Flask Deployment - IPO Prediction App

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Steps:

1. Found a problem of predicting Initial Public Offering performance of stocks in the Indian Stock Market and downloaded the below dataset.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Issuer Comp	Listing Date	Issue Price	Lot Size	Issue Price (I	P/E Ratio	QIB	NII	RII	EMP	TOTAL	Open Price	Low Price	High Price	Close Price	% Change
2	Swashthik Pl	12/5/23	86	1600	40.76	17.23	3.42	35.76	13.58		15.43	120.1	115.25	126.1	126.1	46.63
3	Flair Writing	12/1/23	304	49	593	23.36	122.02	35.23	13.73		49.28	503	452.7	514	452.7	48.91
4	Fedbank Fina	11/30/23	140	107	1092.26	25.04	3.48	1.49	1.88	1.34	2.24	137.75	133.15	148	140	0
5	Rockingdeals	11/30/23	140	1000	21	33.33	47.38	458.6	201.42		213.64	300	300	315	315	125
6	Tata Technol	11/30/23	500	30	3042.51	32.53	203.41	62.11	16.5	3.7	69.43	1199.95	1199.95	1400	1314.25	162.85
7	Gandhar Oil	11/30/23	169	88	500.69		129.06	64.34	29.93		65.63	295.4	295	344.6	301.5	78.4
8	Indian Renev	11/29/23	32	460	2150.21	8.47	104.57	24.16	7.73	9.8	38.8	50	49.99	59.99	59.99	87.47
9	Arrowhead S	11/28/23	233	600	13	18.09		46.02	142.3		94.79	250	237.5	255	237.5	1.93
10	Sunrest Lifes	11/20/23	84	1600	10.85	12.33		29.17	65.74		48.54	84	79.8	84	79.8	-5
11	Kalyani Cast	11/17/23	139	1000	30.11	8.67	66.35	439.2	190.95		208.59	264.1	264.1	277.3	277.3	99.5
12	ROX Hi-Tech	11/16/23	83	1600	54.49	9.11	106.25	366.86	204.02		214.44	135	135	141.75	141.75	70.78
13	Baba Food P	11/15/23	76	1600	33		147.02	84.73	60.82		69.44	76	72.2	76	72.2	-5
14	ASK Automo	11/15/23	282	53	834	45.63	142.41	35.47	5.7		51.14	304.9	304.15	317	310.2	10
15	Protean eGo	11/13/23	792	18	490.33	29.91	46.94	31.62	8.93	1.49	23.86	792	775	890.9	883	11.49
16	Micropro Sof	11/10/23	81	1600	30.7	0.34		22.6	49.08		36.88	80	76	80.8	76	-6.17
17	ESAF Small F	11/10/23	60	250	463	8.94	182.66	88.81	17.86	4.59	77	71.9	68.5	74.7	69.05	15.08
18	SAR Televen	11/8/23	55	2000	24.75		77	715.77	222.1		288.09	105	105	110.25	110.25	100.45
19	Honasa Cons	11/7/23	324	46	1701.44		11.5	4.02	1.35	4.88	7.61	324	322	340	337.15	4.06
20	Mish Design	11/7/23	122	1000	9.76	21.75		98.44	166.74		135.43	160	124	165	152	24.59
21	Maitreya Me	11/7/23	82	1600	14.89	10.34	85.41	744.03	509.4		446.79	162.55	154.45	164	154.45	88.35
22	Vrundavan P	11/6/23	108	1200	15.29	34.62		11.6	25.51		18.57	107	101.65	107	101.65	-5.88
23	KK Shah Hos	11/6/23	45	3000	8.78	100		17.75	9.41		13.58	56.1	53.3	58.9	58.9	30.89
24	Transteel Se	11/6/23	70	2000	49.98		12.15	122.88	39.82		49.21	88.9	86.1	93.3	93.3	33.29
25	Cello World I	11/6/23	648	23	1900		122.2	25.65	3.21	2.74	41.69	831	781.5	834.7	791.9	22.21
26	Shanthala FM	11/3/23	91	1200	16.07	25.66		4.76	3.05		3.91	108	103	113.4	103.55	13.79
27	Paragon Fine	11/3/23	100	1200	51.66	14.56	81.38	419.46	185.28		205.74	225	213.75	236	213.75	113.75
28	Blue Jet Hea	11/1/23	346	43	840.27	37.49	13.72	13.59	2.24		7.95	359.9	359.9	395.85	395.85	14.41
29	On Door Con	11/1/23	208	600	31.18	4.56		3.16	7.87		5.59	214	203.3	218	203.4	-2.21
30	Rajgor Casto	10/31/23	50	3000	47.81		35.52	260.01	80.7		107.43	59	56.05	61.95	61.1	22.2
31	WomanCart	10/27/23	86	1600	9.56	50.67		56.3	71.94		67.48	117	117	122.85	122.85	42.85
32	IRM Energy L	10/26/23	505	29	545.4	24.13	44.73	48.34	9.29	2.05	27.05	479	450.05	483	472.95	-6.35
33	Arvind and C	10/25/23	45	3000	14.74	9.74		436.05	321.97		385.03	80	76	84	80.05	77.89

2. Performed EDA on the dataset to identify the necessary features and performed feature engineering to fit the machine learning models in Jupyter Notebook (ipo_prediction.ipynb).

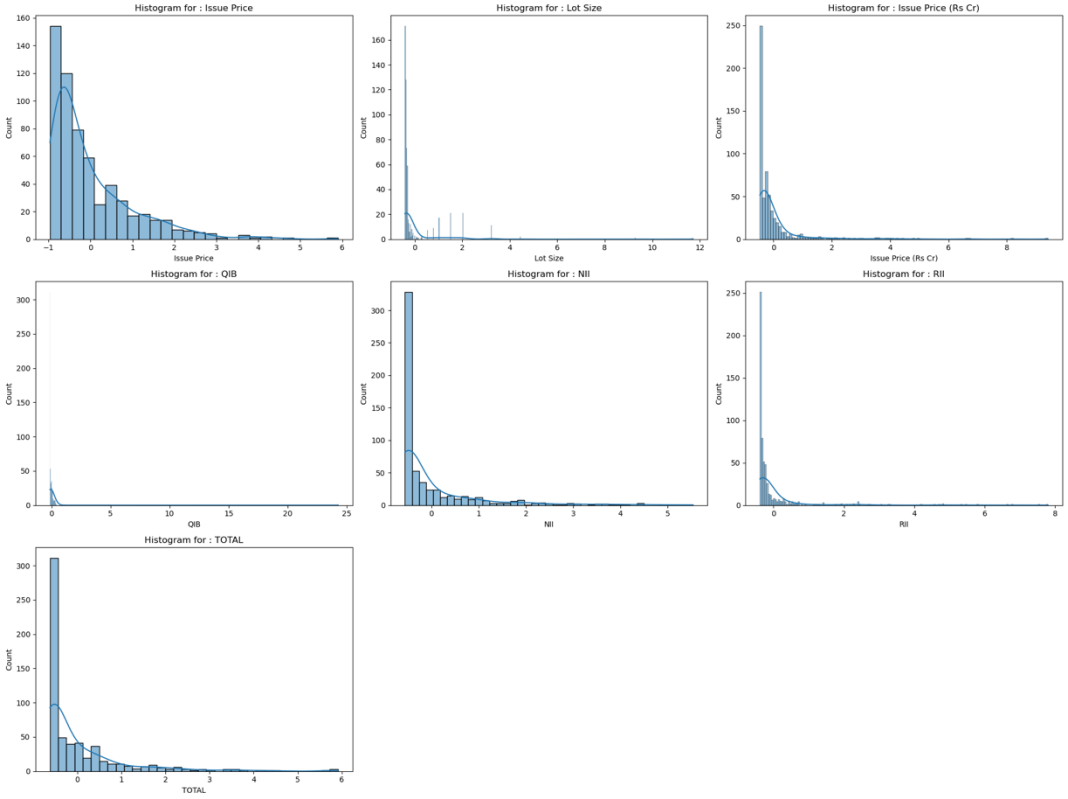


Fig. 2.1 – Histogram of IPO features

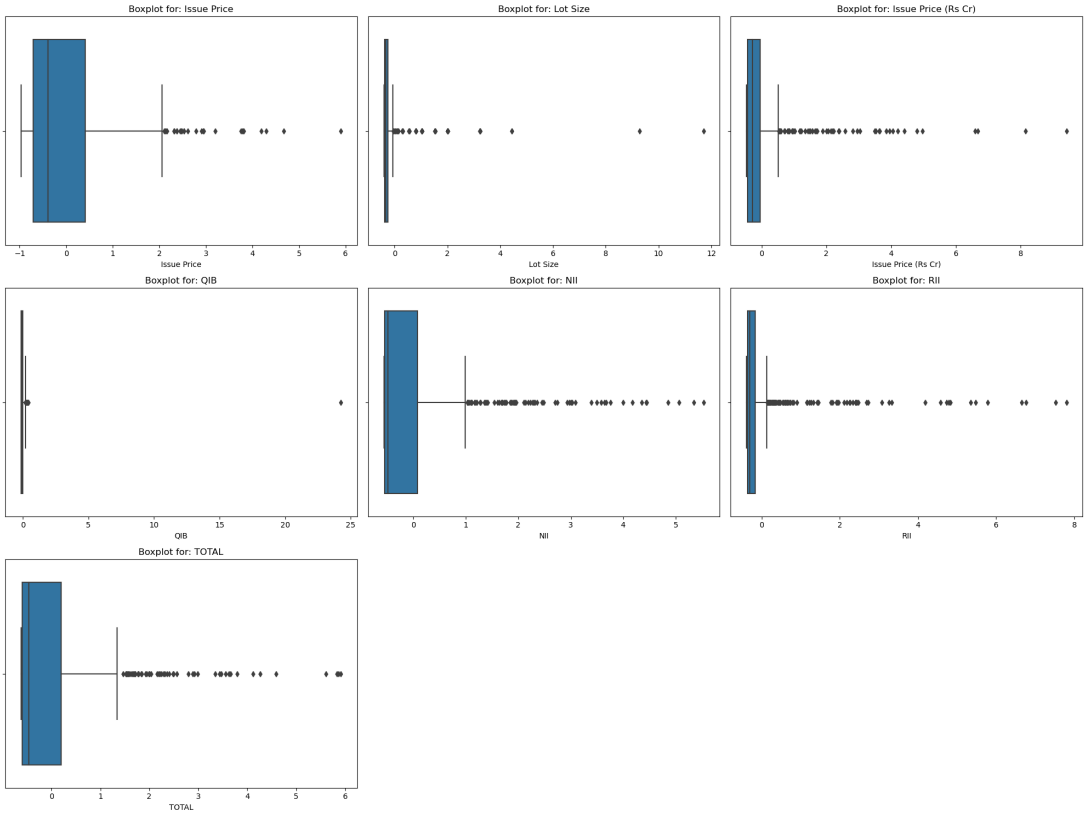
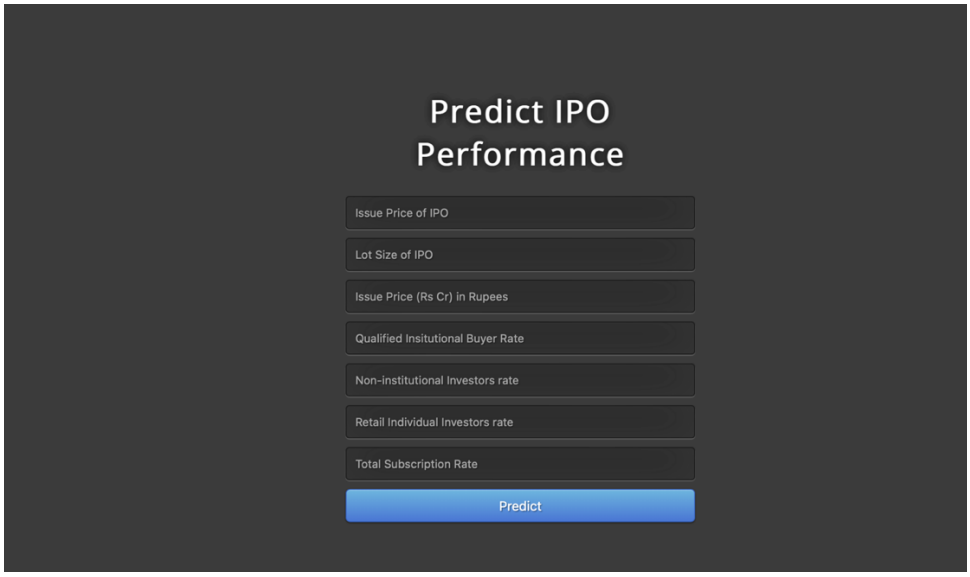


Fig. 2.2 – Boxplot of IPO features

3. Fitted various models to identify the best fit model which are as per the results – Logistics Regression, Decision Tree Classifier, Random Forest and Multilayer Perceptron Neural Network models in the model.py Python file.

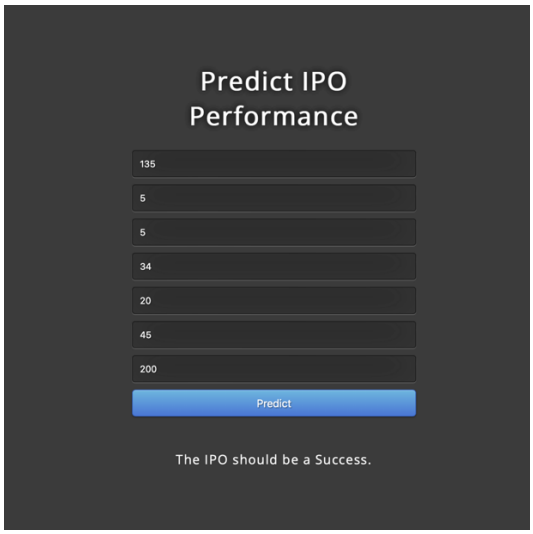
	Model	Accuracy
0	Logistic Regression	0.766667
1	Decision Tree Classifier	0.766667
2	Random Forest	0.766667
3	AdaBoost Classifier	0.700000
4	CatBoost Classifier	0.758333
5	XGBoost Classifier	0.733333
6	SVM Classifier	0.750000
7	Neural Network Model	0.766667

4. Created a webpage form using HTML and CSS for getting the features and providing the prediction results in form of IPO 'Success' or 'Failure' to invest based on model insights.

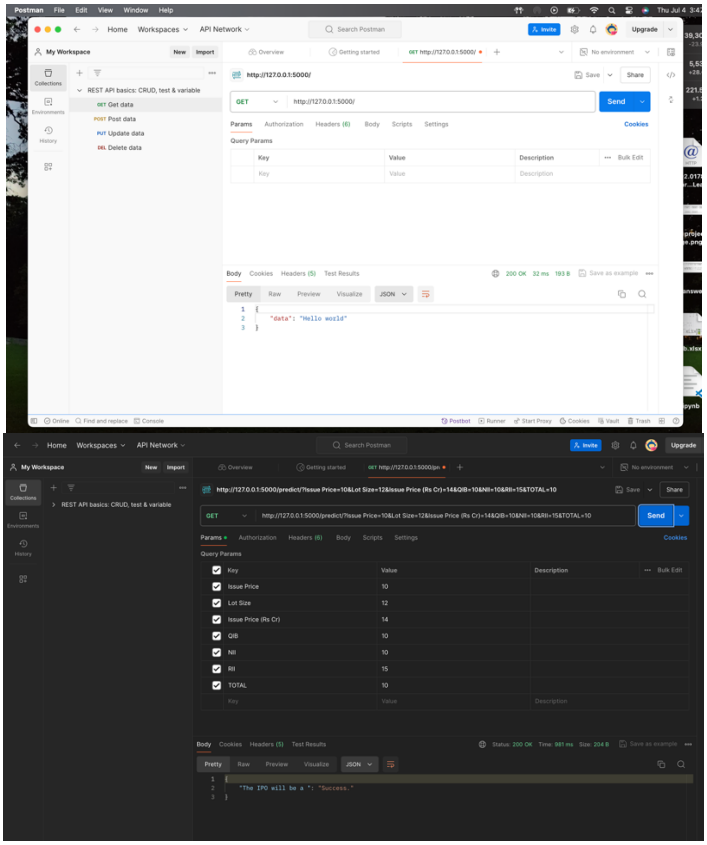


5. Integrated the model to a Web Application using Flask (app.py).

6. Enter the features of the IPO (only integers) on the webpage form to get the prediction results.



7. Integrated the API with the Python model using Postman as seen below.



8. Deployed the Flask web application to Heroku cloud as seen below.

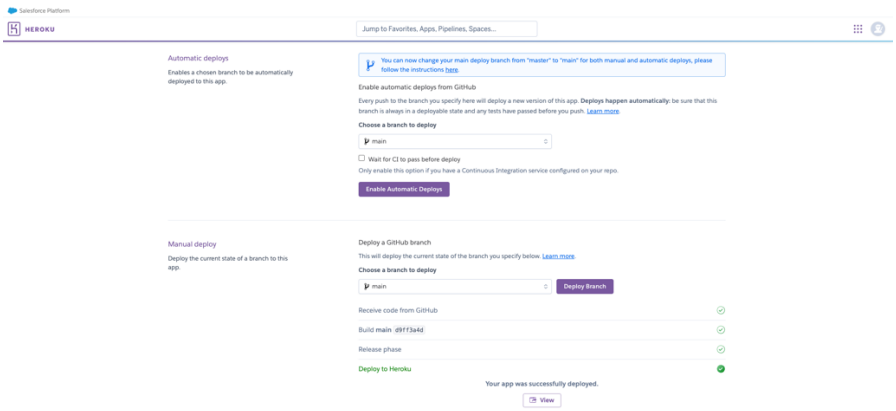


Fig – Heroku successful deployment

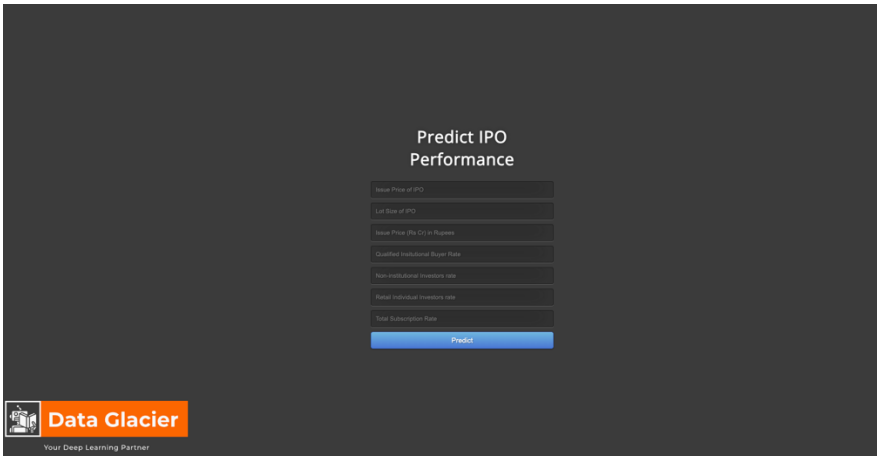


Fig – Heroku successful web application hosting

End.