


```
Payment channels used by most customers:
credit_card    11092
UPI            32160
voucher        7252
debit_card    2067
Name: payment_type, dtype: int64

In [97]: #Top 10 maximum rated categories
top_10_max_rated_categories = final.groupby('product_category_name')['review_score'].mean().nlargest(10)
print('Top 10 maximum rated categories:')
print(top_10_max_rated_categories)

Top 10 maximum rated categories:
product_category_name
Fashion_Childrens_Clothes    5.000000
Books_Imported              4.626667
Cds_Dvds_Musicals           4.611111
Small_Appliances_Home_Oven_And_Coffee    4.467332
Books_General_Interest       4.461069
Cine_Photo                  4.355556
Construction_Tools_Tools     4.318239
Luggage_Accessories          4.309819
Books_Technical              4.307420
Fashion_Shoes                4.271386
Name: review_score, dtype: float64

In [98]: #Top 10 minimum rated categories
top_10_min_rated_categories = final.groupby('product_category_name')['review_score'].mean().smallest(10)
print('Top 10 minimum rated categories:')
print(top_10_min_rated_categories)

Top 10 minimum rated categories:
product_category_name
Security_And_Services         2.500000
Diapers_And_Ryggiene          2.670330
Home_Comfort_2               2.911111
Fixed_Telephony              3.225951
Office_Furniture             3.273868
La_Cuisine                   3.437500
Furniture_Living_Room        3.474556
Fashion_Male_Clothing        3.505319
Party_Supplies               3.547170
Christmas_Supplies           3.673387
Name: review_score, dtype: float64

In [99]: # top 10 products maximum rated
top_10_max_rated_products = final.groupby('product_id', as_index=False)['review_score'].mean().nlargest(10, 'review_score')
print('Top 10 maximum rated products:')
print(top_10_max_rated_products)

Top 10 maximum rated products:
      product_id  review_score
0  00066f42aeeb9f3007548bb9d3f33c38      5.0
3  000b8f95fcb9e0096488278317764d19      5.0
4  000d9b9e2b5207b5e6f6a6d1b1ac4872      5.0
0012ef270813603687e6ce4e8e69d99d01      5.0
8  001b237c0e9eb435f2e5d07129237e9      5.0
10 001c5071a6e6a6f6d2231595758fa04      5.0
13 0021a87d6977a4eb6ce4f166502b0e0f5      5.0
16 002959d7a0b0990fe2d69988affcbb80      5.0
17 002ca86874ba1b0c7b5cfc6e4e6dfe65      5.0
18 002c6da60557c48cf6c6c222e7f7d76      5.0

In [100]: #top 10 products minimum rated
top_10_min_rated_products = final.groupby('product_id')['review_score'].mean().smallest(10)
print('Top 10 minimum rated products:')
print(top_10_min_rated_products)

Top 10 minimum rated products:
      product_id  review_score
0009406fd7479715e4bef61dd91f2462      1.0
0011c0512e8265aa03db5448d0f9cf6e      1.0
002d4e47cd4793c130ba7e7e7c7cdd1d94      1.0
0043c62d00db47eff6a6bcb4cfc6baeda      1.0
004bda125e08f0b2f1b8fa6ef91742ab      1.0
006b6d15594c5e1200324eac1a1843c4      1.0
00e62bce93373ca4c5d5b4c5c8188f8d2      1.0
00e7b9a84cc0cf3b2f37892ab03d6dc10      1.0
0135900191a4b83219257d6cf6e9b5dcf2      1.0
01604238fbc11ce379e537a76b2b6bc94      1.0
Name: review_score, dtype: float64

In [101]: #Average rating by location
average_rating_by_location = final.groupby('customer_city')['review_score'].mean()
average_rating_by_location

customer_city
Aadityana      3.714286
Aambaliyasan   3.500000
Aantaliyay     3.724138
Aarambhada     3.205882
Abramam        5.000000
.              .
Zamin_Uthukuli 4.000000
Ziauddin_Pur  4.172897
Zira           4.600000
Zirakpur       4.500000
Ziro           3.808824
Name: review_score, Length: 4050, dtype: float64

In [102]: #Average rating by seller
average_rating_by_seller = final.groupby('seller_id')['review_score'].mean()
average_rating_by_seller

seller_id
0015a82c2db0d00af6aaaf3ae2ecb0532      3.666667
001cca7ae9ae17fb1cae990bf1094831      3.798235
002100077f0eb841b7a1020cf7a6a8f2      4.396970
004c9cd9d87a3c3c522c48c4fc07416      4.187192
00720abe95ba0859807595bdc045a33b      3.539474
.
.
.
f6d470761de7d0232558ba5e786e57b7      4.078947
fd0d9f62b3a447f6f8b4b91554cc7d03      4.160000
f6ee66acbd5d42ce6d80ba262c832534      4.242886
fff45d13c0700ac820c7069d66d98e89      3.918033
fff756aa4f9085cd26170f4732393726      3.250000
Name: review_score, Length: 6693, dtype: float64

In [103]: #Average rating by product
average_rating_by_product = final.groupby('product_id')['review_score'].mean()
average_rating_by_product

product_id
00066f42aeeb9f3007548bb9d3f33c38      5.0
000d8930e925c41d09ba9b6956d055      4.0
0009406fd7479715e4bef61dd91f2462      1.0
000b8f95fcb9e0096488278317764d19      5.0
000d9b9e2b5207b5e6f6a6d1b1ac4872      5.0
.
.
.
fff6177642830a9a0f2c8a5e476d1      4.5
fff61c0318d2725c655a9ba0d5712c      4.0
fff9553ac224cec9d15d49f5a263411f      5.0
fffcb2d0ec8d6a61f0a0a0b3f22b441      5.0
fff9a9eff12fcd74a222b007d6e0c50      4.0
Name: review_score, Length: 31083, dtype: float64

In [104]: #Average rating by category
average_rating_by_category = final.groupby('product_category_name')['review_score'].mean()
average_rating_by_category

product_category_name
Agro_Industry_And_Commerce      4.105405
Air_Conditioning                3.707434
Art                              3.990196
Arts_And_Craftmanship           4.074074
Audio                           3.833107
.
.
.
Stationery                      4.111327
Tablets_Printing_Image          4.010417
Telephony                      3.789723
Toys                            4.144156
Watches_Gifts                  3.918832
Name: review_score, Length: 71, dtype: float64

In [105]: #Average rating by month
average_rating_by_month = final.groupby(final['order_purchase_timestamp'].dt.to_period("M"))['review_score'].mean()
average_rating_by_month

order_purchase_timestamp
2016-10      3.780538
2016-12      5.000000
2017-01      4.156980
2017-02      4.160900
2017-03      4.023762
2017-04      4.024209
2017-05      4.132185
2017-06      4.133659
2017-07      3.873698
2017-08      4.039831
2017-09      3.993505
2017-10      3.879211
2017-11      3.752484
2017-12      3.799585
2018-01      3.766945
2018-02      3.440903
2018-03      3.626481
2018-04      3.950488
2018-05      4.036425
2018-06      3.995735
2018-07      4.187505
2018-08      4.153168
Freq: M, Name: review_score, dtype: float64
```