Rising Waters: A Machine Learning Approach To Flood Prediction

Technology Stack

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1. Programming Language

- Python – Core development language for data processing, model building, and evaluation.

2. Data Collection & Storage

- Pandas – Data manipulation and preprocessing.
- NumPy – Numerical computations.
- CSV / Excel Files – Historical rainfall and water level datasets.
- SQL (MySQL / PostgreSQL) – Structured data storage.
- APIs – Real-time weather and river data integration.

3. Data Visualization

- Matplotlib – Basic plotting and trend analysis.
- Seaborn – Statistical data visualization.
- Plotly – Interactive flood risk dashboards.

4. Machine Learning Frameworks

- Scikit-learn – Model training and evaluation (Linear Regression, Random Forest, Decision Tree, Support Vector Machine).
- TensorFlow – Deep learning models.
- Keras – Neural network implementation.

5. Model Deployment

- Flask – Web application framework.
- Streamlit – Interactive web dashboard.
- FastAPI – High-performance API deployment.

6. Cloud & Hosting (Optional)

- AWS / Google Cloud / Azure – Cloud storage and deployment.
- Heroku – Web app hosting.

7. Version Control

- Git – Code version management.
- GitHub – Repository hosting.

8. Development Environment

- Jupyter Notebook – Model experimentation.
- VS Code / PyCharm – Code development.

9. Additional Tools

- Power BI / Tableau – Advanced visualization and reporting.
- Docker – Containerization for deployment.
- Linux / Windows OS – Operating system support.