Flight Rank

By: Sahar Mahar
Rehab Mohamed
Supervised by: Dr. Mona Farouk

FlightRank 2025: Aeroclub RecSys Cup | Kaggle

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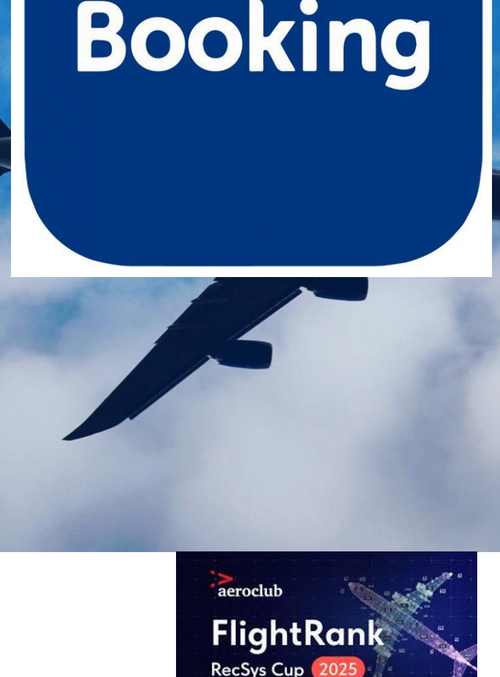
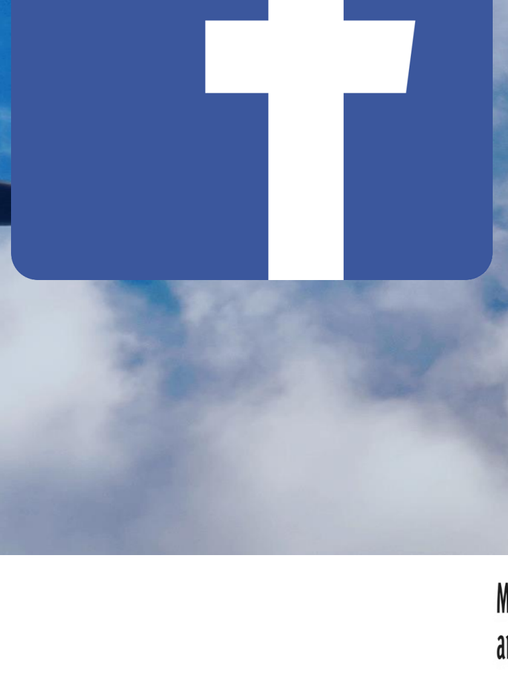
How Many of you uses YouTube, Facebook, Booking, etc.. Apps?





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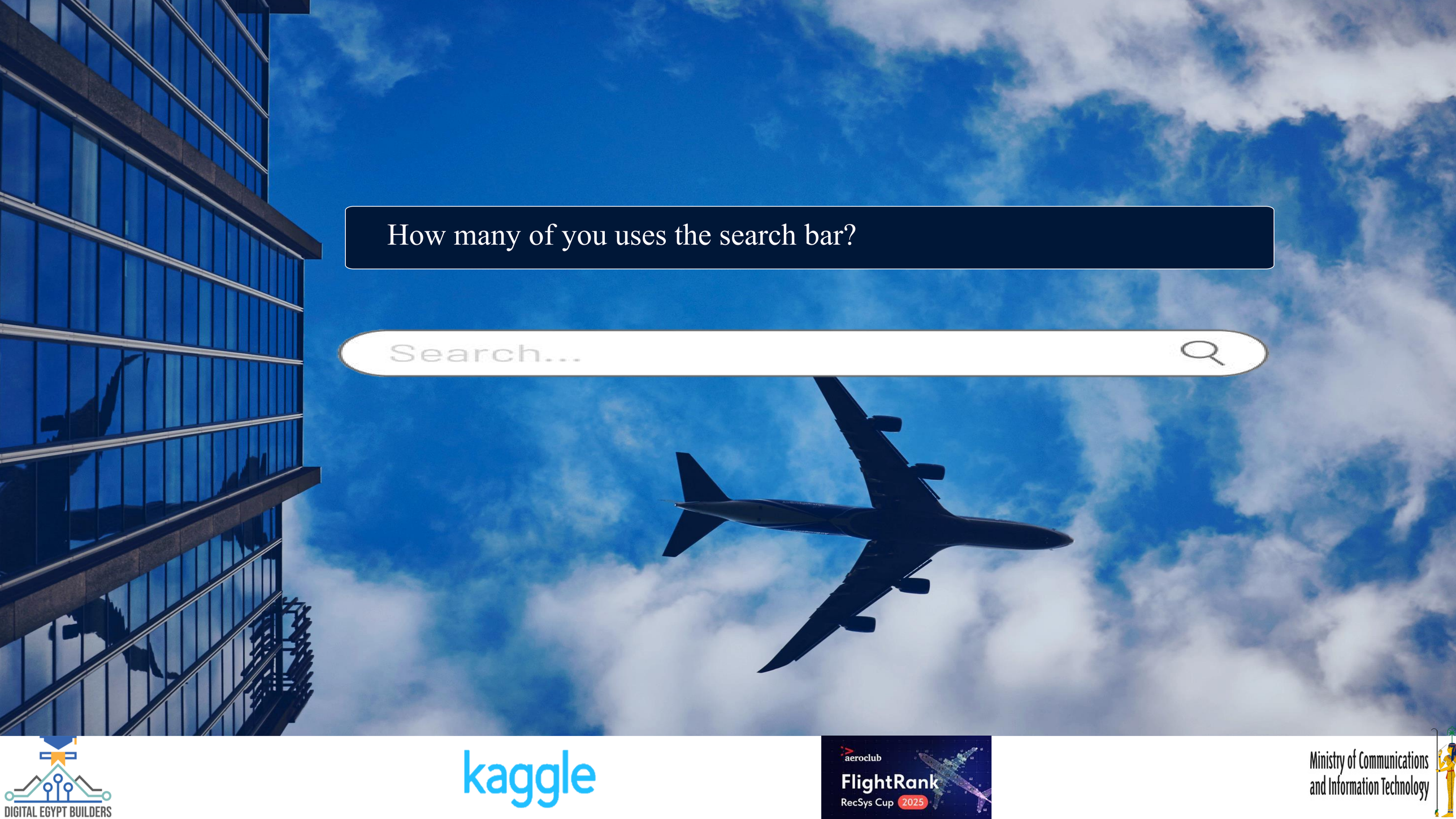

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How many of you find what they are searching for?

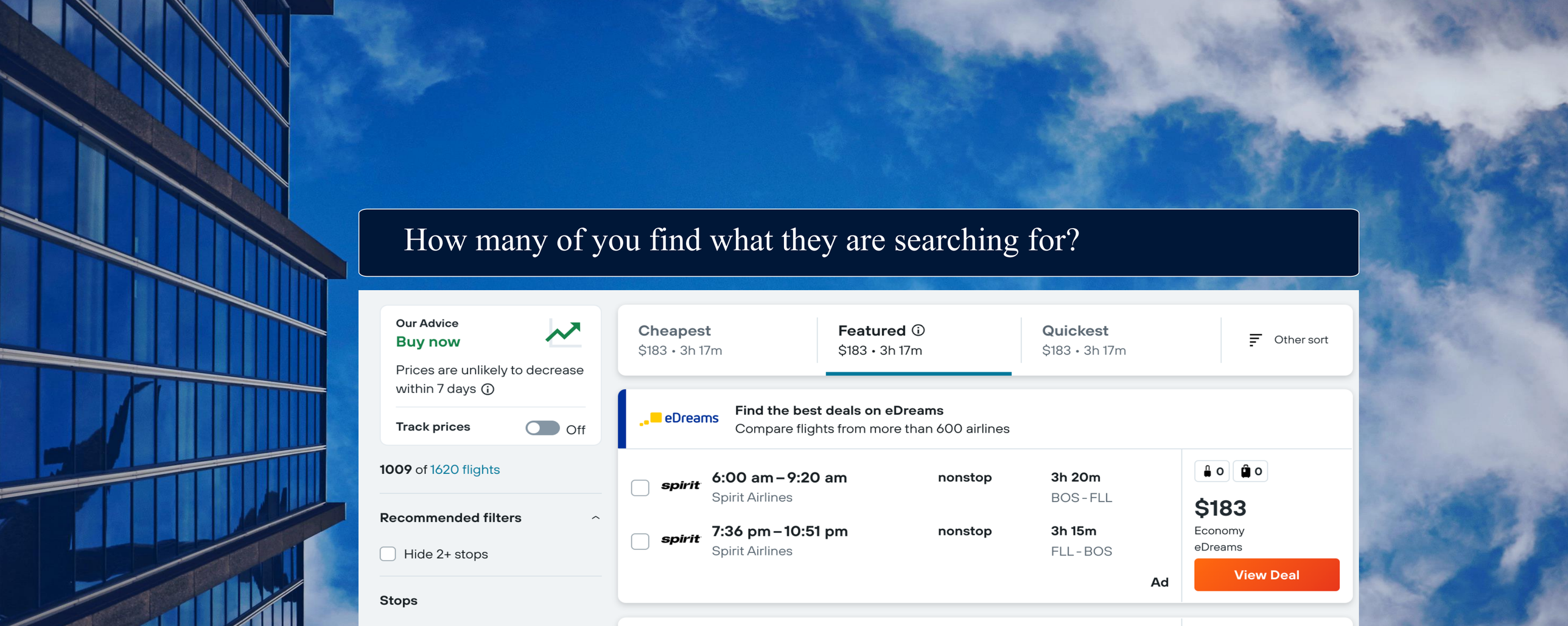

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Table Of Content

Problem Definition

- Build a recommendation system that predicts which flight option a business traveler is most likely to choose within a given search session.
- The model has to rank all the available flight options from best to worst based on the user's specific preferences, company policies and other factors.

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Motivation

- Our goal is to create a model that predicts future airline recommendation system's performance using a large and complex. dataset from a global competition.
- Learn how to deal with real-world problem.

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Methodology

Data

- Each search session = ranker_id → multiple flight options
- Train: selected (1 = chosen, 0 = not chosen)
- Test: predict rank (1= Best, N = worst)
- train.parquet → Training data
- Test.parquet → Test data (no target)

Data

- User Info: gender, nationality, frequent flyer, VIP
- Company Policy: tariff code, policy compliance
- Route & Search: route, request date/time
- Pricing: total price, taxes
- Flight Timing: outbound/return times & durations
- Segments: airline, aircraft, baggage, seats, cabin class
- Rules: cancellation & exchange penalties

Data Analysis

- Drop columns with null values > 98%
- Drop unnecessary columns.
- Convert data type columns from string into date & time using regex and polar functions.
- Total Price

Model Selection

XGBoost

1. Performance (Accuracy / Ranking Score)

- 38%

2. Training & Inference Speed

- Fast training, but can be slower with large categorical data (needs one hot encoding).

3. Handling of Categorical Features

- Needs preprocessing (label encoding or one-hot).

4. Robustness & Ease of Use

- Requires more manual hyper parameter tuning to reach good performance.

CatBoost

1. Performance (Accuracy / Ranking Score)

- 40%

2. Training & Inference Speed

- Automatically handles categorical features efficiently, usually faster on inference when many categorical features exist.

3. Handling of Categorical Features

- Native categorical handling no need for heavy preprocessing.

4. Robustness & Ease of Use

- Often works well out of the box with fewer parameter.

Challenges

1. Data size = 5.27 GB
2. CPU & TPU VM v3-8 limitation
3. Selecting the best model


Demo

Result

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Late Submission ...

Overview | Data | Code | Models | Discussion | Leaderboard | Rules | Team | Submissions

#	Team	Members	Score	Entries	Last	Solution
1	gezi		0.54062	100	3d	
2	Phaedrus		0.53548	51	3d	
3	AF		0.53548	190	3d	
4	mango789 & Ionut Visan		0.53438	210	3d	
5	Taos David		0.52970	56	3d	
6	Mikhail Golubchik		0.52814	105	3d	
7	kif		0.52795	63	4d	
8	XS 330		0.52529	39	3d	
9	Muhammad Hassaan		0.52446	156	3d	
10	Dmitriy Ch		0.52437	134	4d	

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Result

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Late Submission

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437	▼ 2	Sagor Kumar Mitra	0.40540	2	3d
438	▼ 4	Dayou Wang	0.40459	1	7d
439	▼ 2	Jay Prajapati	0.40451	1	1mo
440	—	Zhong Haitian	0.40354	7	2mo
441	—	akmonymous	0.40350	2	1mo
442	—	sahar mah3r99	0.40226	10	2d

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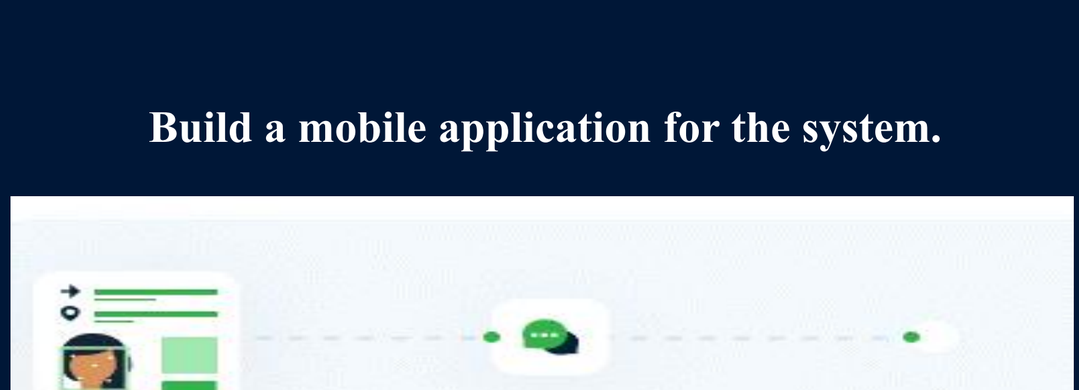
Future Work

Build a mobile application for the system.



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