
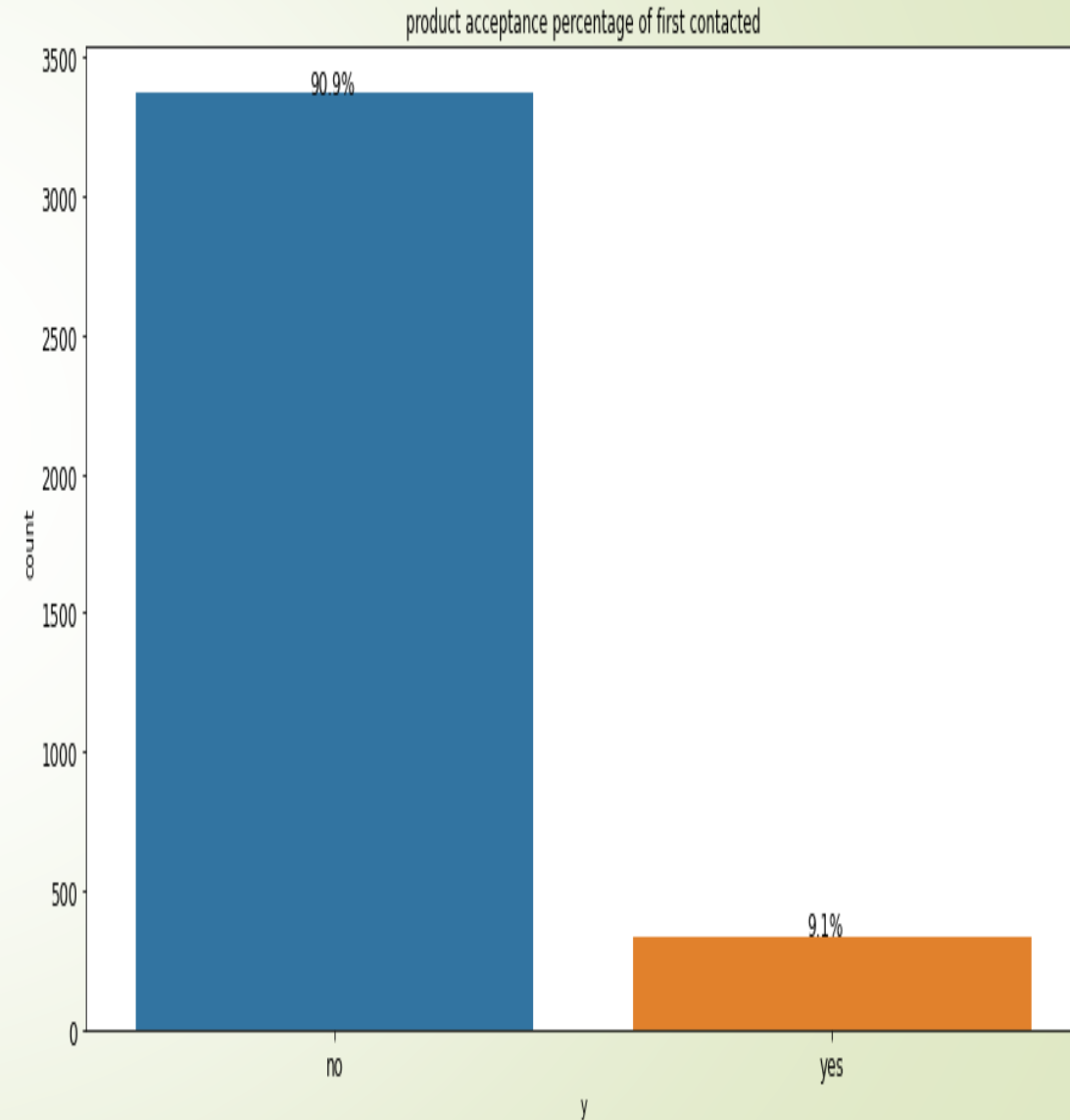
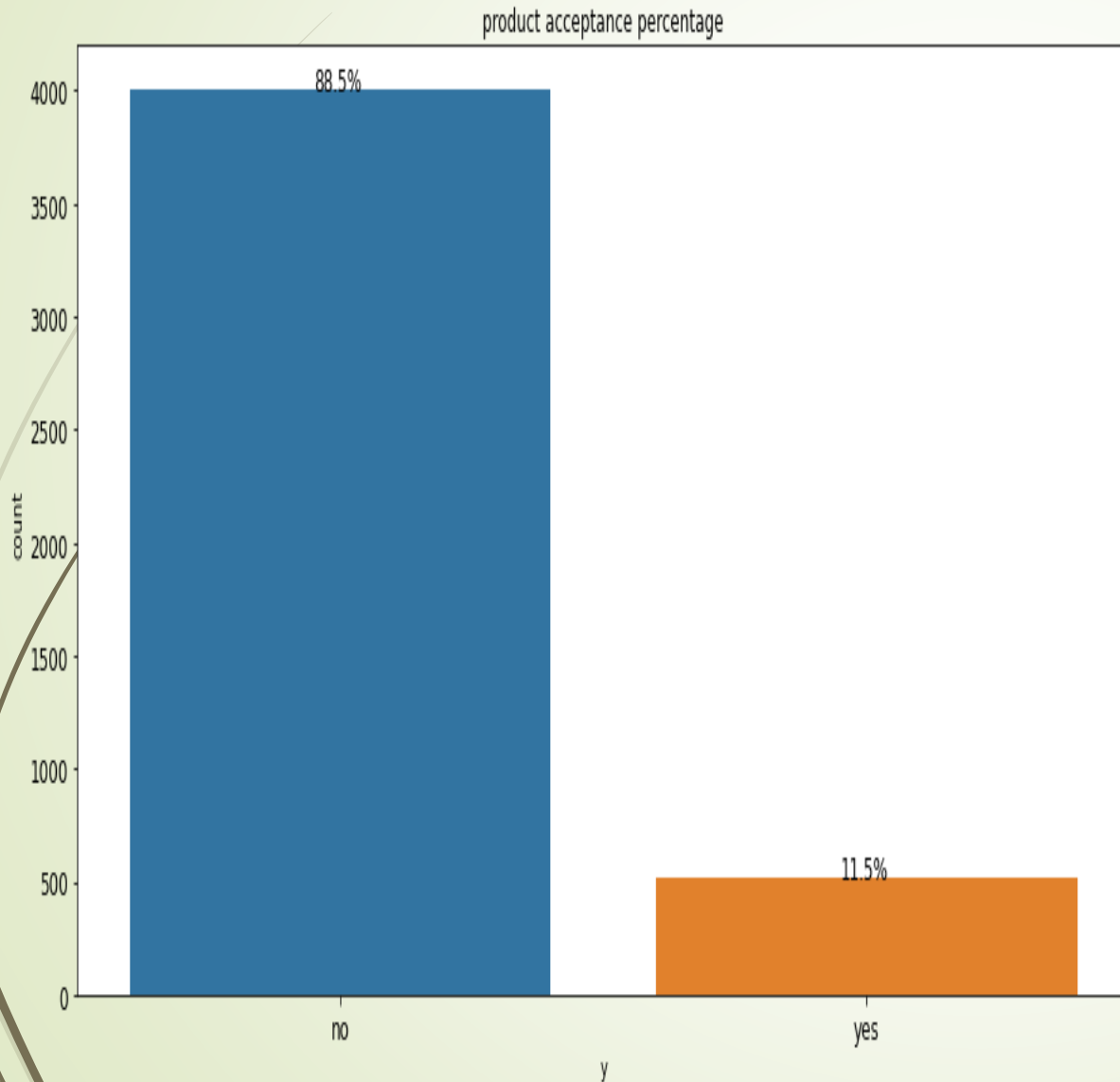


Bank product acceptance

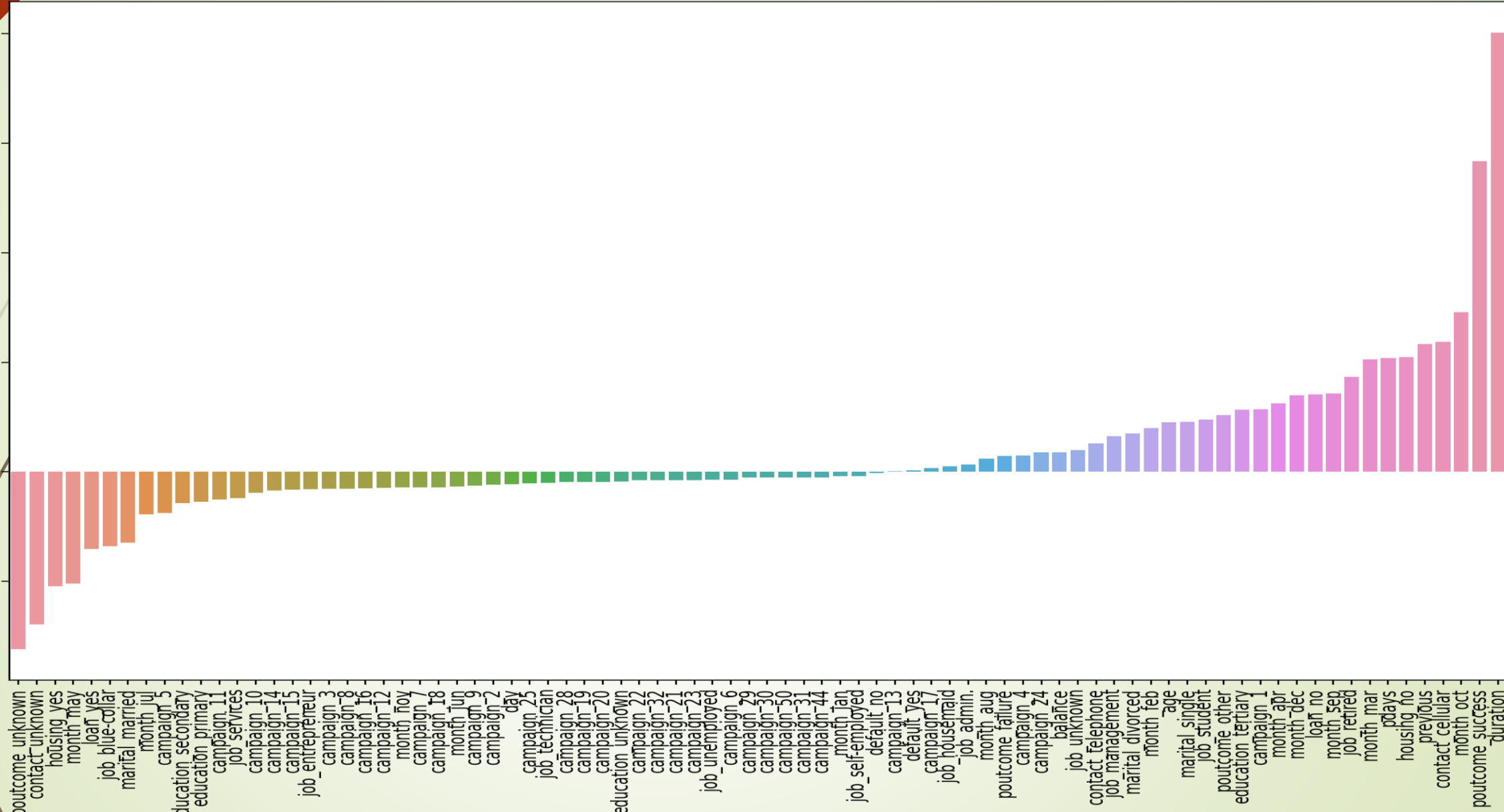


We analyze a bank dataset from UCI , where customers were offered a closed contract on their deposits. We search for the basic determinants of the outcome, and possible interactions that influence the result.

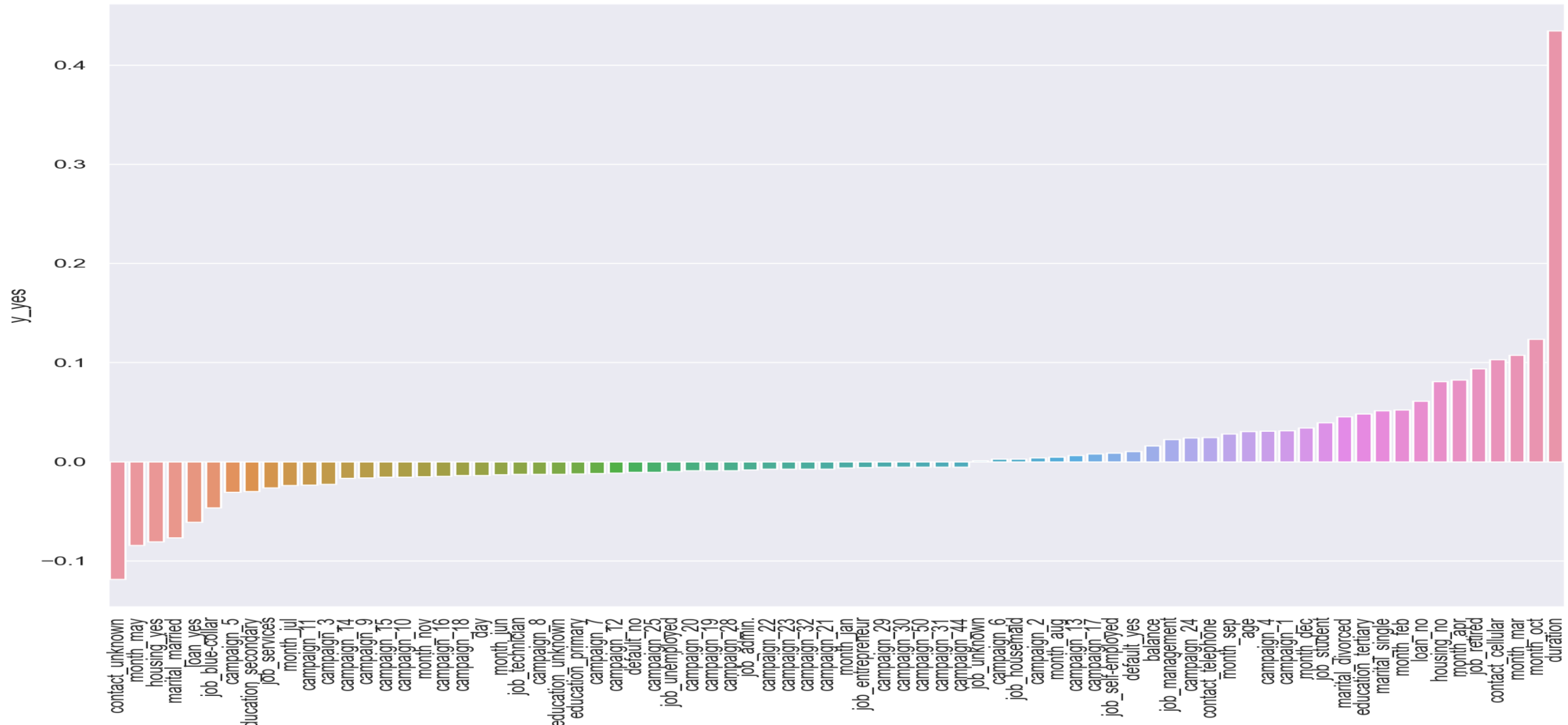
In this graph we see the general % of acceptance of the product, which is 11,5% vs the same percentage for the first time contacted customers(9,5%). Whereas, the general acceptance level is not big, it seems that for those who where previously contacted successfully was easier to accept again, so the general level is bigger.



Correlation between accepting the product, and all customers contacted. In other words, we see the most important positive and negative factors of accepting the offer. Most positive: duration, successful outcome of previous campaign, cellular contact, previous contact and days from that, no housing.

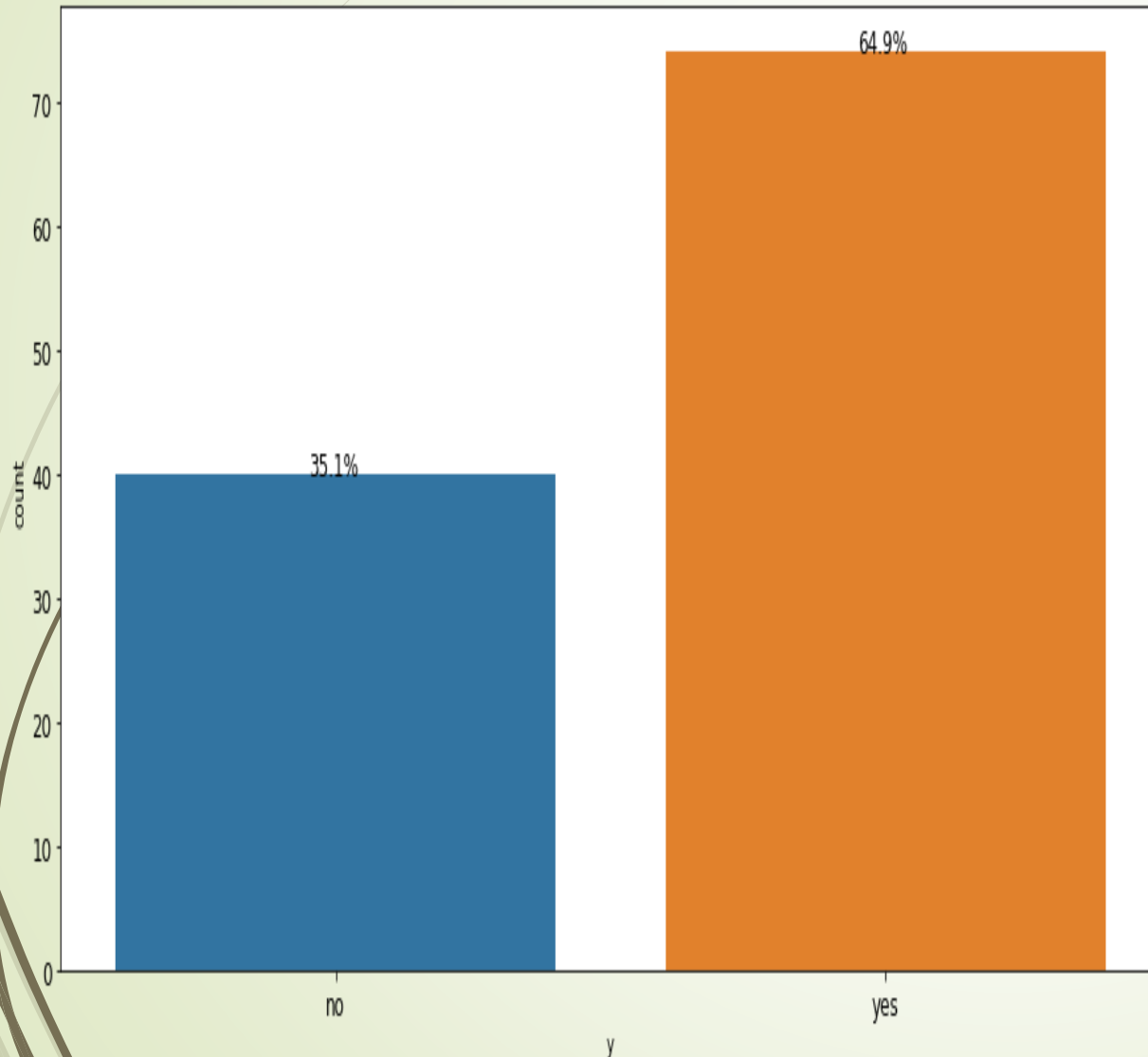


Correlation between accepting the product, given that they were contacted for the first time. In other words, we see the most important positive and negative factors of accepting the offer, for the customers contacted in this campaign for the first time. Most positive: duration, cellular contact, job retired, no housing and some months.

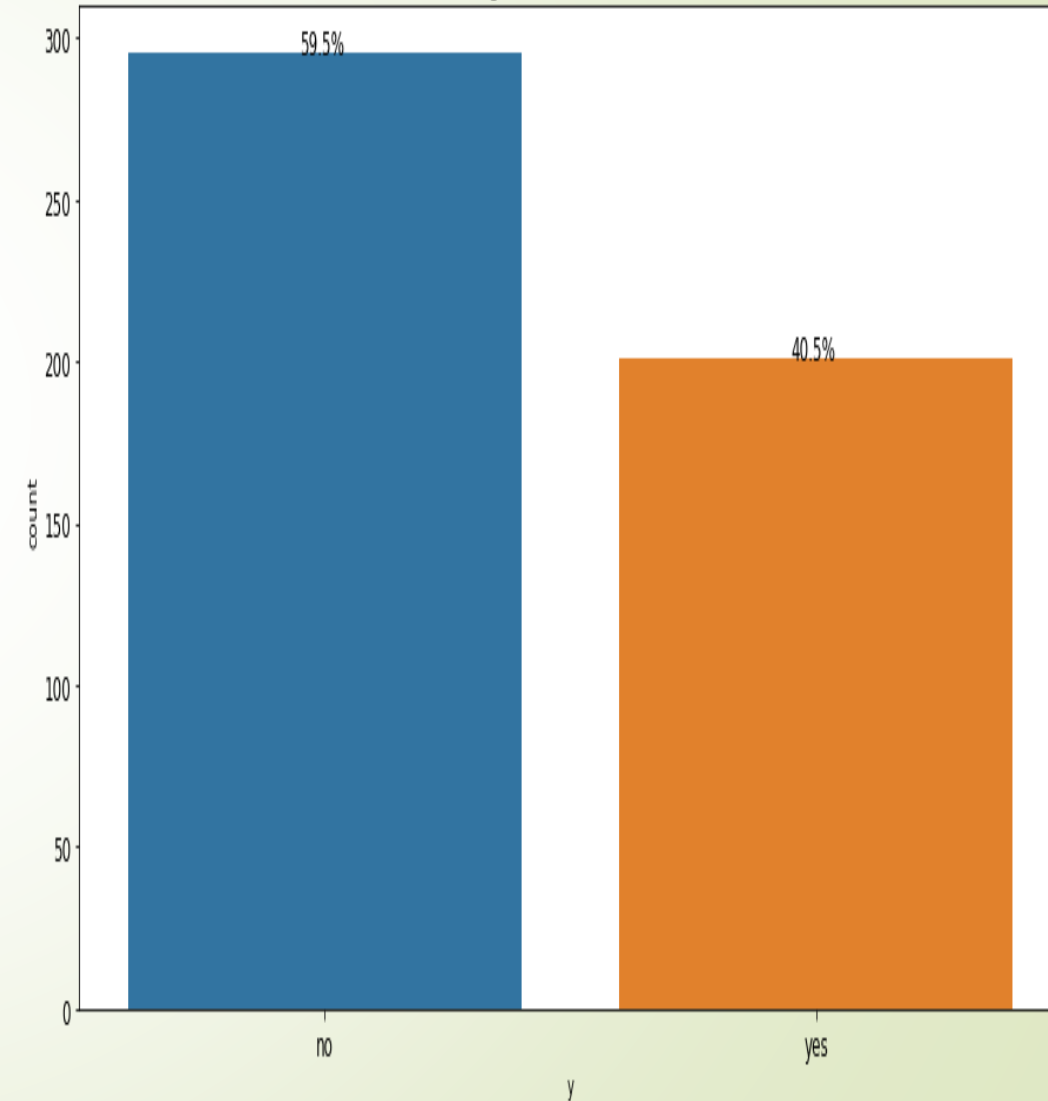


Here we see how results change if we combine two positive related variables together: at the left, we see a combined positive previous outcome and cellular contact, gives a 67,3% chance of accepting the product vs 11,5% for the whole population, while at the right it is over 70years old plus over 10 previous contacts which gives a 50% success chance.

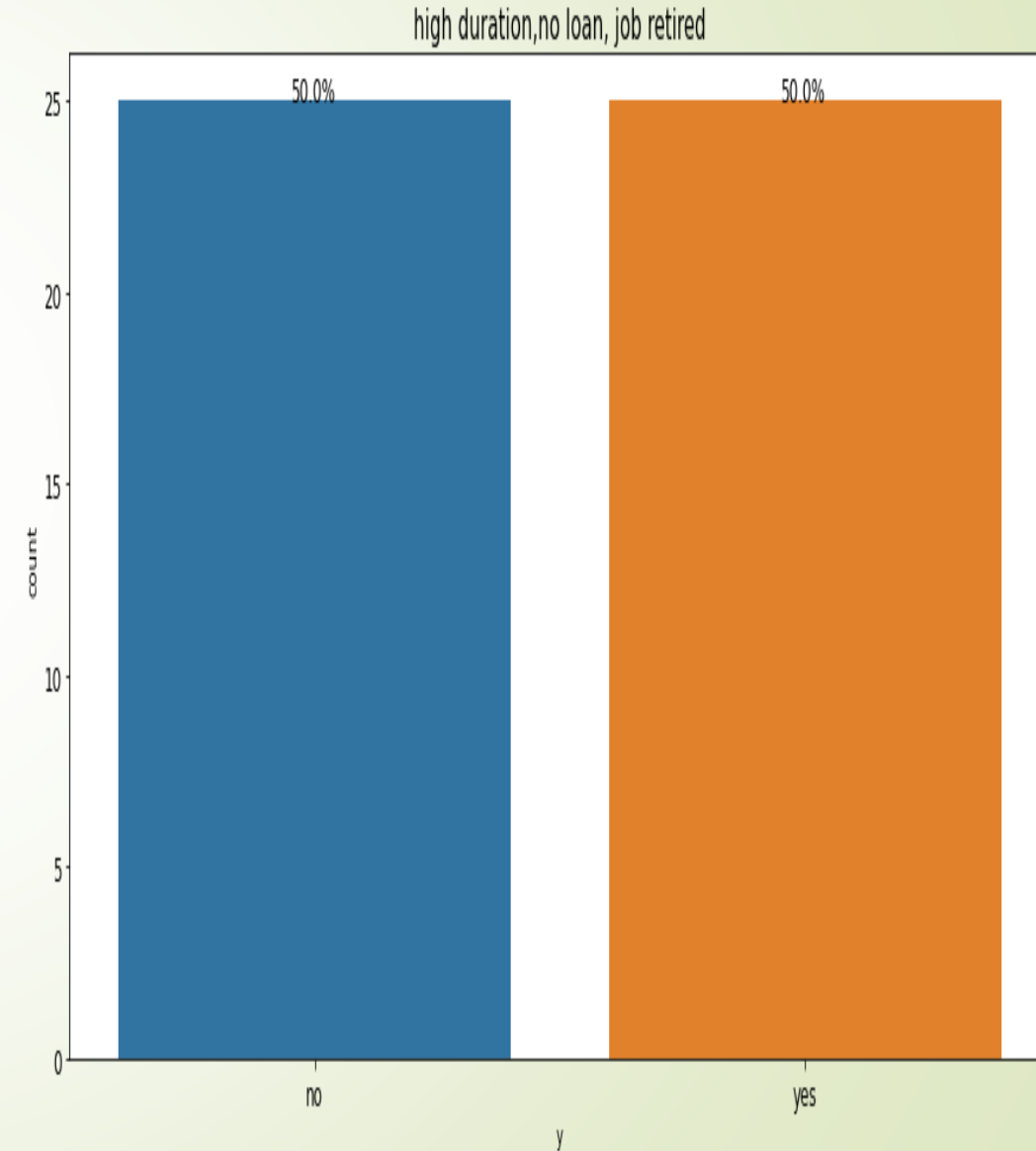
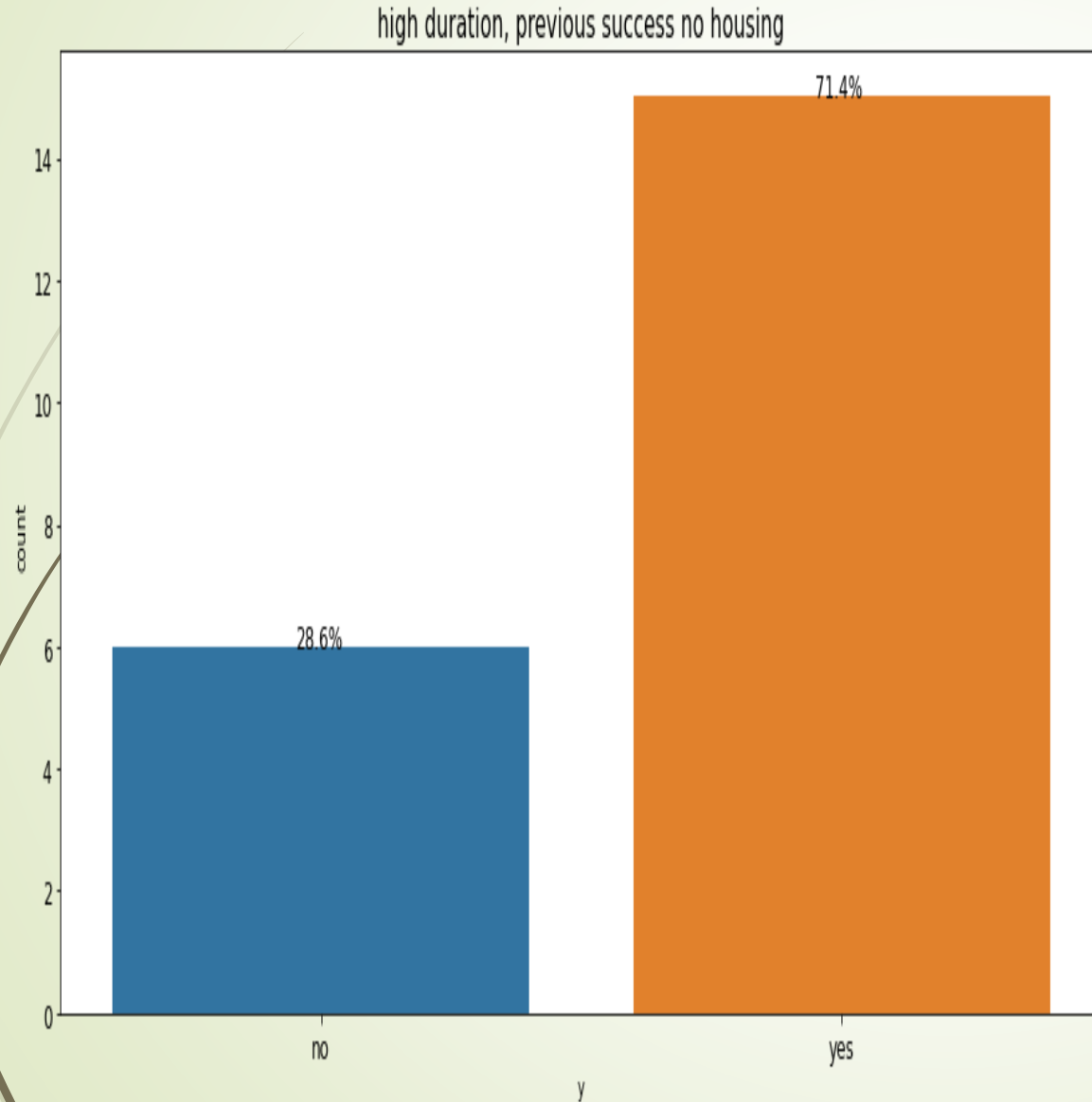
Previous outcome success and contact cellular



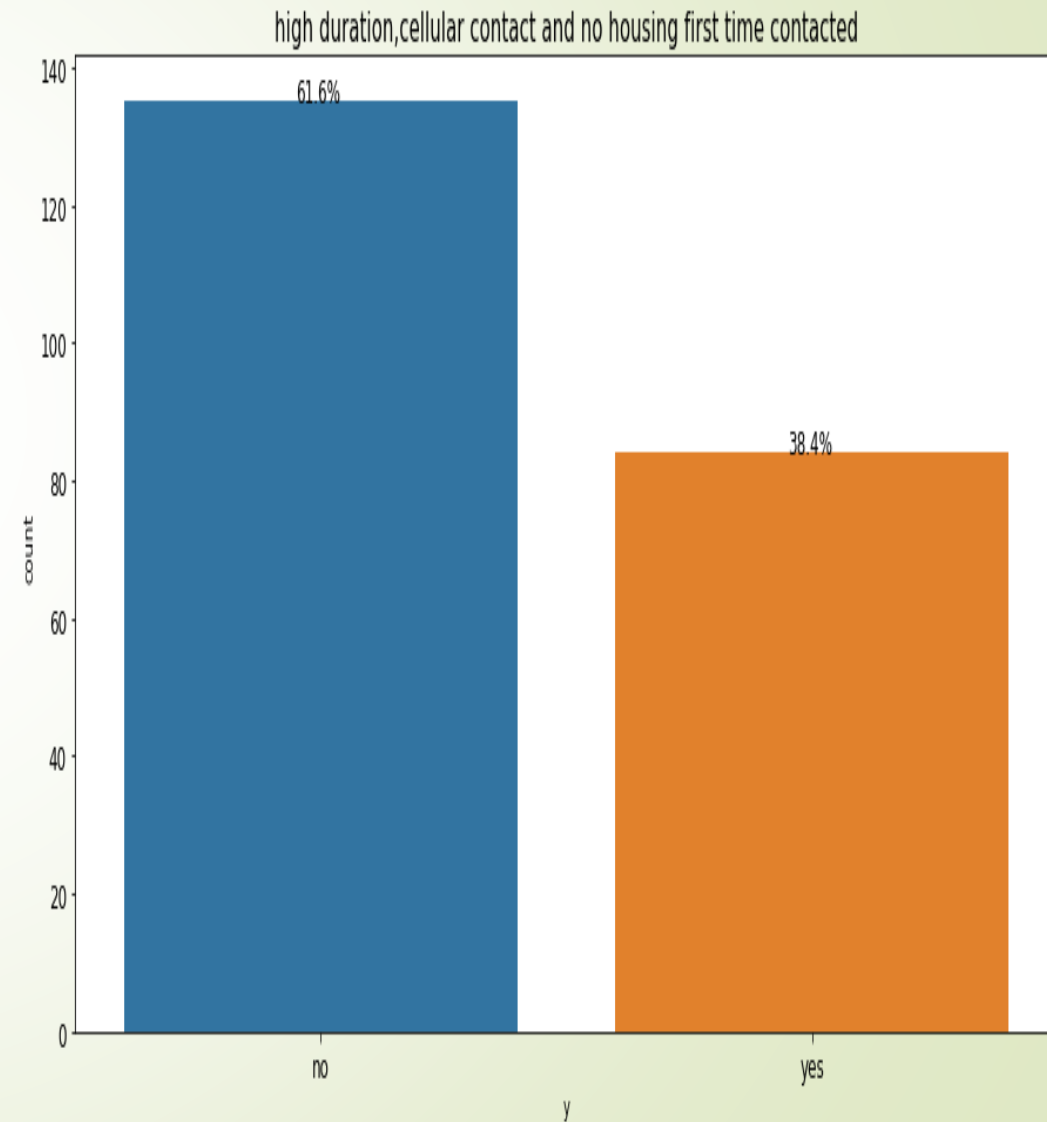
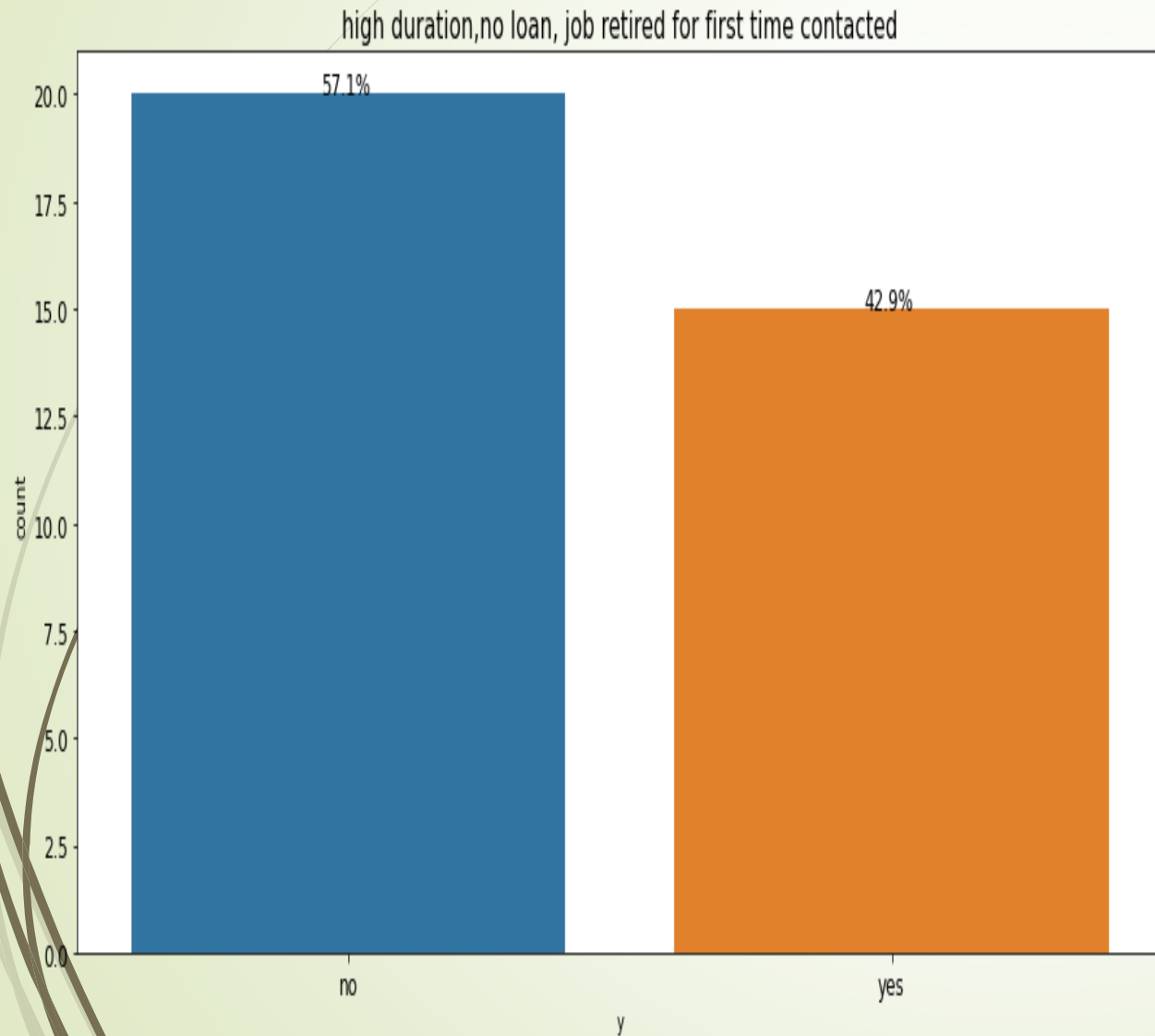
high duration, no loan



In this slide, we examine the acceptance rates based on three positively significant variables: at the left we see high duration, previous outcome success and no housing, which gives an impressive 71,4% rate, while high duration, no loan and job retired gives a 50% acceptance rate.

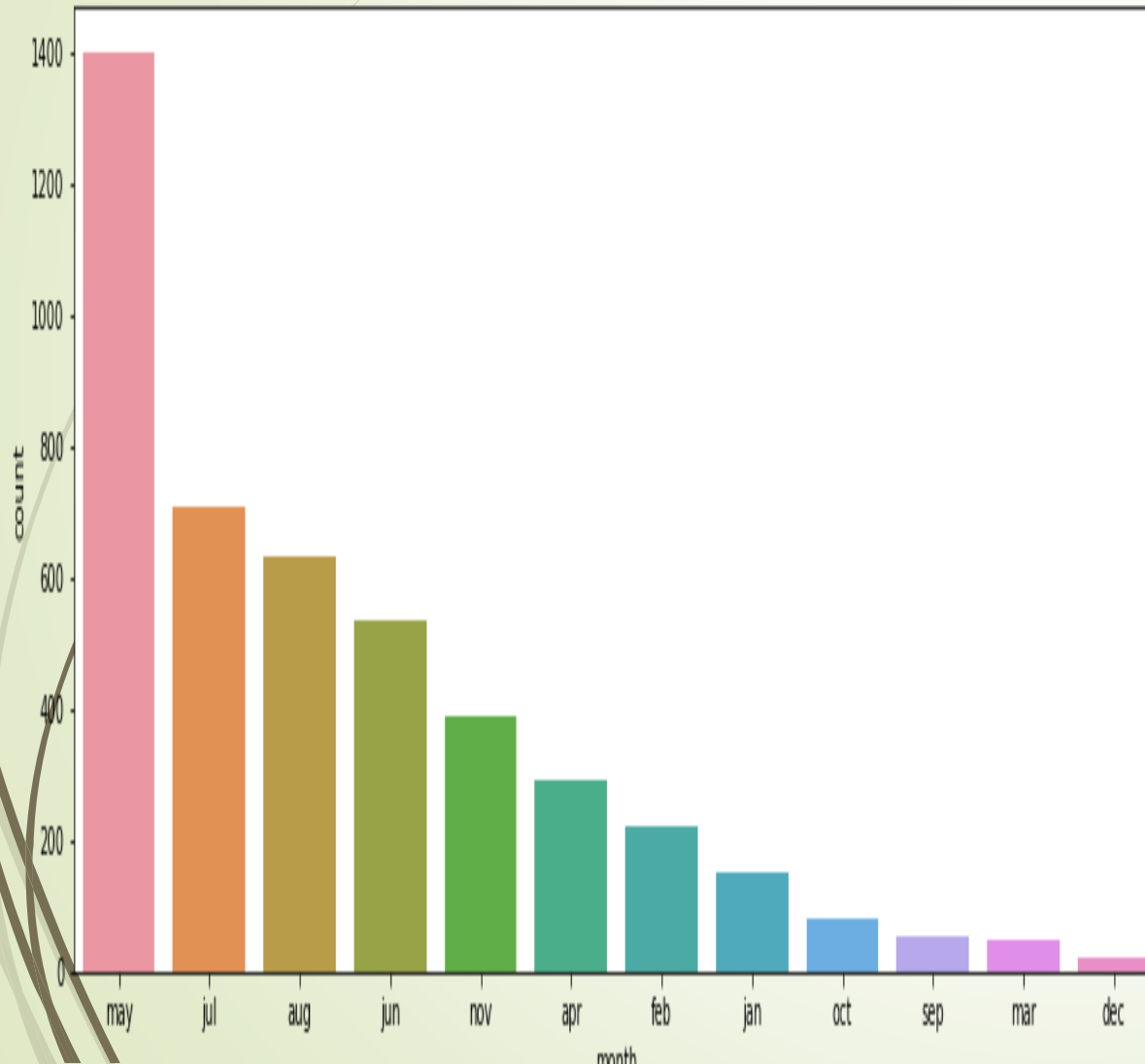


This slide shows the acceptance rate for first time contacted customers, based on 3 positively significant variables. At the left we see that high duration, job retired and no loan has a 42,9% acceptance rate and at the right high duration, cellular contact and no housing gave us a 38,4% rate. These rates are below those of the whole sample, but this is expected.

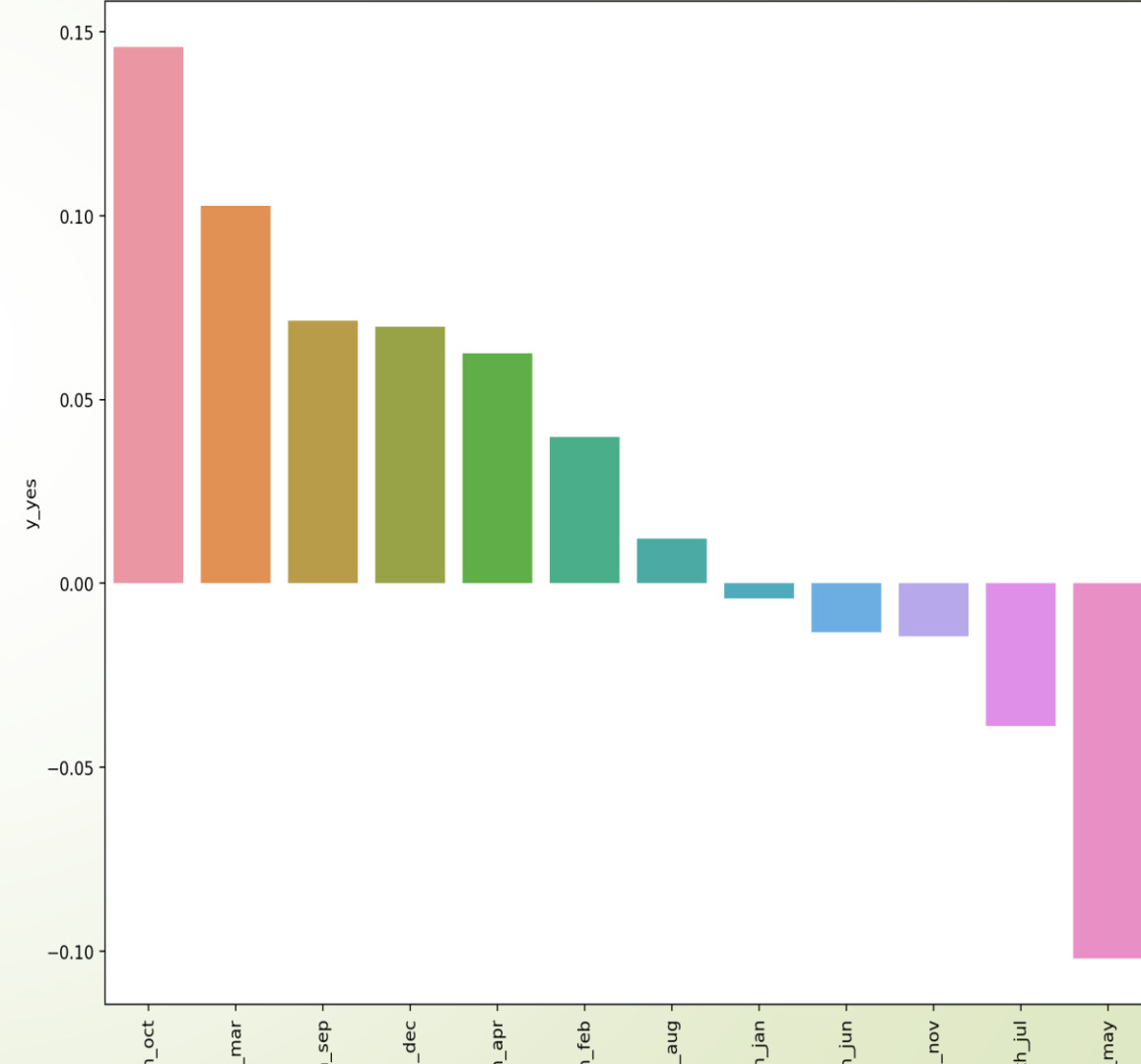


Here, we explored the paradox of some months having much better positive correlation and acceptance rates, than others. We solved this paradox, when we saw that contacts per month were completely uneven and directly opposite to acceptance rate. This uneven distribution, may have to do with the start of a campaign, so when too many calls were made of course, the rate falls; or the better rates were made with no campaign to (some) people that would renew their existing product etc.

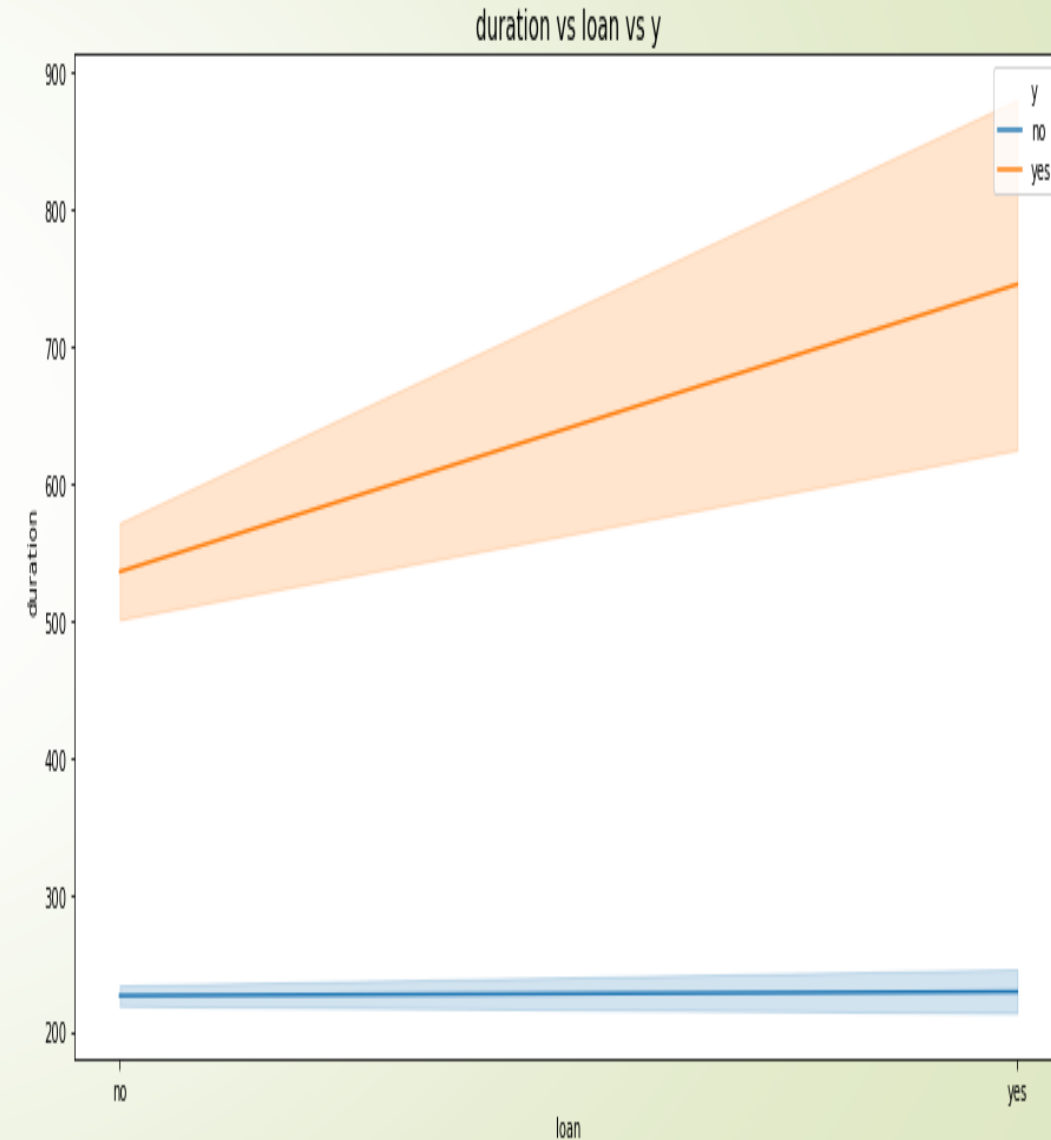
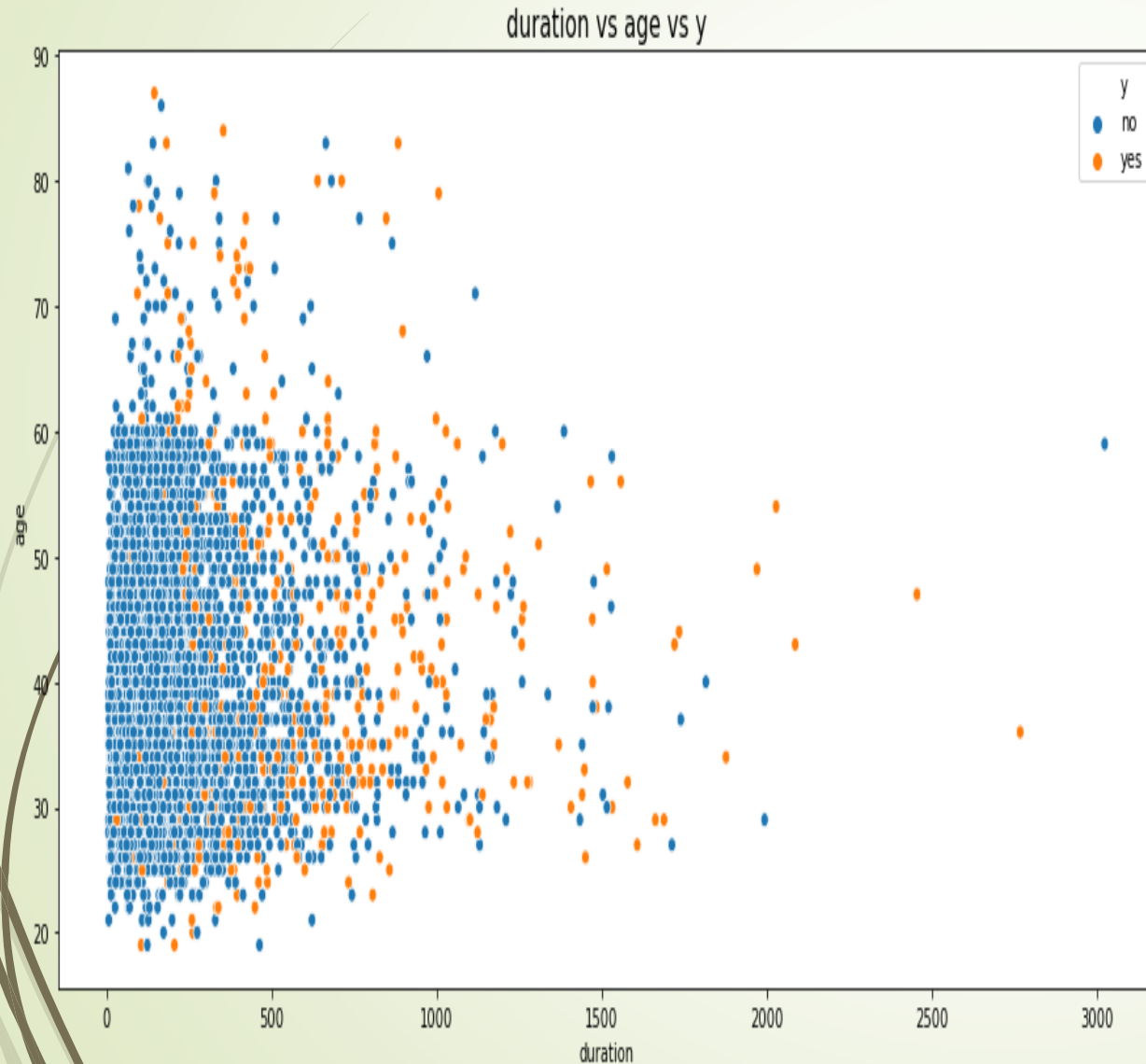
contacts by month



correlation yes by month



In this slide we see graphically the importance of the most correlated variable, high duration, to the final outcome: at the left, a scatterplot, duration vs age vs product taken, we shows clearly that as duration increases, acceptance increases for most part of population(age)-maybe only people over 60 do not need as much. At the right, we see duration vs loan vs acceptance, with a lineplot, which shows the big difference of duration based on the final outcome.



Conclusions-Summary

- a) We explored the dataset as a whole and as a part separately for those first time contacted (as some variables refer only to customers that participated in previous campaigns. Another subset could be customers over 70, which have a high acceptance ratio, but these are not many, that is why we did not analyze them more.
- b) We first found the most important positive variables with a correlogram, and then based on this, we examined these positive variables by two and then by three. Results justify this positive correlation, as acceptance rate when variables combined can reach +70% , from around 10%, which is the average for the whole sample.
- c) We solved the uneven acceptance rate by month paradox.
- d) Duration, cellular contact, no housing, no loan, retired job, single (besides of course the variables referring to previous outcome like success and many previous contacts) are the most positive and significant variables.
- e) Business taking : the profile of those with high acceptance ratio is: (i) people with not many obligations(single, no loan, no housing) , (ii) older people, (iii) people that already accepted the product based on similar findings. Approach method: prefer high duration calls, cellular. So, if bank wants to raise acceptance rates, according to findings, should target these three groups with the methods suggested and if they wanted to approach more people with different characteristics probably they could try a different product matching more their needs.