

Assignment 1 – Pandas

Problem Statement:

You work in XYZ Corporation as a Data Analyst. Your corporation has told you to analyze the customer_churn dataset with various functions.

Tasks To Be Performed:

1. Start off by importing the customer_churn.csv file in the jupyter notebook and store that in churn DataFrame.
2. From the churn DataFrame, select only 3rd, 7th, 8th, and 20th columns and all the rows and store that in a new DataFrame named newCols.
3. From the original DataFrame, select only the rows from the 200th index till the 1000th index(inclusive) column.
4. Now select the rows from 20th index till 200th index(exclusive)and
- columns from 2nd index till 15th index value.
5. Display the top 100 records from the original DataFrame.
6. Display the last 10 records from the DataFrame.
7. Display the last record from the DataFrame.
8. Now from the churn DataFrame, try to sort the data by the tenure column according to the descending order.
9. Fetch all the records that are satisfying the following condition- a. Tenure>50 and the gender as 'Female' - b. Gender as 'Male' and SeniorCitizen as 0 - c. TechSupport as 'Yes' and Churn as 'No' - d. Contract type as 'Month-to-month' and Churn as 'Yes' 10. Use a for loop to calculate the number of customers that are getting the tech support and are male senior citizens.

```
In [1]: import numpy as np
import pandas as pd

In [2]: churn_DataFrame = pd.read_csv(r'csv_files/customer_churn-1.csv')
churn_DataFrame

Out[2]:
```

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService	OnlineSecurity	...	DeviceProtection	TechSupport	StreamingTV	StreamingMovies	Contract	PaperlessBilling	PaymentMethod	MonthlyCharges	TotalCharges	Churn
0	7590-VHVEG	Female	0	Yes	No	1	No	No phone service	DSL	No	...	No	No	No	No	Month-to-month	Yes	Electronic check	29.85	29.85	No
1	5575-GNVDI	Male	0	No	No	34	Yes	No	DSL	Yes	...	Yes	No	No	No	One year	No	Mailed check	56.95	1889.5	No
2	3668-GPYBK	Male	0	No	No	2	Yes	No	DSL	Yes	...	No	No	No	No	Month-to-month	Yes	Mailed check	53.85	108.15	Yes
3	7795-CFCOW	Male	0	No	No	45	No	No phone service	DSL	Yes	...	Yes	Yes	No	No	One year	No	Bank transfer (automatic)	42.30	1540.75	No
4	8237-HQITU	Female	0	No	No	2	Yes	No	Fiber optic	No	...	No	No	No	No	Month-to-month	Yes	Electronic check	70.70	151.65	Yes
...
7038	6840-REBVB	Male	0	Yes	Yes	24	Yes	Yes	DSL	Yes	...	Yes	Yes	Yes	Yes	One year	Yes	Mailed check	84.80	1990.5	No
7039	2234-XAOUH	Female	0	Yes	Yes	72	Yes	Yes	Fiber optic	No	...	Yes	No	Yes	Yes	One year	Yes	Credit card (automatic)	103.20	7362.9	No
7040	4801-JZAKL	Female	0	Yes	Yes	11	No	No phone service	DSL	Yes	...	No	No	No	No	Month-to-month	Yes	Electronic check	29.60	346.45	No
7041	8361-LTMKD	Male	1	Yes	No	4	Yes	Yes	Fiber optic	No	...	No	No	No	No	Month-to-month	Yes	Mailed check	74.40	306.6	Yes
7042	3186-AJBEK	Male	0	No	No	66	Yes	No	Fiber optic	Yes	...	Yes	Yes	Yes	Yes	Two year	Yes	Bank transfer (automatic)	105.65	6844.5	No

7043 rows x 21 columns

```
In [3]: newCols = churn_DataFrame.iloc[:, [2,6,8,19]]
newCols

Out[3]:
```

	SeniorCitizen	PhoneService	InternetService	TotalCharges
0	0	No	DSL	29.85
1	0	Yes	DSL	1889.5
2	0	Yes	DSL	108.15
3	0	No	DSL	1540.75
4	0	Yes	Fiber optic	151.65
...
7038	0	Yes	DSL	1990.5
7039	0	Yes	Fiber optic	7362.9
7040	0	No	DSL	346.45
7041	1	Yes	Fiber optic	306.6
7042	0	Yes	Fiber optic	6844.5

7043 rows x 4 columns

```
In [4]: churn_DataFrame.iloc[199:1001]

Out[4]:
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	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService	OnlineSecurity	...	DeviceProtection	TechSupport	StreamingTV	StreamingMovies	Contract	PaperlessBilling	PaymentMethod	MonthlyCharges	TotalCharges	Churn
200	9323-HGFVV	Female	0	Yes	No	27	Yes	No	Fiber optic	Yes	...	No	Yes	Yes	Yes	One year	Yes	Credit card (automatic)	101.90	2681.15	No
201	8546-GQGBH	Female	0	No	No	14	Yes	No	Fiber optic	No	...	No	Yes	No	No	Month-to-month	Yes	Credit card (automatic)	80.05	1112.3	No
202	3363-DITVO	Male	0	Yes	Yes	71	Yes	Yes	Fiber optic	Yes	...	Yes	No	Yes	Yes	Two year	No	Electronic check	105.55	7495.5	No
203	7018-WJUNK	Male	0	No	Yes	13	Yes	No	Fiber optic	No	...	No	No	No	Yes	Month-to-month	Yes	Credit card (automatic)	78.30	1033.95	No
204	9140-KZQOP	Male	0	No	No	44	Yes	No	Fiber optic	No	...	No	No	No	No	Month-to-month	No	Credit card (automatic)	68.85	2958.95	No
...
996	6641-XGPSU	Female	0	No	No	34	Yes	No	Fiber optic	No	...	No	No	No	No	Month-to-month	Yes	Credit card (automatic)	70.00	2416.1	Yes
997	1374-DMZUE	Female	1	No	No	4	Yes	Yes	Fiber optic	No	...	No	No	Yes	Yes	Month-to-month	Yes	Electronic check	94.30	424.45	Yes
998	2546-LXYVJ	Male	0	Yes	No	72	Yes	No	No internet service	...	No	No	No	No	No	Two year	No	Bank transfer (automatic)	20.70	1492.1	No
999	3234-VKACU	Male	0	No	No	2	Yes	No	DSL	No	...	No	Yes	Yes	Yes	Month-to-month	No	Electronic check	70.30	132.4	No
1000	8351-EQKFD	Female	0	No	No	7	Yes	No	Fiber optic	No	...	Yes	No	Yes	Yes	Month-to-month	Yes	Electronic check	95.35	660.9	Yes

801 rows x 21 columns

```
In [5]: churn_DataFrame.iloc[29:200, 2:16]

Out[5]:
```

	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService	OnlineSecurity	OnlineBackup	DeviceProtection	TechSupport	StreamingTV	StreamingMovies	Contract	
20	1	No	No	1	No	No phone service	DSL	No	No	Yes	No	No	No	Yes	Month-to-month
21	0	Yes	No	12	Yes	No	No	No internet service	No internet service	No internet service	No internet service	No internet service	No internet service	One year	
22	0	No	No	1	Yes	No	No	No internet service	No internet service	No internet service	No internet service	No internet service	No internet service	Month-to-month	
23	0	Yes	No	58	Yes	Yes	DSL	No	Yes	No	Yes	No	No	Two year	
24	0	Yes	Yes	49	Yes	No	DSL	Yes	Yes	No	Yes	No	No	Month-to-month	
...	
196	0	Yes	No	20	Yes	No	Fiber optic	Yes	Yes	No	Yes	Yes	No	Month-to-month	
196	0	Yes	Yes	24	Yes	Yes	No	No internet service	No internet service	No internet service	No internet service	No internet service	No internet service	Two year	
197	0	No	No	59	Yes	Yes	Fiber optic	No	Yes	Yes	Yes	Yes	Yes	Month-to-month	
198	0	Yes	Yes	72	Yes	Yes	Fiber optic	No	Yes	Yes	Yes	Yes	Yes	Two year	
199	0	No	Yes	1	Yes	No	No	No internet service	No internet service	No internet service	No internet service	No internet service	No internet service	Month-to-month	

190 rows x 14 columns

```
In [6]: churn_DataFrame.head(189)

Out[6]:
```

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService	OnlineSecurity	...	DeviceProtection	TechSupport	StreamingTV	StreamingMovies	Contract	PaperlessBilling	PaymentMethod	MonthlyCharges	TotalCharges	Churn
0	7590-VHVEG	Female	0	Yes	No	1	No	No phone service	DSL	No	...	No	No	No	No	Month-to-month	Yes	Electronic check	29.85	29.85	No
1	5575-GNVDI	Male	0	No	No	34	Yes	No	DSL	Yes	...	Yes	No	No	No	One year	No	Mailed check	56.95	1889.5	No
2	3668-GPYBK	Male	0	No	No	2	Yes	No	DSL	Yes	...	No	No	No	No	Month-to-month	Yes	Mailed check	53.85	108.15	Yes
3	7795-CFCOW	Male	0	No	No	45	No	No phone service	DSL	Yes	...	Yes	Yes	No	No	One year	No	Bank transfer (automatic)	42.30	1540.75	No
4	8237-HQITU	Female	0	No	No	2	Yes	No	Fiber optic	No	...	No	No	No	No	Month-to-month	Yes	Electronic check	70.70	151.65	Yes
...
95	8637-XZVRU	Female	0	No	No	12	Yes	Yes	Fiber optic	Yes	...	No	No	No	No	Month-to-month	Yes	Electronic check	78.95	927.35	Yes
96	9803-FJCGJ	Male	0	Yes	Yes	71	Yes	Yes	DSL	Yes	...	No	Yes	No	No	One year	Yes	Credit card (automatic)	66.85	4748.7	No
97	0278-VXOGG	Male	0	No	No	5	Yes	No	No internet service	...	No	No	No	No	No	Month-to-month	No	Mailed check	21.05	113.85	Yes
98	3212-KXOCR	Male	0	No	No	52	Yes	No	No	No internet service	...	No	No	No	No	Two year	No	Bank transfer (automatic)	21.00	1107.2	No
99	4598-XLNUJ	Female	1	Yes	No	25	Yes	No	Fiber optic	No	...	Yes	No	Yes	Yes	Month-to-month	Yes	Electronic check	95.50	2514.5	Yes

100 rows x 21 columns

```
In [7]: churn_DataFrame.tail(18)

Out[7]:
```

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService	OnlineSecurity	...	DeviceProtection	TechSupport	StreamingTV	StreamingMovies	Contract	PaperlessBilling	PaymentMethod	MonthlyCharges	TotalCharges	Churn	
7033	9767-FPLEM	Male	0	No	No	38	Yes	No	Fiber optic	No	...	No	No	No	No	Month-to-month	Yes	Credit card (automatic)	69.50	2625.25	No	
7034	0639-TSISW	Female	0	No	No	67	Yes	Yes	Fiber optic	Yes	...	Yes	No	Yes	Yes	No	Month-to-month	Yes	Credit card (automatic)	102.95	6886.25	Yes
7035	8456-QDAVC	Male	0	No	No	19	Yes	No	Fiber optic	No	...	No	No	No	Yes	No	Month-to-month	Yes	Bank transfer (automatic)	78.70	1495.1	No
7036	7750-EYVWZ	Female	0	No	No	12	No	No phone service	DSL	No	...	Yes	Yes	Yes	Yes	One year	No	Electronic check	60.65	743.3	No	
7037	2659-WGEBR	Female	0	No	No	72	Yes	No	No	No internet service	...	No	No	No	No	Two year	Yes	Bank transfer (automatic)	21.15	1419.4	No	
7038	6840-REBVB	Male	0	Yes	Yes	24	Yes	Yes	DSL	Yes	...	Yes	Yes	Yes	Yes	One year	Yes	Mailed check	84.80	1990.5	No	
7039	2234-XAOUH	Female	0	Yes	Yes	72	Yes	Yes	Fiber optic	No	...	Yes	No	Yes	Yes	One year	Yes	Credit card (automatic)	103.20	7362.9	No	
7040	4801-JZAKL	Female	0	Yes	Yes	11	No	No phone service	DSL	Yes	...	No	No	No	No	Month-to-month	Yes	Electronic check	29.60	346.45	No	
7041	8361-LTMKD	Male	1	Yes	No	4	Yes	Yes	Fiber optic	No	...	No	No	No	No	Month-to-month	Yes	Mailed check	74.40	306.6	Yes	
7042	3186-AJBEK	Male	0	No	No	66	Yes	No	Fiber optic	Yes	...	Yes	Yes	Yes	Yes	Two year	Yes	Bank transfer (automatic)	105.65	6844.5	No	

10 rows x 21 columns

```
In [8]: churn_DataFrame.sort_values('tenure',ascending=False)

Out[8]:
```

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService	OnlineSecurity	...	DeviceProtection	TechSupport	StreamingTV	StreamingMovies	Contract	PaperlessBilling	PaymentMethod	MonthlyCharges	TotalCharges	Churn
1872	4737-AQCFU	Male	0	Yes	Yes	72	Yes	Yes	DSL	Yes	...	Yes	Yes	No	No	Two year	No	Credit card (automatic)	72.10	5016.65	No
193	9690-NALJV	Female	0	Yes	Yes	72	Yes	Yes	Fiber optic	Yes	...	Yes	Yes	Yes	Yes	Two year	No	Credit card (automatic)	109.70	8129.3	No
4553	5914-XFPQB	Female	0	Yes	No	72	Yes	Yes	Fiber optic	Yes	...	Yes	Yes	Yes	Yes	Two year	Yes	Bank transfer (automatic)	115.80	8424.9	No
483	5168-MQGCA	Female	0	Yes	No	72	Yes	Yes	Fiber optic	No	...	Yes	Yes	Yes	Yes	One year	Yes	Bank transfer (automatic)	108.50	8003.8	No
3266	0464-WUTKO	Female	0	Yes	Yes	72	Yes	No	No	No internet service	...	No	No	No	No	Two year	No	Bank transfer (automatic)	20.10	1460.85	No
...
1082	4367-NVYAO	Male	0	Yes	Yes	0	Yes	Yes	No	No internet service	...	No	No	No	No	Two year	No	Mailed check	...	25.75	No
3626	3213-VVCLG	Male	0	Yes	Yes	0	Yes	Yes	No	No internet service	...	No	No	No	No	Two year	No	Mailed check	...	25.55	No
836	5709-LVCEQ	Female	0	Yes	Yes	0	Yes	No	DSL	Yes	...	Yes	No	Yes	Yes	Two year	No	Mailed check	...	83.85	No
6754	2775-SEFEE	Male	0	No	Yes	0	Yes	Yes	DSL	Yes	...	No	Yes	No	No	Two year	Yes	Bank transfer (automatic)	...	61.90	No
1340	1371-DWPAZ	Female	0	Yes	Yes	0	No	No phone service	DSL	Yes	...	Yes	Yes	No	No	Two year	No	Credit card (automatic)	...	56.05	No

7043 rows x 21 columns

```
In [9]: # a. 'tenure' as 'Male' and SeniorCitizen as 0
churn_DataFrame[churn_DataFrame['tenure']>50 & (churn_DataFrame['gender']=='Male')]

Out[9]:
```

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService	OnlineSecurity	...	DeviceProtection	TechSupport	StreamingTV	StreamingMovies	Contract	PaperlessBilling	PaymentMethod	MonthlyCharges	TotalCharges	Churn
15	3655-SNOVZ	Female	0	Yes	Yes	69	Yes	Yes	Fiber optic	Yes	...	Yes	Yes	Yes	Yes	Two year	No	Credit card (automatic)	113.25	7995.15	No
16	8191-XWSIG	Female	0	No	No	52	Yes	No	No	No internet service	...	No	No	No	No	One year	No	Mailed check	20.65	1022.95	No
23	3638-WEABW	Female	0	Yes	No	58	Yes	Yes	DSL	No	...	No	Yes	No	No	Two year	Yes	Credit card (automatic)	59.90	3505.1	No
30	3841-NFEEX	Female	1	Yes	No	71	Yes	Yes	Fiber optic	Yes	...	Yes	Yes	No	No	Two year	Yes	Credit card (automatic)	96.35	6766.95	No
35	6234-RAAPL	Female	0	Yes	Yes	72	Yes	Yes	Fiber optic	Yes	...	No	Yes	Yes	No	Two year	No	Bank transfer (automatic)	99.90	7251.7	No
...																			