
CAPSTONE PROJECT

FITNESS BUDDY

Presented By:
Namrata Popat Gavhane –Bhagwan Mahavir University

OUTLINE

- Problem Statement
- Proposed System/Solution
- System Development Approach
- Algorithm & Deployment
- Result (Output Image)
- Conclusion
- Future Scope

PROBLEM STATEMENT

In today's fast-paced world, many individuals struggle to maintain a healthy lifestyle due to lack of personalized guidance, time constraints, and inconsistent motivation. Traditional fitness solutions often require expensive subscriptions, in-person consultations, or rigid schedules that don't adapt to personal preferences or daily routines.

PROPOSED SOLUTION

- The proposed system aims to address the challenge of predicting the most suitable workout type (Cardio, Strength, or Yoga) for a user based on their health data. It uses machine learning techniques to analyze patterns and suggest personalized workouts, promoting a healthy and active lifestyle. The solution consists of the following components:
- **Data Collection:**
 - Gather user health-related data such as: **rentals, BMI, Fat Percentage, Water Intake, Workout Frequency, Experience Level..**
- **Data Preprocessing:**
 - **Clean and preprocess the collected data to handle missing values, outliers, and inconsistencies.**
 - Normalize and structure the data to fit into a supervised learning model.
- **Machine Learning Algorithm:**
 - **Implement a machine learning algorithm, Use Random Forest Classifier** for multiclass classification.
 - Train the model to predict workout types using health features. Achieve a balance between performance and interpretability.
- **Deployment:**
 - **Develop a user-friendly interface or application that provides real-time predictions For Healthy Exercise.**
 - **Deploy the solution on a scalable and reliable platform, considering factors like server infrastructure, response time, and user accessibility.**
- **Evaluation:**
 - **Assess the model's performance using appropriate metrics such as** Confusion Matrix), Precision, Recall, and F1-Score)
 - **Fine-tune the model based on** Misclassified results Improving features like Experience Level or Fat % impact.
 - Result:

SYSTEM APPROACH

- **System requirements**
 - **RAM:** Minimum 8 GB
 - **Storage:** At least 4 GB free space for datasets and model files
 - **Operating System:** Window 10/11 or any modern Linux
- **Library required to build the model**
 - **IBM Watson Studio** – For model training, deployment, and API testing

ALGORITHM & DEPLOYMENT

- Here's your customized Algorithm section for your Fitness Buddy project, written in the same structured format.

❑ **Algorithm Selection:**

- We selected the Random Forest Classifier, a supervised ensemble learning algorithm, for solving this multiclass classification problem (Yoga, Cardio, Strength).
- It works well with structured data.
- Handles high-dimensional input features and avoids overfitting by combining multiple decision trees.
- Provides good accuracy and interpretability, making it ideal for health-related predictions.

❑ **Data Input:**

- Calories Burned, Fat Percentage, Water Intake (Liters) ,Workout Frequency (days/week), Experience Level (fitness knowledge), BMI (Body Mass Index)

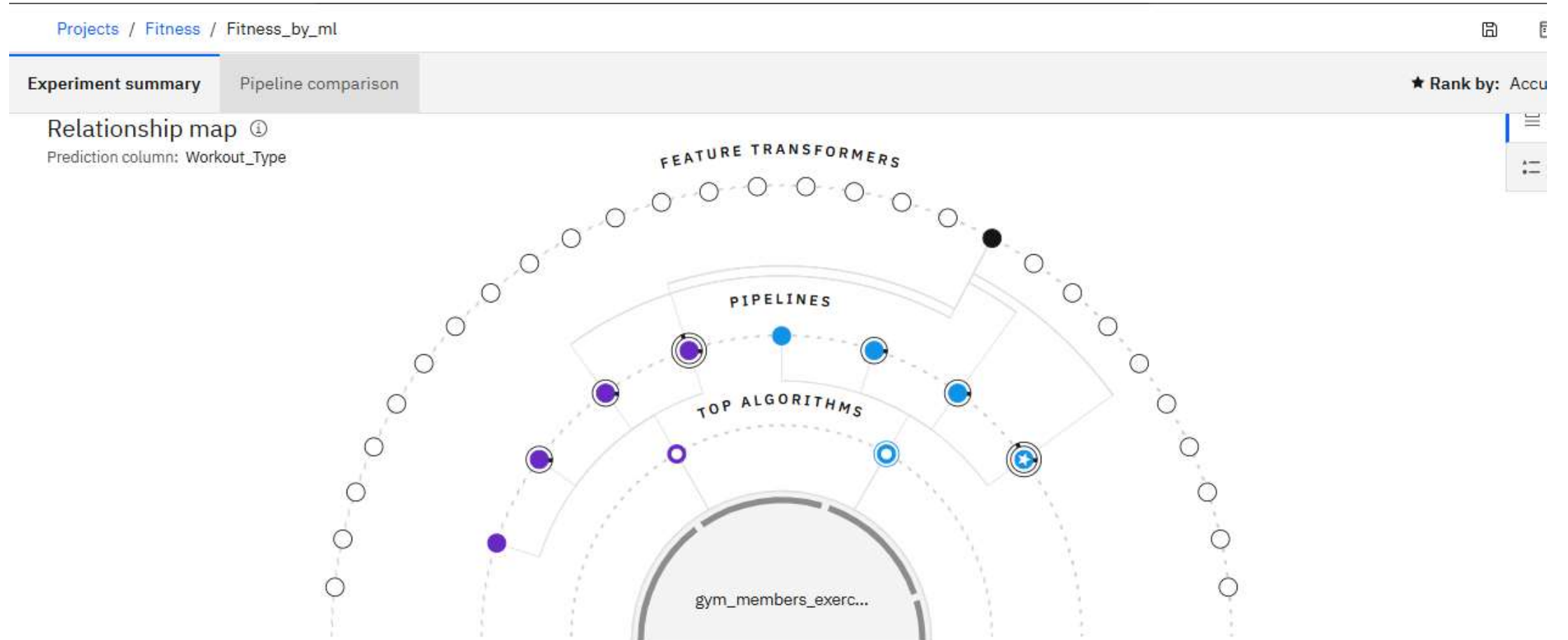
❑ **Training Process:**

- The model was trained using labeled historical fitness data, where each record included user metrics and a labeled workout type.
- Data preprocessing was done to ensure consistency, and non-numeric fields were encoded if required
- Cross-validation was used to prevent overfitting and ensure generalization.
- The model was fine-tuned by adjusting the number of estimators and max depth for optimal performance.

❑ **Prediction Process:**

- Once deployed, the trained model receives new input values (e.g., Calories, BMI, Fat %).
- It processes the input through all trees in the forest and outputs the predicted workout class with a confidence score.
- The model runs in real time on IBM Cloud, returning predictions via a web-based interface.
- Output includes both the predicted class and its probability.

RESULT

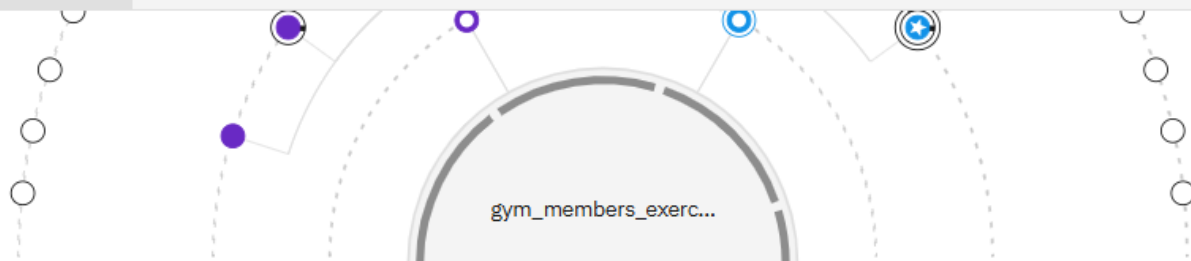


RESULT

Experiment summary

Pipeline comparison

★ Rank by: Accuracy (Optimized) | Cross validation score



pipeline leaderboard below for more detail.

Time elapsed: 9 minutes

[View log](#)

[Save code](#)

Pipeline leaderboard

	Rank	Name	Algorithm	Specialization	Accuracy (Optimized) Cross Validation	Enhancements	Build time
★	1	Pipeline 8	Random Forest Classifier		0.261	HPO-1 FE HPO-2	00:00:51
	2	Pipeline 7	Random Forest Classifier		0.261	HPO-1 FE	00:00:37
	3	Pipeline 4	Decision Tree Classifier		0.259	HPO-1 FE HPO-2	00:02:12
	4	Pipeline 3	Decision Tree Classifier		0.259	HPO-1 FE	00:02:08

RESULT

Deployment spaces / Fitness_final_ml / P8 - Random Forest Classifier: Fitness_by_ml /



Fitness_Deploy ✓ Deployed Online

Fitness_Deploy

API reference rest

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](#)

	Hours (double)	Calories_Burned (double)	Fat_Percentage (double)	Water_Intake (liters) (double)	Workout_Frequency (days/week) (double)	Experience_Level (double)	BMI (double)
1		712	12.8	2.4	5	2	14.31
2		1238	11.9	3.7	2	2	18.12
3		1410	16	3.5	4	2	13.91
4		802	27.8	2.2	3	1	49.84
5		500	15	2.5	3	1	50.81
6							

5 rows, 14 columns

Predict

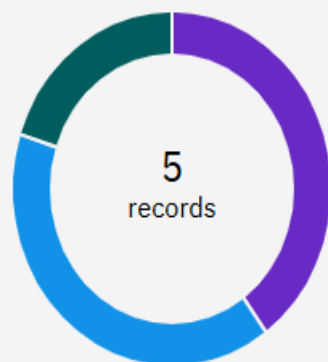
RESULT

Prediction results

Prediction type

Multiclass classification

Prediction percentage



Strength Cardio Yoga

Confidence level distribution

Display format for prediction results

☒ Table view ☐ JSON view

☐ Show input data ⓘ

	Prediction	Confidence
1	Strength	41%
2	Cardio	34%
3	Yoga	35%
4	Cardio	50%
5	Strength	56%
6		
7		
8		
9		
10		
11		
12		

CONCLUSION

- The Fitness Buddy project demonstrates the effective application of machine learning in the field of personalized health and fitness. By using a Random Forest Classifier, the system is capable of predicting the most suitable workout type—whether it be Yoga, Cardio, or Strength—based on a user's personal fitness metrics such as BMI, calories burned, fat percentage, and workout frequency. The model was successfully trained and deployed on IBM Cloud, allowing users to input their data and receive real-time, accurate predictions through a user-friendly interface. This solution addresses the growing need for accessible and personalized fitness recommendations without requiring expensive gym memberships or one-on-one trainers. Overall, Fitness Buddy not only enhances user engagement with fitness but also demonstrates how AI and cloud technology can make health management more intelligent, scalable, and impactful.

FUTURE SCOPE

- Develop a chatbot or virtual assistant to provide interactive fitness tips, reminders, and motivation
- Convert the project into a mobile application for easy access and daily use
- Enable automatic data collection from sensors to improve prediction accuracy

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According to the Adobe Learning Manager system of record

Completion date: 23 Jul 2025 (GMT)

Learning hours: 20 mins



THANK YOU