Phase 2
Milestone 1
Presentation

Classification Model for

Telco Customer Churn

This material is made only for learning material
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Background

Project reason & Problem Statement

The context in this case is "Predict behavior to retain customers". The data set includes information about customers who left in the past month, services each customer has registered with such as telephone, multiple lines, internet, online security, online backup, device protection, technical support, and TV and movie streaming. 🔑

Well, based on telco agency or company, predict on how much customer that will retain their loyalty by using our services as our revenue is actually somehow difficult to calculate due to uncertainty on business fluctuation and customer behaviour.

McKinsey & Company Standard Chartered Telkom Indonesia

Problem Statement & Objective

So, by **making a Machine Learning Classification Model**, this subjectivity of Retain rate of Telco Customer with a large dollar impact value can be an alternative to determining the status whether the customer will retain or not.

kaggle

BLASTCHAR · UPDATED 5 YEARS AGO

Telco Customer Churn

Focused customer retention programs

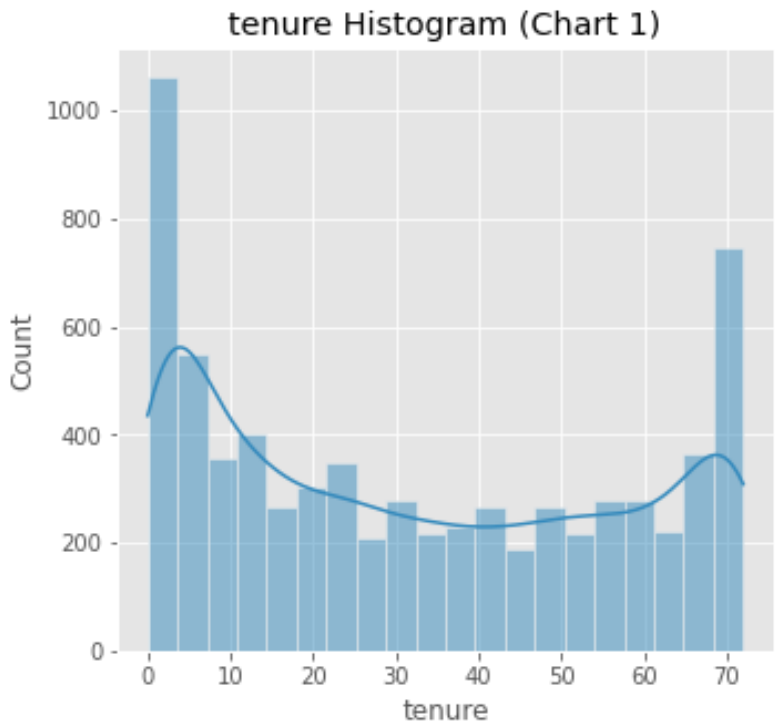
https://www.kaggle.com/datasets/blastchar/telco-customer-churn

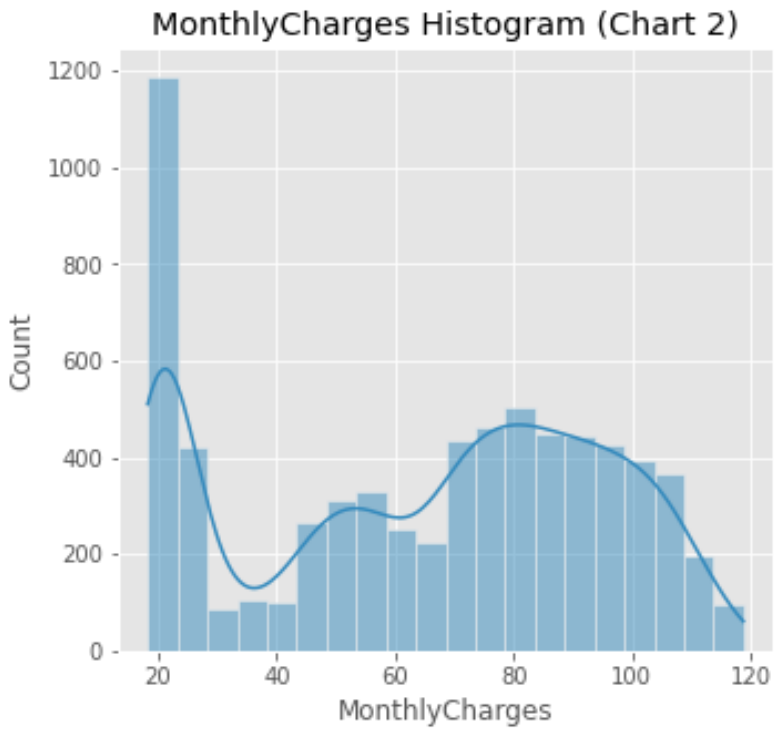
MODEL YANG DIGUNAKAN

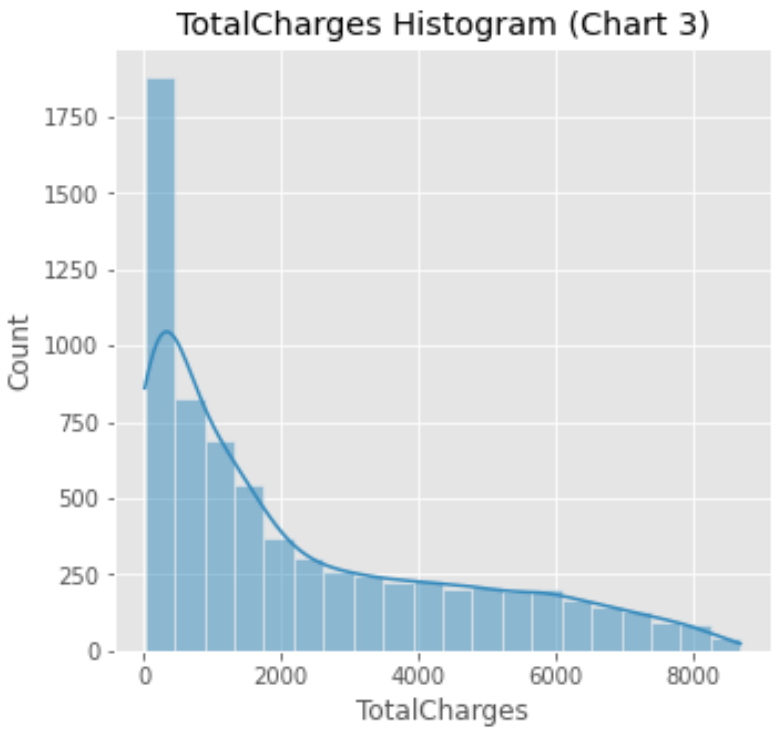
A multilayer perceptron (MLP) is a feedforward artificial neural network that generates a set of outputs from a set of inputs. An MLP is characterized by several layers of input nodes connected as a directed graph between the input and output layers.

Techopedia

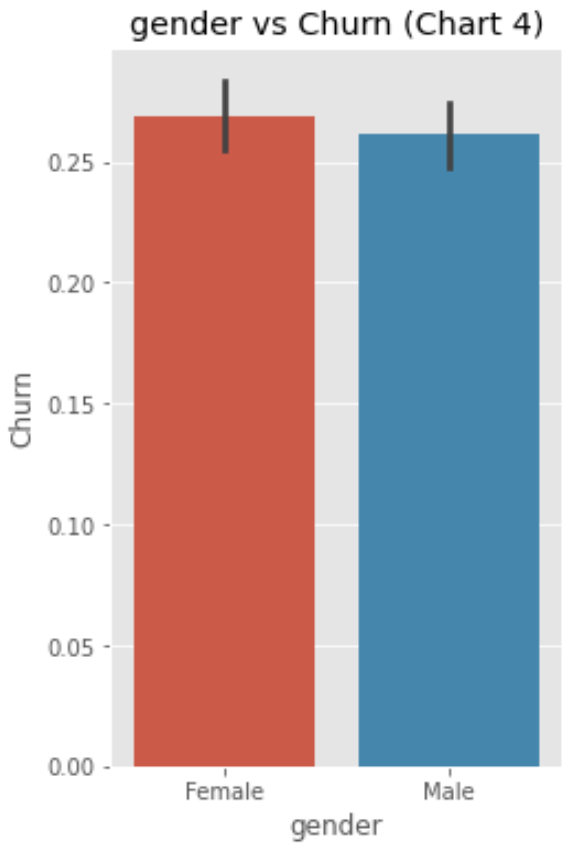
customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService	OnlineSecurity
Customer ID	Whether the customer is a male or a female	Whether the customer is a senior citizen or not (1, 0)	Whether the customer has a partner or not (Yes, No)	Whether the customer has dependents or not (Yes, No)	Number of months the customer has stayed with the company	Whether the customer has a phone service or not (Yes, No)	Whether the customer has multiple lines or not (Yes, No, No phone service)	Customer's internet service provider (DSL, Fiber optic, No)	Whether the customer has online security or not (Yes, No, No internet service)
7043 unique values	Male 50% Female 50%	0 1	true 0 0% false 0 0%	true 0 0% false 0 0%	0 72	true 0 0% false 0 0%	No 48% Yes 42% Other (682) 10%	Fiber optic 44% DSL 34% Other (1526) 22%	No 50% Yes 29% Other (1526) 22%
7590-VHVEG	Female	0	Yes	No	1	No	No phone service	DSL	No
5575-GNVDE	Male	0	No	No	34	Yes	No	DSL	Yes
3668-QPYBK	Male	0	No	No	2	Yes	No	DSL	Yes
7795-CFOCW	Male	0	No	No	45	No	No phone service	DSL	Yes
9237-HQITU	Female	0	No	No	2	Yes	No	Fiber optic	No
9305-CDSKC	Female	0	No	No	8	Yes	Yes	Fiber optic	No
1452-KIOVK	Male	0	No	Yes	22	Yes	Yes	Fiber optic	No
6713-OKOMC	Female	0	No	No	10	No	No phone service	DSL	Yes
7892-POOKP	Female	0	Yes	No	28	Yes	Yes	Fiber optic	No
6388-TABGU	Male	0	No	Yes	62	Yes	No	DSL	Yes

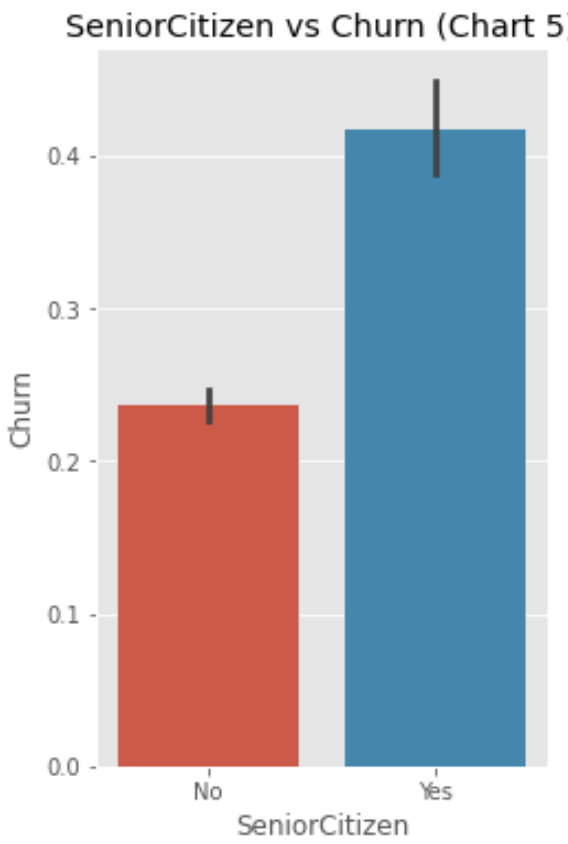


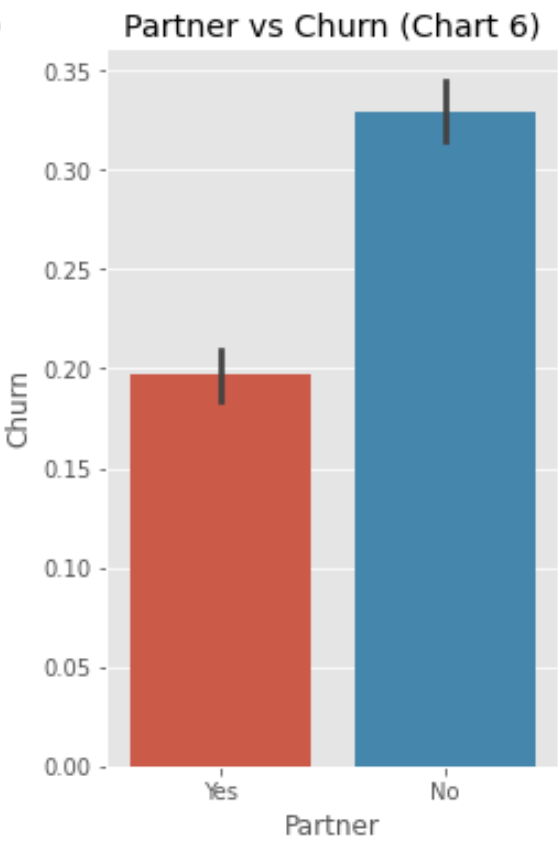


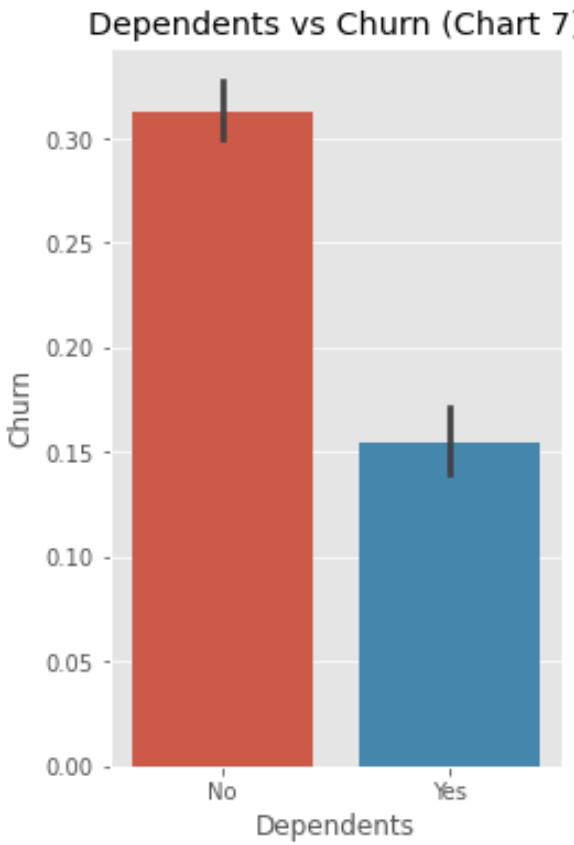


- Chart 1) **It is very unexpected that the tenure of customers varies greatly**, from 0 to 70. Although, there is a tendency for tenure to be higher at 0 to 10 (new customers) than at 65 to 70 (loyal customers) → (Number of months the customer has stayed with the company)
- Chart 2) Distribusi MonthlyCharges is unusual. These are very high numbers in the range of 10 to 30. Likely, the **customer is still in the trial or trial period of telco services to the provider in the dataset, and the telco service fails to keep the customer subscribed afterward** (calculated extreme decrease in GAP from 30 to 40).
- Chart 3) The highest total charge (accumulation) is > 8000, while the lowest is ~ 0 to 1000.

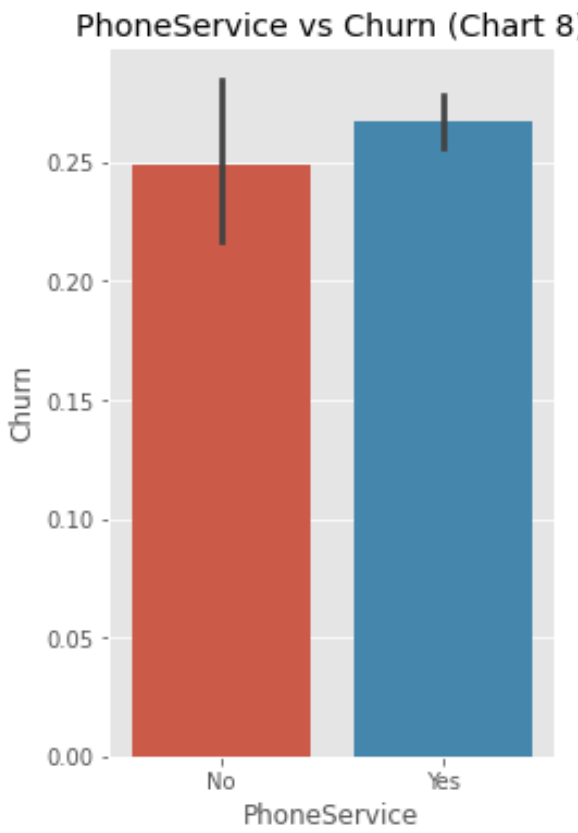


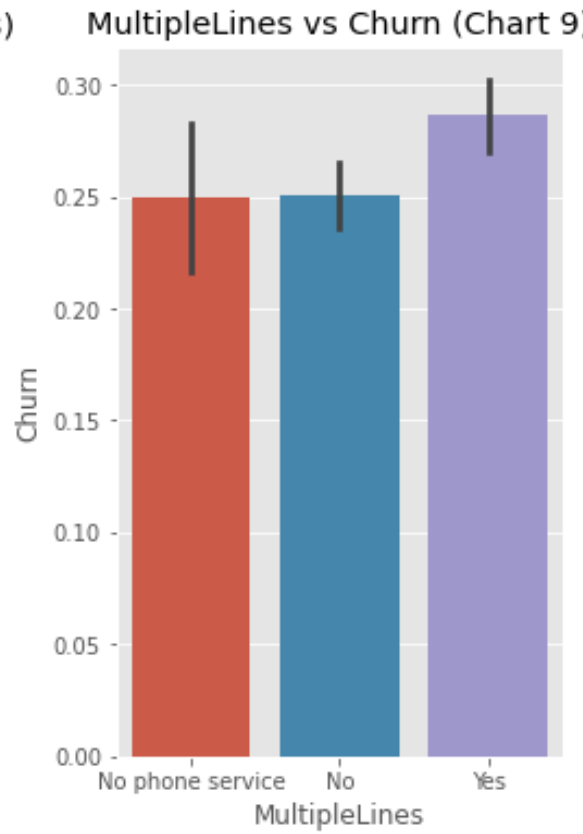


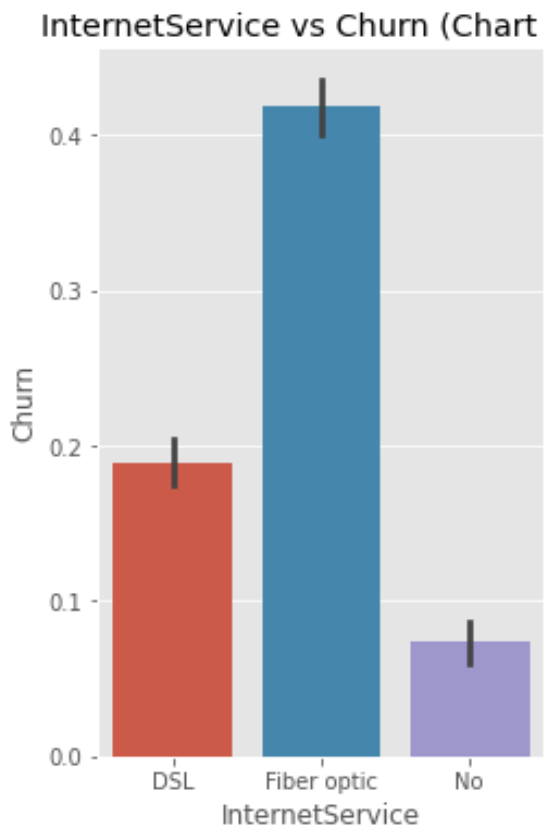


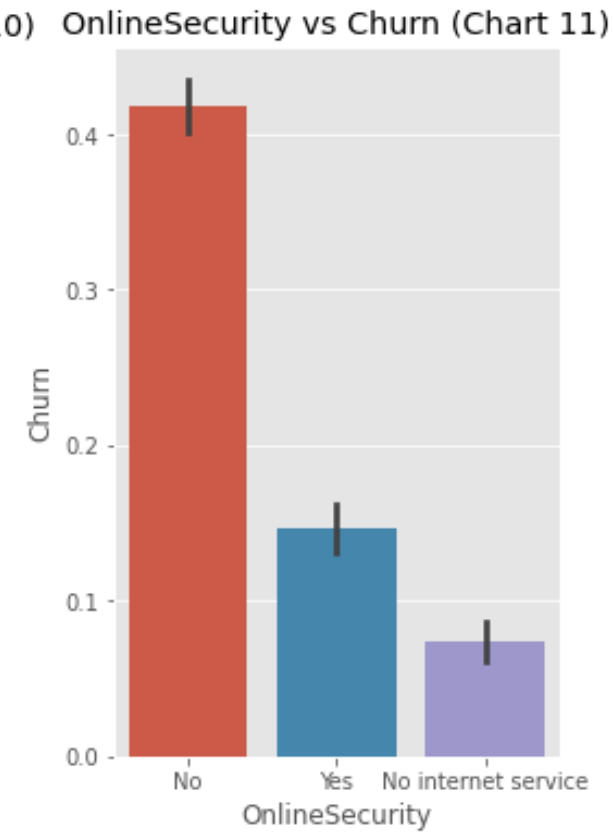


- **It can be seen that from all Charts above (Charts 4 to 7), each feature is quite influential in influencing churn**. Some features are not very influential.
- As in gender, the difference between female and male vs Churn is very small. As for Senior Citizens, partners, and dependents, it also can be seen that there are data differences between yes and no for each feature.

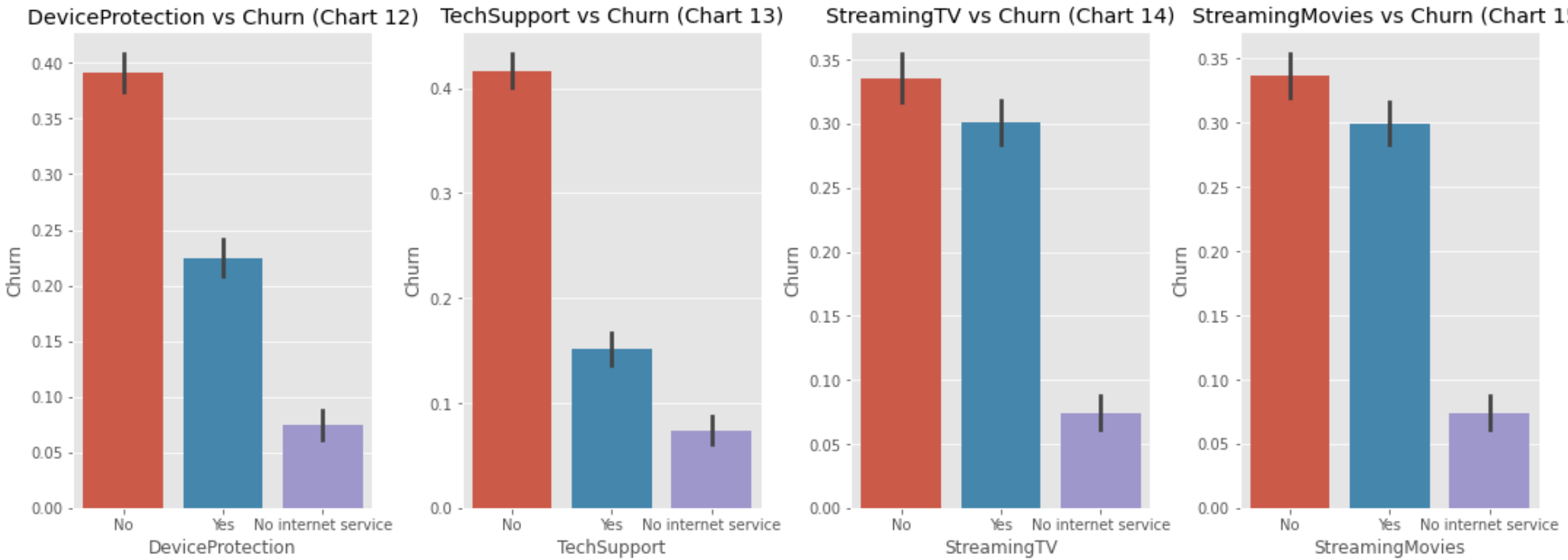








- On Chart 8, PhoneService yes and no do not look much different vs Churn (slightly correlated).... likewise, with MultipleLines in Chart 9.
- However, for InternetService and OnlineSecurity, it appears that each data has a fairly high GAP, so we need to consider using it during model development. For example, customers with Fiber optic tend to have higher Churn than DSL and No on Internet Service.



- DeviceProtection, TechSupport, StreamingTV, and StreamingMovies are some of the services provided by telco services to customers.
- It can be seen that customers are more likely to stay subscribed (Higher Churn) when they prefer not to use these services offered by telco services.

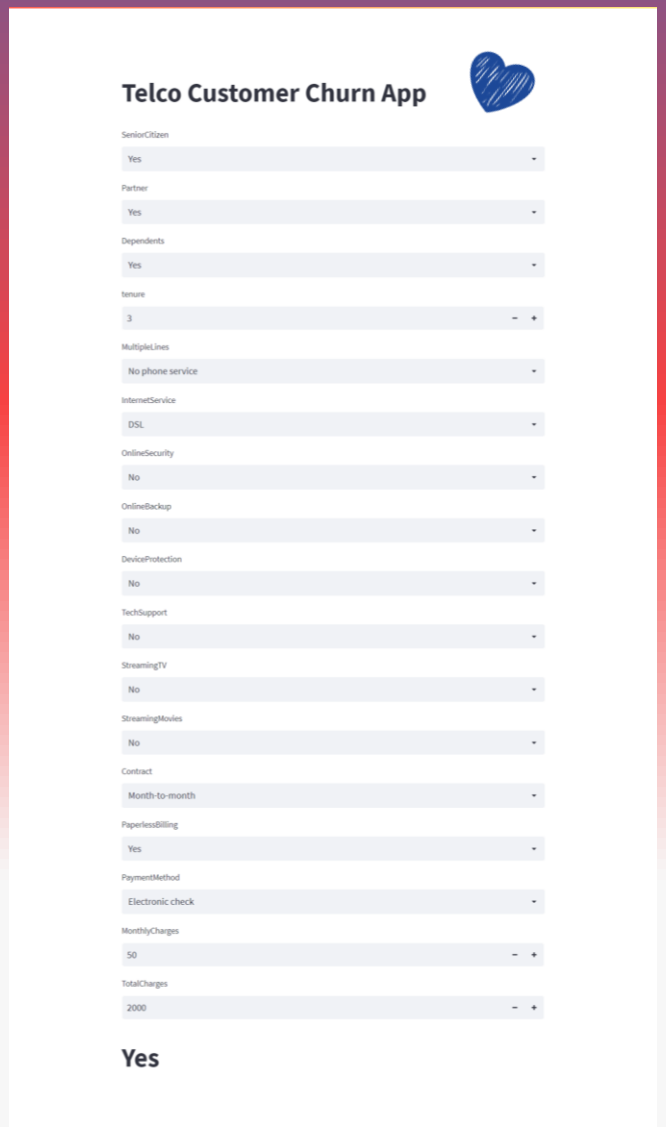
Streamlit heroku

Classification Model
Telco Customer Churn

~80%

by doing optimization & improvement models, in general, the accuracy and loss of the model become more consistent so that the model tends to be more fit, especially in terms of loss.

Model Deployment



The evaluation results of the overall model are not good enough (underfit)

Notes : To understand the case easier, Churn will be named by retain or not retain.

- The model is still incorrect in predicting the number of customers that should be labeled as “will not retain” when the answer should be “retain” (ratio 1:5).
- From a business perspective, more concern should be put here. Telco services will certainly lose the opportunity to get more customers which means less revenue.
- Moreover, the marketing team cant grasp the opportunity to penetrate more customers by this incorrect prediction from the model.
- To produce a better model, there are still many things that must be improved, both in terms of optimization experiments on the model, adding model improvements, and re-adjusting the threshold of precision and recall values on the model.

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THANK YOU

"The smallest act of kindness is worth more than the grandest intention."
Oscar Wilde (Playwright & Novelist)

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