

12_customer_seg_bankchurndata_report

January 5, 2023

1 Customer Segmentation Report

```
c:\Users\Sebas\anaconda3\envs\customer_cluster_app\lib\site-  
packages\tqdm\auto.py:22: TqdmWarning: IPProgress not found. Please update  
jupyter and ipywidgets. See  
https://ipywidgets.readthedocs.io/en/stable/user\_install.html  
from .autonotebook import tqdm as notebook_tqdm
```

2 Import Data

3 Load Model Artifacts

4 Transform Dataset

	credit_score	age	tenure	balance	products_number	\
customer_id						
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	

	estimated_salary	country	gender	credit_card	active_member	\
customer_id						
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	

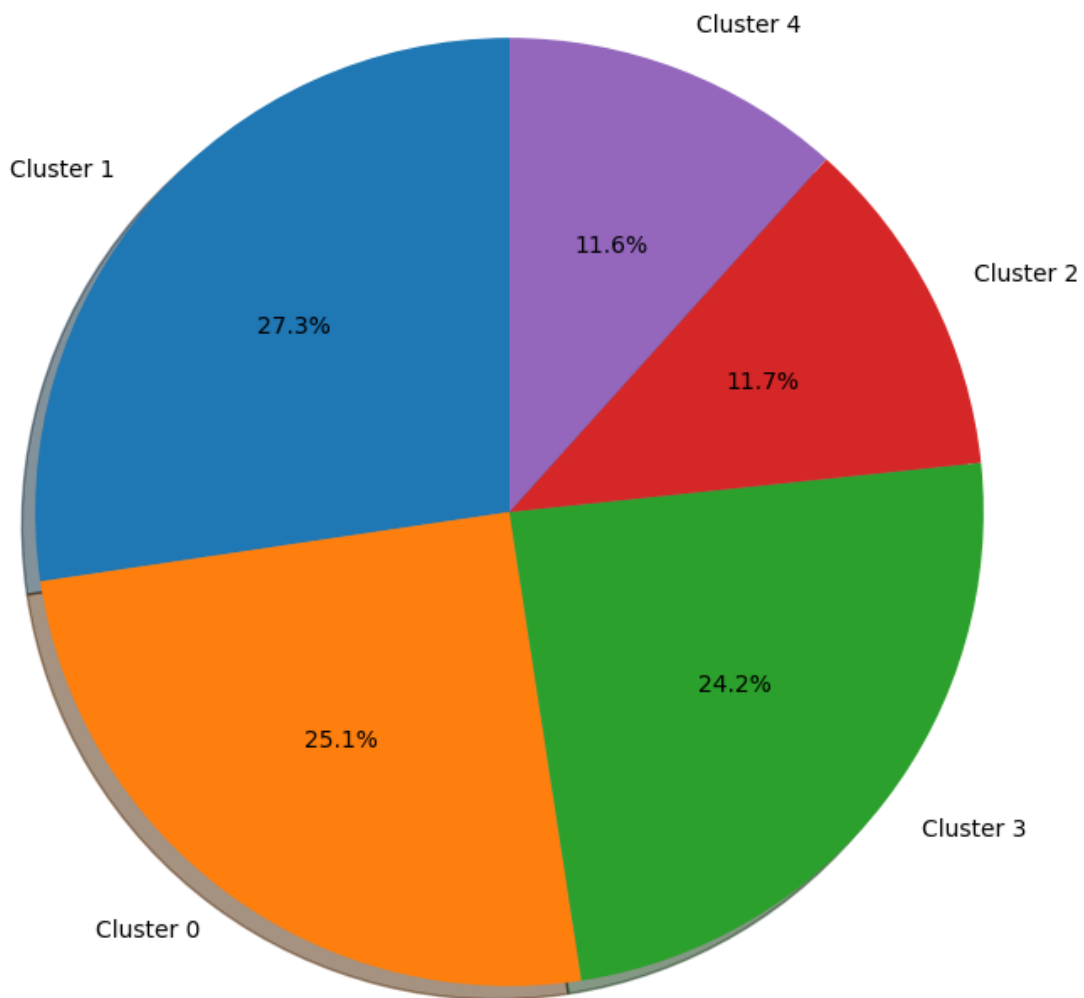
	cluster
customer_id	
15634602	1
15647311	2
15619304	3
15701354	3
15737888	1

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

The default value of `numeric_only` in `DataFrameGroupBy.mean` is deprecated. In a future version, `numeric_only` will default to `False`. Either specify `numeric_only` or select only columns which should be valid for the function.

`['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.

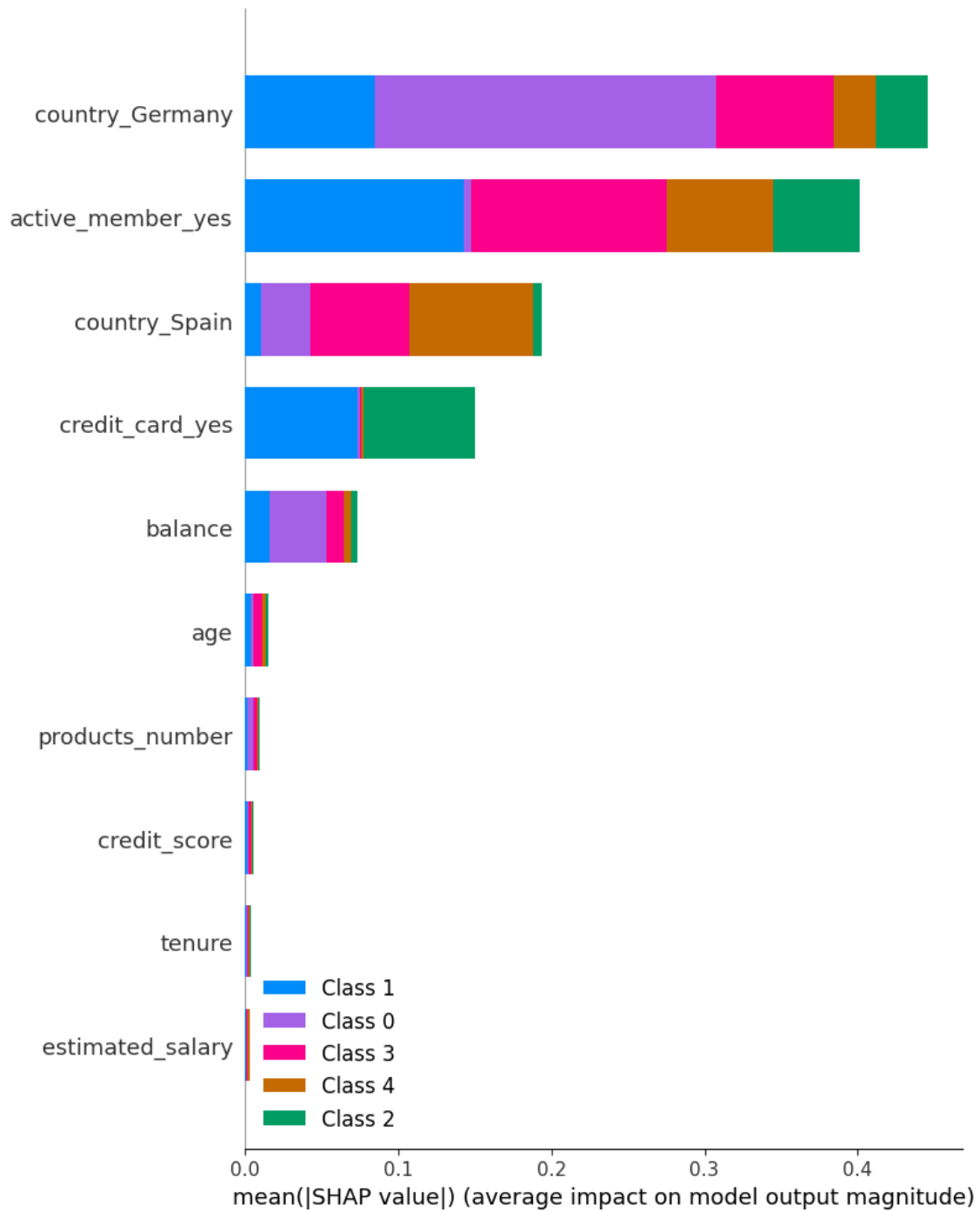
	credit_score	age	tenure	balance	products_number \
cluster					
0	651.453567	39.720469	5.009964	119730.116134	1.512869
1	652.849305	39.484752	5.032919	60451.419214	1.528936
2	651.337896	39.947621	4.796407	64975.713370	1.529737
3	646.894759	37.340945	5.054065	63463.576232	1.513989
4	649.837768	37.677730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

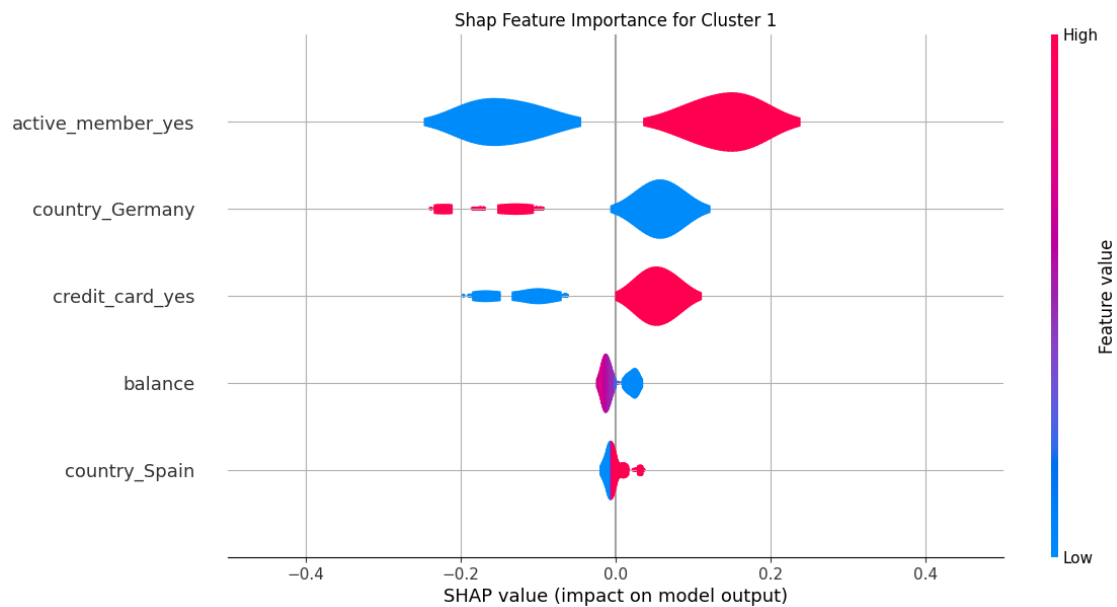
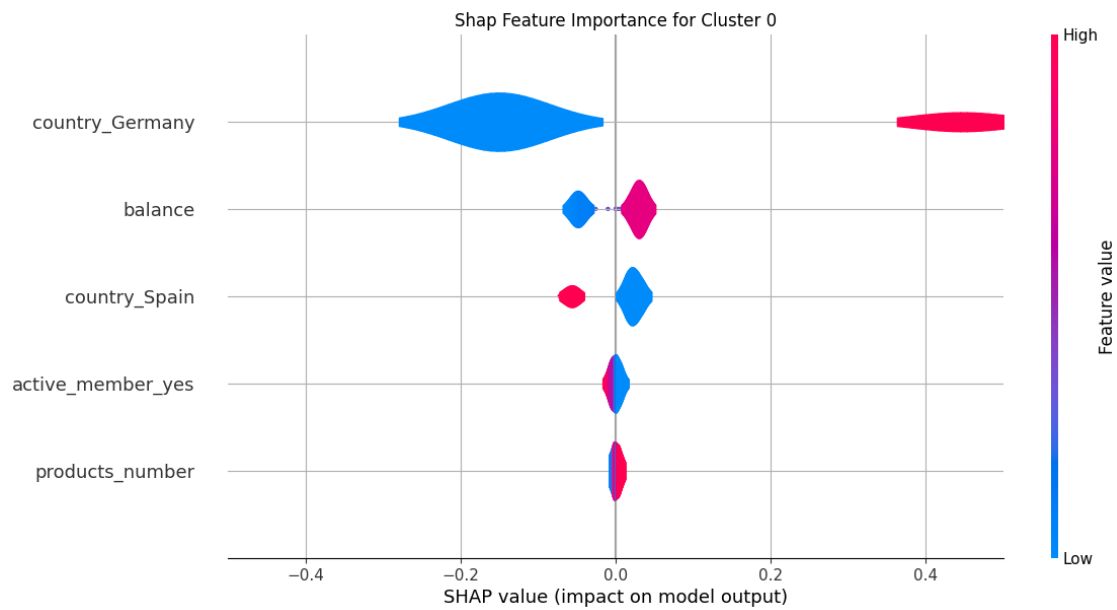
8 Custom Functions

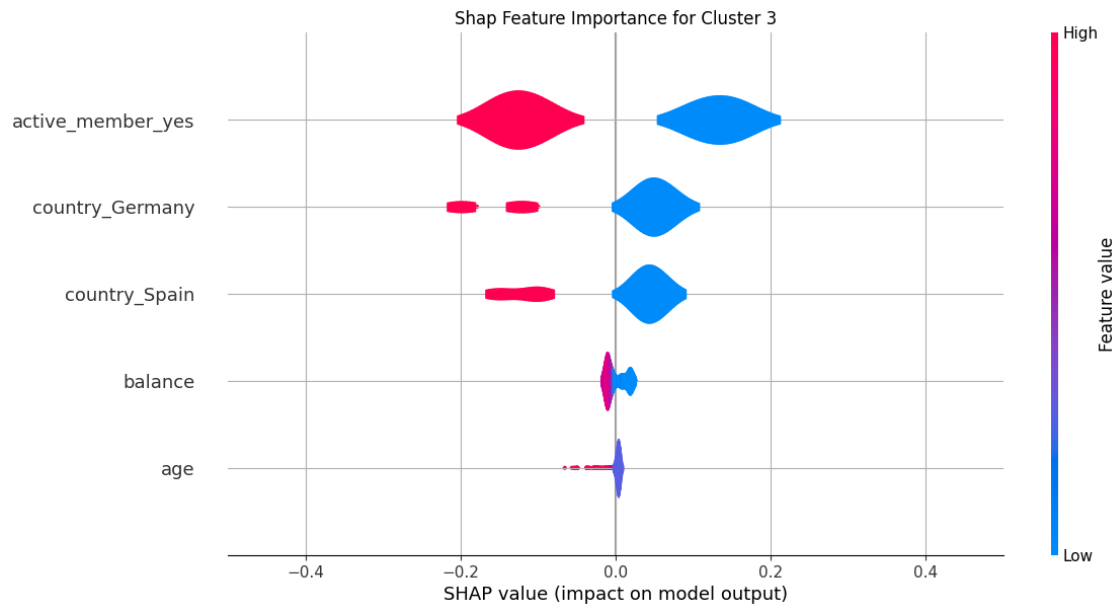
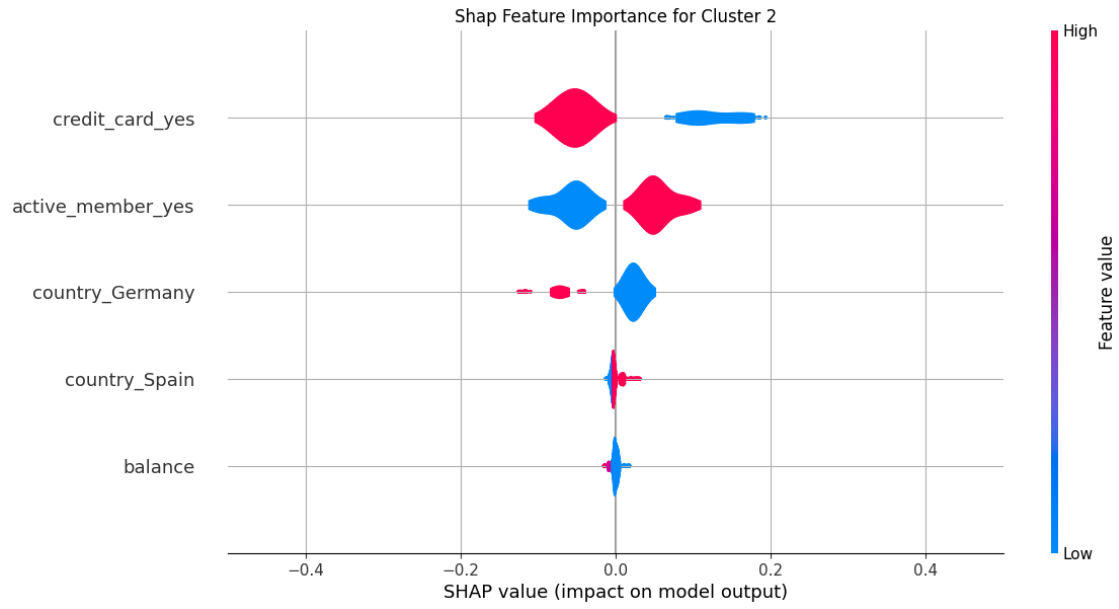
8.1 Average Feature Importance on Cluster Building

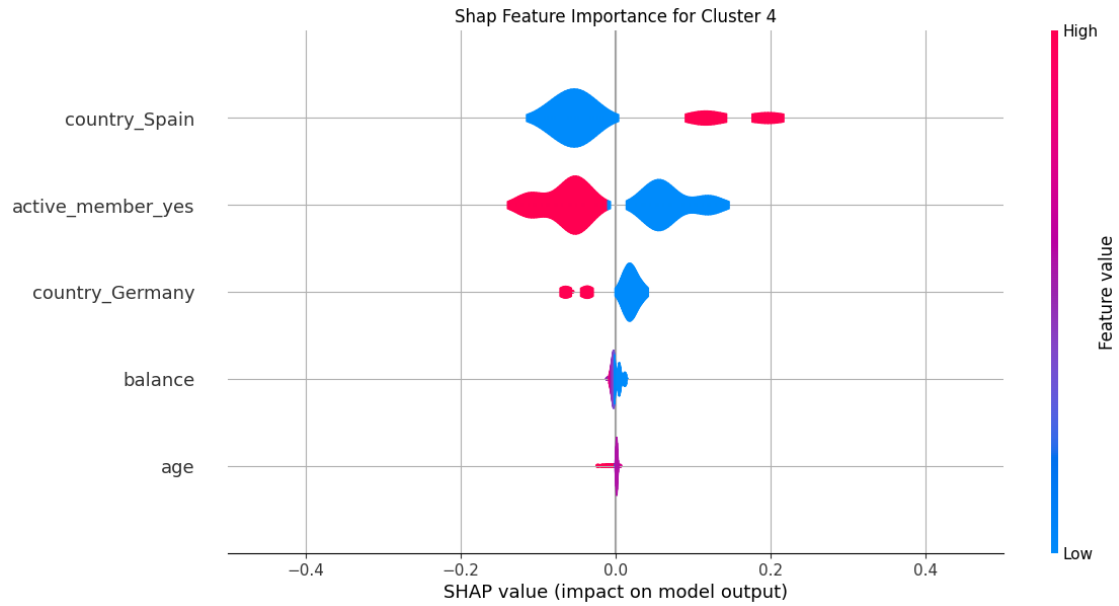


8.2 Explain Single Cluster vs Rest

No data for colormapping provided via 'c'. Parameters 'vmin', 'vmax' will be ignored





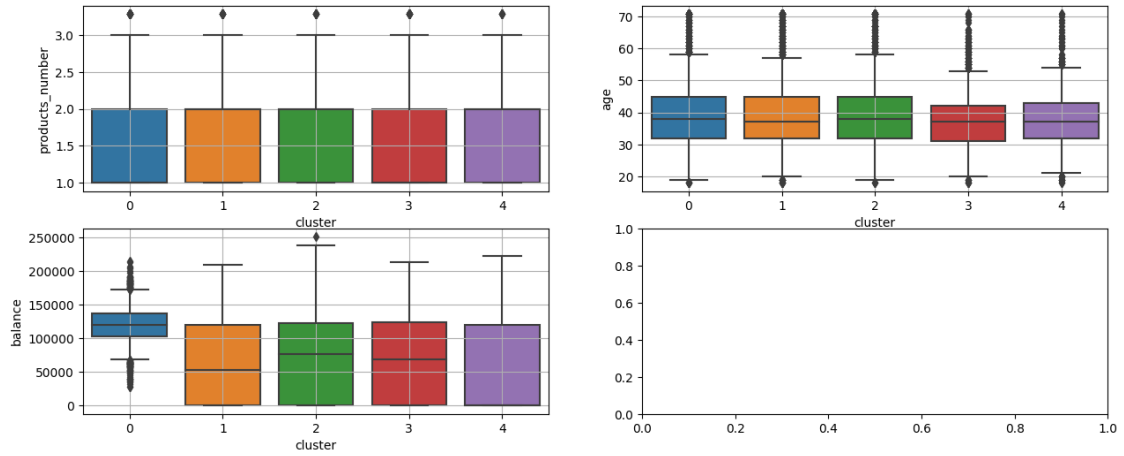


```
[ 'credit_card_yes',
  'active_member_yes',
  'country_Germany',
  'country_Spain',
  'balance']
```

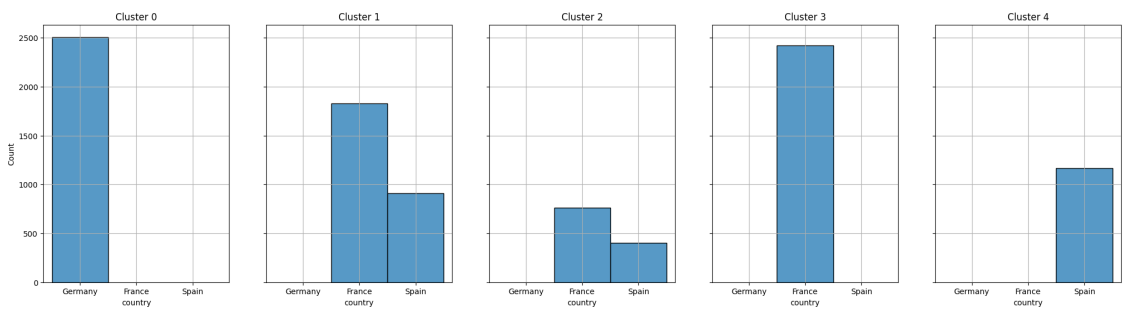
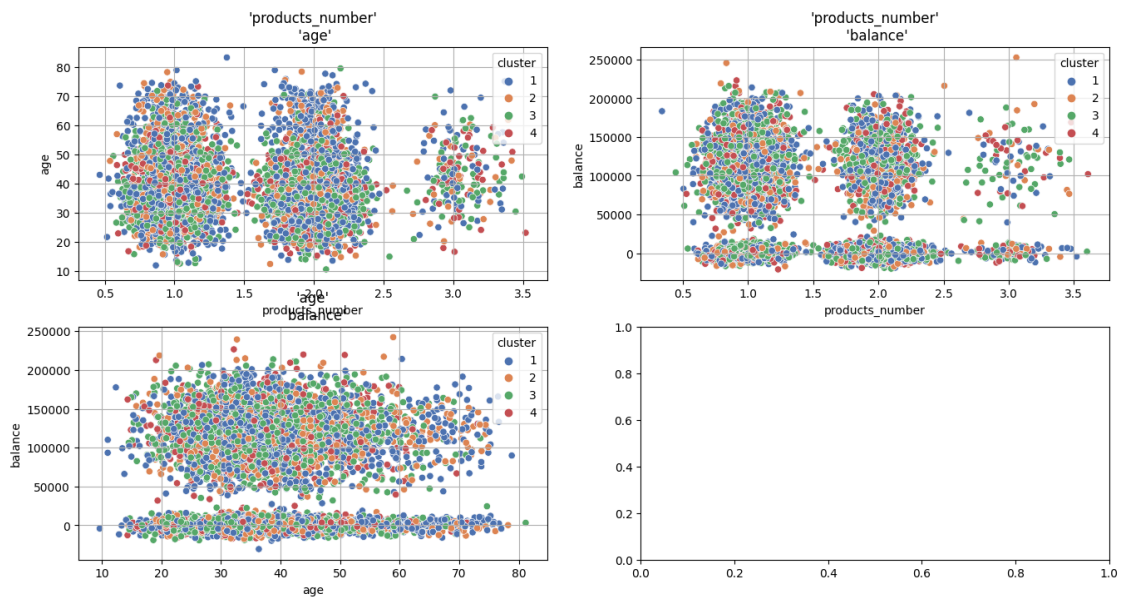
```
[ 'credit_card_yes',
  'country_Spain',
  'active_member_yes',
  'country_Germany',
  'products_number',
  'age',
  'balance']
```

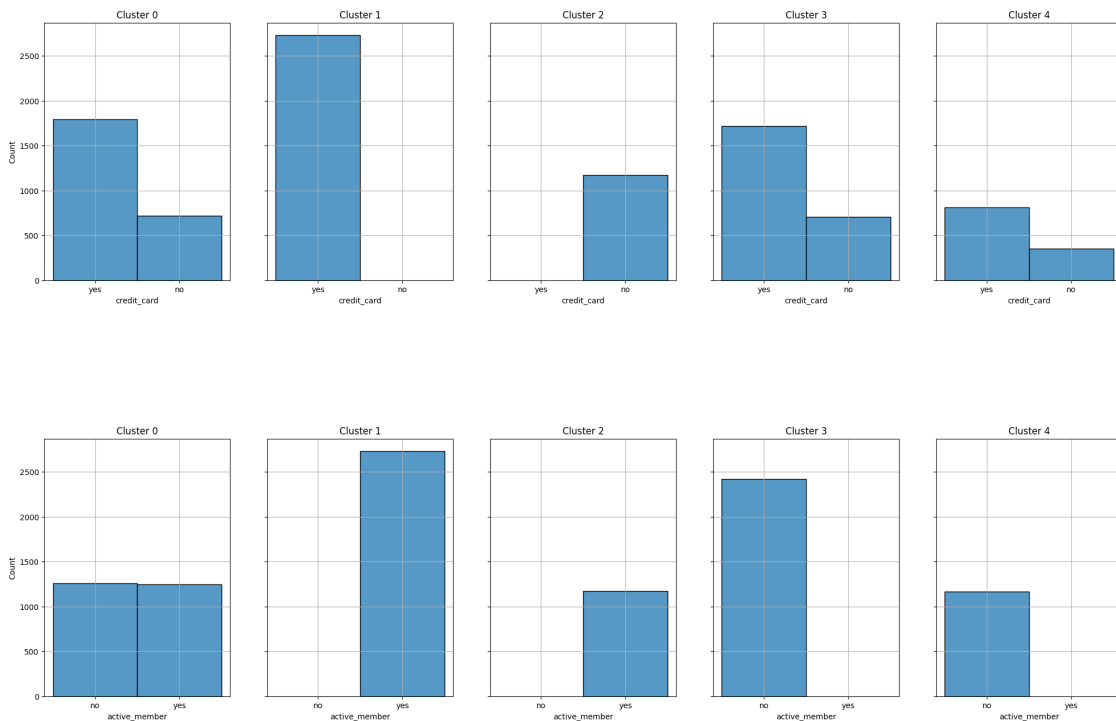
```
[ 'products_number', 'age', 'balance']
```

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



3





C:\Users\Sebas\anaconda3\envs\customer_cluster_app\lib\site-packages\traitlets\traitlets.py:2544: 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 Customer_Segmentation_Report_files\

[NbConvertApp] Making directory .\Customer_Segmentation_Report_files

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[NbConvertApp] Building PDF

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[NbConvertApp] Running xelatex 3 times: ['xelatex', 'notebook.tex', '-quiet']  
[NbConvertApp] Running bibtex 1 time: ['bibtex', 'notebook']  
[NbConvertApp] WARNING | b had problems, most likely because there were no  
citations  
[NbConvertApp] PDF successfully created  
[NbConvertApp] Writing 569860 bytes to  
..\reports\Customer_Segmentation_Report.pdf
```