CAPSTONE PROJECT

PREDICTING ELIGIBILITY FOR NATIONAL SOCIAL ASSISTANCE PROGRAM (NSAP)

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OUTLINE

- Problem Statement
- Proposed System/Solution
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PROBLEM STATEMENT

The National Social Assistance Program (NSAP) is a flagship social security and welfare program by the Government of India. It aims to provide financial assistance to the elderly, widows, and persons with disabilities belonging to below-poverty-line (BPL) households. The program consists of several sub-schemes, each with specific eligibility criteria. Manually verifying applications and assigning the correct scheme can be a time-consuming and error-prone process. Delays or incorrect allocation can prevent deserving individuals from receiving timely financial aid. Your task is to design, build, and evaluate a multi-class classification model that can accurately predict the most appropriate NSAP scheme for an applicant based on their demographic and socio-economic data. The goal is to create a reliable tool that could assist government agencies in quickly and accurately categorizing applicants, ensuring that benefits are delivered to the right people efficiently.

PROPOSED SOLUTION

- To solve this, we propose a **multi-class classification system** using **machine learning** deployed on **IBM Cloud**. The model will classify applicants into the appropriate NSAP scheme based on socio-economic and demographic inputs.

Key components:

- Data Collection: Use AI Kosh dataset for NSAP schemes.
- Data Preprocessing: Clean, encode, and normalize demographic and socio-economic data.
- Model Training: Using algorithms like Random Forest, XGBoost, or Logistic Regression
- Deployment: Deploy on IBM Watson Machine Learning service via IBM Cloud.
- Evaluation: Validate model with accuracy,recall,precision and F1-score.
- Prediction: Real-time classification for incoming applications.

SYSTEM APPROACH

The "System Approach" section outlines the overall strategy and methodology for developing and implementing the NSAP eligibility prediction system. Here's a suggested structure for this section:

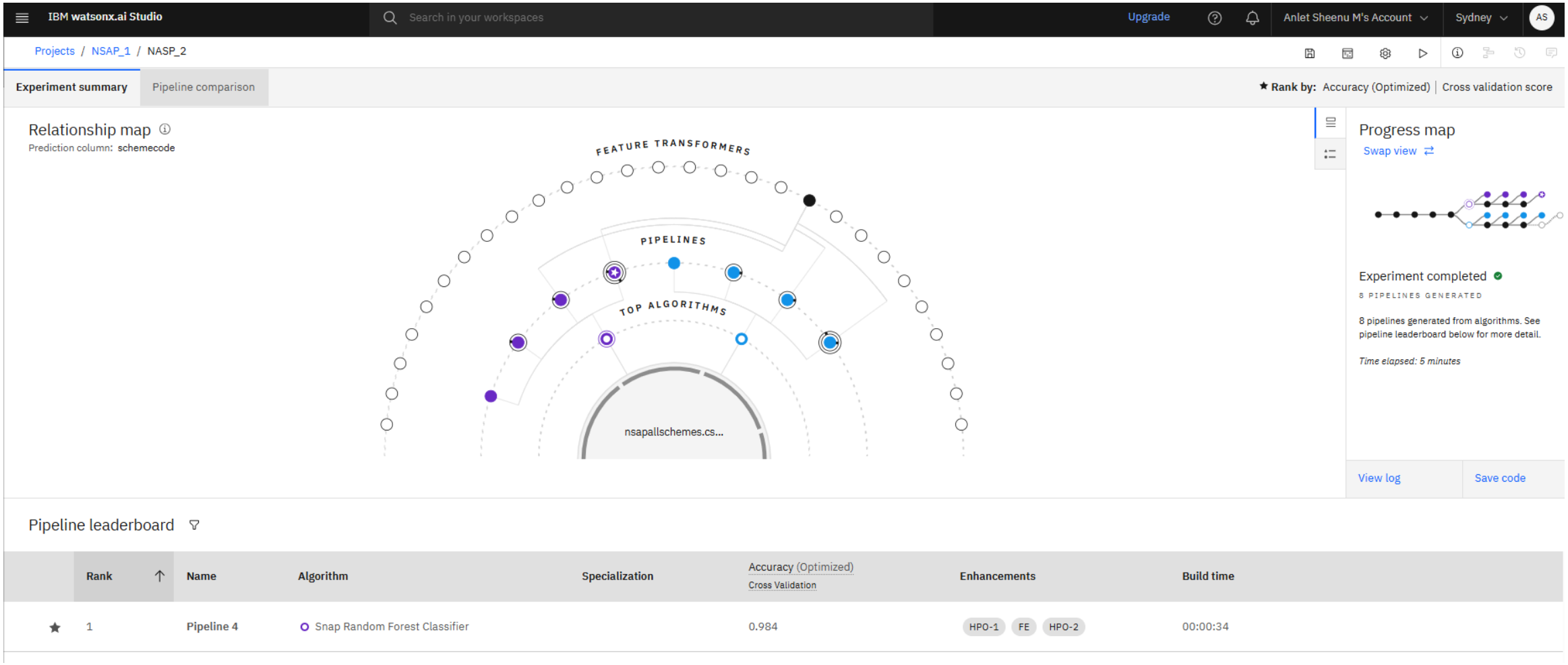
System Requirements:

- IBM Cloud (Free Account – mandatory)
- IBM Watsonx.ai Studio – Model development & deployment
- IBM Cloud Object Storage – Dataset storage & retrieval handling

ALGORITHM & DEPLOYMENT

- Algorithm Selection:
  - Random Forest Classifier (or XGBoost based on performance).
- Data Input:
  - State/District codes, caste-wise counts, gender-wise counts, Aadhaar status, mobile number availability, etc.
- Training Process:
  - Supervised learning using labeled schemecode values in the dataset.
- Prediction Process:
  - Model deployed in IBM Watson Studio with a REST API endpoint for real-time scheme eligibility prediction.

RESULT



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RESULT

NASP_FINAL Deployed Online

API reference | Test

Enter input data

Text | JSON

Enter data manually or use a CSV file to populate the spreadsheet. Max file size is 50 MB.

Download CSV template | Browse local files | Search in space | Clear all

	finyear (other)	lgdstatecode (double)	statename (other)	lgddistrictcode (double)	districtname (other)	totalbeneficiaries (double)	totalmale (double)	totalfemale (double)	totaltransgender (double)	totalsc (double)	totalst (double)	totalgen (double)	totalobc (double)	totalaadhaar (double)	totalmobilenumber (double)
1	2025-2026	1	JAMMU AND KASH	1	ANANTNAG	108	72	36	0	0	3	104	1	108	69
2	2024-2025	10	BIHAR	188	ARARIA	1263	700	563	0	140	9	1030	2	979	872
3	2025-2026	10	BIHAR	193	BHOJPUR	223	97	120	6	150	73	85	6	167	140
4	2022-2023	10	BIHAR	193	BHOJPUR	2813	1868	943	2	943	2	458	612	2218	2234
5	2024-2025	12	SIKKIM	226	NORTH DISTRICT	172	100	72	0	25	1	150	28	58	82
6	2022-2023	15	GUJARAT	234	GUJARAT	857	399	450	7	75	120	840	57	45	820
7	2025-2026	23	MADHYA PRADESH	413	KATNI	3318	2283	1035	0	536	762	366	1654	2932	960
8	2025-2026	27	MAHARASHTRA	500	YAVATMAL	34138	12951	21184	3	2487	2261	23906	5544	33031	20867
9	2025-2026	32	KERALA	544	ALAPPUZHA	1981	1151	830	0	49	9	1923	5	90	5
10	2025-2026	33	TAMILNADU	22	SALEM	4787	0	4784	0	834	0	915	3038	4544	4744
11															

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RESULT

Prediction results

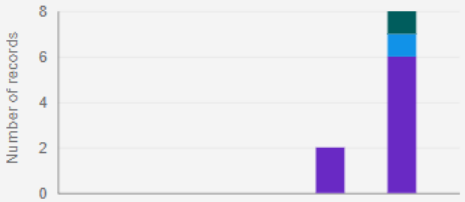
Prediction type

Multiclass classification

Prediction percentage

IGNDPS IGNOAPS IGNWPS

Confidence level distribution



Display format for prediction results

(•) Table view ( ) JSON view

	Prediction	Confidence
1	IGNDPS	100%
2	IGNDPS	100%
3	IGNDPS	100%
4	IGNDPS	80%
5	IGNDPS	100%
6	IGNDPS	60%
7	IGNDPS	70%
8	IGNOAPS	100%
9	IGNDPS	80%
10	IGNWPS	90%
11		
12		
13		
14		
15		
16		

CONCLUSION

- The developed model successfully predicts the correct NSAP scheme for applicants using socio-economic data.
- This automation reduces delays in benefit distribution and minimizes allocation errors.

FUTURE SCOPE

- Expand dataset with more granular beneficiary-level details.
- Integrate with government application portals for real-time predictions.
- Explore deep learning models for improved accuracy.
- Support predictions for new social assistance schemes.

REFERENCES

- AI Kosh NSAP Dataset: https://aikosh.indiaai.gov.in.
- IBM Watson Machine Learning Documentation.
- Research papers on multi-class classification for social benefit allocation.

IBM CERTIFICATIONS

IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence

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THANK YOU

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