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

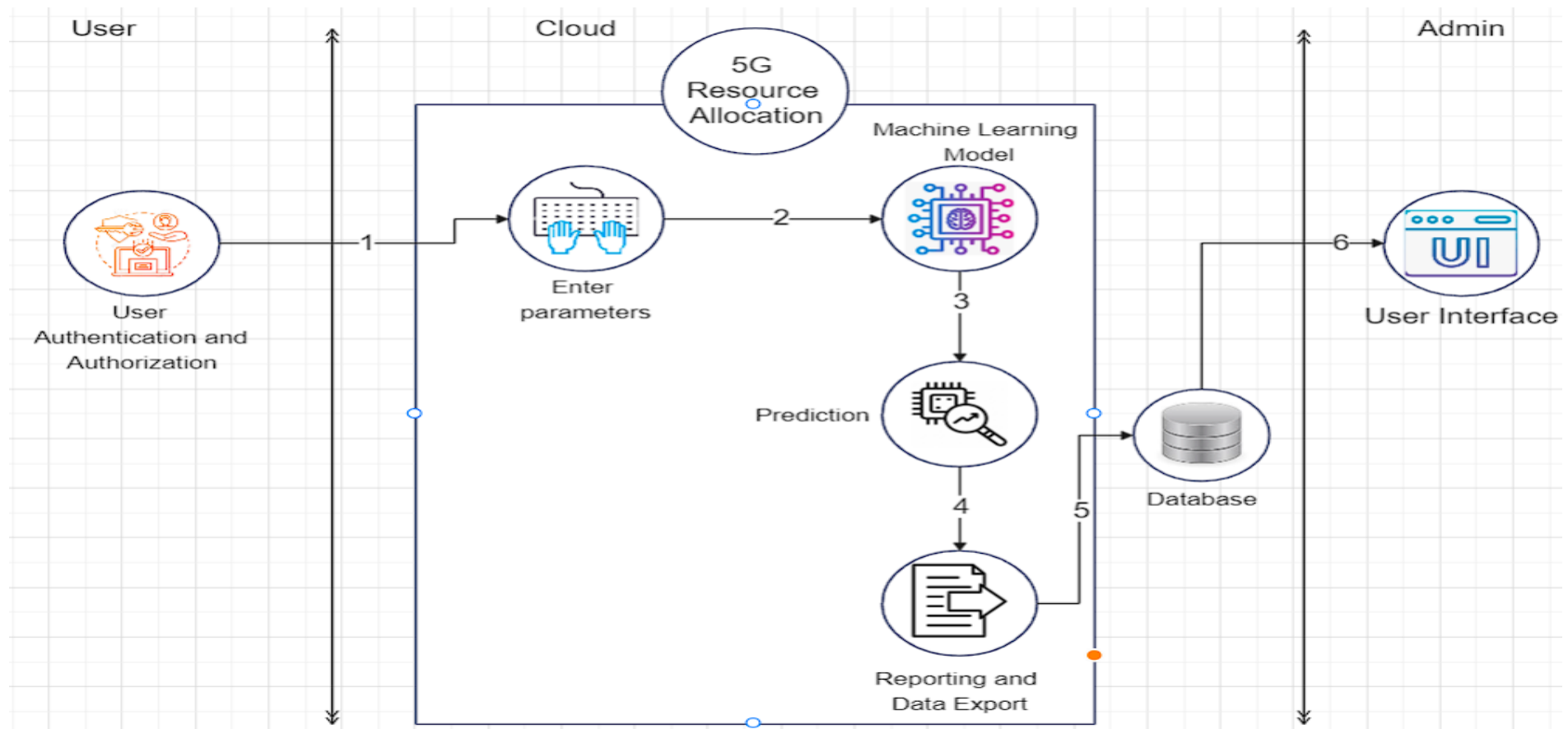| Date	27 October 2023
Team ID	PNT2022TMID592348
Project Name	Project - AI-Driven Optimization of 5G Resource Allocation for Network Efficiency
Maximum Marks	4 Marks

Technical Architecture:

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1	Data Collection and Preprocessing	Collect and preprocess network data for modeling	SQL, Python, Pandas
2	Feature Engineering	Extract relevant features from preprocessed data	Python, Pandas
3	Machine Learning Model Development	Create and train resource allocation models	Python, Scikit-Learn
4	Model Evaluation and Selection	Assess and choose the best-performing model	Python, Scikit-Learn
5	Web User Interface Development	Create a user-friendly web interface	HTML, CSS, Flask/Streamlit
6	User Authentication and Authorization	Implement secure user access	Python, Flask/Streamlit
7	Monitoring and Feedback Mechanism	Monitor system performance and gather feedback	Python, Flask/Streamlit
8	Reporting and Data Export	Generate network performance reports	Python, Flask/Streamlit
9	User Account and System Configuration	Manage user accounts and configure system	Python, Flask/Streamlit
10	Documentation and Reporting	Create system documentation and reports	Markdown, Word Processors

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1	Resource Prediction	Predict resource requirements based on historical data.	Machine Learning (ML) algorithms
2	Reporting and Analysis	Provide performance reports and data analysis.	Data Visualization, Reporting Tools
3	Security and Privacy	Ensure data security and user privacy.	Encryption, Access Control
4	Scalability	Scale to accommodate growing user and device numbers.	Load Balancing, Cloud Technologies
5	Fault Tolerance	Ensure system reliability and recovery from failures.	Redundancy, Error Handling
6	Data Visualization	Display network metrics in a visually comprehensible way.	Data Visualization Libraries
7	Mobile Compatibility	Enable users to access the system from mobile devices.	Responsive Web Design
8	Data Analytics	Analyze data to identify optimization opportunities.	Data Analytics Tools, ML algorithms