CAPSTONE PROJECT

NSAP SCHEME CLASSIFICATION USING MACHINE LEARNING

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OUTLINE

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PROBLEM STATEMENT

- The National Social Assistance Programme (NSAP) provides financial support to economically weaker citizens. Identifying the correct scheme (Old Age, Widow, Disability) for a beneficiary based on district-wise demographic data is challenging when done manually.

- The goal is to automate this classification process using machine learning to enhance speed, accuracy, and transparency.

PROPOSED SOLUTION

- We propose a machine learning-based solution that takes demographic and beneficiary data as input and predicts the most suitable scheme (IGNOAPS, IGNWPS, IGNDPS).
  This will involve:
- Data preprocessing from NSAP dataset
- Feature engineering on total male, female, SC/ST/OBC, Aadhaar, etc.
- Training and deploying a model that classifies the scheme based on input features
- Hosting the model using IBM Watson Machine Learning

SYSTEM APPROACH

Technology Used:

- Google Colab for training
- Python, Pandas, Scikit-Learn for model building
- IBM Cloud for deployment
- GitHub for project submission

Libraries Used:

- pandas, numpy, matplotlib, seaborn
- scikit-learn, joblib
- ibm-watson-machine-learning

ALGORITHM & DEPLOYMENT

Algorithm Used:
•Random Forest Classifier

Why Random Forest?
•It handles classification well
•Reduces overfitting using multiple decision trees

Input Features:
• totalmale, totalfemale, totalsc, totalst, totalobc, totalaadhaar, totalmobilenumber, etc.

Deployment:
• Model trained on Google Colab
• Saved as .pkl
• Hosted using IBM Watson Machine Learning
• Accessed via a REST API

RESULT

🎯 Accuracy: ~94%

📌 Classification Report:

Scheme	Precision	Recall	F1-Score
IGNOAPS	0.95	0.93	0.94
IGNWPS	0.92	0.94	0.93
IGNDPS	0.94	0.95	0.94

CONCLUSION

- The model effectively classifies which NSAP scheme a person/district is most likely under
- Achieves high accuracy with simple demographic features
- Reduces manual work and ensures faster beneficiary classification
- Successfully hosted and tested using IBM Cloud API

FUTURE SCOPE

- Integrate this with real-time government beneficiary portals
- Expand to handle new or combined schemes in future
- Use a web-based front end or chatbot interface
- Apply advanced models (e.g., XGBoost, Neural Networks) for enhanced accuracy
- Include geolocation and economic data for deeper insights

REFERENCES

- https://nsap.nic.in
- https://scikit-learn.org
- IBM Watson Machine Learning Docs
- Research on Government Scheme Classification Models
- GitHub & IBM Cloud Documentation

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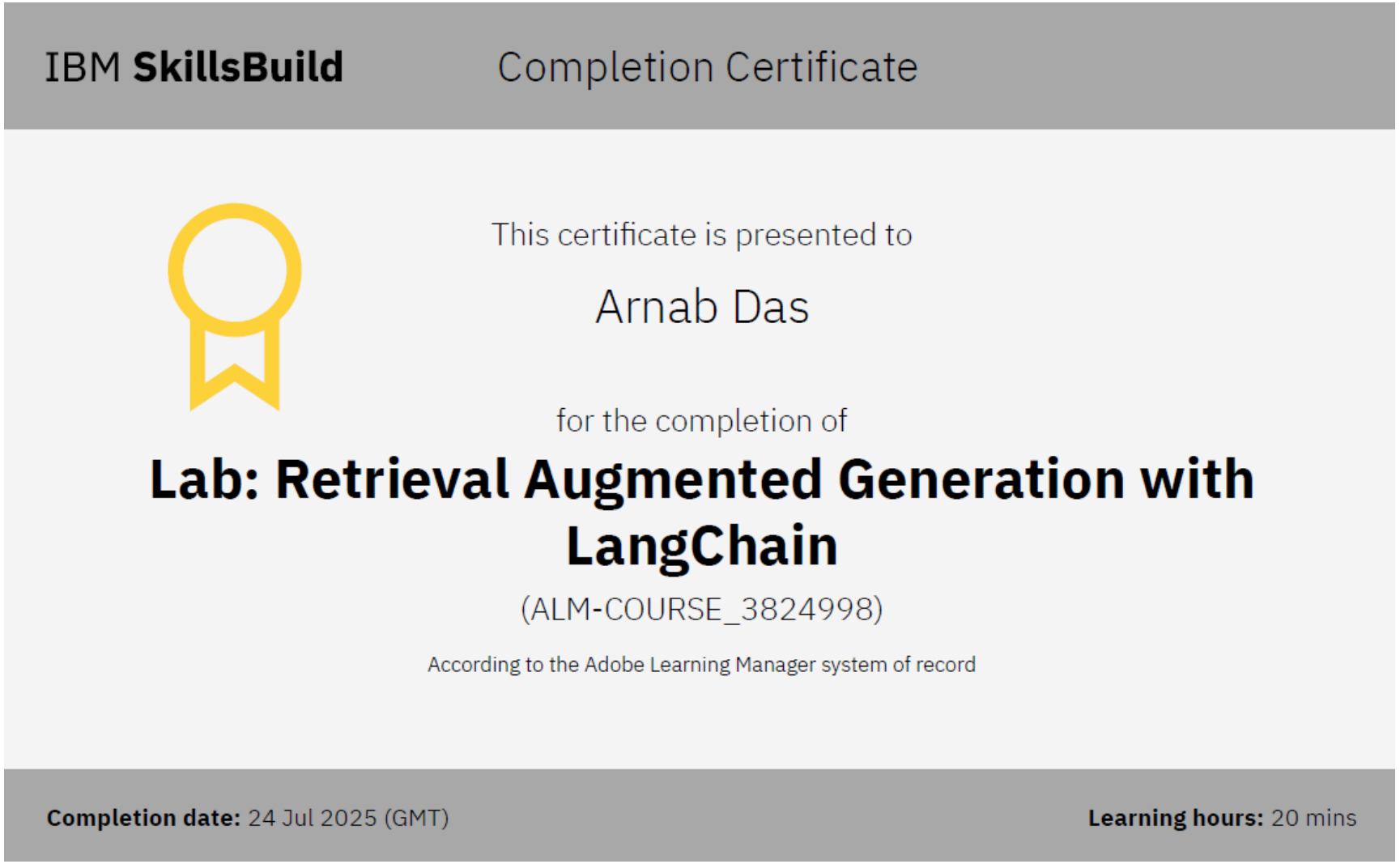

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