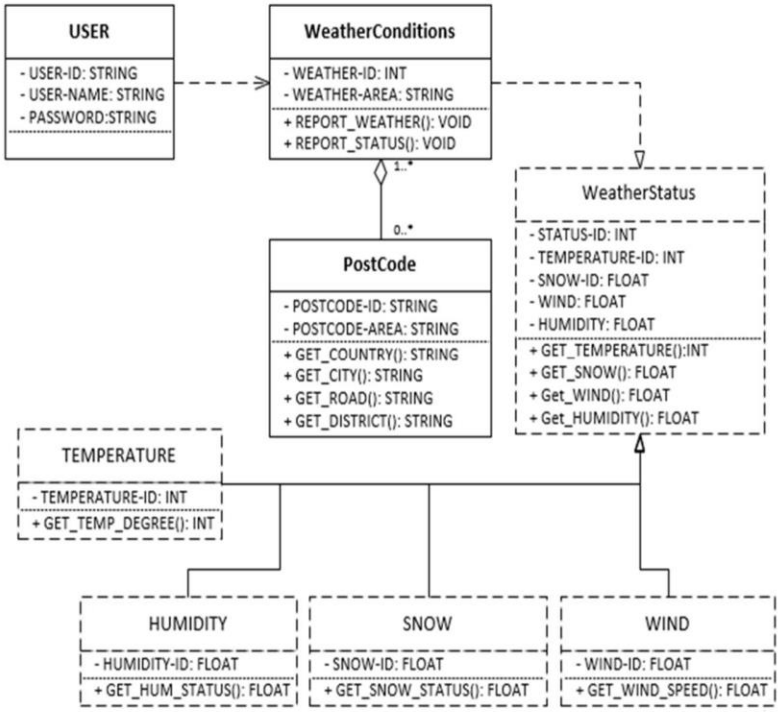
SYSTEM ARCHITECTURE – Example



USE CASE DIAGRAM :



CLASS DIAGRAM :


USER
- USER-ID: STRING
- USER-NAME: STRING
- PASSWORD:STRING
WeatherConditions
- WEATHER-ID: INT
- WEATHER-AREA: STRING
+ REPORT_WEATHER(): VOID
+ REPORT_STATUS(): VOID
1..*
0..*
PostCode
- POSTCODE-ID: STRING
- POSTCODE-AREA: STRING
+ GET_COUNTRY(): STRING
+ GET_CITY(): STRING
+ GET_ROAD(): STRING
+ GET_DISTRICT(): STRING
WeatherStatus
- STATUS-ID: INT
- TEMPERATURE-ID: INT
- SNOW-ID: FLOAT
- WIND: FLOAT
- HUMIDITY: FLOAT
+ GET_TEMPERATURE():INT
+ GET_SNOW(): FLOAT
+ Get_WIND(): FLOAT
+ Get_HUMIDITY(): FLOAT
TEMPERATURE
- TEMPERATURE-ID: INT
+ GET_TEMP_DEGREE(): INT
HUMIDITY
- HUMIDITY-ID: FLOAT
+ GET_HUM_STATUS(): FLOAT
SNOW
- SNOW-ID: FLOAT
+ GET_SNOW_STATUS(): FLOAT
WIND
- WIND-ID: FLOAT
+ GET_WIND_SPEED(): FLOAT

School of Computing

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	7
Title of Experiment	Design a Entity relationship diagram
Name of the candidate	P. BALAJI MURUGAN
Team Members	BALAJI MURUGAN , SAI VARMA , AKSHAT
Register Number	RA2011003011404
Date of Experiment	12/5/22

Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

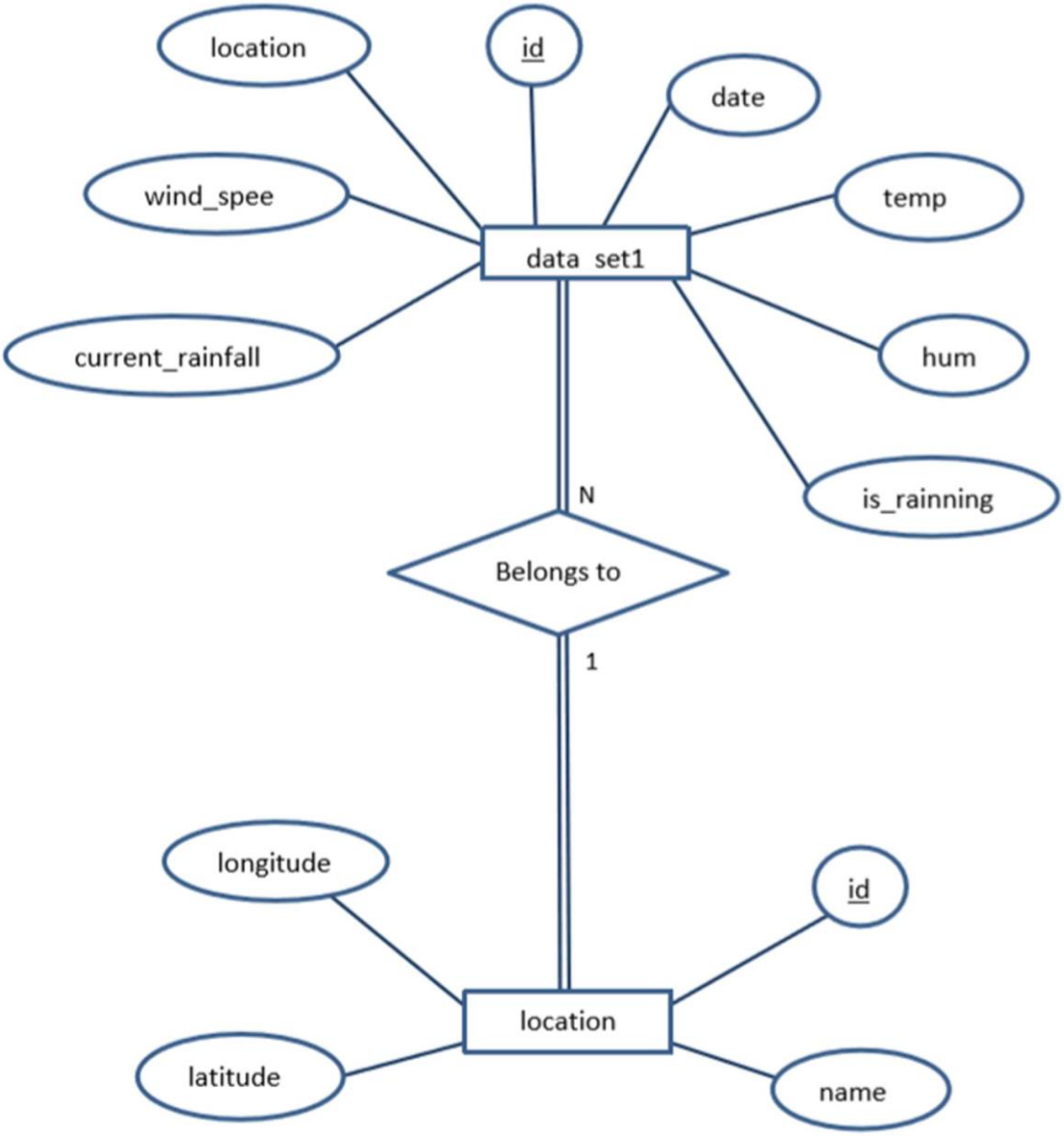
Aim

To create the Entity Relationship Diagram

Team Members:

S No	Register No	Name	Role
1	**RA2011003011404**	**BALAJI MURUGAN**	**Rep**
2	**RA201103011372**	**SAI VARMA**	**Member**
3	**RA2011003011407**	**AKSHAT**	**Member**

<ER Diagram >



Result:

Thus, the entity relationship diagram was created successfully.

***/ ER Diagram, Notation and Example**

What is ER Diagram?

- ER Diagram stands for Entity Relationship Diagram, also known as ERD is a diagram that displays the relationship of entity sets stored in a database. In other words, ER diagrams help to explain the logical structure of databases. ER diagrams are created based on three basic concepts: entities, attributes and relationships.
- ER Diagrams contain different symbols that use rectangles to represent entities, ovals to define attributes and diamond shapes to represent relationships.

- At first look, an ER diagram looks very similar to the flowchart. However, ER Diagram includes many specialized symbols, and its meanings make this model unique. The purpose of ER Diagram is to represent the entity framework infrastructure.

What is ER Model?

- ER Model stands for Entity Relationship Model is a high-level conceptual data model diagram. ER model helps to systematically analyze data requirements to produce a well-designed database.
- ER Model represents real-world entities and the relationships between them. Creating an ER Model in DBMS is considered as a best practice before implementing your database.
- ER Modeling helps you to analyze data requirements systematically to produce a well-designed database. So, it is considered a best practice to complete ER modeling before implementing your database.

Why use ER Diagrams?

Here, are prime reasons for using the ER Diagram

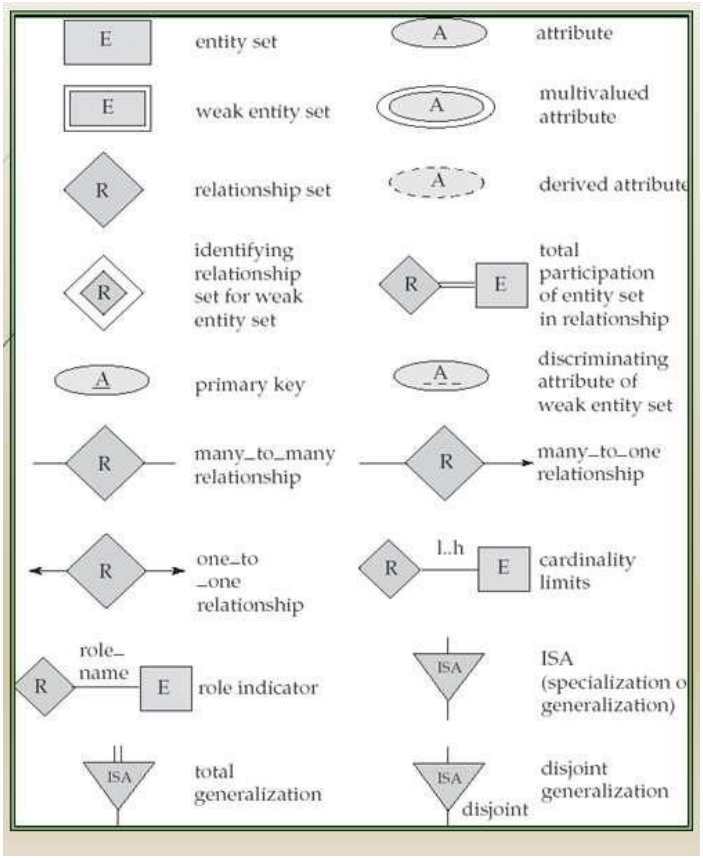
- Helps you to define terms related to entity relationship modeling
- Provide a preview of how all your tables should connect, what fields are going to be on each table
- Helps to describe entities, attributes, relationships
- ER diagrams are translatable into relational tables which allows you to build databases quickly
- ER diagrams can be used by database designers as a blueprint for implementing data in specific software applications
- The database designer gains a better understanding of the information to be contained in the database with the help of ERP diagram
- ERD Diagram allows you to communicate with the logical structure of the database to users

Components of the ER Diagram

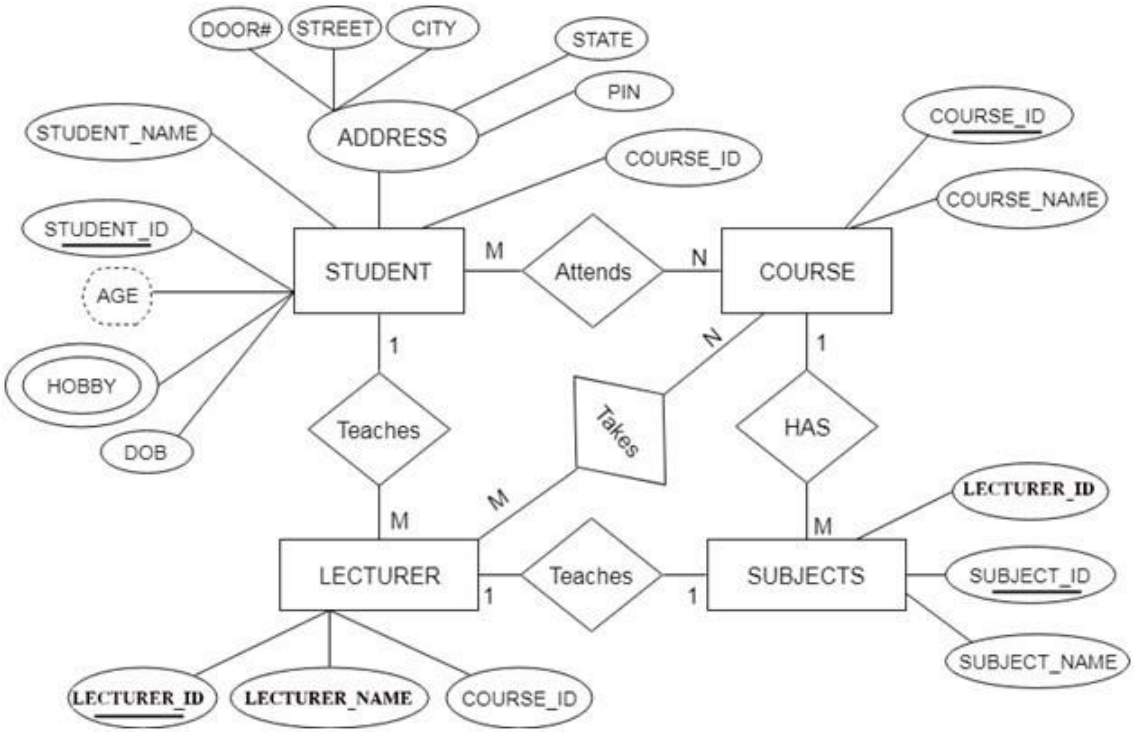
This model is based on three basic concepts: Entities, Attributes, Relationships

ER Diagram – Notations

- Rectangles represent entity sets.
- Diamonds represent relationship sets.
- Lines link attributes to entity sets and entity sets to relationship sets.
- Ellipses represent attributes
- Double ellipses represent multivalued attributes.
- Dashed ellipses denote derived attributes.
- Underline indicates primary key attributes



ER Diagram of University Database



ADDITIONAL NOTES

- A database can be modeled as a collection of entities, relationship among entities.
- An entity is an object that exists and is distinguishable from other objects.
Example: specific person, company, event, plant
- Entities have attributes.
Example: people have names and addresses
- An entity set is a set of entities of the same type that share the same properties.
Example: set of all persons, companies, trees, holidays

- Express the number of entities to which another entity can be associated via a relationship set.
- Most useful in describing binary relationship sets.
- We express cardinality constraints by drawing either a directed line (->), signifying "one," or an undirected line (—), signifying "many," between the relationship set and the entity set.

- An entity is represented by a set of attributes, that is descriptive properties possessed by all members of an entity set.
Example: customer = (customer-id, customer-name, customer-street, customer-city)
loan = (loan-number, amount)
- Domain – the set of permitted values for each attribute
- Attribute types:
1. Simple and composite attributes.
2. Single-valued and multi-valued attributes
E.g. multivalued attribute: phone-numbers
3. Derived attributes-Can be computed from other attributes

E.g. age, given date of birth

Cardinality

- For a binary relationship set the mapping cardinality must be one of the following types:

1. One to one

A customer is associated with at most one loan via the relationship borrower. A loan is associated with at most one customer via borrower

2. One to many

A loan is associated with at most one customer via borrower, a customer is associated with several (including 0) loans via borrower

3. Many to one

A loan is associated with several (including 0) customers via borrower, a customer is associated with at most one loan via borrower

4. Many to many

A loan is associated with several (including 0) customers via borrower, a customer is associated with several loans (including 0) via borrower

Weak Entity Set

- An entity set that does not have a primary key is referred to as a weak entity set and represented by double outlined box in E-R diagram.

Example : Consider the entity set payment which got three attributes : payment_number, payment_date and payment_amount. Payment numbers are sequential starting from 1 generally separately for each loan. Although each payment entity is distinct, payments for different loans may share the same payment number. Thus this entity set does not have a primary key.

Discriminator

- The discriminator (or partial key) of a weak entity set is the set of attributes that distinguishes among all the entities of a weak entity set

Example: discriminator of weak entity set payment is the attribute payment_number since for each loan a payment number uniquely identifies one single payment for that loan.

Specialization-Generalization-ISA

- E-R model provides means of representing these distinctive entity groupings
- Process of designating subgroupings within an entity set is called specialization depicted by triangle component labelled ISA (“is a”)
- Bottom up design process in which multiple entity sets are synthesized into higher level entity set - Generalization
- ISA relationship may also be referred to as superclass-subclass relationship
- Higher and lower level entity sets are designated by the terms superclass and subclass.
- Specialization and generalization are simple inversions of each other; they are represented in an E-R diagram in the same way.

Total & Partial Participation

- Total participation (indicated by double line): every entity in the entity set participates in at least one relationship in the relationship set

E.g. participation of loan in borrower is total, every loan must have a customer associated to it via borrower

- Partial participation: some entities may not participate in any relationship in the relationship set

Example: participation of customer in borrower is partial

Cardinality limits

- Cardinality limits can also express participation constraints
- Minimum and maximum cardinality is expressed as l..h where l is the minimum and h is the maximum cardinality
- Minimum value of 1 indicates total participation of entity set in relationship set
- Maximum value of 1 indicates entity participates in atmost one relationship set.
- Maximum value of * indicates no limit

Role indicator

- Entity sets of a relationship need not be distinct
- The labels "manager" and "worker" are called roles; they specify how employee entities interact via the works-for relationship set.
- Roles are indicated in E-R diagrams by labeling the lines that connect diamonds to rectangles.
- Role labels are optional, and are used to clarify semantics of the relationship

Disjoint Generalization

- Disjointness constraint requires that an entity belong to more than one lower level entity set. Example: account entity can satisfy only one condition for account_type attribute ; entity can either be savings or chequing account but not both.

School of Computing

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	8
Title of Experiment	Develop a Data Flow Diagram (Process-Up to Level 1)
Name of the candidate	P.BALAJI MURUGAN
Team Members	BALAJI MURUGAN , SAI VARMA , AKSHAT
Register Number	RA2011003011404
Date of Experiment	16-5-2022

Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

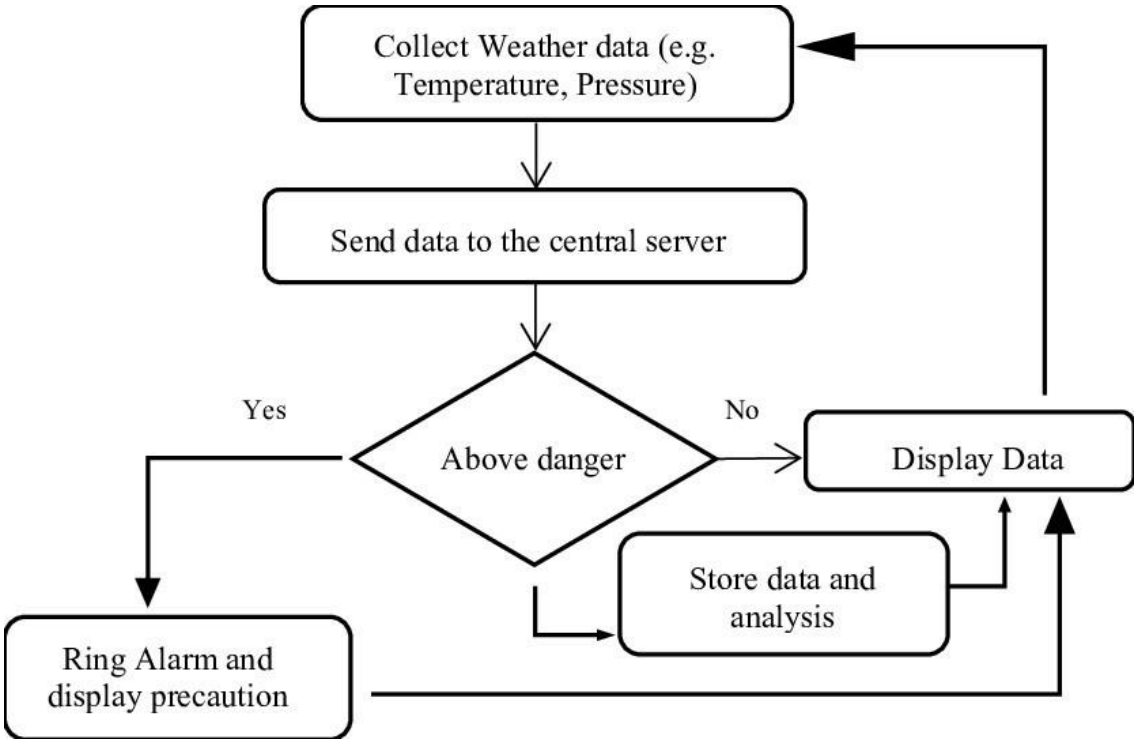
Aim

To develop the data flow diagram up to level 1 for the WEATHER FORECASTING WEBSITE.

Team Members:

S No	Register No	Name	Role
1	**RA2011003011404**	BALAJI MURUGAN	**Rep**
2	**RA2011003011372**	SAI VARMA	**Member**
3	**RA2011003011407**	AKSHAT	**Member**

<DFD >



Result:

Thus, the data flow diagrams have been created for the weather forecasting website.

School of Computing

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	9
Title of Experiment	Design a Sequence and Collaboration Diagram
Name of the candidate	P. BALAJI MURUGAN
Team Members	BALAJI MURUGAN , SAI VARMA , AKSHAT
Register Number	RA2011003011404
Date of Experiment	27/5/22

Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

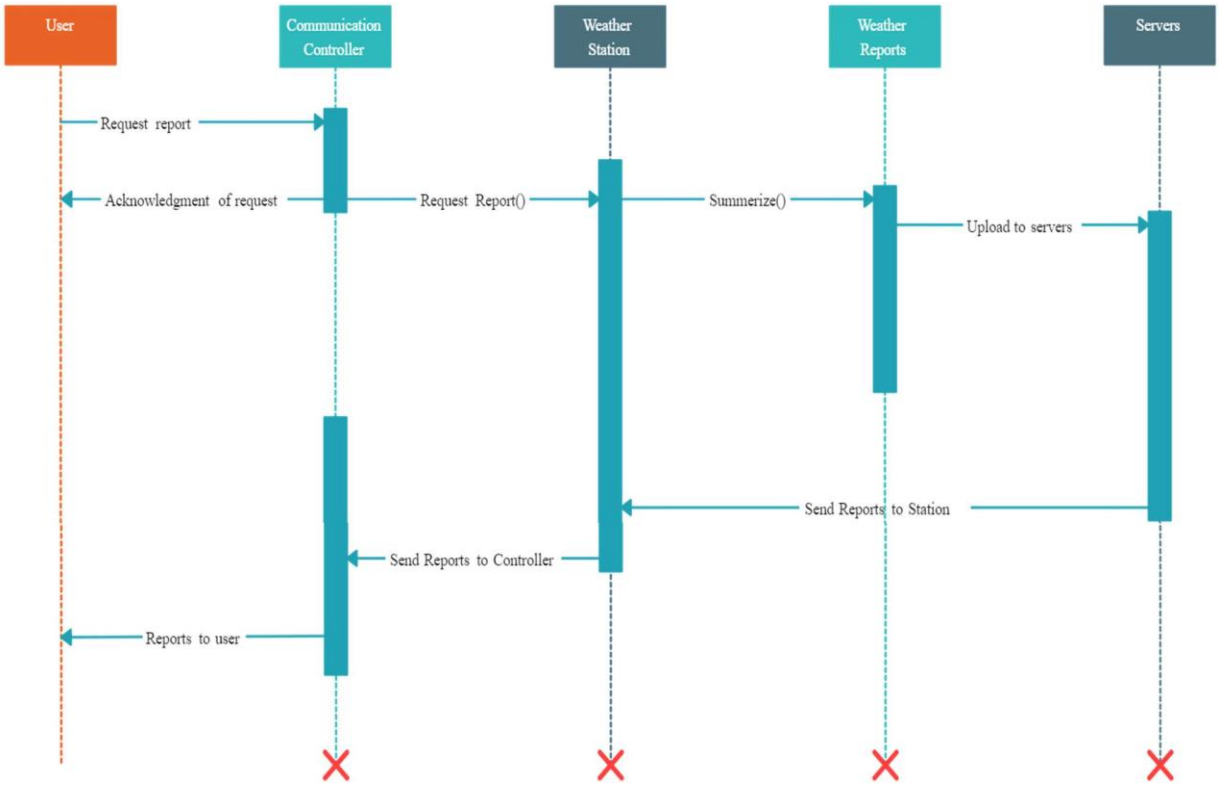
Aim

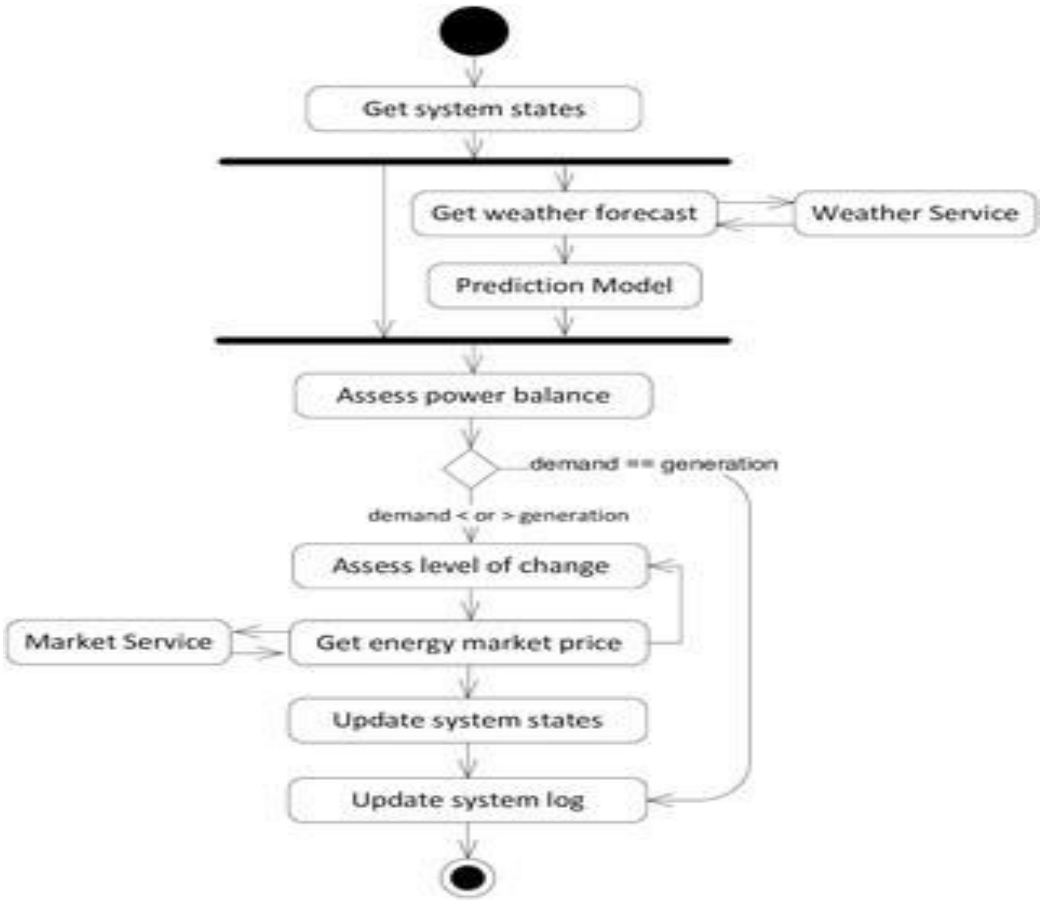
To create the sequence and collaboration diagram for the <project name>

Team Members:

S No	Register No	Name	Role
1	RA2011003011404	BALAJI MURUGAN	Rep/Member
2	RA2011003011372	SAI VARMA	Member
3	RA2011003011407	AKSHAT	Member

<Sequence and Collaboration Diagram>



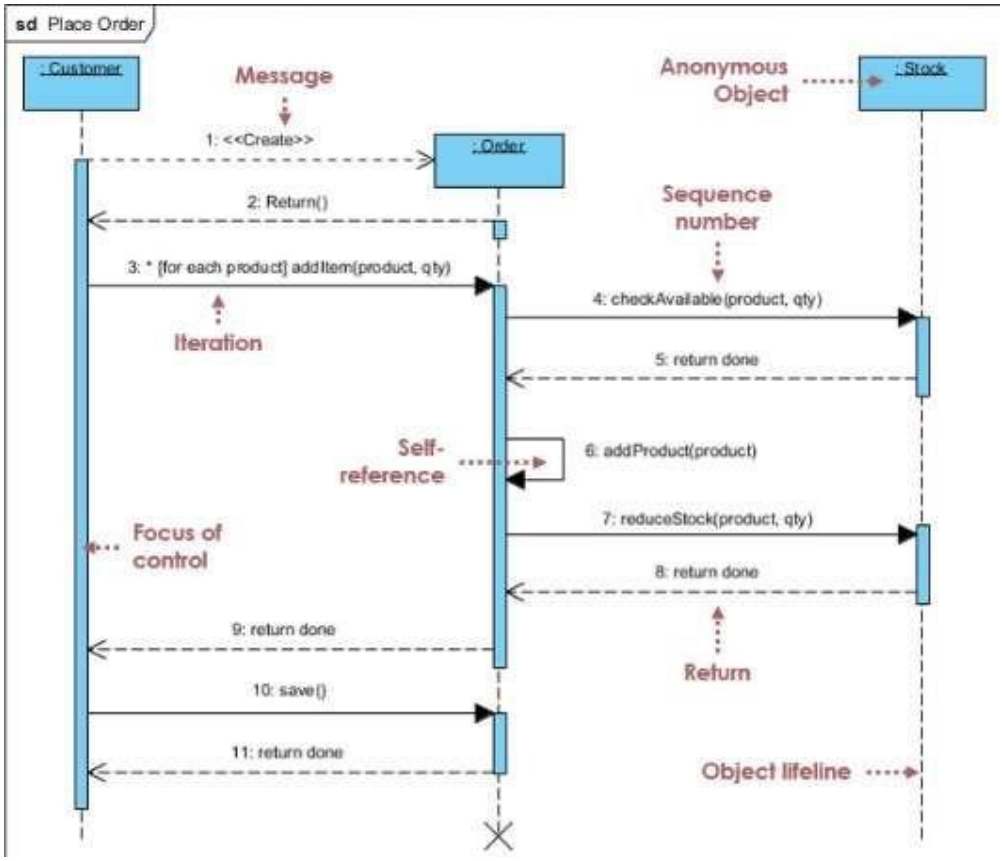


Result:

Thus, the sequence and collaboration diagrams were created for the <project name>.

***/ For Example**

Sequence Diagram



Collaboration Diagram

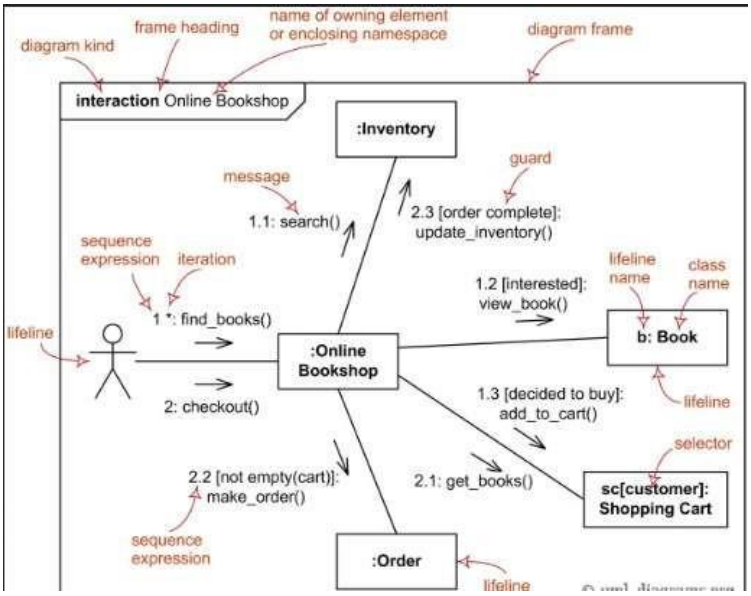


diagram kind
frame heading
name of owning element or enclosing namespace
diagram frame
interaction Online Bookshop
:Inventory
guard
message
1.1: search()
2.3 [order complete]: update_inventory()
sequence expression
iteration
1 *: find_books()
lifeline name
class name
1.2 [interested]: view_book()
b: Book
lifeline
:Online Bookshop
2: checkout()
1.3 [decided to buy]: add_to_cart()
lifeline
selector
2.2 [not empty(cart)]: make_order()
2.1: get_books()
sc[customer]: Shopping Cart
sequence expression
:Order
lifeline

School of Computing

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	10
Title of Experiment	Develop a Testing Framework/User Interface
Name of the candidate	P.BALAJI MURUGAN
Team Members	BALAJI MURUGAN , SAI VARMA , AKSHAT
Register Number	RA2011003011404
Date of Experiment	15/6/22

Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

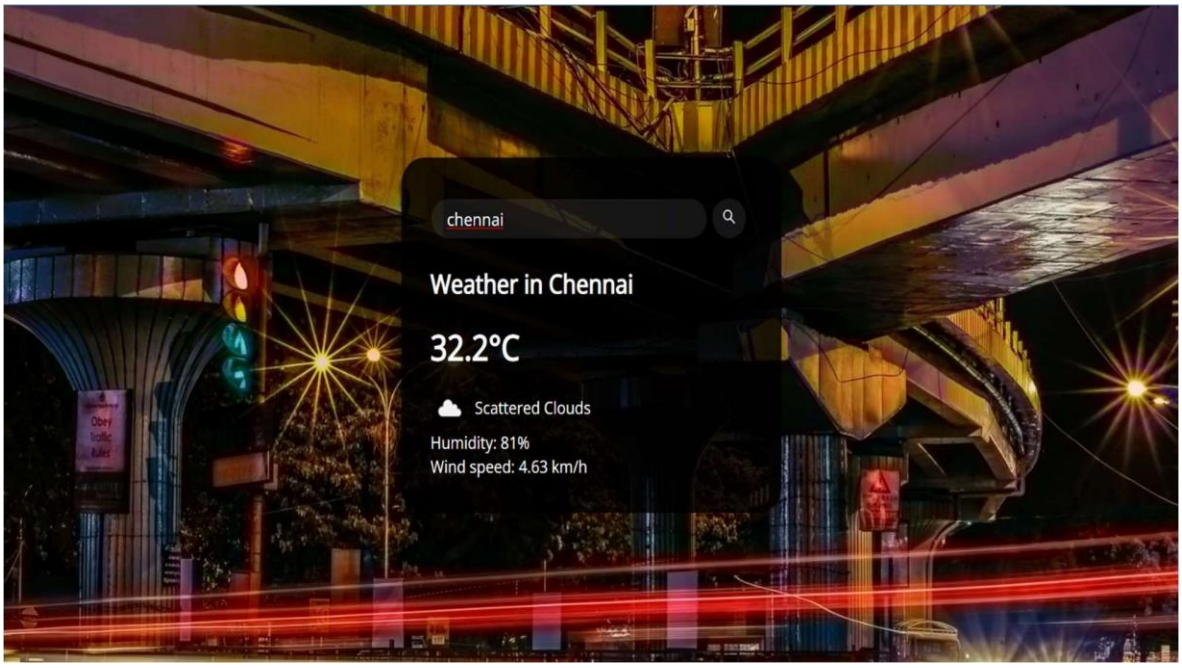
To develop the testing framework and/or user interface framework for the WEATHER FORECASTING SITE.

Team Members:

S No	Register No	Name	Role
1	RA2011003011404	BALAJI MURUGAN	Rep/Member
2	RA2011003011372	SAI VARMA	Member
3	RA2011003011407	AKSHAT	Member

<Incorporate the necessary information regarding testing/user interface of the project>

USER INTERFACE :



Result:

Thus, the testing framework/user interface framework has been created for the <project name>.

***/ For example**

Executive Summary

<<defines the scope, objective, and approach to test the software application>>

Test Plan

Scope of Testing

<<summarize the scope of testing >

Functional: Are all modules covered? Any exception for any modules ? Does automation cover all functional test cases or Regression – Critical Path Test Cases ?

Non-Functional: Are all NFR (Non-Functional Requirements) covered?

Types of Testing, Methodology, Tools

Category	Methodology	Tools Required
Functional Requirements	Manual	Word Template

School of Computing

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	11
Title of Experiment	Test Cases
Name of the candidate	P.BALAJI MURUGAN
Team Members	BALAJI MURUGAN , SAI VARMA , AKSHAT
Register Number	RA2011003011404
Date of Experiment	20/6/22

Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

To develop the test cases manual for the WEATHER FORECASTING WEBSITE.

Team Members:

S No	Register No	Name	Role
1	RA2011003011404	BALAJI MURUGAN	Rep
2	RA2011003011372	SAI VARMA	Member
3	RA2011003011407	AKSHAT	Member

<Utilize the templates below and incorporate the project's test cases - Manual Test case to be written for at least one module >

***/ For example**

Test Case

Functional Test Cases

Test ID (#)	Test Scenario	Test Case	Execution Steps	Expected Outcome	Actual Outcome	Status	Remarks
	Verify User ENTERED LOCATION	Accept Valid LOCATION FROM USER	1. User clicks on SEARCH BAR 2. Enter the LOCATION IN the SEARCH box 3. Click SEARCH button	User should be taken to the next page for WEATHER FORECASTING DETAILS	USER IS TAKEN TO WEATHER FORESATING DETAILS	Pass	success

Non-Functional Test Cases

Test ID (#)	Test Scenario	Test Case	Execution Steps	Expected Outcome	Actual Outcome	Status	Remarks
	IF ENTERED WRONG LOCATION	GGFFD	LOCATION NOT FOUND MESSAGE WILL BE DISLAYED	LOCATION NOT FOUND	LOCATION NOT FOUND	PASS	SUCCESS

Result:

Thus, the test case manual has been created for the WEATHER FORECASTING SITE.

School of Computing

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	12
Title of Experiment	Manual Test Case Reporting
Name of the candidate	P. BALAJI MURUGAN
Team Members	BALAJI MURUGAN , SAI VARMA , AKSHAT
Register Number	RA2011003011404
Date of Experiment	27/5/22

Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

To prepare the manual test case report for the <project name>

Team Members:

S No	Register No	Name	Role
1	RA2011003011404	BALAJI MURUGAN	Rep/Member
2	RA2011003011372	SAI VARMA	Member
3	RA2011003011407	AKSHAT	Member

<Manual Test Case Report to be incorporated >

<< Summarize the current status of the Testing>

<<present obstacles to proceed further >>

<< Seek help from stakeholders to remove obstacles/constraints>>

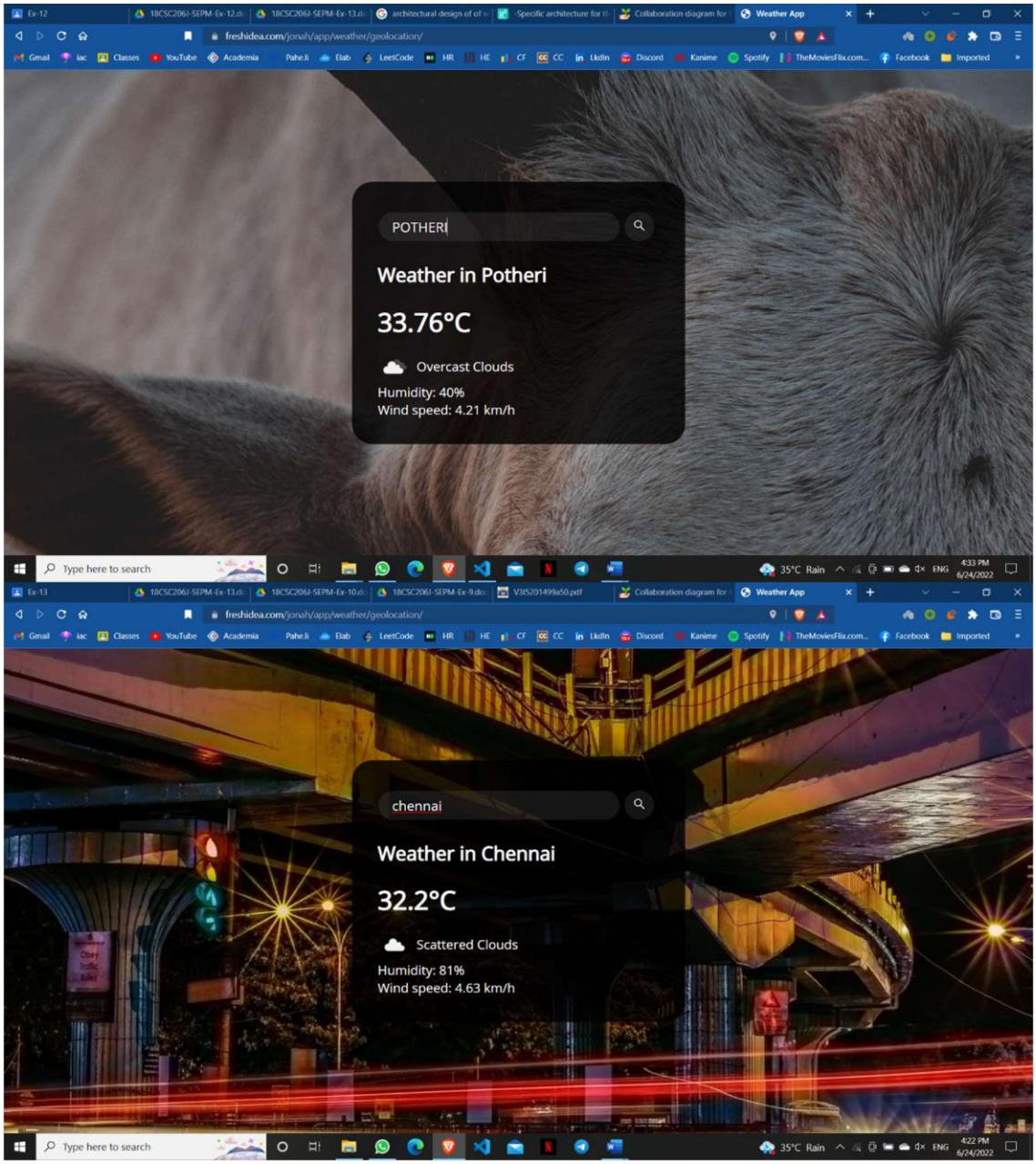
TEST CASES :

1) BENGALURU

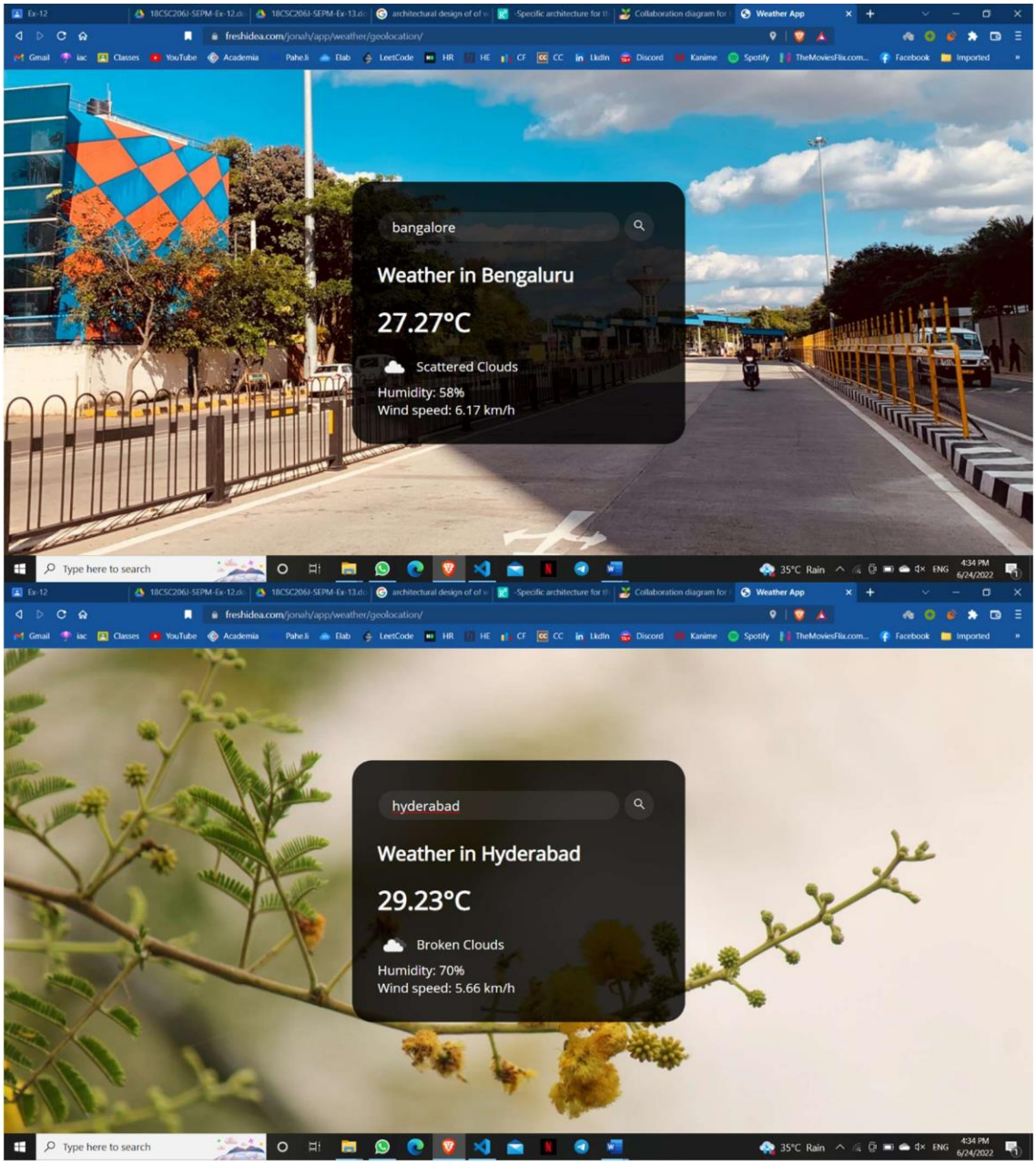
2) HYDERABAD

3) POTHERI

4) CHENNAI


Weather App
freshidea.com/jonah/app/weather/geolocation/
POTHERI
Weather in Potheri
33.76°C
Overcast Clouds
Humidity: 40%
Wind speed: 4.21 km/h
Type here to search
35°C Rain
ENG
4:33 PM
6/24/2022

Weather App
freshidea.com/jonah/app/weather/geolocation/
chennai
Weather in Chennai
32.2°C
Scattered Clouds
Humidity: 81%
Wind speed: 4.63 km/h
Type here to search
35°C Rain
ENG
4:22 PM
6/24/2022



Category	Progress Against Plan	Status
Functional Testing	Green / Amber / Red	Not-Started / In-Progress / Completed
Non-Functional Testing		

Functional	Test Case Coverage (%)	Status
Module ID	30%	Not-Started / In-Progress / Completed

Result:

Thus, the test case report has been created for the WEATHER FORECASTING SITE.

School of Computing

SRM IST, Kattankulathur – 603 203

Course Code: 18CSC206J

Course Name: Software Engineering and Project Management

Experiment No	13
Title of Experiment	Provide the details of Architecture Design/Framework/Implementation
Name of the candidate	P. BALAJI MURUGAN
Team Members	BALAJI MURUGAN , SAI VARMA , AKSHAT
Register Numbers	RA2011003011404
Date of Experiment	20/6/22

Mark Split Up

S. No	Description	Maximum Mark	Mark Obtained
1	Exercise	5	
2	Viva	5	
	Total	**10**	

Staff Signature with date

Aim

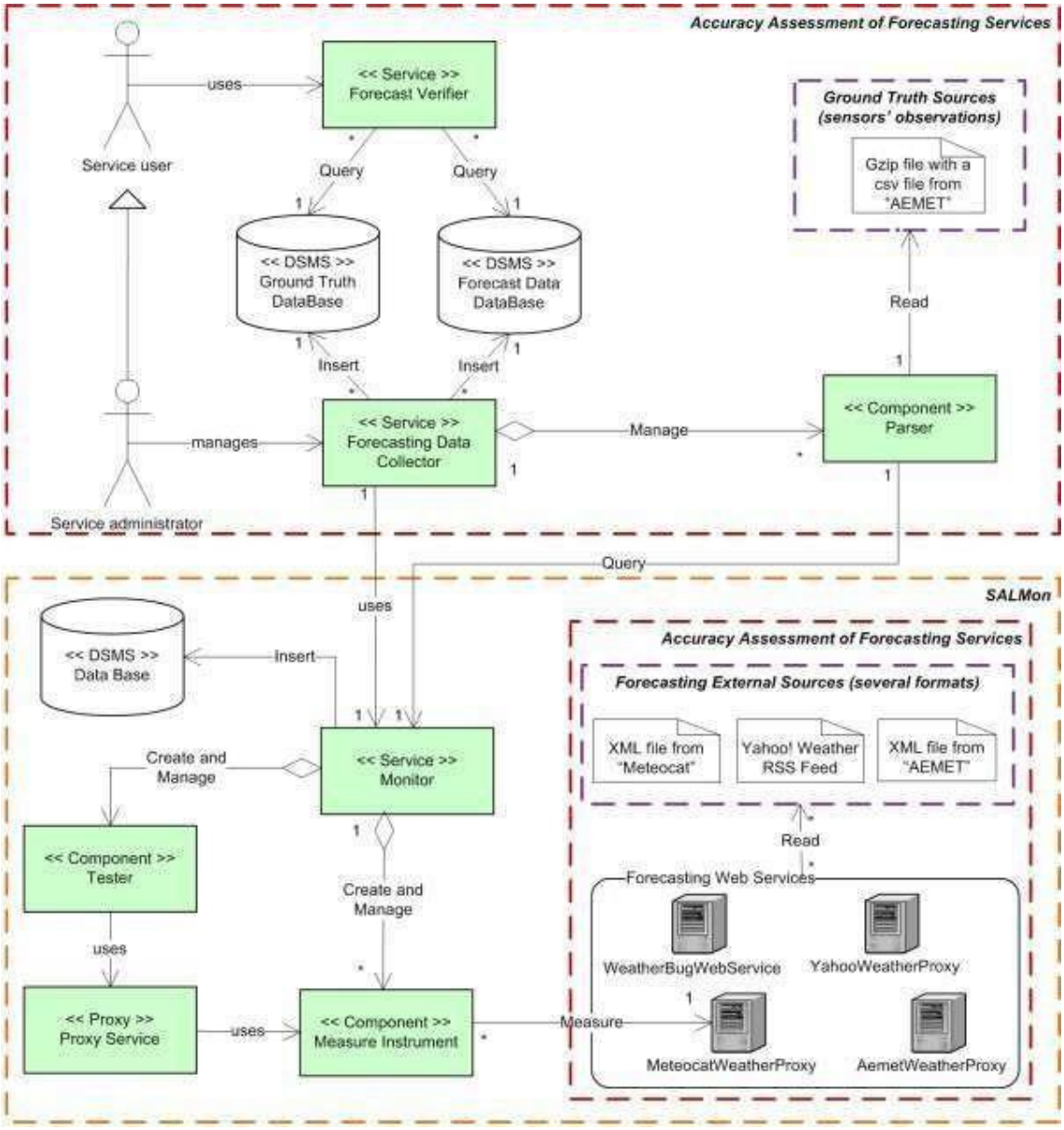
To provide the details of architectural design/framework/implementation

Team Members:

S No	Register No	Name	Role
1	RA2011003011404	BALAJI MURUGAN	Rep/Member
2	RA2011003011372	SAI VARMA	Member
3	RA2011003011407	AKSHAT	Member

< Provide the details of architectural design/framework/implementation with screenshots - Minimum three modules to be completed (excluding login page) use of software on their choice to implement>

Full documentation with the coding



HTML CODE :

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Weather App</title>
  <link rel="preconnect" href="https://fonts.gstatic.com">
  <link  href="https://fonts.googleapis.com/css2?family=Open+Sans&display=swap"
rel="stylesheet">
```

```
  <link rel="stylesheet" href="./style.css">
  <script src="./script.js" defer></script>
</head>

<body>
  <div class="card">
    <div class="search">
      <input type="text" class="search-bar" placeholder="Search">
      <button><svg stroke="currentColor" fill="currentColor" stroke-width="0"
viewBox="0 0 1024 1024" height="1.5em"
          width="1.5em" xmlns="http://www.w3.org/2000/svg">
          <path
            d="M909.6 854.5L649.9 594.8C690.2 542.7 712 479 712 412c0-80.2-
31.3-155.4-87.9-212.1-56.6-56.7-132-87.9-212.1-87.9s-155.5 31.3-212.1
87.9C143.2 256.5 112 331.8 112 412c0 80.1 31.3 155.5 87.9 212.1C256.5 680.8
331.8 712 412 712c67 0 130.6-21.8 182.7-62l259.7 259.6a8.2 8.2 0 0 0 11.6
0l43.6-43.5a8.2 8.2 0 0 0 0-11.6zM570.4 570.4C528 612.7 471.8 636 412 636s-
116-23.3-158.4-65.6C211.3 528 188 471.8 188 412s23.3-116.1 65.6-158.4C296
211.3 352.2 188 412 188s116.1 23.2 158.4 65.6S636 352.2 636 412s-23.3 116.1-
65.6 158.4z">
          </path>
        </svg></button>
    </div>
    <div class="weather loading">
      <h2 class="city">Weather in Denver</h2>
      <h1 class="temp">51°C</h1>
      <div class="flex">
        <img src="https://openweathermap.org/img/wn/04n.png" alt=""
class="icon" />
        <div class="description">Cloudy</div>
      </div>
      <div class="humidity">Humidity: 60%</div>
      <div class="wind">Wind speed: 6.2 km/h</div>
    </div>
  </div>
</body>

</html>
```

CSS CODE :

```
body {
    display: flex;
    justify-content: center;
    align-items: center;
    height: 100vh;
    margin: 0;
    font-family: 'Open Sans', sans-serif;
    background: #222;
```

```
  background-image: url('https://source.unsplash.com/1600x900/?landscape');
  font-size: 120%;
}

.card {
  background: #000000d0;
  color: white;
  padding: 2em;
  border-radius: 30px;
  width: 100%;
  max-width: 420px;
  margin: 1em;
}

.search {
  display: flex;
  align-items: center;
  justify-content: center;
}

button {
  margin: 0.5em;
  border-radius: 50%;
  border: none;
  height: 44px;
  width: 44px;
  outline: none;
  background: #7c7c7c2b;
  color: white;
  cursor: pointer;
  transition: 0.2s ease-in-out;
}

input.search-bar {
  border: none;
  outline: none;
  padding: 0.4em 1em;
  border-radius: 24px;
  background: #7c7c7c2b;
  color: white;
  font-family: inherit;
  font-size: 105%;
  width: calc(100% - 100px);
}

button:hover {
  background: #7c7c7c6b;
}
```

```css
h1.temp {
  margin: 0;
  margin-bottom: 0.4em;
}

.flex {
  display: flex;
  align-items: center;
}

.description {
  text-transform: capitalize;
  margin-left: 8px;
}

.weather.loading {
  visibility: hidden;
  max-height: 20px;
  position: relative;
}

.weather.loading:after {
  visibility: visible;
  content: "Loading...";
  color: white;
  position: absolute;
  top: 0;
  left: 20px;
}
```

JAVA SCRIPT CODE:

```javascript
let weather = {
    apiKey: "API KEY GOES HERE",
    fetchWeather: function (city) {
      fetch(
        "https://api.openweathermap.org/data/2.5/weather?q=" +
          city +
          "&units=metric&appid=" +
          this.apiKey
      )
        .then((response) => {
          if (!response.ok) {
            alert("No weather found.");
            throw new Error("No weather found.");
          }
          return response.json();
        })
```

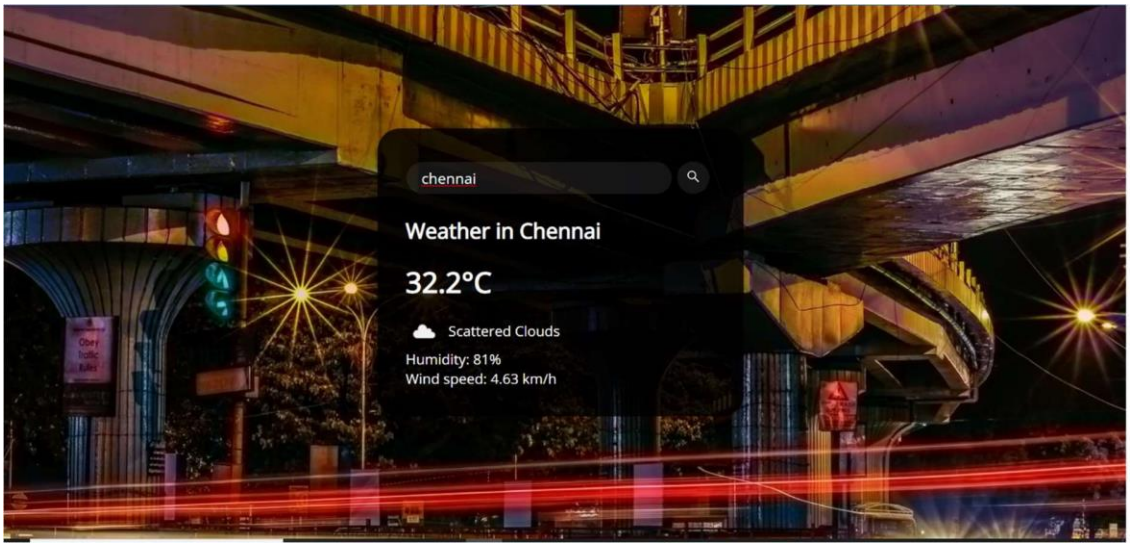
```
        .then((data) => this.displayWeather(data));
    },
    displayWeather: function (data) {
      const { name } = data;
      const { icon, description } = data.weather[0];
      const { temp, humidity } = data.main;
      const { speed } = data.wind;
      document.querySelector(".city").innerText = "Weather in " + name;
      document.querySelector(".icon").src =
        "https://openweathermap.org/img/wn/" + icon + ".png";
      document.querySelector(".description").innerText = description;
      document.querySelector(".temp").innerText = temp + "°C";
      document.querySelector(".humidity").innerText =
        "Humidity: " + humidity + "%";
      document.querySelector(".wind").innerText =
        "Wind speed: " + speed + " km/h";
      document.querySelector(".weather").classList.remove("loading");
      document.body.style.backgroundImage =
        "url('https://source.unsplash.com/1600x900/?" + name + "')";
    },
    search: function () {
      this.fetchWeather(document.querySelector(".search-bar").value);
    },
  };

  document.querySelector(".search button").addEventListener("click", function
() {
    weather.search();
  });

  document
    .querySelector(".search-bar")
    .addEventListener("keyup", function (event) {
      if (event.key == "Enter") {
        weather.search();
      }
    });

  weather.fetchWeather("Chennai");
```

SCREENSHOT :



Result:

Thus, the details of architectural design/framework/implementation along with the screenshots were provided.