

## ABOUT DATA

### INITIAL

**7043 entries, 21 attributes** [type of attribute: {object (18), int64 (2), float64 (1)}]

### PREPROCESSING

- Removing null values, i.e., 11 in 'TotalCharges' column
- Removing 'CustomerID' column, as it is of no use as it is unique for each entry
- 'TotalCharges' is numerical type attribute but it was explicitly casted into object. Converting 'TotalCharges' attribute into numeric type

### FINAL

**7032 entries, 20 Attributes** [type of attribute: {object (16), int64 (2), float64 (2)}]

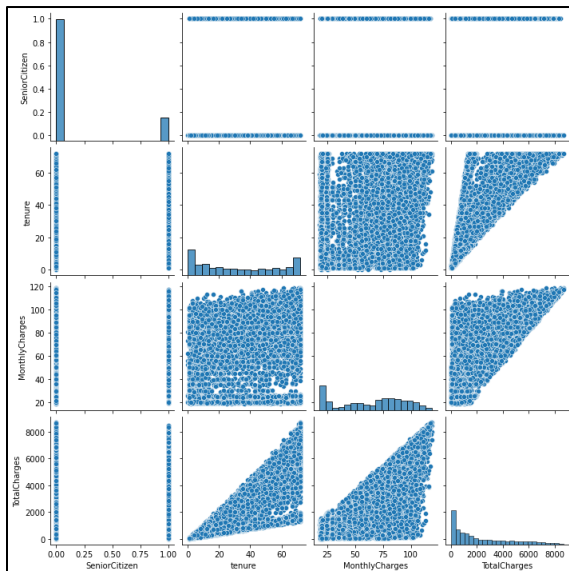
## INSIGHTS

- Lesser population is in range of senior citizens group as mean of 'SeniorCitizen' attribute is 0.1624
- Average tenure is 32.42 months with a standard deviation of 24.54
- Minimum tenure is one months and maximum is 72 months
- Average monthly charges are 64.79 with a standard deviation of 30.08
- Minimum monthly charge is 18.25 and maximum is 118.75
- Average total charges are 2283.30 with a standard deviation of 2266.77
- Minimum total charge is 18.80 and maximum is 8684.80
- There are more number of male telecom customers than female
- Number of senior citizens are very less when compared to others
- Number of people with partners are almost equal to number of people without partners
- There are almost 60% less people with dependents. People with dependents are very less compared when compared with people without dependents
- There are less than 1000 people without phone service. Almost 90% of people have phone services with them
- Around 50% of people don't use multiple phone services and around 40% of people use multiple phone services
- There are around 1500 people, who don't use internet services, around 3000 people use Fiber optic services, and around 2500 people use DSL services
- Around 3500 people don't have online security services, while around 2000 people have online security services
- Online Backup is available with around 2500 people, and not available with around 3000 people
- Device protection is available with around 3000 people, and not available with around 2500 people
- Surprisingly, only 2000 people can avail tech support for the internet services
- Equal number of people are using and not using internet services for streaming TV and streaming movies
- Around 3700 people avails monthly contract, around 1500 people avails yearly contract, and around 1800 people avails two year contract
- Around 4000 people are availing paperless billing services, rest are not willing to use paperless billing services
- 2400 people are using Electronic check as their payment method, 1600 people are using Mailed check, around 1500 people are using Bank transfer, and around 1500 people are using Credit card as their payment method
- More than 5000 people are willing to stay with their current telecom service, while around 2000 people want to change their telecom services
- Total charges seems to be positively skewed and more no. of people are paying less than 2000 for telecom services
- Monthly charges seems to be negatively skewed and more no. of people are paying more than mean, i.e., 64.79
- Tenure seems to be positively skewed, this suggests people are using particular services for a short term

- Churn rate in female and male seems to be same
- Churn rate in senior citizens seems to be higher, this shows the level of dissatisfaction with services is higher in senior citizens
- Surprisingly, Fiber optic having fast internet service have the higher churn rate than DSL, & the difference is quite high
- When there is no tech support, there is higher churn rate and which seems to be aligned as per human behavior
- People with monthly contract has a much higher churn rate compared to yearly and two year contracts. This also follows human behavior as monthly contract gives freedom to people to change their services if they are not happy with the current services
- Paperless Billing increases the churn rate, this maybe because people still stick with paying in cash
- As per above observation, electronic check has the highest churn rate out of all payment methods
- No online backup seems to increase the churn rate
- After a surprising observation of fiber optic having the higher churn rate, the reason behind it is worst tech support
- One more reason behind the higher churn rate for fiber optic is more paperless billing
- More people without dependents are using fiber optic services, and the kind of services (fiber optic) make people frustrating and they are willing to change services without any thought
- People with monthly contract with higher total charges are more willing to change their services and that seems reasonable
- People paying higher monthly charges with less tenure are more willing to change their services and have higher churn rate
- People paying more total charges with less tenure are willing to change their services

Code Link: <https://colab.research.google.com/drive/1NJzsfBQ1g5LaSM45Wxf18XLCVL-y6fM?usp=sharing>

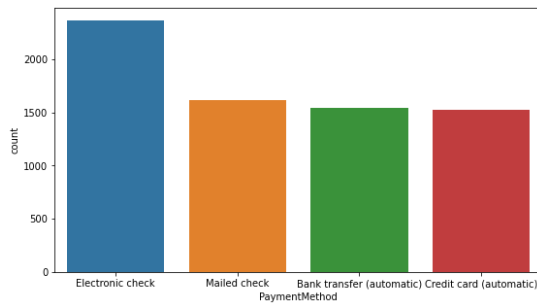
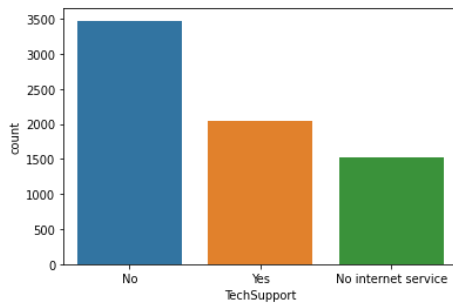
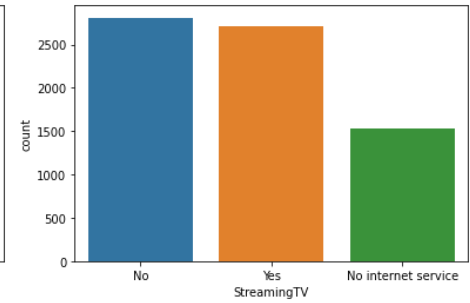
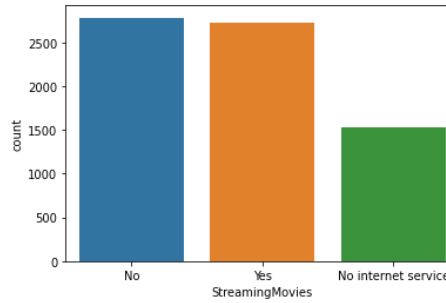
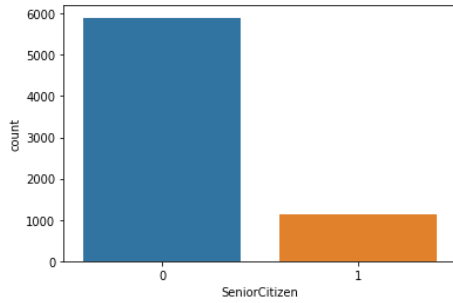
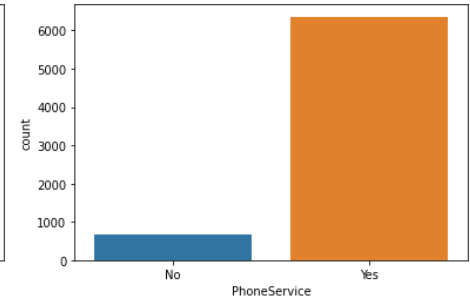
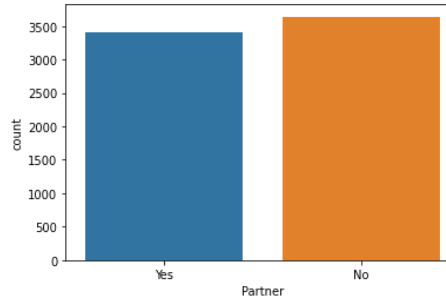
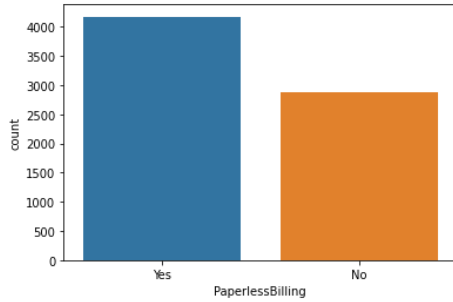
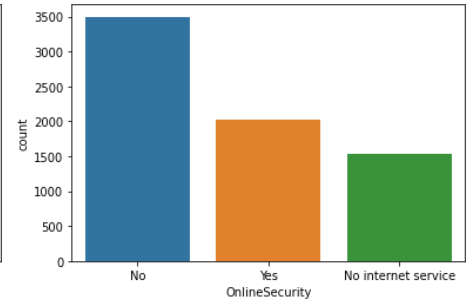
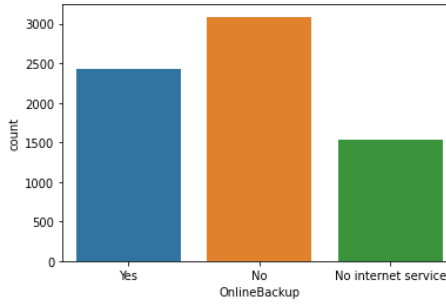
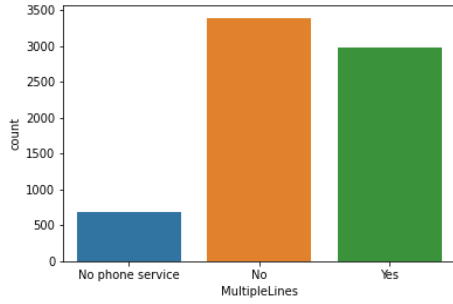
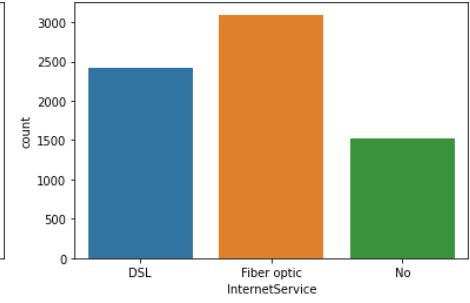
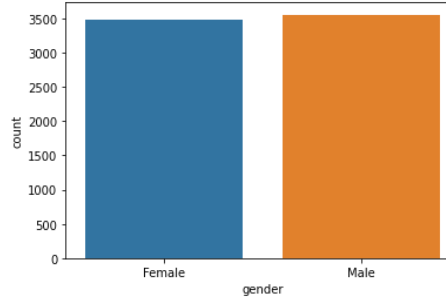
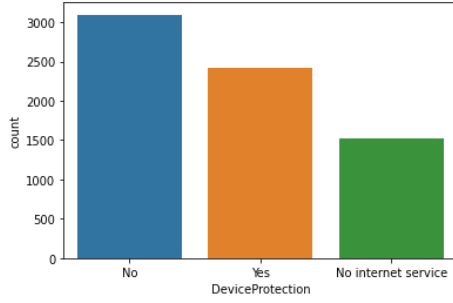
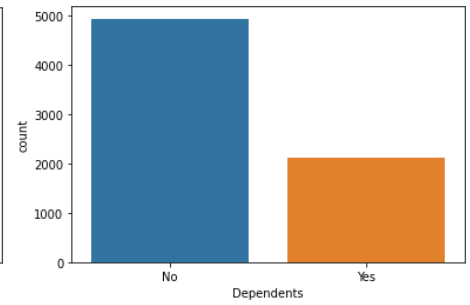
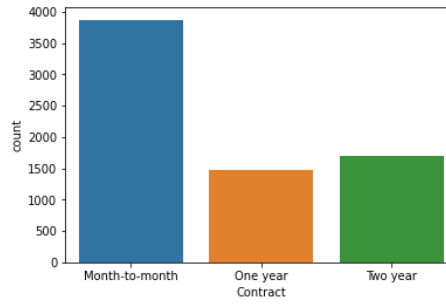
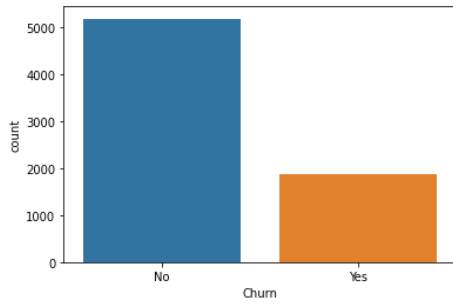
## PAIR PLOT



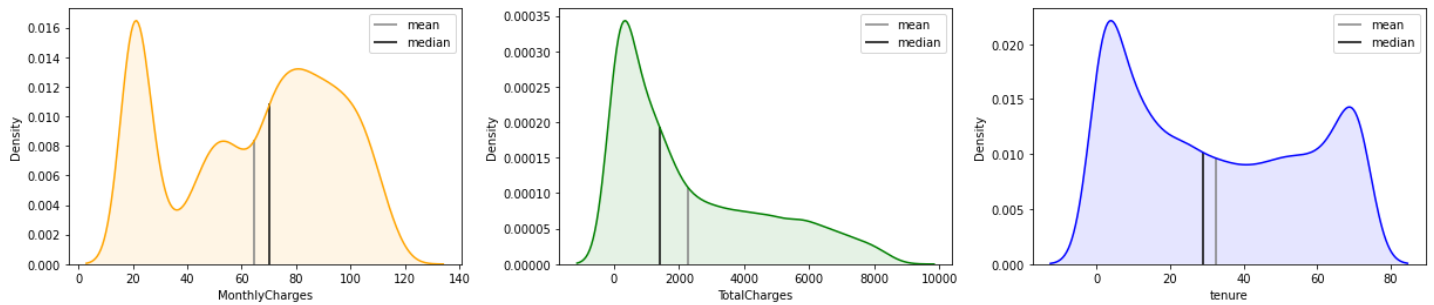
## DESCRIPTIVE STATISTICS

	SeniorCitizen	tenure	MonthlyCharges	TotalCharges
count	7043.000000	7043.000000	7043.000000	7032.000000
mean	0.162147	32.371149	64.761692	2283.300441
std	0.368612	24.559481	30.090047	2266.771362
min	0.000000	0.000000	18.250000	18.800000
25%	0.000000	9.000000	35.500000	401.450000
50%	0.000000	29.000000	70.350000	1397.475000
75%	0.000000	55.000000	89.850000	3794.737500
max	1.000000	72.000000	118.750000	8684.800000

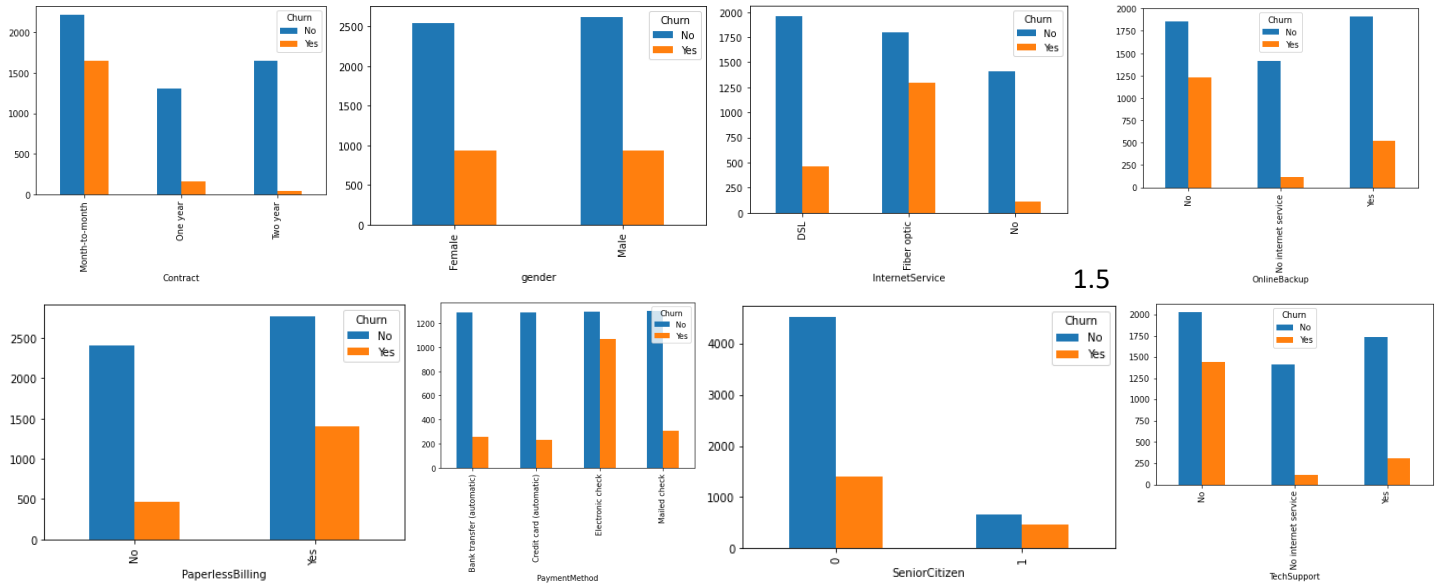
# COUNT PLOTS



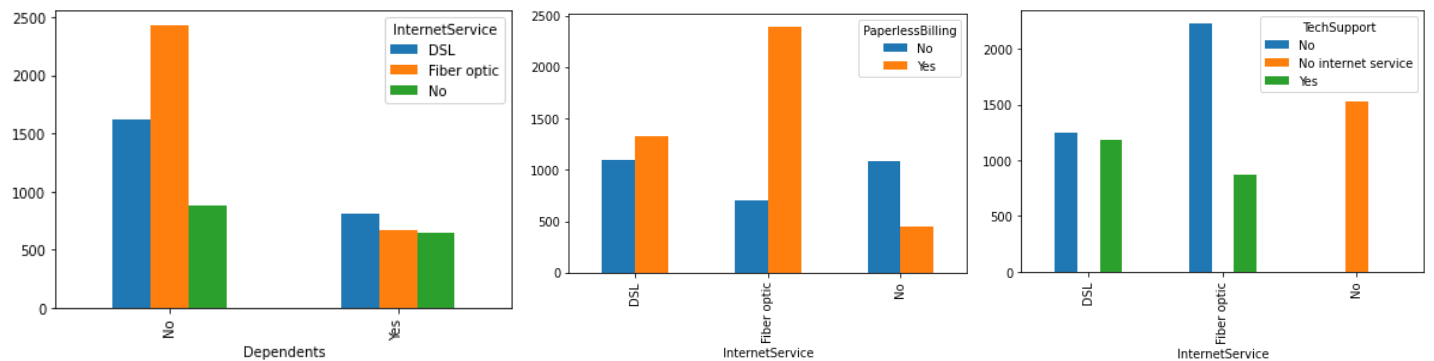
## KDE PLOTS



## EFFECT OF VAIRABLES ON CHURN



## WHY FIBER OPTIC HAS HIGHER CHURN RATE?



## SCATTER PLOTS

