Personalized Food Recommendation System

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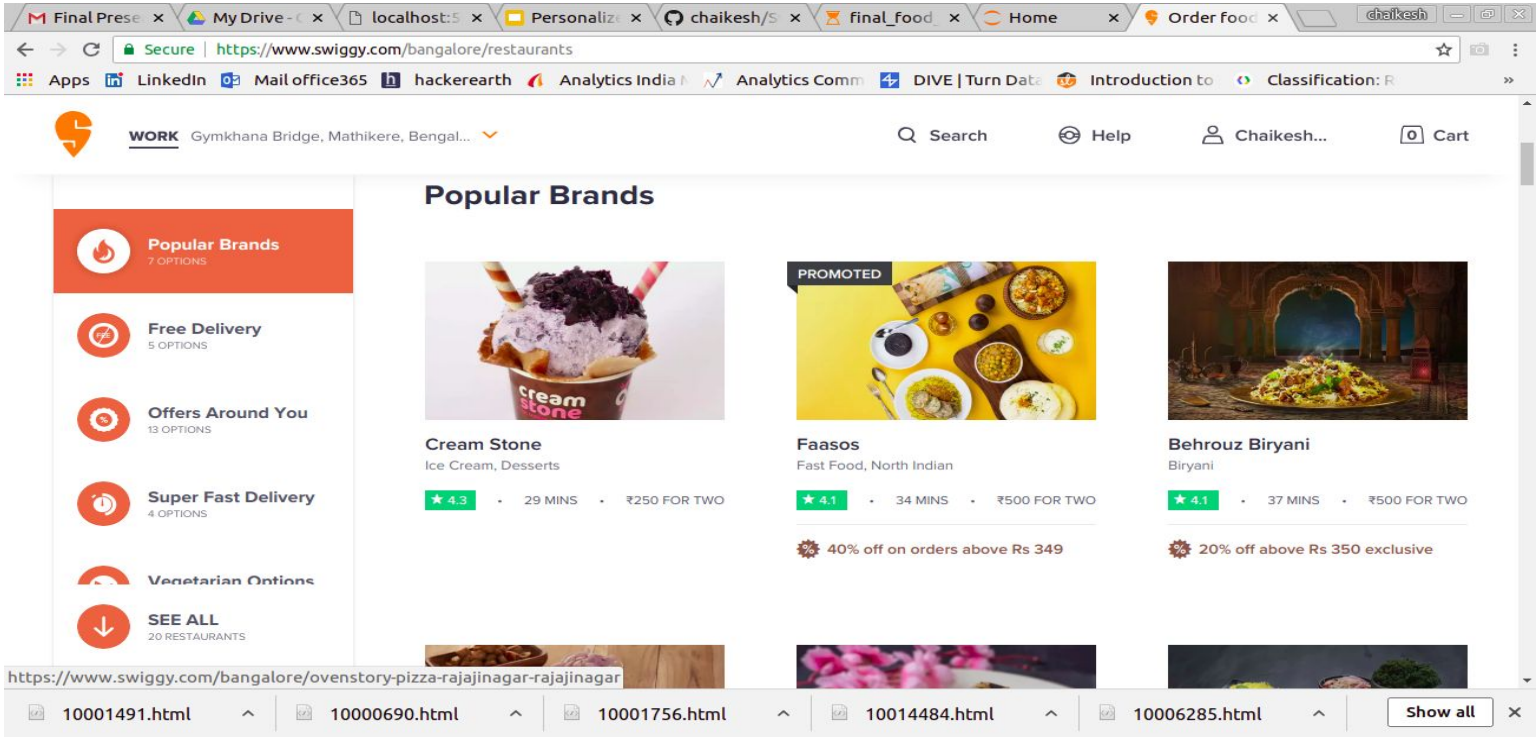
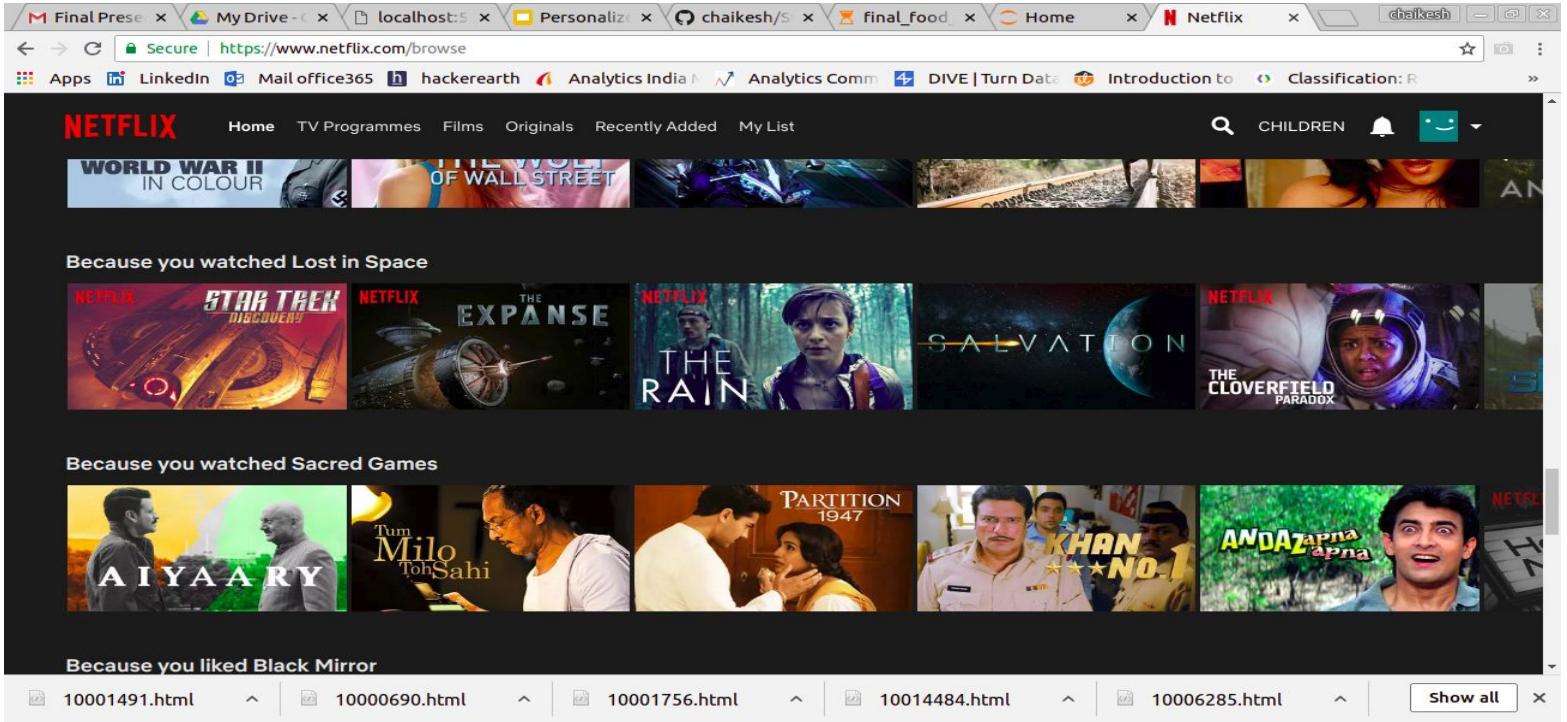
Motivation

- Almost all food deleivery platform offer restaurant based recomendation.



Motivation

- We present a dish based recommendation system,much like netflix movie recommendation.



Swiggy Dataset

Order Datasets

	customer_id	order_id	restaurant_id	ordered_time	pickedup_time	delivered_time	discount_flag	customer_geohash	gmv_total	items	post_status
949457	11126178	279768286	180708	2024-05-20 20:09:08.000	NaN	NaN	0	4nxfejk	0.0	[106176870]	Failed
949458	22907246	217309343	250802	2024-05-20 22:47:19.000	2024-05-20 22:53:51.340	2024-05-20 23:10:18.037	0	4nxfvfu	268.0	[105652765]	Completed
949459	13370819	207480179	110156	2024-05-20 17:51:43.000	2024-05-20 18:10:57.843	2024-05-20 18:29:04.803	0	4nxfvgw	291.0	[105415145]	Completed
949460	11211087	250950698	193347	2024-05-20 19:42:56.000	2024-05-20 20:13:22.204	2024-05-20 20:29:13.214	0	4nxfgf5	381.0	[107087869, 100163433, 104945560]	Completed
949461	10871052	282454399	124110	2024-05-20 15:09:39.000	2024-05-20 15:39:25.735	2024-05-20 15:45:54.741	0	4nxcg93	129.0	[100584218]	Completed
949462	24561499	234269216	342340	2024-05-20 14:31:48.000	2024-05-20 14:43:33.506	2024-05-20 15:03:03.866	0	4nxftsg	104.0	[103967554, 106922413]	Completed

Swiggy Dataset

Item Datset

	item_id	dish_family	category	cuisine
0	102927323	pav	snacks - evening	north indian
1	102250682	soft drinks	beverage - branded cola/cold	others
2	103846009	breakfast	snacks- others	north indian
3	105415872	dips	sides	others
4	100610198	combos	combos	continental

Pre-processed Data

- Total no of orders : 1546906
- Total No of unique users :154117
- Total No of unique items :147528

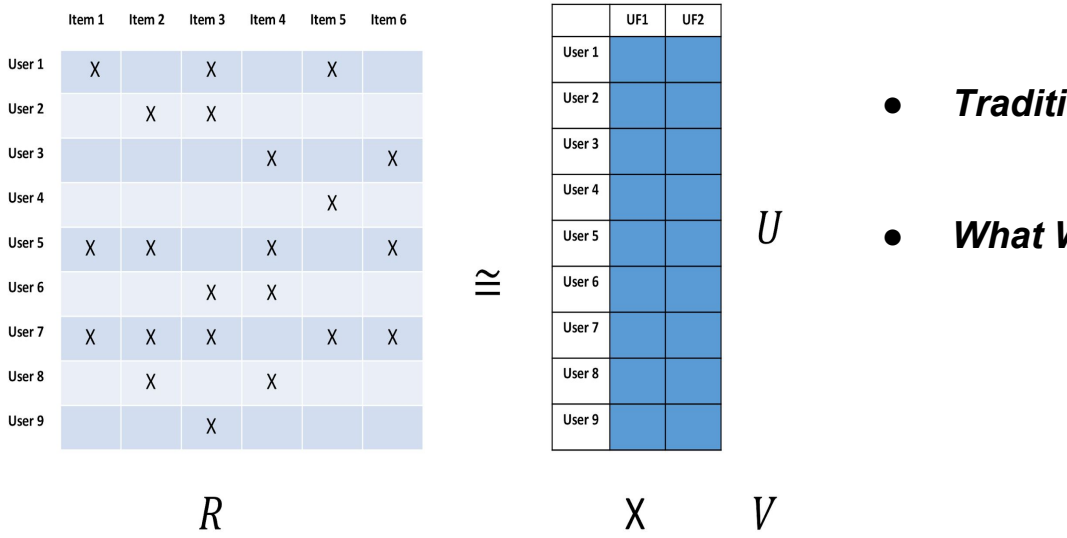
	user	item	count
55	10000690	101593327	1
56	10000690	102438804	1
57	10000690	105742169	1
58	10000690	106119148	4
59	10000690	108163887	2
60	10000779	105247104	1
61	10000779	105705022	1
62	10000840	100780831	2
63	10000840	107070205	2
64	10001010	100372382	1

Sparsity almost 100%

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
User 1	X		X		X	
User 2		X	X			
User 3				X		X
User 4					X	
User 5	X	X		X		X
User 6			X	X		
User 7	X	X	X		X	X
User 8		X		X		
User 9			X			

R

Matrix Factorization Technique



- ***Traditional Method*** - SVD
- ***What We Implemented*** - ALS[1]

[1] Hu, Kolen, et.el. Collaborative Filtering for Implicit Feedback Datasets

ALS Method

$$p_{ui} = \begin{cases} 1 & r_{ui} > 0 \\ 0 & r_{ui} = 0 \end{cases}$$

$$c_{ui} = 1 + \alpha r_{ui}$$

ALS

$$\min_{x_\star, y_\star} \sum_{u,i} c_{ui}(p_{ui} - x_u^T y_i)^2 + \lambda \left(\sum_u \|x_u\|^2 + \sum_i \|y_i\|^2 \right)$$

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100%|██████████| 100.0/100 [00:53<00:00,  2.06it/s]
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SVD

$$\min_{x_\star, y_\star} \sum_{r_{u,i} \text{ is known}} (r_{ui} - x_u^T y_i)^2 + \lambda(\|x_u\|^2 + \|y_i\|^2)$$

Demonstration

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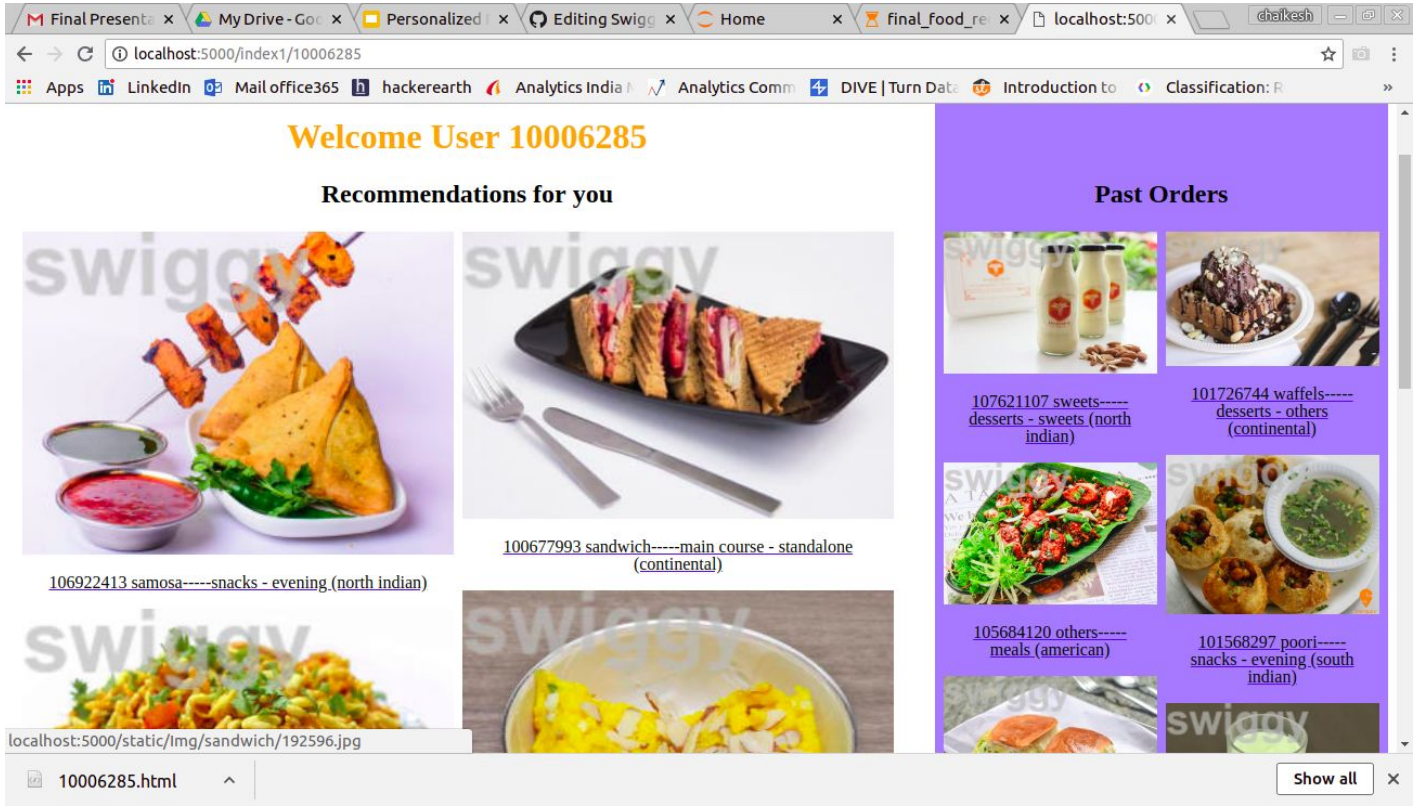
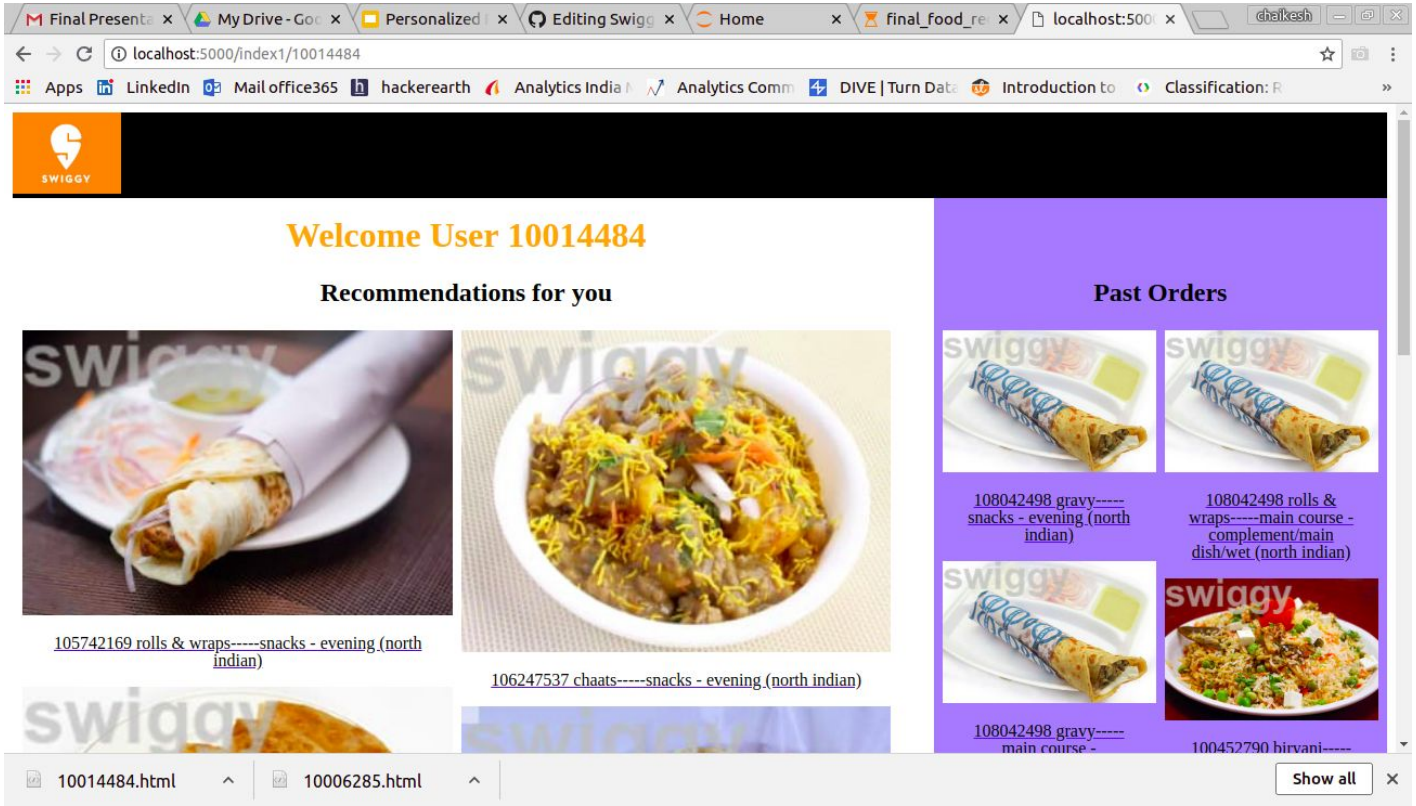


Demonstration



Q&A