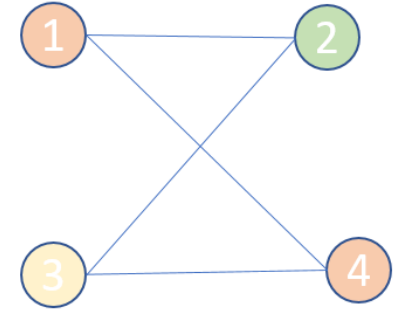
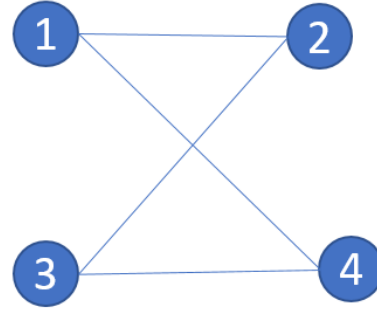
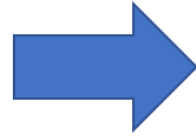
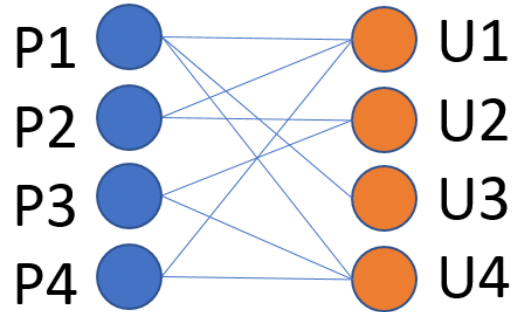


Shwap



Edge's weight with Jaccard's similarity

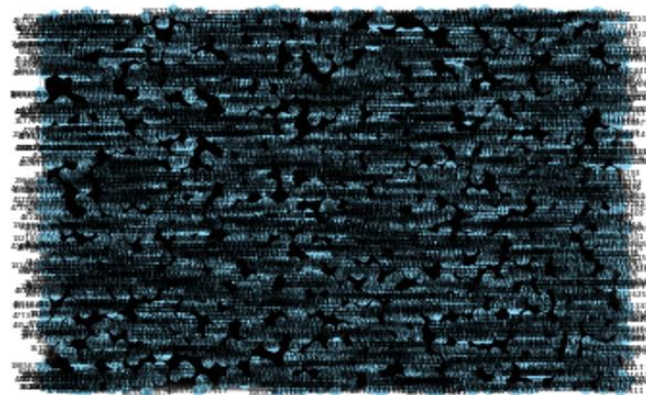
$$q(i,j) = \frac{|C(a_i, a_j)|}{|C(a_i)| + |C(a_j)|}$$

$$\begin{aligned} q(P1, P2) &= 1 / (3+2) = 0.20 \\ q(P1, P4) &= 2 / (3+2) = 0.40 \\ q(P3, P4) &= 1 / (2+2) = 0.25 \end{aligned}$$

Louvain Community Detection

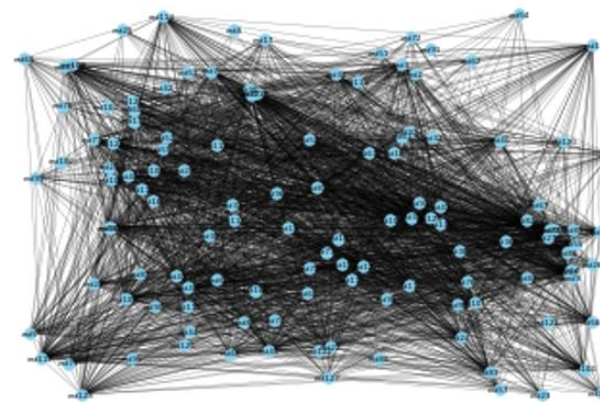
Shwap

0, day : 0 (0.0%)
1, order_id : 0 (0.0%)
2, sale_kind : 8 (0.01%)
3, billing_city : 36904 (51.79%)
4, billing_country : 36883 (51.76%)
5, customer_id : 0 (0.0%)
6, customer_type : 12575 (17.65%)
7, product_id : 0 (0.0%)
8, product_price : 0 (0.0%)
9, product_title : 10564 (14.82%)
10, product_type : 13510 (18.96%)
11, product_vendor : 13160 (18.47%)
12, variant_id : 0 (0.0%)
13, variant_sku : 16094 (22.59%)
14, variant_title : 25730 (36.11%)
15, api_client_title : 8 (0.01%)
16, shipping_city : 36706 (51.51%)
17, shipping_country : 36706 (51.51%)
18, orders : 0 (0.0%)
19, gross_sales : 0 (0.0%)
20, discounts : 0 (0.0%)
21, returns : 0 (0.0%)
22, net_sales : 0 (0.0%)
23, shipping : 0 (0.0%)
24, taxes : 0 (0.0%)
25, total_sales : 0 (0.0%)
26, total_cost : 0 (0.0%)
27, net_quantity : 0 (0.0%)
28, ordered_item_quantity : 0 (0.0%)
29, returned_item_quantity : 0 (0.0%)



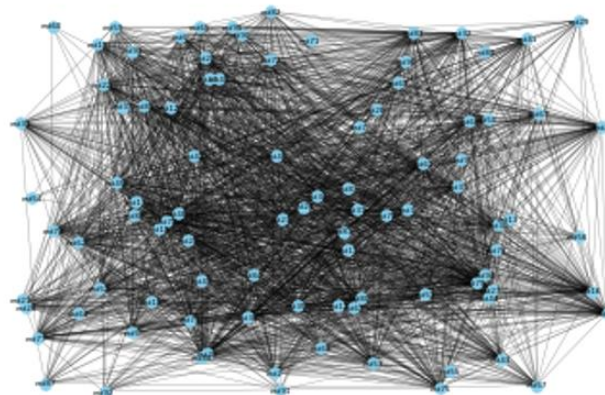
Customer vs. Product Id

Total product id: 2871
Network density: 0.023464
Evaluation: 5074 => 0.004138



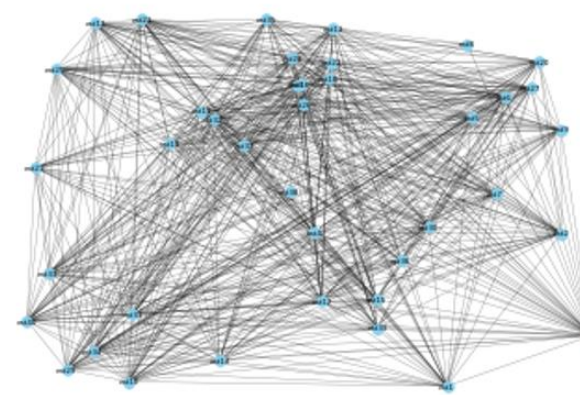
Customer vs. Product Vendor

Total product category: 129
Network density: 0.375096
Evaluation: 4996 => 0.04



Customer vs. Product Type

Total product category: 96
Network density: 0.5227636
Evaluation : 4996 => 0.12



Customer vs. Product Type

Total product category: 40
Network density: 0.817948
Evaluation : 4993 => 0.28

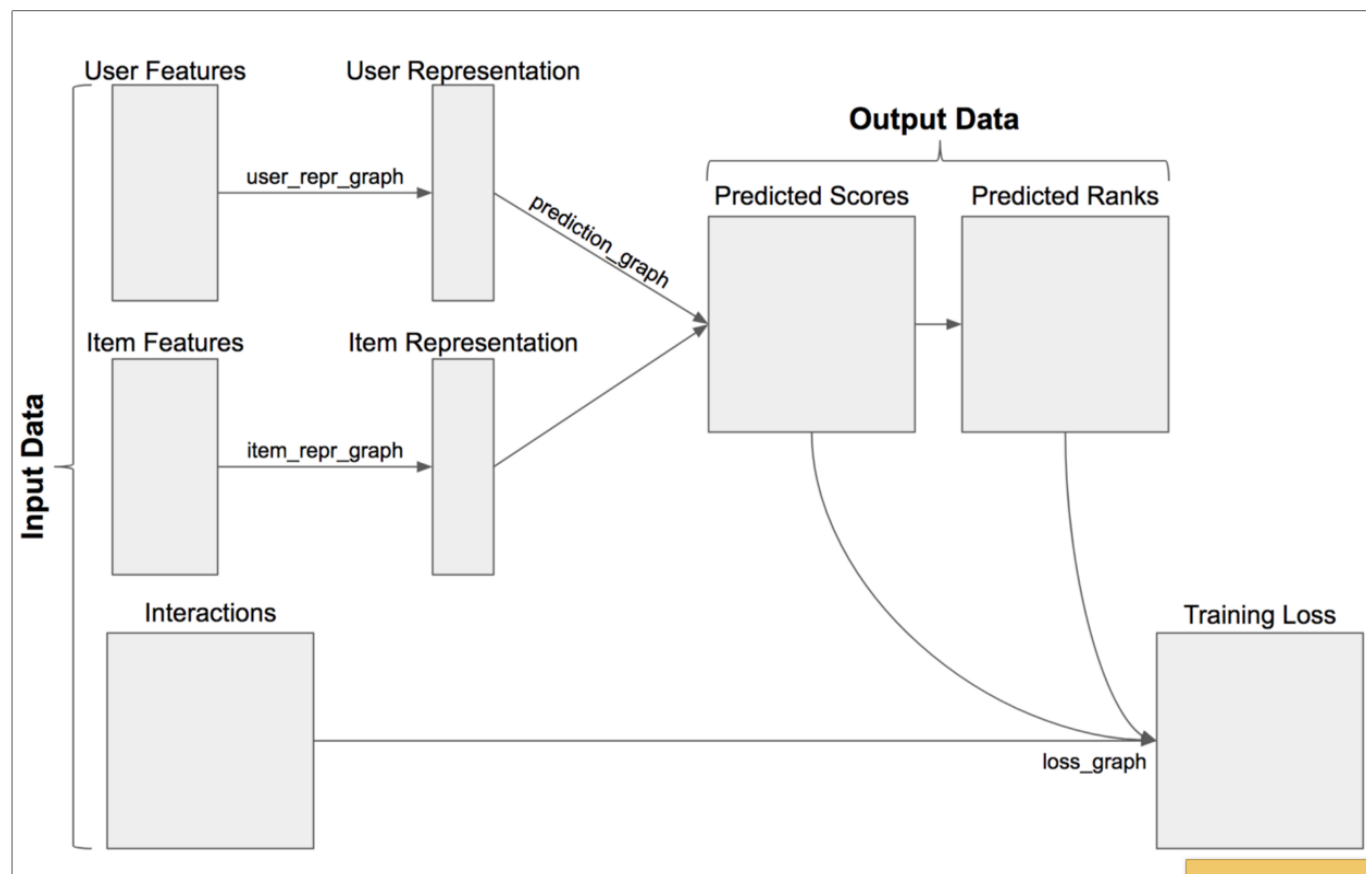
Shwap

0, day : 0 (0.0%)
1, order_id : 0 (0.0%)
2, sale_kind : 8 (0.01%)
3, billing_city : 36904 (51.79%)
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5, customer_id : 0 (0.0%)
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8, product_price : 0 (0.0%)
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20, discounts : 0 (0.0%)
21, returns : 0 (0.0%)
22, net_sales : 0 (0.0%)
23, shipping : 0 (0.0%)
24, taxes : 0 (0.0%)
25, total_sales : 0 (0.0%)
26, total_cost : 0 (0.0%)
27, net_quantity : 0 (0.0%)
28, ordered_item_quantity : 0 (0.0%)
29, returned_item_quantity : 0 (0.0%)

The *user-item interaction matrix* defines the interaction between the user (customer_id) to the item (product_id)

Product features: (product_type, product_vendor, variant_sku, product_cat).

User features: (recency, frequency, monetary, variety, cluster).



Shwap

product_id	3824582572	6458964228	6455427716	9523757444	10029359759	38029369613
customer_id						
267336673	0	0	0	0	0	0
313714285	0	0	0	0	0	0
399541992	0	0	0	0	0	0
953385604	2	0	0	0	0	0
1079947012	0	0	0	0	0	0

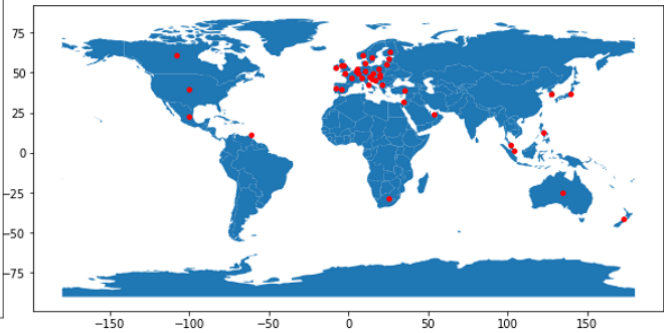
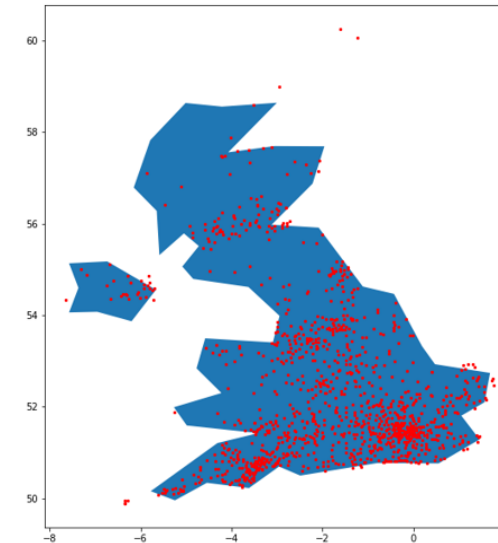
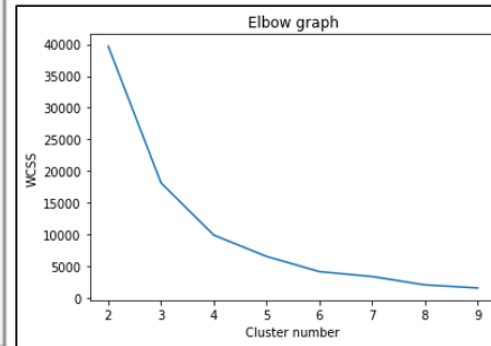
The *user-item interaction matrix* defines the interaction between the user (customer_id) to the item (product_id)

Product features: (product_type, product_vendor, variant_sku, product_cat).

User features: (recency, frequency, monetary, variety, cluster).

	product_id	product_cat	product_vendor	variant_sku
0	1482471964765	cat29	Egos Shoes	EGOS-403
1	1297346986077	cat26	People Tree	PPT-U442UV.BK1
2	3575933141085	cat26	Sancho's	SAN-CREATOR-01-WHITE
3	3770035929181	cat15	Armedangels	AA-30001353-501
4	628919664667	cat26	Thought	WST3533

	customer_id	recency	frequency	monetary	variety
0	267336673	98	5	209.49	5
1	313714285	493	2	52.59	2
2	399541992	848	2	16.00	2
3	953385604	357	57	1326.91	46
4	1079947012	288	4	65.92	4



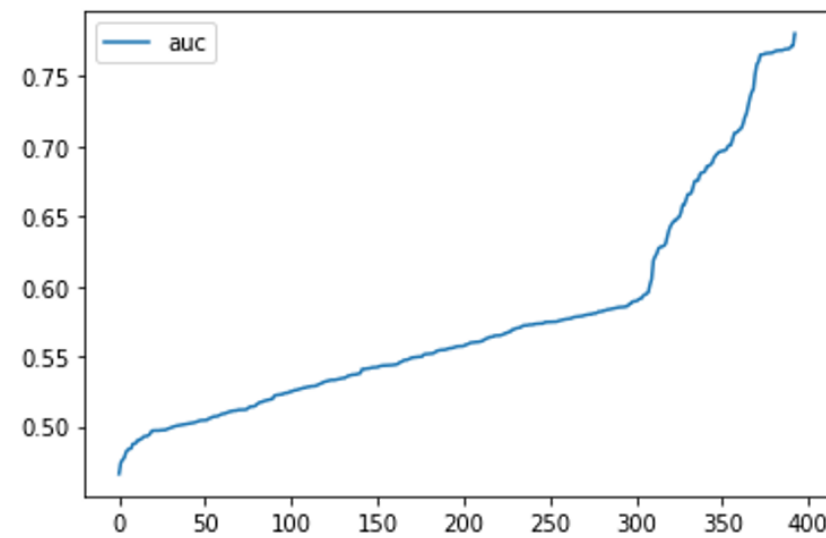
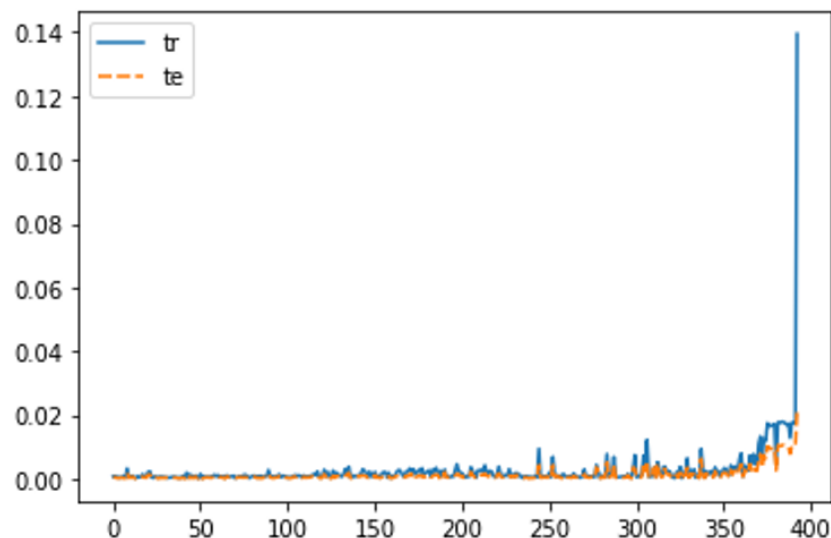
Shwap

featTit	auc	tr	te
None	0.780328	0.139426	0.021435
(userVar, userFre)	0.771651	0.017690	0.010418
(userFre, userVar)	0.771225	0.017581	0.010418
(userVar,)	0.769692	0.017556	0.010268
(userClu, userVar, userFre, userMon)	0.769408	0.012873	0.007926
(userClu, userVar, userFre)	0.769337	0.017388	0.009949
(userFre,)	0.769084	0.017095	0.010043
(userClu, userFre, userVar)	0.768499	0.017388	0.010418
(userFre, userVar, userClu)	0.768423	0.017942	0.010605
(userVar, userFre, userClu)	0.768339	0.017816	0.010455

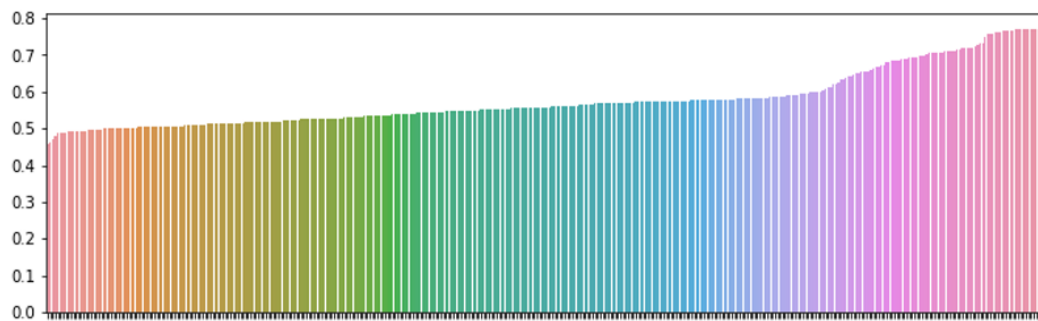
The *user-item interaction matrix* defines the interaction between the user (customer_id) to the item (product_id)

Product features: (product_type, product_vendor, variant_sku, product_cat).

User features: (recency, frequency, monetary, variety, cluster).



List of features vs. auc



Shwap

```
User: 267336573 [98.0, 5.0, 209.49, 5.0]
Known positives:
  751850455133 ['trousers', 'Thought', 'WSB3705', 'cat15']
  4534658433117 ['jumpsuit', 'People Tree', 'PPT-X328UY.NY1', 'cat18']
  4545201176669 ['dress', 'Armedangels', 'AA-30001803-1237', 'cat18']
  4508295856221 ['socks', 'People Tree', 'PPT-X905UY.BLX', 'cat32']
  4705063665757 ['shoes', 'Komodo', 'KOM-B38KFS20-MOSS', 'cat29']
Recommended:
  4545201340509 ['t-shirt', 'Armedangels', 'AA-30001276-1317', 'cat26']
  3677066395741 ['socks', 'Komodo', 'KOM-BEA-OBRED', 'cat32']
  4678396477533 ['pyjama', 'Thought', 'THO-WSB4868-CREAM', 'cat27']
  4465424990301 ['jeans noos', 'United Change Makers', 'UCM-MAYA-LD', 'cat15']
  439010099227 ['socks', 'Thought', 'SPW238', 'cat32']
  2001469702237 ['jeans', 'Monkee Genes', 'MG-MG018SS-DW', 'cat15']
  4573204316253 ['nail polish', 'A Weathered Penny', 'AWP-SS20-017', 'cat6']
```

```
User: 313714285 [493.0, 2.0, 52.59, 2.0]
Known positives:
  1407379603549 ['underwear', 'Organic Basics', 'OB-M-BXR-S-WH', 'cat33']
  1973769601117 ['top', 'Thought', 'THO-WST4021-GRAPHITE', 'cat26']
Recommended:
  3608536121437 ['earrings', 'Luciana Art', 'LART-MISC', 'cat1']
  3793625448541 ['trousers', 'Armedangels', 'AA-30000305-138', 'cat15']
  1998123270237 ['dress', 'Komodo', 'KOM-INA-CORAL', 'cat18']
  4399594373213 ['ring', 'People Tree', 'PPT-W488UX.SL1', 'cat1']
  4678396477533 ['pyjama', 'Thought', 'THO-WSB4868-CREAM', 'cat27']
```

```
User: 399541992 [848.0, 2.0, 16.0, 2.0]
Known positives:
  587391926299 ['leggings', 'People Tree', 'PPT-P754UR.NY1', 'cat2']
  1573995184221 ['socks', 'Doris & Dude', 'DDS485', 'cat32']
Recommended:
  1923669721181 ['necklaces', 'Holly Made This', 'HMT-NECKLACE-5', 'cat1']
  1305244794973 ['dress', 'Ella Moda', 'EM-826/S18/PLN/BLUSH/AS', 'cat18']
  316683812891 ['underwear', 'Organic Basics', 'F-BNI-C-BL-5', 'cat33']
  420283875355 ['underwear', 'Thought', 'MAC3432', 'cat33']
  1922007728221 ['underwear', 'Thought', 'THO-MAC3660', 'cat33']
  1416661172317 ['socks', 'Doris & Dude', 'DDS537', 'cat32']
  650481926171 ['socks', 'Thought', 'SPM292', 'cat32']
```