



**Data Glacier**

Your Deep Learning Partner

# Business Understanding

Virtual Internship

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# Agenda

Data Understanding

Clients

Last contact

Campaign

Bivarial analysis of some features

Recommendations



# Data Understanding

Features are divided into 4 groups:

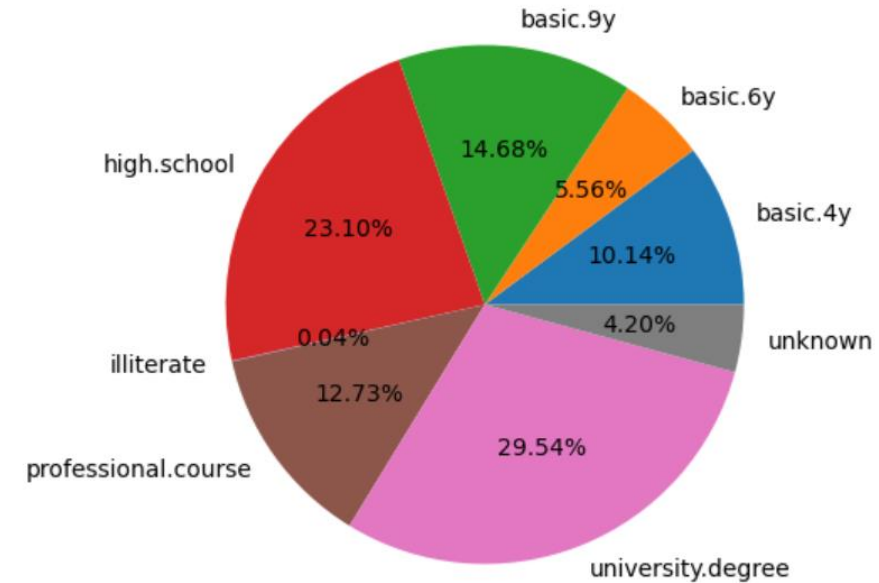
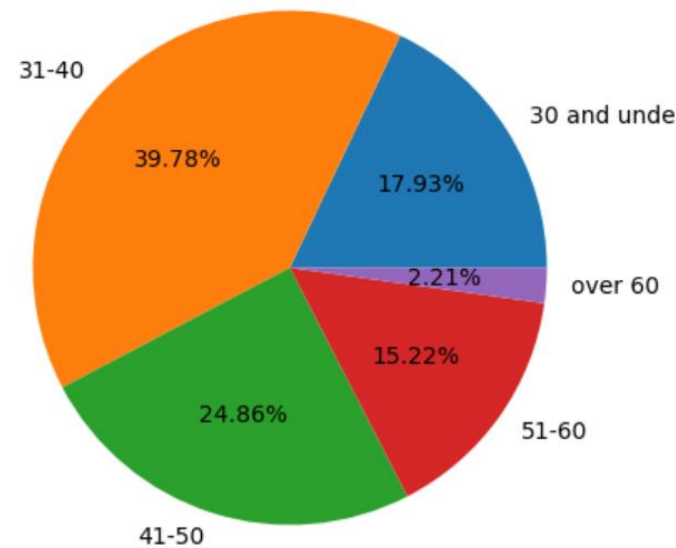
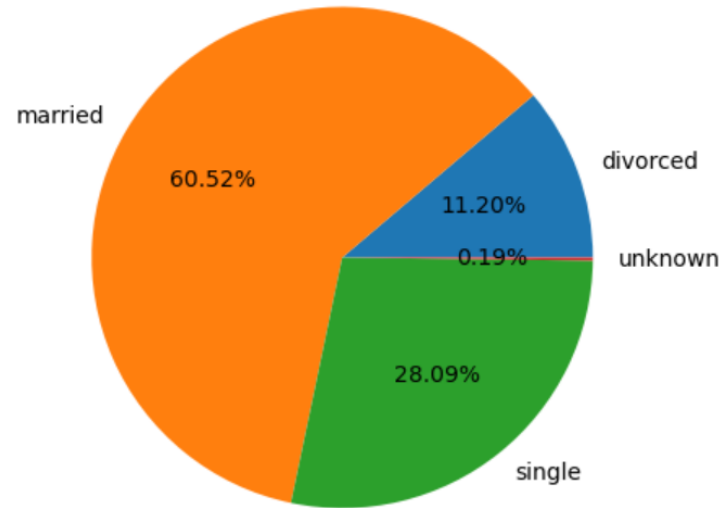
1. Data related to clients (age, job, marital, education, default, housing and loan).
2. Data related with the last contact of the current campaign (contact, month, day\_of\_week and duration).
3. Data related with campaigns (campaign, odays, previous and poutcome).
4. Data related with socio economic context attributes (emp.var.rate, cons.Price.idx, cons.conf.idx, euribor3m, nr.employed).
5. TARGET: "y".

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Rows = 41188 | Columns = 21

```
['age', 'job', 'marital', 'education', 'default', 'housing', 'loan',  
 'contact', 'month', 'day_of_week', 'duration', 'campaign', 'pdays',  
 'previous', 'poutcome', 'emp.var.rate', 'cons.price.idx',  
 'cons.conf.idx', 'euribor3m', 'nr.employed', 'y'],
```

# Client



Customers job (%):

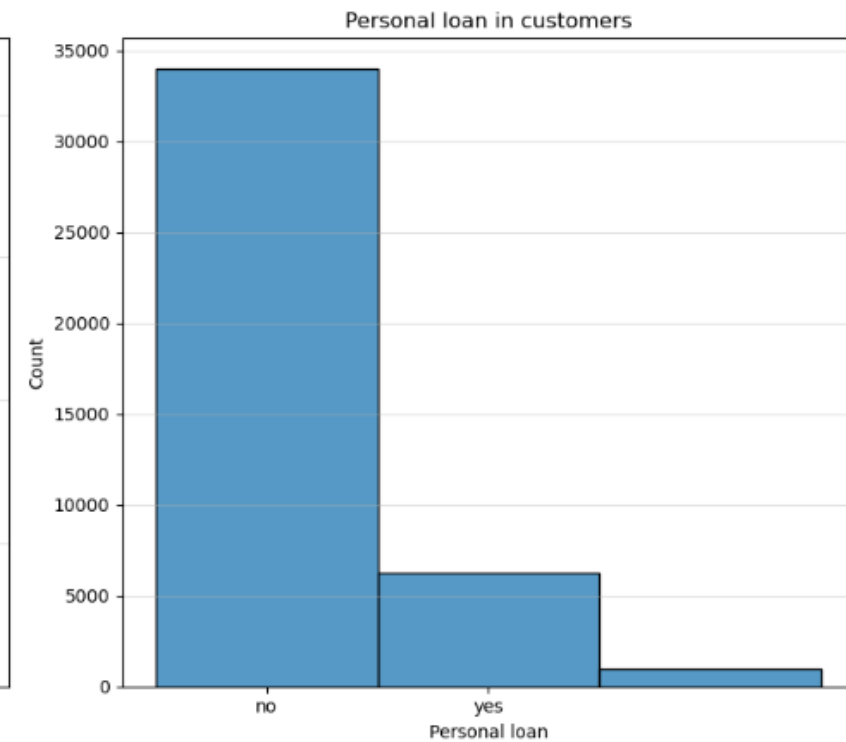
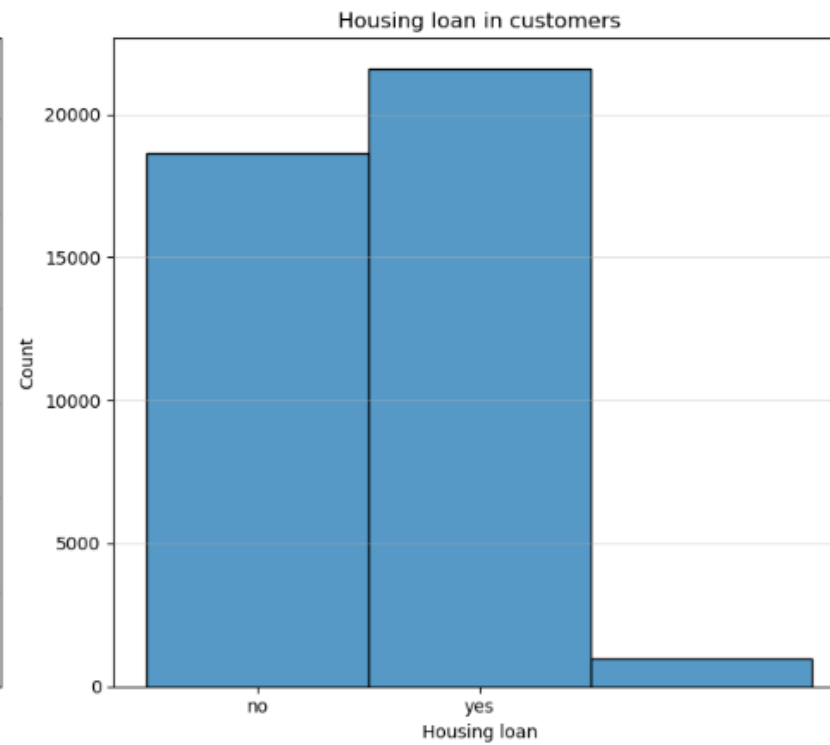
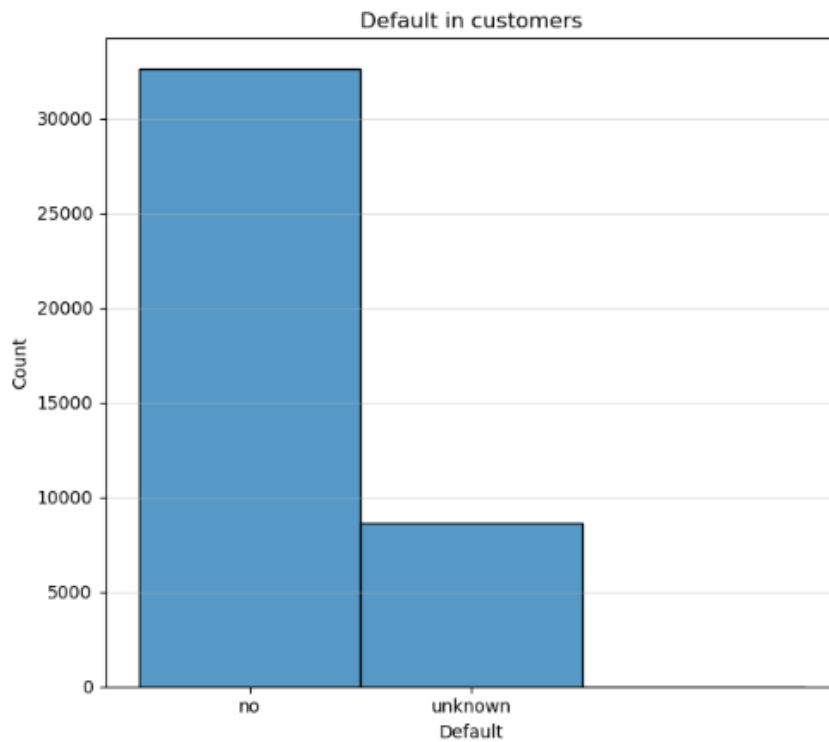
job		self-employed	
admin.	25.303486	housemaid	2.573565
blue-collar	22.467709	unemployed	2.461882
technician	16.371273	student	2.124405
services	9.636302	unknown	0.801204
management	7.099155		
retired	4.175974		
entrepreneur	3.535010		

Marital state of customers (%):

marital	
divorced	11.197436
married	60.522482
single	28.085850
unknown	0.194231

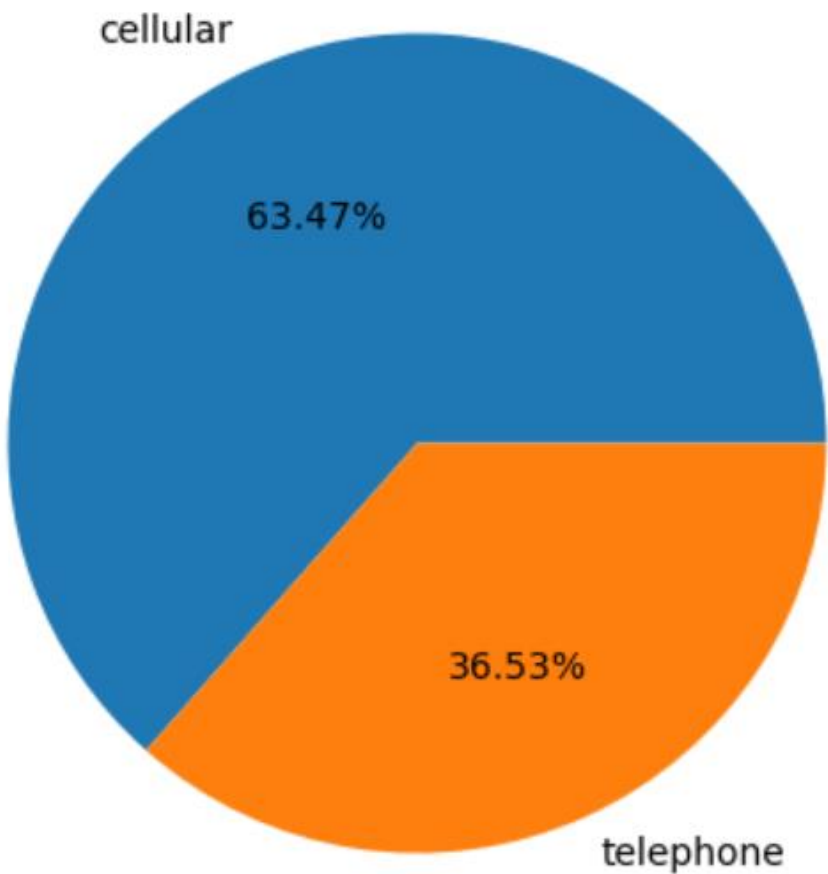
# Client

Customers and Default, Housing Loan and Personal Loan:



# Last Contact

Contact to Costumers

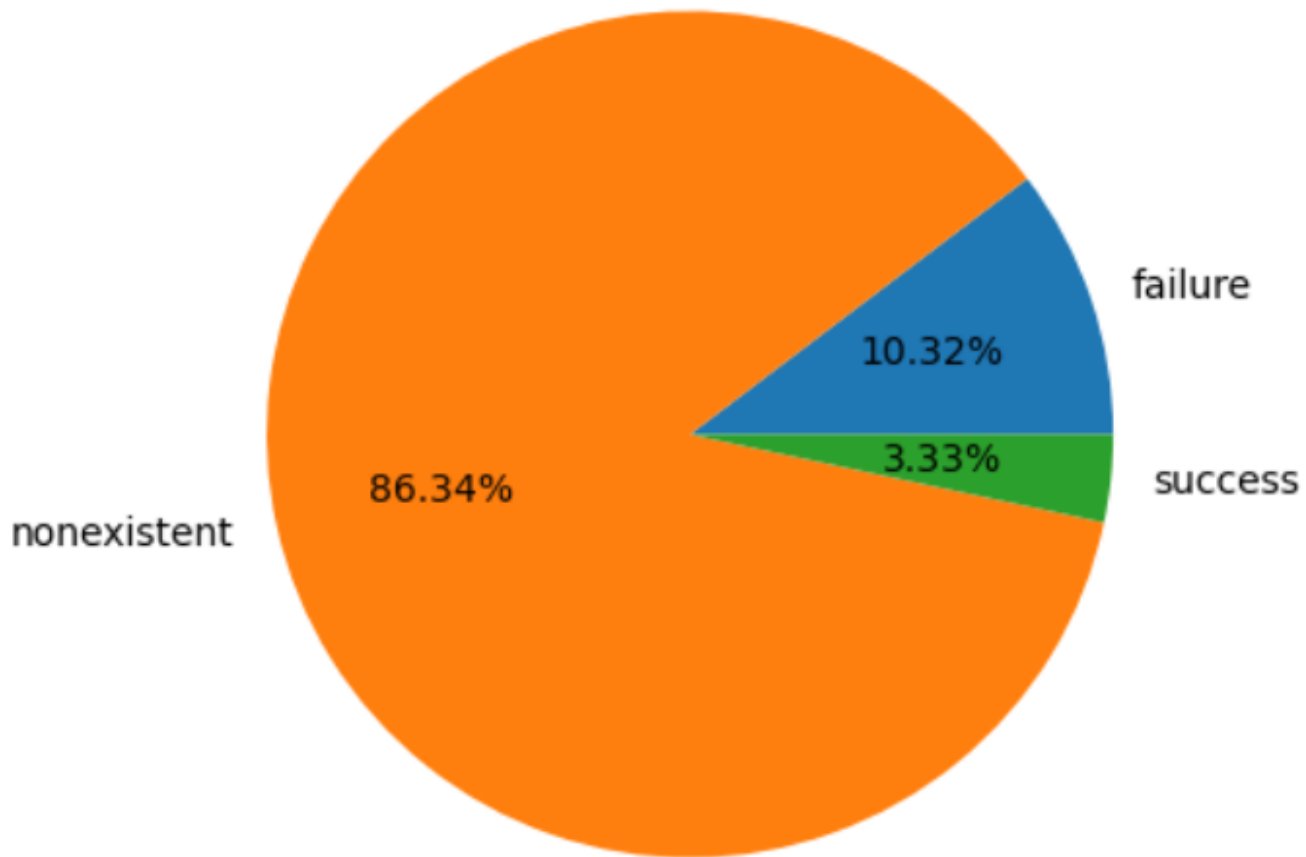


contact	
month	
may	13769
jul	7174
aug	6178
jun	5318
nov	4101

duration_range	
0-200	22760
201-400	11264
401-600	3700
601-800	1707
801-1000	801
over 1000	956
contact	
cellular	63.474798
telephone	36.525202

# Campaing

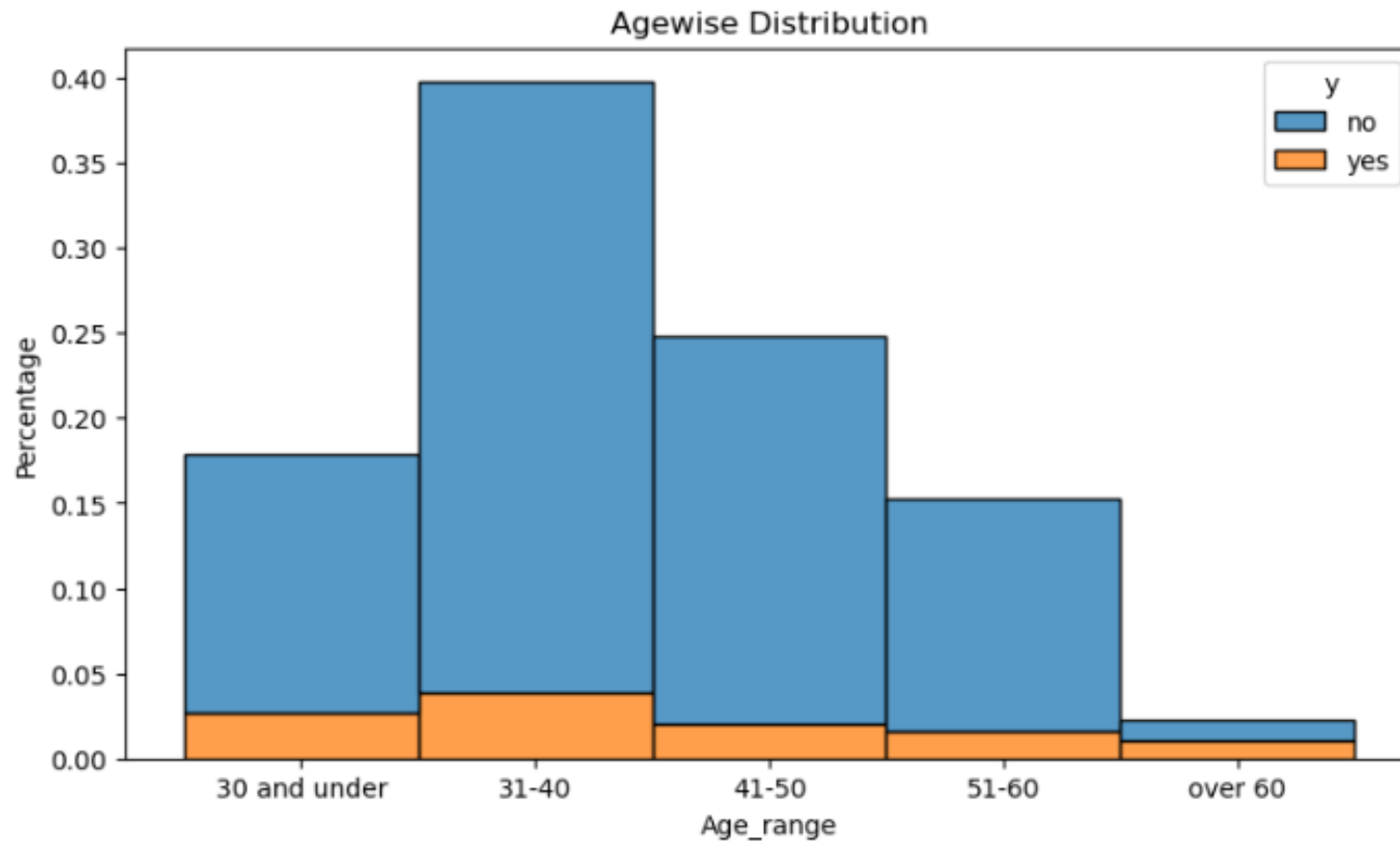
Previous Relation



campaign\_range

0-3	81.463047
4-6	12.695445
7-9	3.185394
10-12	1.279499
More than 12	1.376615

# Biavarial for some Features

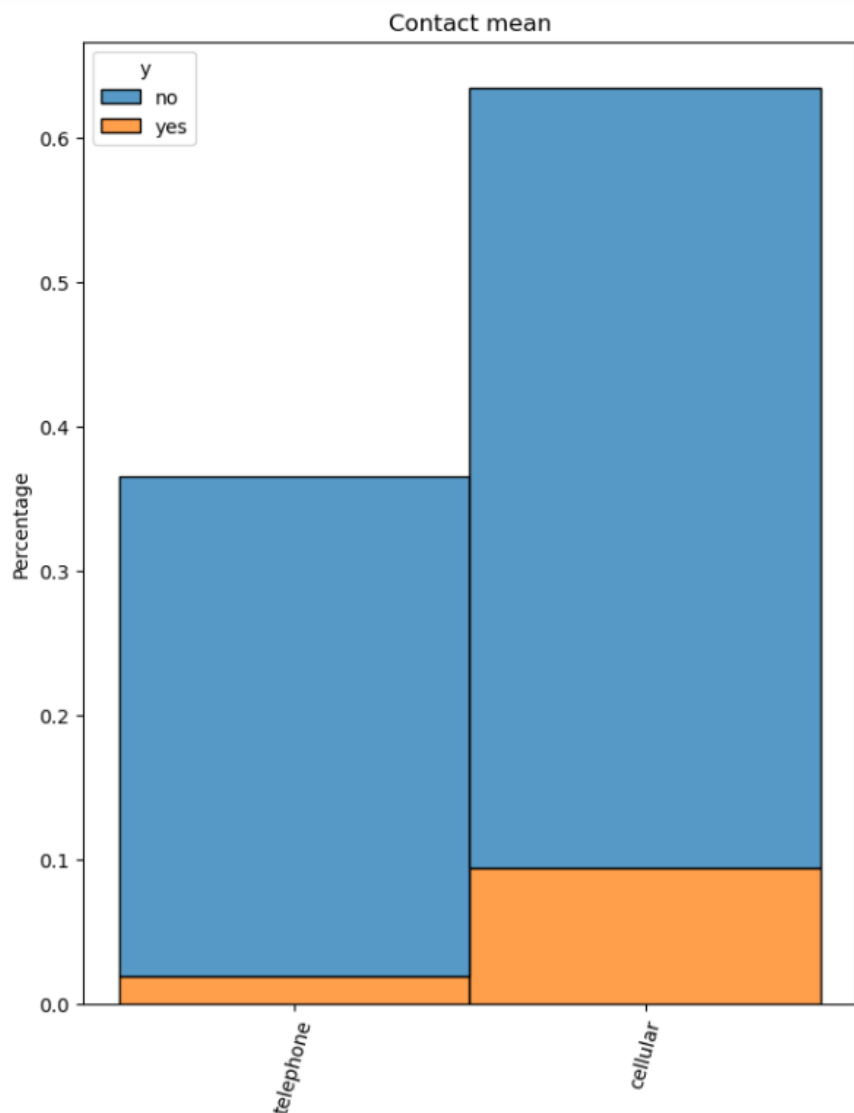


y	no	yes	totals	% no	% yes
job					
admin.	9070	1352	10422	87.027442	12.972558
blue-collar	8616	638	9254	93.105684	6.894316
entrepreneur	1332	124	1456	91.483516	8.516484
housemaid	954	106	1060	90.000000	10.000000
management	2596	328	2924	88.782490	11.217510
retired	1286	434	1720	74.767442	25.232558
self-employed	1272	149	1421	89.514426	10.485574
services	3646	323	3969	91.861930	8.138070
student	600	275	875	68.571429	31.428571
technician	6013	730	6743	89.173958	10.826042
unemployed	870	144	1014	85.798817	14.201183
unknown	293	37	330	88.787879	11.212121
totals	36548	4640	41188	88.734583	11.265417

The acceptance rate for customers under 30 years old and over 60 years old is higher, at 15% and 45% respectively. In terms of job occupation, students and retirees have the highest acceptance rates. Additionally, unemployed individuals may also be considered as potential customers



# Biavarial for some Features



y	no	yes	totals	% no	% yes
month					
apr	2093	539	2632	79.521277	20.478723
aug	5523	655	6178	89.397863	10.602137
dec	93	89	182	51.098901	48.901099
jul	6525	649	7174	90.953443	9.046557
jun	4759	559	5318	89.488530	10.511470
mar	270	276	546	49.450549	50.549451
may	12883	886	13769	93.565255	6.434745
nov	3685	416	4101	89.856133	10.143867
oct	403	315	718	56.128134	43.871866
sep	314	256	570	55.087719	44.912281
totals	36548	4640	41188	88.734583	11.265417

y	no	yes	totals	% no	% yes
duration_range					
0-300	28466	1518	29984	94.937300	5.062700
301-600	6302	1438	7740	81.421189	18.578811
601-900	1259	924	2183	57.672927	42.327073
901-1200	329	439	768	42.838542	57.161458
1201-1500	115	192	307	37.459283	62.540717
1501-1800	36	69	105	34.285714	65.714286
1801-2100	22	34	56	39.285714	60.714286
2101-2400	6	8	14	42.857143	57.142857
More than 2400	13	18	31	41.935484	58.064516
totals	36548	4640	41188	88.734583	11.265417

15% of cellphone contacts accepted the deposit offer, compared to 5% of telephone contacts. Conversion rates in December, March, October, and September are over 40%. Longer calls have higher conversion rates, but very few calls lasted over 900 seconds.

# Early Recommendations

Based on our initial exploratory analysis, we can conclude the following:

1. Customers who are under 30 years old or over 60 years old have the highest conversion rates within their respective age ranges, and they make up 20% of the customer base. However, it's important to note that they may be more risk averse.
2. Contacting customers by cellphone appears to be more effective than contacting them by telephone, as evidenced by a higher conversion rate (15% versus 5%).
3. Our bivariate analysis revealed some interesting relationships that warrant further investigation. For a more in-depth analysis, please refer to the notebook which includes the rest of the features.

# Thank You



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