CAPSTONE PROJECT

AI AGENT FOR CHRONIC DISEASE MONITORING

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OUTLINE

- **Problem Statement**
- **Proposed System/Solution**
- **System Development Approach** (Technology Used)
- **Algorithm & Deployment**
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PROBLEM STATEMENT

Managing chronic diseases such as diabetes, hypertension, and heart conditions requires continuous monitoring and proactive care. Traditional healthcare systems struggle with real-time tracking and early detection of complications. There is a need for an AI-based system that can analyze health data from wearables, electronic health records (EHR), and patient-reported inputs to provide early alerts, ensure medication adherence, and reduce hospital visits.

PROPOSED SOLUTION

- The proposed solution is an AI-powered agent deployed on IBM Cloud that continuously monitors patient health data in real time.
  Key Features:
- Real-time data collection from wearables and medical records
- Predictive analytics for detecting early warning signs
- Personalized recommendations for medication and lifestyle
- Notifications and alerts for anomalies
- Integration with IBM Granity for intelligent dashboard and data pipelines

SYSTEM APPROACH

Technology Stack:

- **IBM Cloud Lite** – Hosting AI services and backend logic
- **IBM Watson Studio** – For building and training AI models
- **IBM Granity** – Data integration, visualization, and monitoring

Libraries/Tools:

- IBM cloud
- Cloud based storage
- IBM watsonx.ai

ALGORITHM & DEPLOYMENT

1.Data Collection

- Collect vitals (BP, heart rate, glucose, etc.) via wearables
- Store in IBM Cloud Object Storage

2.Preprocessing

- Use Watson Studio Notebooks
- Clean data, normalize, and extract key features

3.Model Training

- Train ML model (e.g., Random Forest, LSTM)
- Utilize Watson Machine Learning

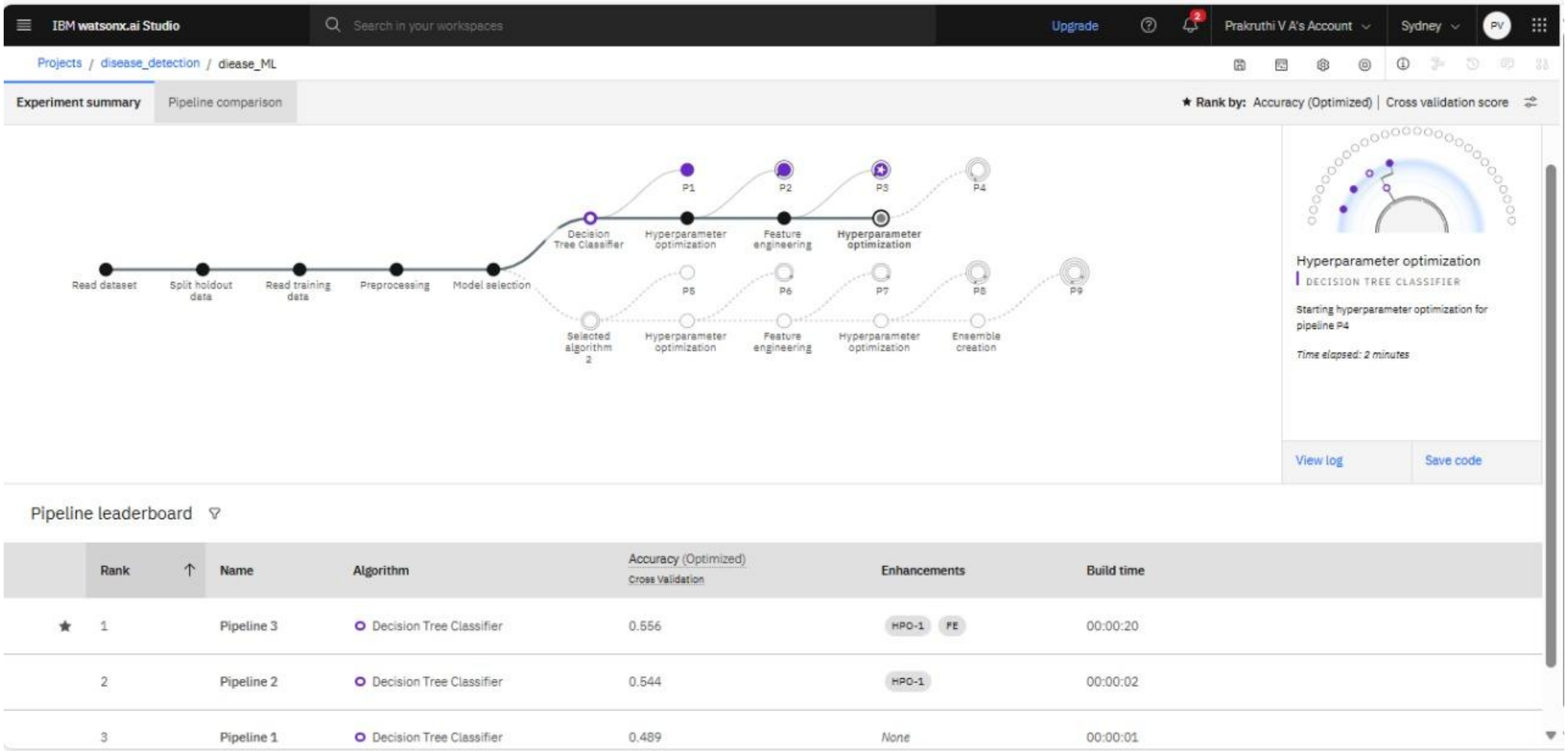
4.Deployment

- Deploy model as API with Watson ML
- Integrate with Node-RED for alert automation

5.Monitoring & Alerts

- Trigger SMS/email for high-risk predictions
- Visualize live data using IBM Granity

RESULT



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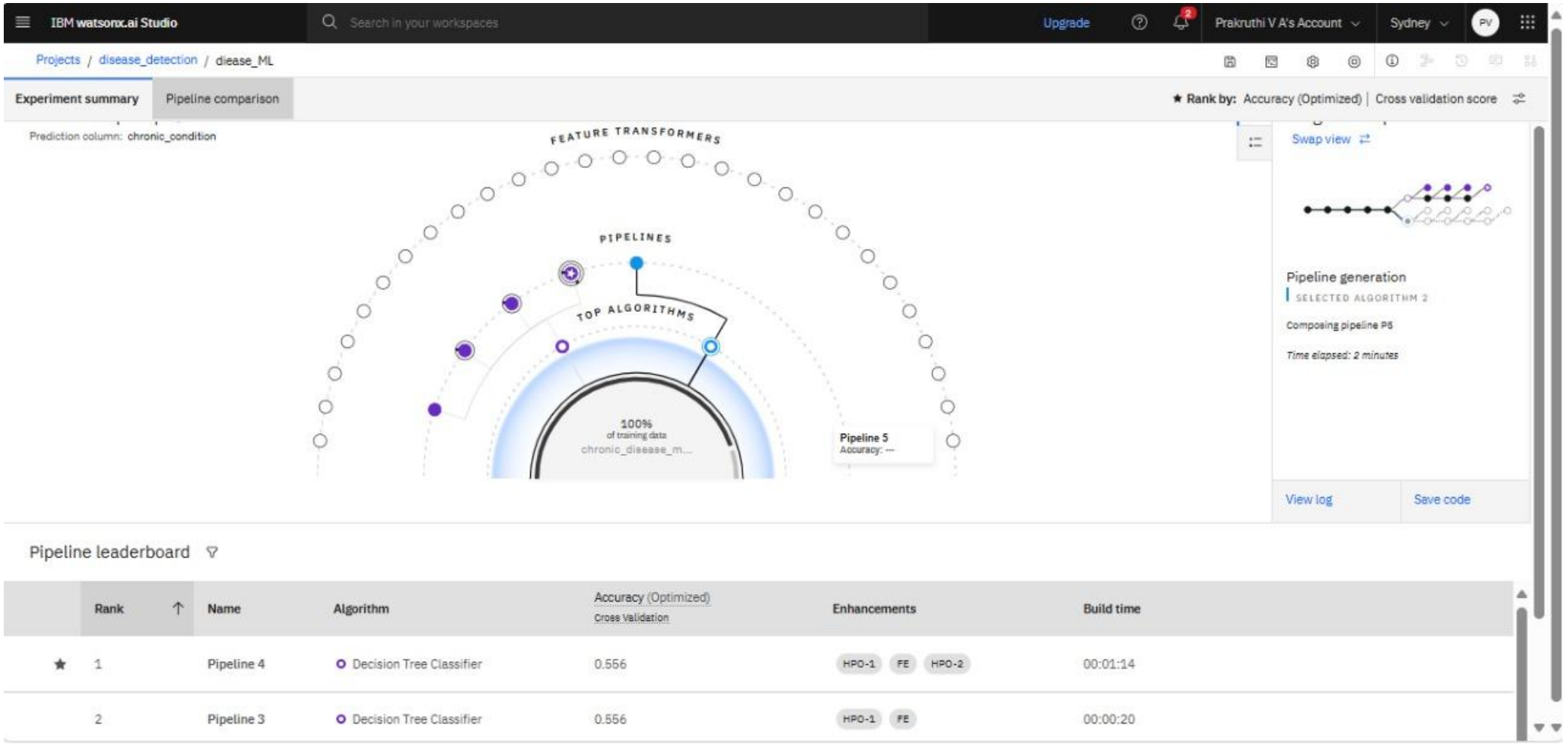
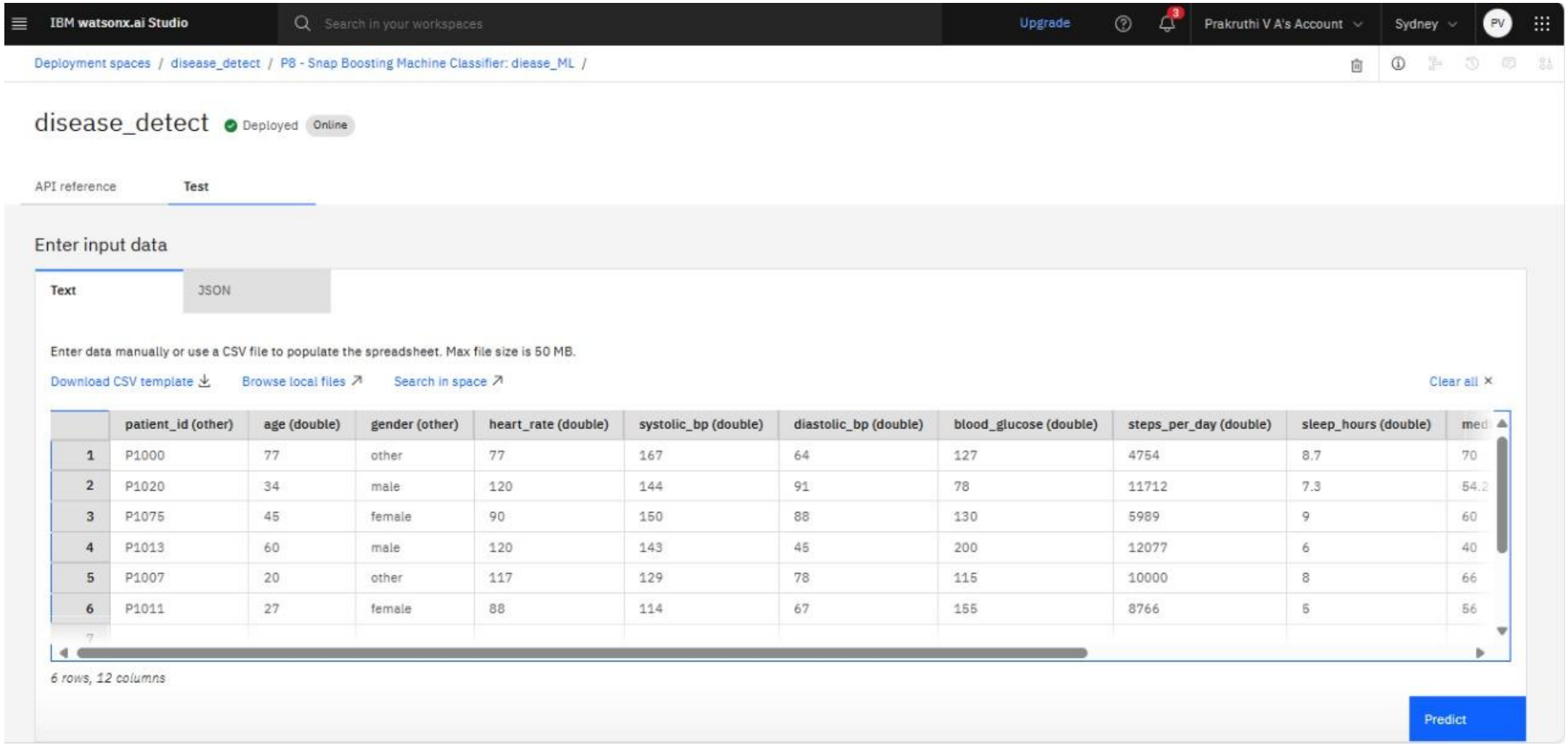
RESULT

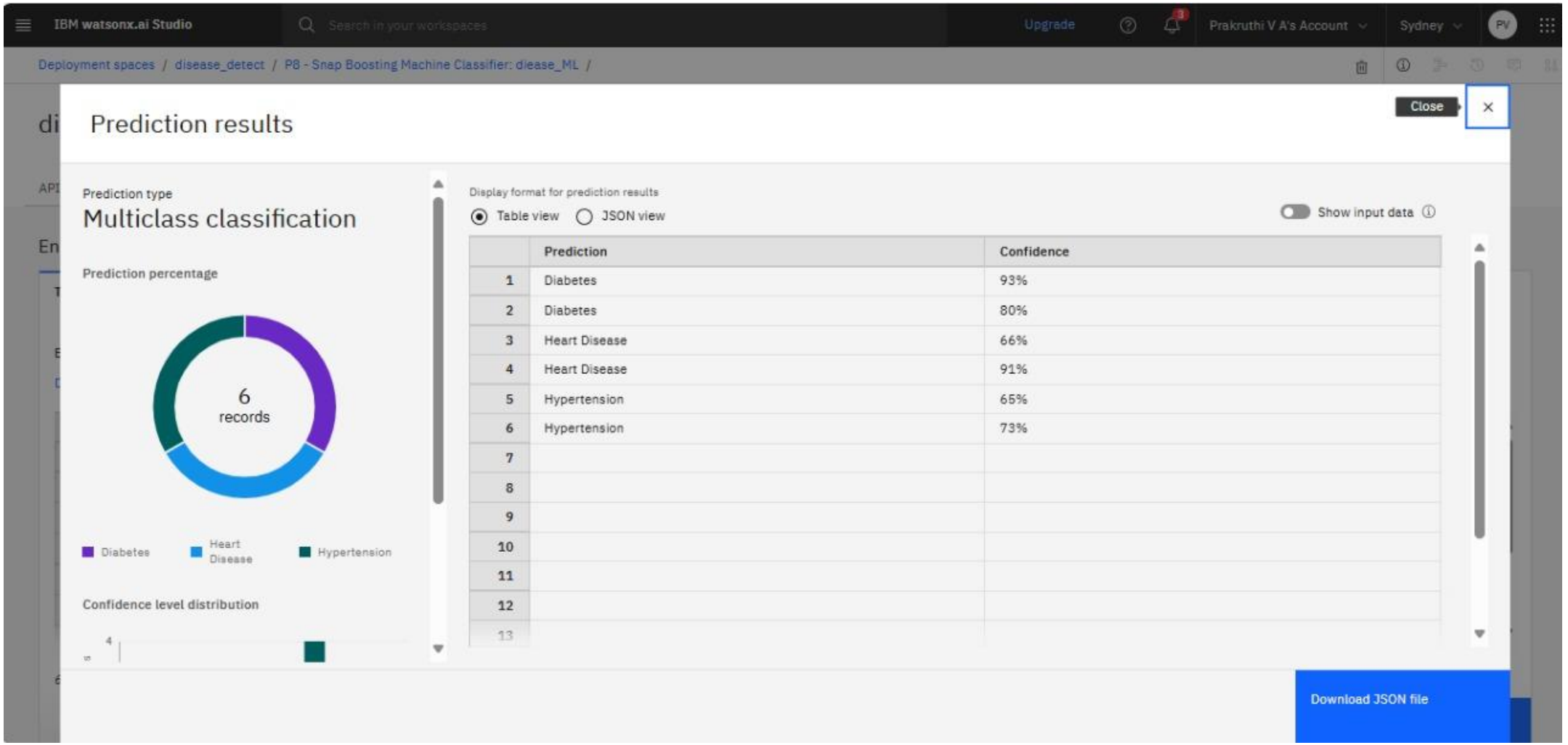


RESULT



	patient_id (other)	age (double)	gender (other)	heart_rate (double)	systolic_bp (double)	diastolic_bp (double)	blood_glucose (double)	steps_per_day (double)	sleep_hours (double)	med
1	P1000	77	other	77	167	64	127	4754	8.7	70
2	P1020	34	male	120	144	91	78	11712	7.3	54.2
3	P1075	45	female	90	150	88	130	5989	9	60
4	P1013	60	male	120	143	45	200	12077	6	40
5	P1007	20	other	117	129	78	115	10000	8	66
6	P1011	27	female	88	114	67	155	8766	5	56

RESULT



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CONCLUSION

- The AI agent successfully bridges the gap between patients and healthcare providers by offering intelligent, real-time chronic disease monitoring. It enhances patient engagement, ensures medication compliance, and promotes preventive care.

FUTURE SCOPE

- Expand to support more diseases (e.g., COPD, kidney disease)
- Integrate voice-based virtual assistant for elderly users
- Support multilingual notifications
- Use blockchain for secure patient data sharing
- Edge computing for offline health tracking

REFERENCES

- IBM Watson Studio Documentation
- IBM Watson Machine Learning
- IBM Cloud Object Storage
- WHO – Chronic Disease Management Overview
- Armand, P., & Wu, M. (2021). *AI for Health Monitoring using Cloud-based Architecture*. International Journal of Health Informatics and Medical Systems.

IBM CERTIFICATIONS

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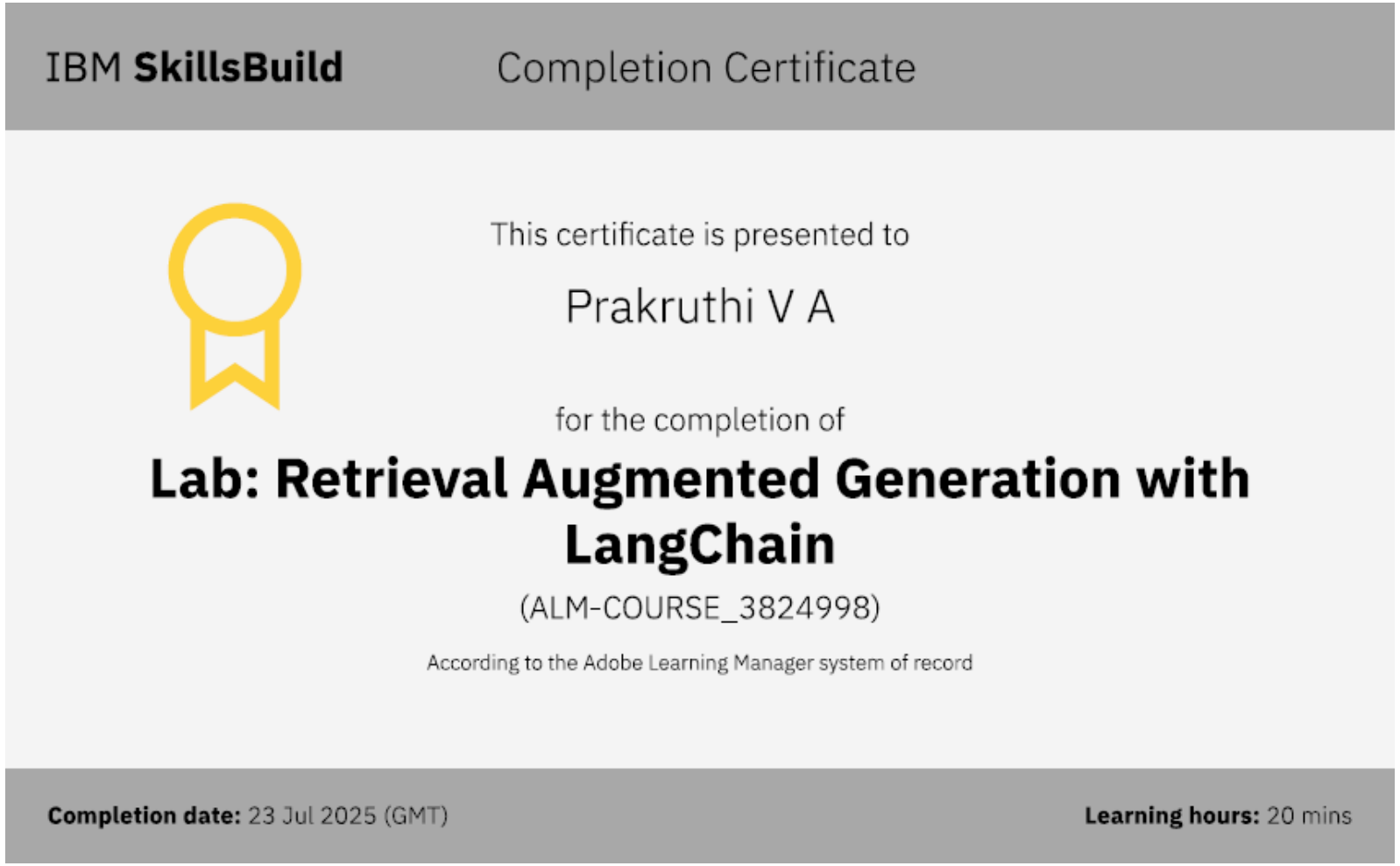

IBM **SkillsBuild** Completion Certificate

This certificate is presented to

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According to the Adobe Learning Manager system of record

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