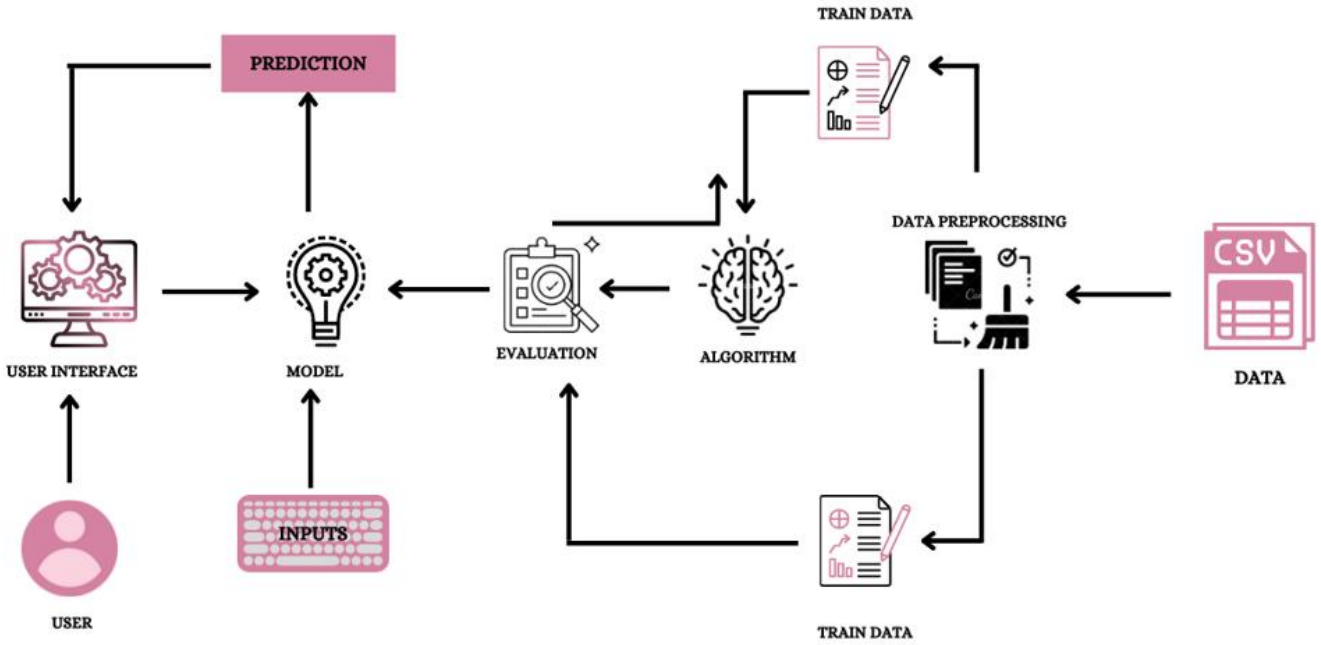
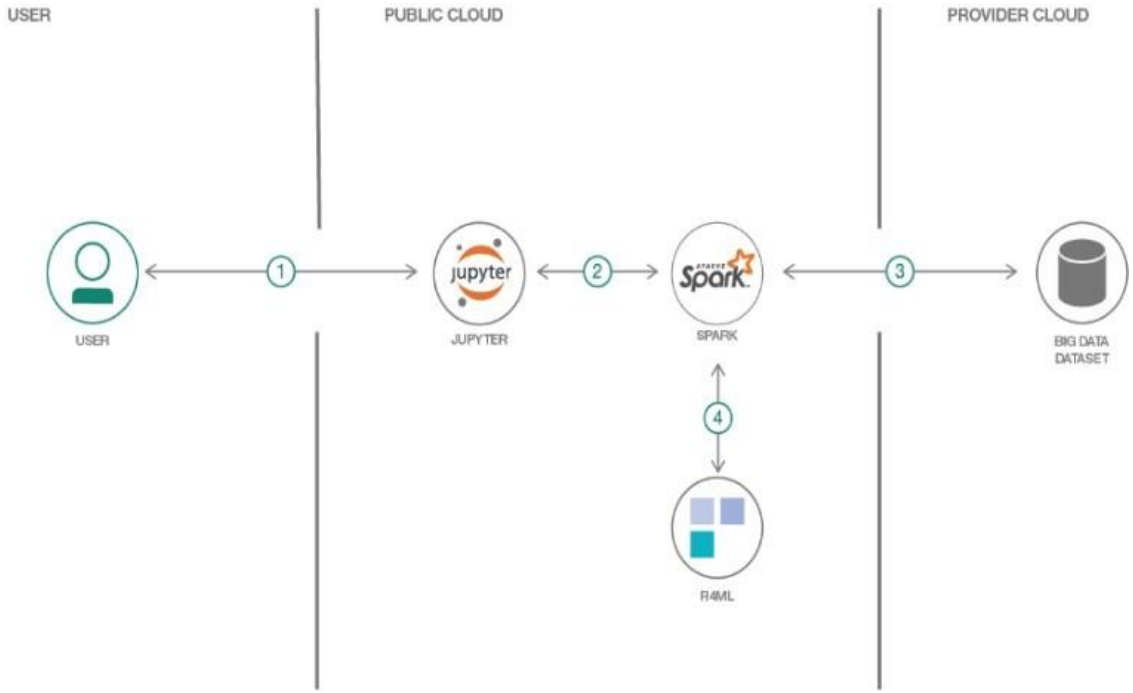
Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	16 October 2022
Team ID	PNT2022TMID01346
Project Name	Developing a Flight Delay Prediction Model using Machine Learning
Maximum Marks	4 Marks

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2





Guidelines:

1. Include all the processes (As an application logic / Technology Block)
2. Provide infrastructural demarcation (Local / Cloud)
3. Indicate external interfaces (third party API's etc.)
4. Indicate Data Storage components / services
5. Indicate interface to machine learning models (if applicable)

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	User interacts using web application Web UI	HTML, CSS, JS, Flask
2.	Application Logic-1	Logic for a process in the application	Python (numpy libraries)
3.	Application Logic-2	Logic for a process in the application	Python, java
4.	Application Logic-3	Logic for model building	Machine learning model Decision tree classifier .
5.	Data Preprocessing	To clean data	Panadas, numpy
6.	Database	Database contains the user information and flight details	MySQL
7.	File Storage	File storage requirements	IBM Block Storage or Other storage
8.	External API-1	Time Door is a REST API for statistical insights into time series data.	IBM Weather API, Http, Timedoor.
9.	External API-2	Purpose of External API used in the application	Email API, etc
10.	Machine Learning Model	Ensemble of multiple decision trees provide better classification accuracy. Random forest obtains a class vote for decision tree.	Random forest, Decision tree classifier.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System	IBM cloud

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	It is used to build almost any type of website — from content management systems and wikis, through to social networks and news sites	Python-Flask
2.	Security Implementations	It is used to identify the threats in the system. To measure the potential vulnerabilities of the system	Encryptions, Risk assessment, Authentication
3.	Scalable Architecture	To determine the user limit for the web application.	Scalability testing
4.	Availability	Running an application for a planned period of time, collecting failure events and repair times	Load testing, endurance testing.
5.	Performance	Determines the behaviour of web application when it receives extreme variations in Traffic.	Spike testing, stress testing.