

12_customer_seg_bankchurndata_report

December 27, 2022

1 Customer Segmentation Report

2 Import Data

customer_id	credit_score	country	gender	age	tenure	balance	\
15634602	619	France	Female	42	2	0.00	
15647311	608	Spain	Female	41	1	83807.86	
15619304	502	France	Female	42	8	159660.80	
15701354	699	France	Female	39	1	0.00	
15737888	850	Spain	Female	43	2	125510.82	

customer_id	products_number	credit_card	active_member	estimated_salary
15634602	1	yes	yes	101348.88
15647311	1	no	yes	112542.58
15619304	3	yes	no	113931.57
15701354	2	no	no	93826.63
15737888	1	yes	yes	79084.10

3 Load Model Artifacts

4 Transform Dataset

customer_id	credit_score	age	tenure	balance	products_number	\
15634602	619.0	42.0	2.0	0.00	1.0	
15647311	608.0	41.0	1.0	83807.86	1.0	
15619304	502.0	42.0	8.0	159660.80	3.0	
15701354	699.0	39.0	1.0	0.00	2.0	
15737888	850.0	43.0	2.0	125510.82	1.0	

customer_id	estimated_salary	country	gender	credit_card	active_member	\
15634602	101348.88	France	Female	yes	yes	
15647311	112542.58	Spain	Female	no	yes	

15619304	113931.57	France	Female	yes	no
15701354	93826.63	France	Female	no	no
15737888	79084.10	Spain	Female	yes	yes

	cluster
customer_id	
15634602	1
15647311	2
15619304	3
15701354	3
15737888	1

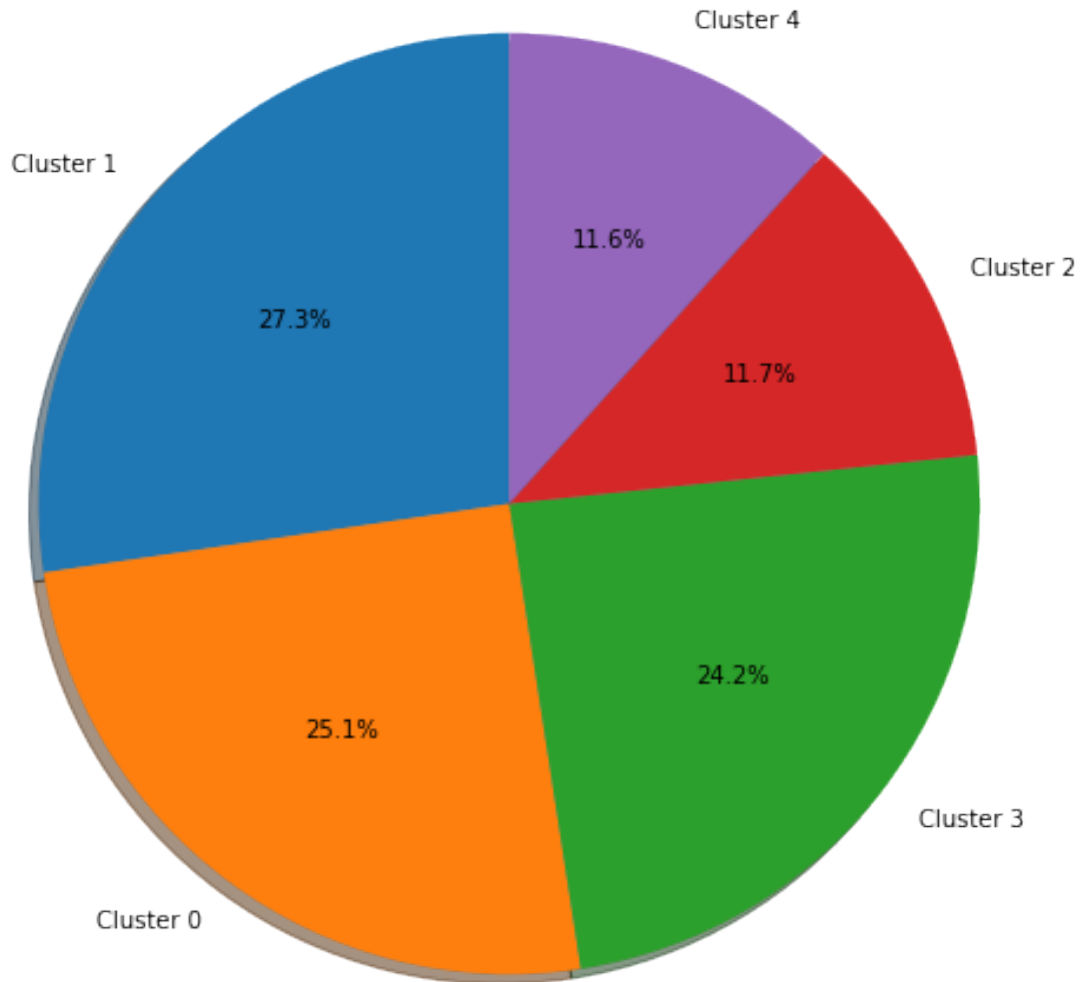
5 Data Visualization

1	2734
0	2509
3	2423
2	1169
4	1165

Name: cluster, dtype: int64

5.1 What does the Cluster Distribution Look Like?

```
['Cluster 1', 'Cluster 0', 'Cluster 3', 'Cluster 2', 'Cluster 4']
```



6 Determine Cluster Centers

`['estimated_salary']` did not aggregate successfully. If any error is raised this will raise in a future version of pandas. Drop these columns/ops to avoid this warning.

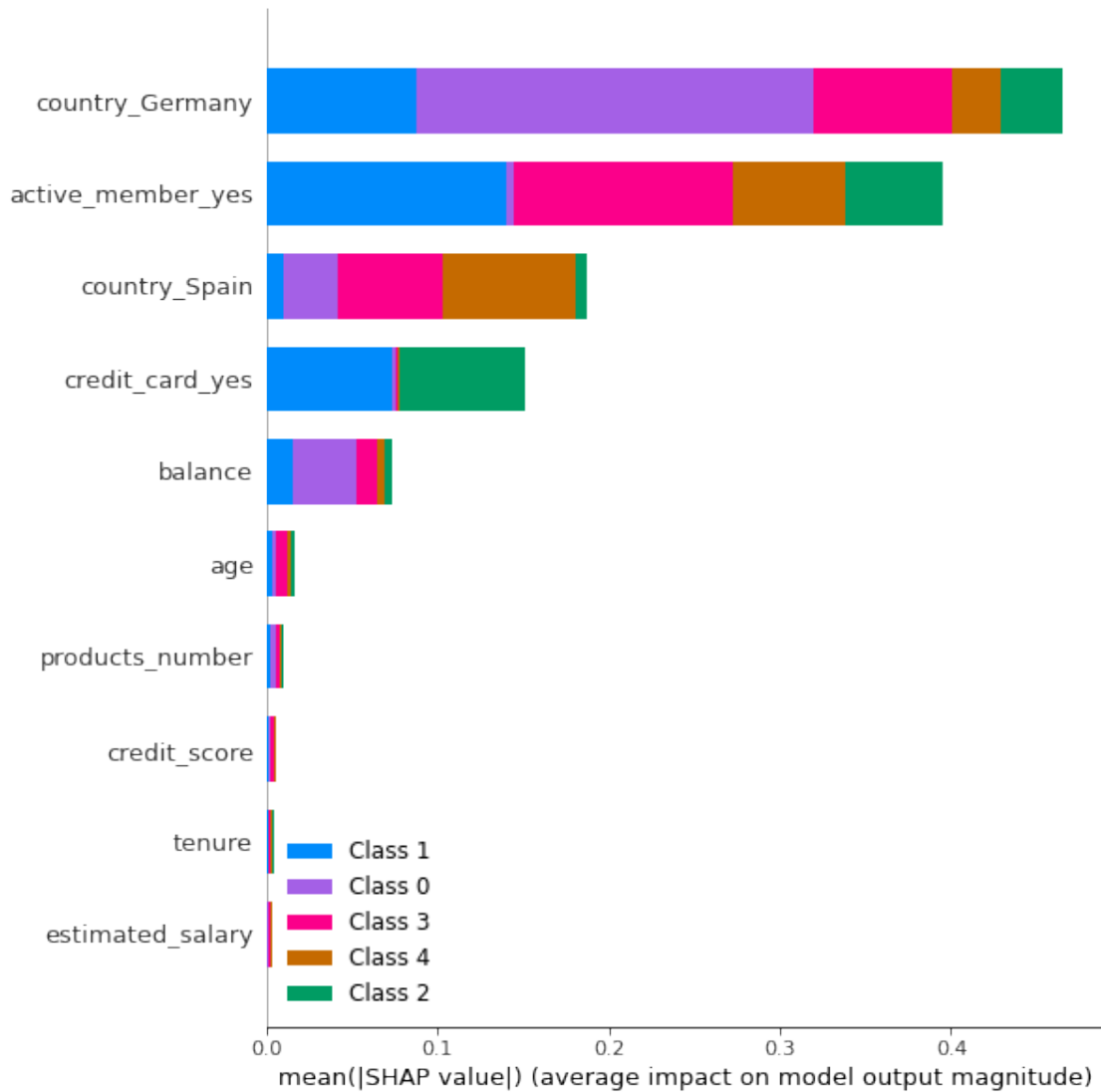
cluster	credit_score	age	tenure	balance	products_number \
0	651.453567	39.720469	5.009964	119730.116134	1.512869
1	652.849305	39.484752	5.032919	60451.419214	1.528936
2	651.337896	39.947621	4.796407	64975.713370	1.529737
3	646.894759	37.340945	5.054065	63463.576232	1.513989
4	649.837768	37.677730	5.103004	59616.306635	1.567738

	estimated_salary	country	gender	credit_card	active_member
cluster					
0	101113.435102	Germany	Male	yes	no
1	98028.231372	France	Male	yes	yes
2	101585.407280	France	Male	no	yes
3	100982.054408	France	Male	yes	no
4	99370.597966	Spain	Male	yes	no

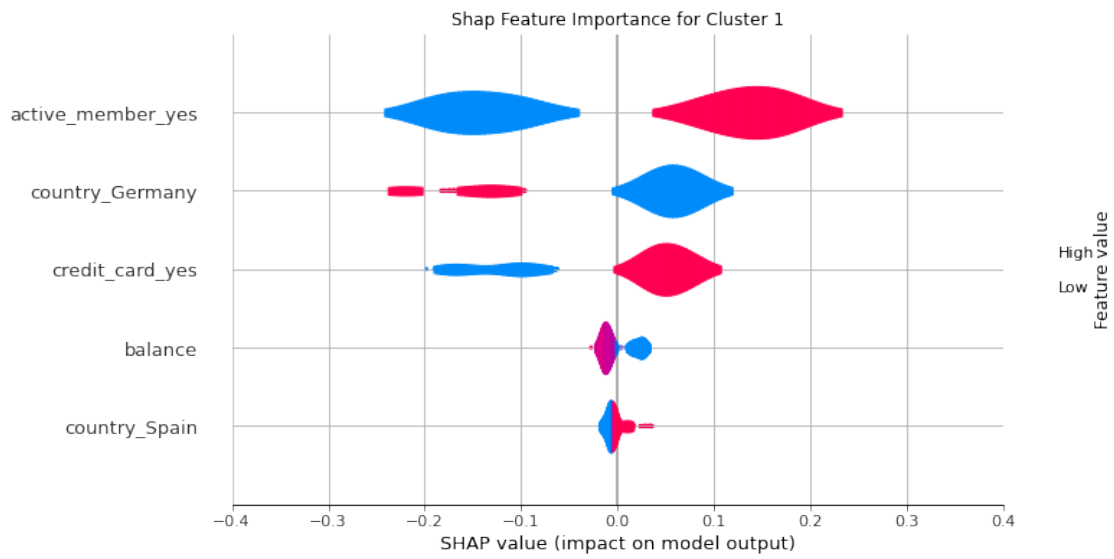
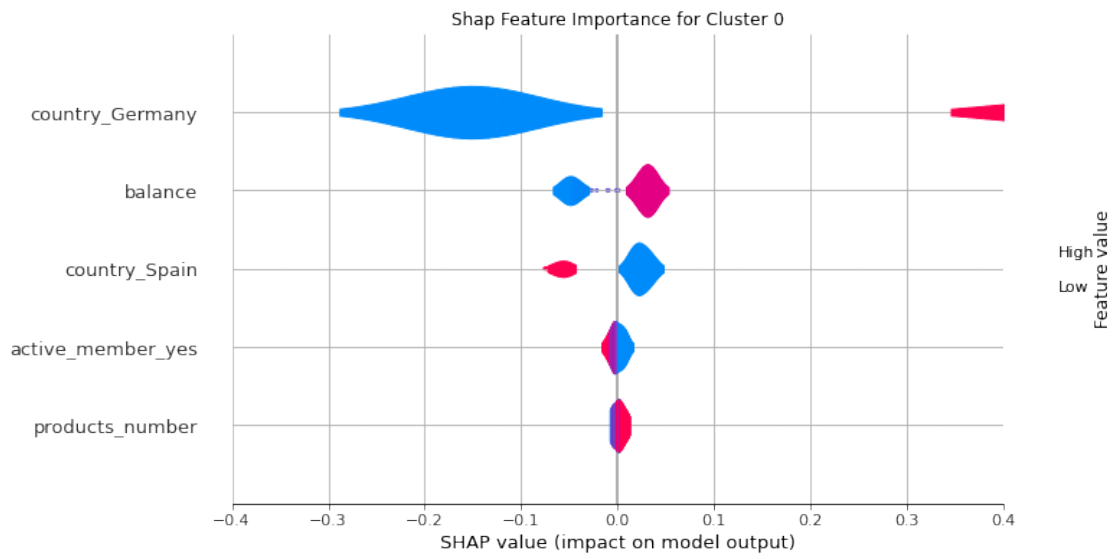
7 Explain Clusters

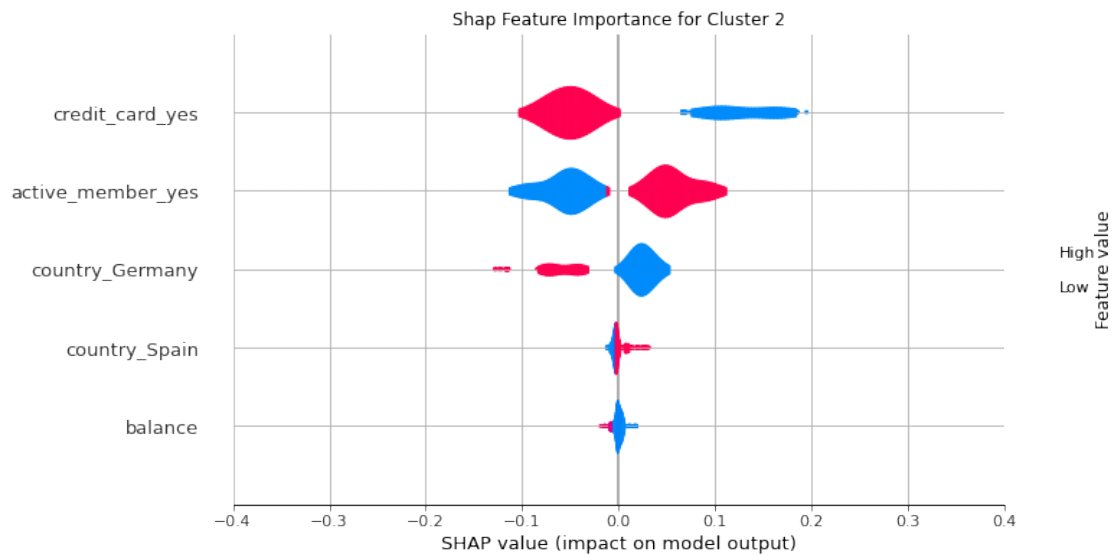
8 Custom Functions

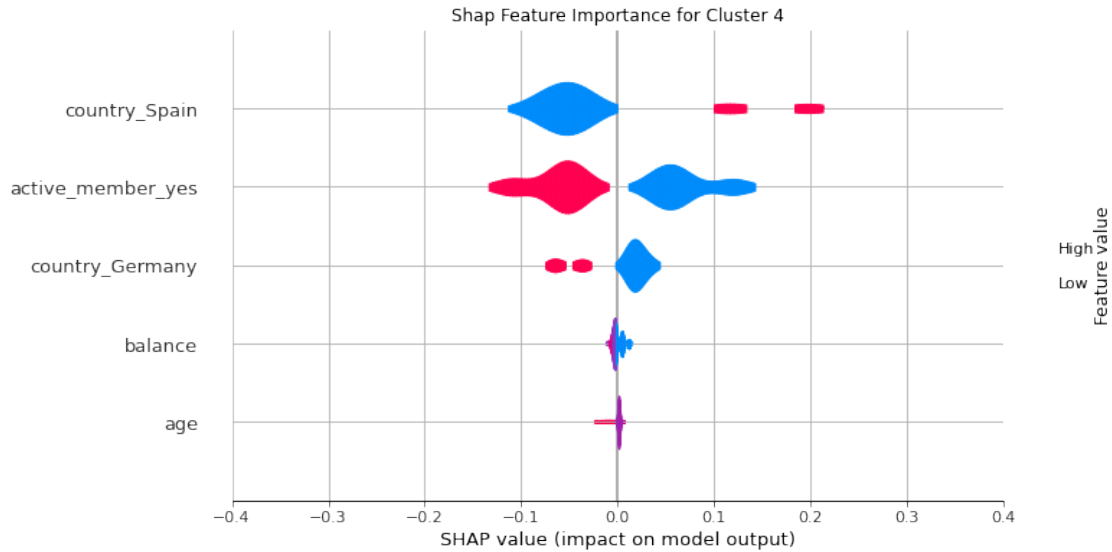
8.1 Average Feature Importance on Cluster Building



8.2 Explain Single Cluster vs Rest







```
['credit_card_yes',
 'active_member_yes',
 'country_Germany',
 'country_Spain',
 'balance']
```

```
['active_member_yes',
 'products_number',
 'credit_card_yes',
 'age',
 'country_Germany',
 'country_Spain',
 'balance']
```

```
['products_number', 'age', 'balance']
```

```
['credit_card', 'active_member', 'country']
```

IndexError

Traceback (most recent call last)

e:

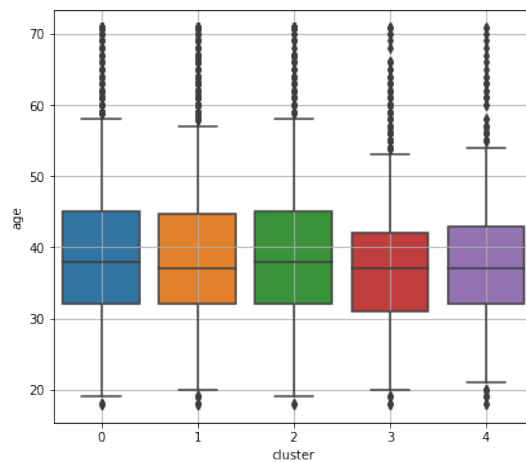
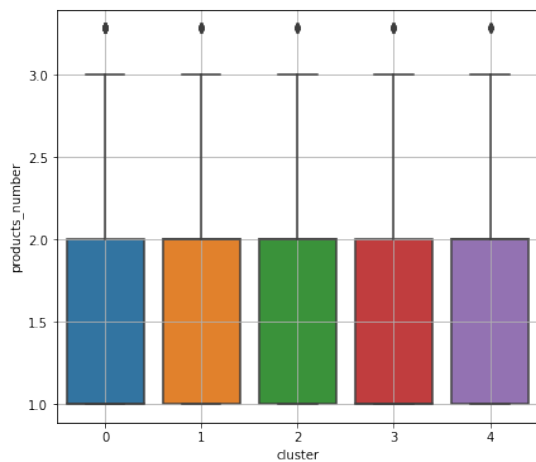
```
↪ \GoogleDrive\Beruf\Freelancing\Code_Repo\Customer_Analytics\Marketing-Sales-Customer-Segmen
↪ ipynb Cell 29 in <cell line: 11>()
    <a href='vscode-notebook-cell:/e%3A/GoogleDrive/Beruf/Freelancing/
↪ Code_Repo/Customer_Analytics/Marketing-Sales-Customer-Segmentation-Webapp/
↪ experiment/12_customer_seg_bankchurndata_report.ipynb#X40sZmlsZQ%3D%3D?
↪ line=7'>8</a> ax = ax.flatten()
```

```

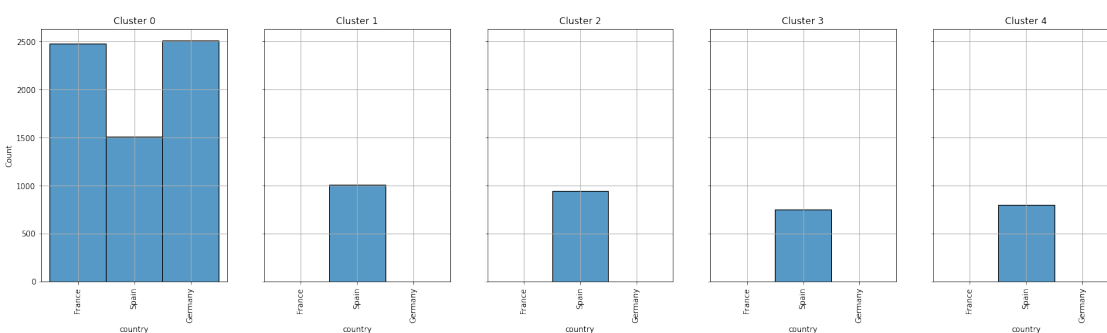
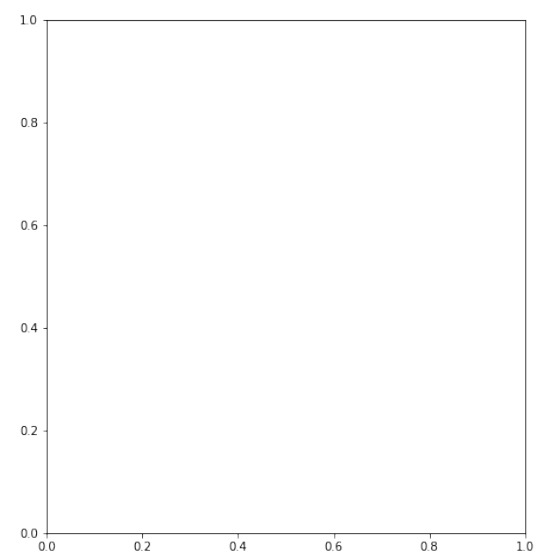
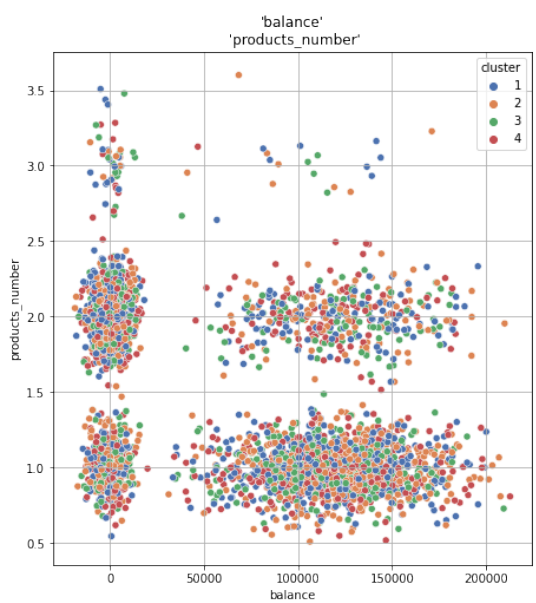
    <a href='vscode-notebook-cell:/e%3A/GoogleDrive/Beruf/Freelancing/Code_Rep /
↳Customer_Analytics/Marketing-Sales-Customer-Segmentation-Webapp/experiment/
↳12_customer_seg_bankchurndata_report.ipynb#X40sZmlsZQ%3D%3D?line=10'>11</a>
↳for n, feat in enumerate(top_features_num):
    <a href='vscode-notebook-cell:/e%3A/GoogleDrive/Beruf/Freelancing/Code_Rep /
↳Customer_Analytics/Marketing-Sales-Customer-Segmentation-Webapp/experiment/
↳12_customer_seg_bankchurndata_report.ipynb#X40sZmlsZQ%3D%3D?line=11'>12</a>
↳sns.boxplot(
    <a href='vscode-notebook-cell:/e%3A/GoogleDrive/Beruf/Freelancing/Code_Rep /
↳Customer_Analytics/Marketing-Sales-Customer-Segmentation-Webapp/experiment/
↳12_customer_seg_bankchurndata_report.ipynb#X40sZmlsZQ%3D%3D?line=12'>13</a>
↳    data=df,
    <a href='vscode-notebook-cell:/e%3A/GoogleDrive/Beruf/Freelancing/Code_Rep /
↳Customer_Analytics/Marketing-Sales-Customer-Segmentation-Webapp/experiment/
↳12_customer_seg_bankchurndata_report.ipynb#X40sZmlsZQ%3D%3D?line=13'>14</a>
↳    x='cluster',
    <a href='vscode-notebook-cell:/e%3A/GoogleDrive/Beruf/Freelancing/Code_Rep /
↳Customer_Analytics/Marketing-Sales-Customer-Segmentation-Webapp/experiment/
↳12_customer_seg_bankchurndata_report.ipynb#X40sZmlsZQ%3D%3D?line=14'>15</a>
↳    y=feat,
    <a href='vscode-notebook-cell:/e%3A/GoogleDrive/Beruf/Freelancing/Code_Rep /
↳Customer_Analytics/Marketing-Sales-Customer-Segmentation-Webapp/experiment/
↳12_customer_seg_bankchurndata_report.ipynb#X40sZmlsZQ%3D%3D?line=15'>16</a>
↳    whis=1.0,
---> <a href='vscode-notebook-cell:/e%3A/GoogleDrive/Beruf/Freelancing/Code_Rep /
↳Customer_Analytics/Marketing-Sales-Customer-Segmentation-Webapp/experiment/
↳12_customer_seg_bankchurndata_report.ipynb#X40sZmlsZQ%3D%3D?line=16'>17</a>
↳    ax=ax[n]
    <a href='vscode-notebook-cell:/e%3A/GoogleDrive/Beruf/Freelancing/Code_Rep /
↳Customer_Analytics/Marketing-Sales-Customer-Segmentation-Webapp/experiment/
↳12_customer_seg_bankchurndata_report.ipynb#X40sZmlsZQ%3D%3D?line=17'>18</a>
↳    )
    <a href='vscode-notebook-cell:/e%3A/GoogleDrive/Beruf/Freelancing/Code_Rep /
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↳12_customer_seg_bankchurndata_report.ipynb#X40sZmlsZQ%3D%3D?line=18'>19</a>
↳    ax[n].grid()
    <a href='vscode-notebook-cell:/e%3A/GoogleDrive/Beruf/Freelancing/Code_Rep /
↳Customer_Analytics/Marketing-Sales-Customer-Segmentation-Webapp/experiment/
↳12_customer_seg_bankchurndata_report.ipynb#X40sZmlsZQ%3D%3D?line=19'>20</a>
↳plt.show()

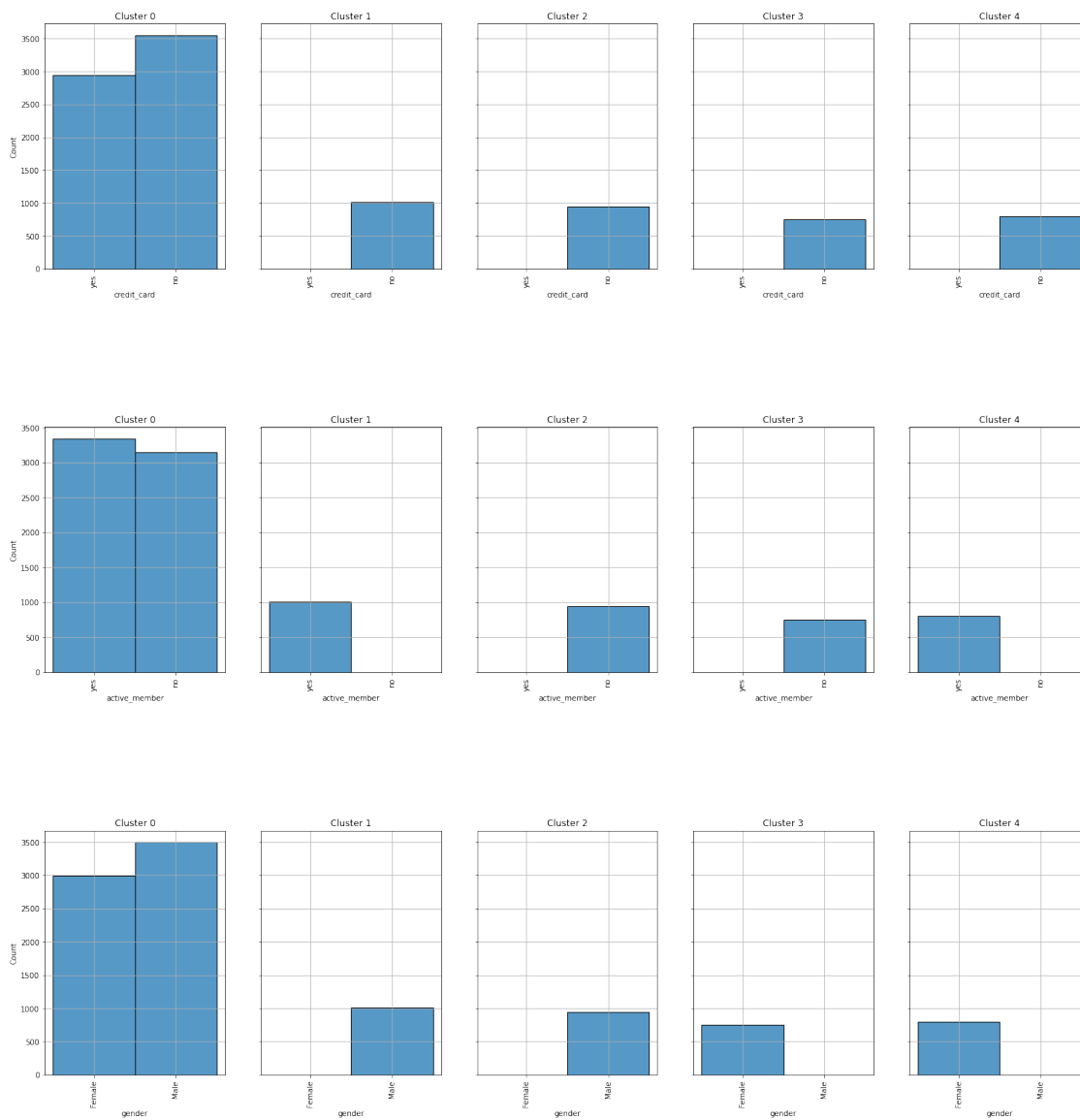
```

IndexError: index 2 is out of bounds for axis 0 with size 2



1





C:\Users\Nutzer\.conda\envs\customer_analytics\lib\site-packages\traitlets\traitlets.py:2389: FutureWarning: Supporting extra quotes around strings is deprecated in traitlets 5.0. You can use '../reports' instead of "'../reports'" if you require traitlets >=5.

warn(

[NbConvertApp] Converting notebook 12_customer_seg_bankchurndata_report.ipynb to pdf

[NbConvertApp] Support files will be in 12_customer_seg_bankchurndata_report_files\

[NbConvertApp] Making directory .\12_customer_seg_bankchurndata_report_files

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