

Problem:

The problem is being able to predict which customers are likely to stop using the services of a telecom company given their demographics and usage of the different services being offered by that company. When a customer stops using the services of a company (i.e. they cancel their subscription), this is known as churn. So, the aim of this project is churn prediction.

Intended beneficiaries/users:

The intended beneficiary or user is any modern telecom company interested in being able to predict which customers they are about to lose.

Source of the dataset:

The dataset is provided/authored by IBM.

Quoting from their website: *“The Telco customer churn data contains information about a fictional telco company that provided home phone and Internet services to 7043 customers in California in Q3. It indicates which customers have left, stayed, or signed up for their service.”*

The detailed description of this dataset can be found at:

<https://community.ibm.com/community/user/businessanalytics/blogs/steven-macko/2019/07/11/telco-customer-churn-1113>

The URL for downloading this dataset is:

<https://community.ibm.com/accelerators/catalog/content/Telco-customer-churn>

Dataset profile:

There are a total of 7043 entries (rows) in the dataset.

There are a total of 33 columns in the dataset

The number of non-null items in each column, along with its data type is provided below:

RangeIndex: 7043 entries, 0 to 7042

Data columns (total 33 columns):

#	Column	Non-Null Count	Dtype
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0	CustomerID	7043 non-null	object
1	Count	7043 non-null	int64
2	Country	7043 non-null	object
3	State	7043 non-null	object
4	City	7043 non-null	object
5	Zip Code	7043 non-null	int64
6	Lat Long	7043 non-null	object
7	Latitude	7043 non-null	float64
8	Longitude	7043 non-null	float64
9	Gender	7043 non-null	object
10	Senior Citizen	7043 non-null	object

11	Partner	7043 non-null	object
12	Dependents	7043 non-null	object
13	Tenure Months	7043 non-null	int64
14	Phone Service	7043 non-null	object
15	Multiple Lines	7043 non-null	object
16	Internet Service	7043 non-null	object
17	Online Security	7043 non-null	object
18	Online Backup	7043 non-null	object
19	Device Protection	7043 non-null	object
20	Tech Support	7043 non-null	object
21	Streaming TV	7043 non-null	object
22	Streaming Movies	7043 non-null	object
23	Contract	7043 non-null	object
24	Paperless Billing	7043 non-null	object
25	Payment Method	7043 non-null	object
26	Monthly Charges	7043 non-null	float64
27	Total Charges	7032 non-null	object
28	Churn Label	7043 non-null	object
29	Churn Value	7043 non-null	int64
30	Churn Score	7043 non-null	int64
31	CLTV	7043 non-null	int64
32	Churn Reason	1869 non-null	object

We can notice that most of the missing data seems to be in the “Churn Reason” column and some missing data is in the “Total Charges” column.

Using information from the IBM website (URL given above), a small description of each column and the possible values (for categorical data) in the dataset is provided below:

CustomerID: A unique ID that identifies each customer.

Count: A value used in reporting/dashboarding to sum up the number of customers in a filtered set.

Country: The country of the customer’s primary residence.

State: The state of the customer’s primary residence.

City: The city of the customer’s primary residence.

Zip Code: The zip code of the customer’s primary residence.

Lat Long: The combined latitude and longitude of the customer’s primary residence.

Latitude: The latitude of the customer’s primary residence.

Longitude: The longitude of the customer’s primary residence.

Gender: The customer’s gender: *Male, Female*

Senior Citizen: Indicates if the customer is 65 or older: *Yes, No*

Partner: Indicates if the customer is married: *Yes, No*

Dependents: Indicates if the customer lives with any dependents: *Yes, No*. Dependents could be children, parents, grandparents, etc.

Tenure Months: Indicates the total amount of months that the customer has been with the company by the end of the quarter specified above.

Phone Service: Indicates if the customer subscribes to home phone service with the company: *Yes, No*

Multiple Lines: Indicates if the customer subscribes to multiple telephone lines with the company: *Yes, No*

Internet Service: Indicates if the customer subscribes to Internet service with the company: *No, DSL, Fiber Optic, Cable*.

Online Security: Indicates if the customer subscribes to an additional online security service provided by the company: *Yes, No*

Online Backup: Indicates if the customer subscribes to an additional online backup service provided by the company: *Yes, No*

Device Protection: Indicates if the customer subscribes to an additional device protection plan for their Internet equipment provided by the company: *Yes, No*

Tech Support: Indicates if the customer subscribes to an additional technical support plan from the company with reduced wait times: *Yes, No*

Streaming TV: Indicates if the customer uses their Internet service to stream television programming from a third party provider: *Yes, No*. The company does not charge an additional fee for this service.

Streaming Movies: Indicates if the customer uses their Internet service to stream movies from a third party provider: *Yes, No*. The company does not charge an additional fee for this service.

Contract: Indicates the customer's current contract type: *Month-to-Month, One Year, Two Year*.

Paperless Billing: Indicates if the customer has chosen paperless billing: *Yes, No*

Payment Method: Indicates how the customer pays their bill: *Bank Withdrawal, Credit Card, Mailed Check*

Monthly Charge: Indicates the customer's current total monthly charge for all their services from the company.

Total Charges: Indicates the customer's total charges, calculated to the end of the quarter specified above.

Churn Label: *Yes* = the customer left the company this quarter. *No* = the customer remained with the company. Directly related to Churn Value.

Churn Value: 1 = the customer left the company this quarter. 0 = the customer remained with the company. Directly related to Churn Label.

Churn Score: A value from 0-100 that is calculated using the predictive tool IBM SPSS Modeler. The model incorporates multiple factors known to cause churn. The higher the score, the more likely the customer will churn.

CLTV: Customer Lifetime Value. A predicted CLTV is calculated using corporate formulas and existing data. The higher the value, the more valuable the customer. High value customers should be monitored for churn.

Churn Reason: A customer's *specific reason* for leaving the company. Directly related to Churn Category.

NOTE: It is worth mentioning that IBM seems to have added two additional columns based on the predictive modelling performed by one of their tools. These two columns are: "Churn Score" and "CLTV". Because our aim is also to perform predictive analytics, hence, we will need to drop these two columns before doing any more work on this dataset. Similarly, the "Count" column, as explained above, seems to be useful only for use with IBM's internal tools. Thus, we will ignore it too.

The value name and its count for every column name (except CustomerID, Latitude, Longitude, Zip Code, Tenure Months, Monthly Charges, Total Charges) are given below:

Column Name: **Country**
United States 7043

Column Name: **State**
California 7043

Column Name: **City**

Los Angeles	305
San Diego	150
San Jose	112
Sacramento	108
San Francisco	104
Fresno	64
Long Beach	60
Oakland	52
Stockton	44
Bakersfield	40
Glendale	40
Riverside	32
Berkeley	32
Whittier	30
Pasadena	30
Santa Barbara	28
Anaheim	28
San Bernardino	28
Modesto	28
Irvine	28
Santa Monica	25
Torrance	25
Burbank	25
Chula Vista	25
Inglewood	25
Santa Ana	24
Santa Rosa	24
Rancho Cucamonga	20
Escondido	20
Salinas	20
Van Nuys	20
Garden Grove	20
North Hollywood	20
Orange	20
Corona	20
Huntington Beach	16
Palmdale	16
Newport Beach	16
Moreno Valley	16
Santa Cruz	16
Palo Alto	16

San Mateo	16
Concord	16
Fremont	16
Hayward	16
Vallejo	16
Fullerton	16
Redwood City	16
Beverly Hills	15
Gardena	15
Downey	15
Oceanside	15
Compton	15
El Cajon	15
Lakewood	15
Ontario	15
Covina	15
West Covina	15
Pomona	15
Los Gatos	12
Novato	12
Roseville	12
Chico	12
Hemet	12
Oxnard	12
Ventura	12
Santa Clara	12
Santa Maria	12
Richmond	12
Visalia	12
Redding	12
Temecula	12
Walnut Creek	12
San Leandro	12
Lancaster	12
Fontana	12
Sun City	12
Sunnyvale	12
Mountain View	12
San Gabriel	10
Carlsbad	10
Vista	10
San Marcos	10
Twentynine Palms	10
Redondo Beach	10
Monterey Park	10
Sherman Oaks	10
Northridge	10
Buena Park	10
Malibu	10

Culver City	10
Canoga Park	10
Woodland Hills	10
El Monte	10
La Puente	10
Carson	10
Alhambra	10
Encino	10
Palm Desert	10
Palm Springs	10
La Mesa	10
Glendora	10
Valencia	10
Spring Valley	10
Arcadia	10
Rancho Santa Fe	10
Desert Hot Springs	10
Apple Valley	10
Thousand Oaks	10
Indio	10
Upland	10
San Pedro	10
Auburn	8
Pleasanton	8
Rocklin	8
Lake Elsinore	8
San Rafael	8
Costa Mesa	8
Tustin	8
Frazier Park	8
Napa	8
Castro Valley	8
Mission Viejo	8
Simi Valley	8
Daly City	8
Los Altos	8
San Clemente	8
Davis	8
Lodi	8
Manteca	8
Camarillo	8
Madera	8
Danville	8
Merced	8
Eureka	8
West Sacramento	8
Citrus Heights	8
Woodland	8
Yuba City	8

Oroville	8
Grass Valley	8
Rancho Cordova	8
Alameda	8
Elk Grove	8
Clovis	8
Petaluma	8
Turlock	8
San Jacinto	8
Vacaville	8
Rialto	8
Murrieta	8
Lompoc	8
Brea	8
San Luis Obispo	8
Redlands	8
Yorba Linda	8
Perris	8
Victorville	8
Reseda	5
Granada Hills	5
Cabazon	5
Sylmar	5
Westlake Village	5
Pacoima	5
Porter Ranch	5
Beaumont	5
Newhall	5
Agoura Hills	5
Sunland	5
Canyon Country	5
Claremont	5
Calipatria	5
Chino	5
El Centro	5
Walnut	5
Altadena	5
Dulzura	5
Jamul	5
Bonsall	5
Cardiff By The Sea	5
Encinitas	5
South Pasadena	5
Bellflower	5
Seal Beach	5
Lomita	5
Sunset Beach	5
Santa Fe Springs	5
Montebello	5

Lawndale	5
Harbor City	5
Morongo Valley	5
Monrovia	5
West Hollywood	5
Borrego Springs	5
Hawaiian Gardens	5
Paramount	5
La Canada Flintridge	5
Winnetka	5
Mount Laguna	5
San Fernando	5
North Hills	5
Hawthorne	5
Hermosa Beach	5
South El Monte	5
Pacific Palisades	5
Montclair	5
Poway	5
La Palma	5
Stanton	5
Ramona	5
La Jolla	5
Coronado	5
Bell	5
Santee	5
Jacumba	5
Studio City	5
Baldwin Park	5
Boulevard	5
Los Alamitos	5
Chino Hills	5
La Verne	5
Mt Baldy	5
Diamond Bar	5
Temple City	5
Descanso	5
Lemon Grove	5
National City	5
Pine Valley	5
Potrero	5
Tecate	5
Santa Ysabel	5
Warner Springs	5
Cathedral City	5
Earp	5
Mecca	5
Guatay	5
Yucca Valley	5

Salton City	5
Pioneertown	5
Oak Park	5
Bonita	5
Newbury Park	5
Palos Verdes	5
Manhattan Beach	5
Tarzana	5
Banning	5
Desert Center	5
Heber	5
La Quinta	5
Rancho Mirage	5
Westmorland	5
Amboy	5
Angelus Oaks	5
Maywood	5
Rancho Palos Verdes	5
West Hills	5
South Gate	5
Playa Del Rey	5
Cypress	5
La Mirada	5
Norwalk	5
Artesia	5
Surfside	5
Wilmington	5
La Crescenta	5
Calabasas	5
Alpine	5
Chatsworth	5
Palo Verde	5
Castaic	5
Coachella	5
Joshua Tree	5
Marina Del Rey	5
Parker Dam	5
Vidal	5
Winterhaven	5
Landers	5
Valley Center	5
San Dimas	5
Santa Clarita	5
Mission Hills	5
Indian Wells	5
Holtville	5
Niland	5
Tujunga	5
La Habra	5

Avalon	5
North Palm Springs	5
Sierra Madre	5
Ocotillo	5
Seeley	5
Thermal	5
Del Mar	5
White Water	5
Imperial	5
Blythe	5
Adelanto	5
Sun Valley	5
Pala	5
Lynwood	5
El Segundo	5
Rowland Heights	5
Topanga	5
Venice	5
Cerritos	5
Duarte	5
Rosemead	5
Montrose	5
Panorama City	5
San Marino	5
Palomar Mountain	5
Azusa	5
Huntington Park	5
Hacienda Heights	5
Pauma Valley	5
Imperial Beach	5
Julian	5
Lakeside	5
Solana Beach	5
Ranchita	5
Stevenson Ranch	5
Thousand Palms	5
Pico Rivera	5
Fallbrook	5
Mira Loma	5
Calexico	5
Valley Village	5
Brawley	5
San Ysidro	5
Campo	5
Woodacre	4
Aptos	4
Woodbridge	4
Olema	4
Rohnert Park	4

Clio	4
Ben Lomond	4
Campbell	4
Felton	4
Hollister	4
Watsonville	4
Litchfield	4
Denair	4
Oakley	4
Coleville	4
Jamestown	4
Livingston	4
Tuolumne	4
Annapolis	4
Hopland	4
Lakeport	4
Laytonville	4
Lucerne	4
Navarro	4
Barstow	4
Groveland	4
Tulelake	4
Shoshone	4
Standish	4
Walnut Grove	4
Emigrant Gap	4
Browns Valley	4
Crescent Mills	4
Markleeville	4
Elk Creek	4
Hamilton City	4
Live Oak	4
Maxwell	4
Meadow Valley	4
Olivehurst	4
Williams	4
Bella Vista	4
Castella	4
Happy Camp	4
Hat Creek	4
Paynes Creek	4
Shingletown	4
Trinity Center	4
Susanville	4
Termo	4
Carnelian Bay	4
Kings Beach	4
Madeline	4
Calpine	4

Highland	4
Yermo	4
Canby	4
Yucaipa	4
Riverdale	4
Brownsville	4
Forbestown	4
Gridley	4
Herlong	4
Carmel By The Sea	4
Chualar	4
Greenfield	4
Portola Valley	4
Orland	4
Angwin	4
Clayton	4
Loyalton	4
Taylorsville	4
Janesville	4
Wendel	4
Platina	4
Mill Creek	4
Mcarthur	4
Los Molinos	4
Hornbrook	4
Greenview	4
Flournoy	4
Etna	4
Dunsmuir	4
Shasta Lake	4
Cassel	4
Kyburz	4
Badger	4
Olancho	4
Lebec	4
Aguanga	4
Yorkville	4
Capistrano Beach	4
Burnt Ranch	4
Laguna Beach	4
Garberville	4
Petrolia	4
Redway	4
California Hot Springs	4
Corcoran	4
Farmersville	4
Ivanhoe	4
New Cuyama	4
Wilton	4

Richgrove	4
Stratford	4
Cool	4
Tulare	4
Solvang	4
Big Pine	4
Caliente	4
Kirkwood	4
Rescue	4
Lone Pine	4
Milford	4
Sutter Creek	4
Graton	4
Alleghany	4
Fort Irwin	4
Sonora	4
Cressey	4
El Nido	4
El Portal	4
Escalon	4
Hilmar	4
Hornitos	4
Chester	4
Keyes	4
Le Grand	4
Big Bar	4
Midpines	4
Ripon	4
Tracy	4
Kenwood	4
Twain Harte	4
Albion	4
Boonville	4
Cazadero	4
Dos Rios	4
Duncans Mills	4
Forestville	4
Washington	4
Fort Bragg	4
Geyserville	4
Glenhaven	4
Stonyford	4
Coulterville	4
Ceres	4
Wilseyville	4
San Andreas	4
Newark	4
French Gulch	4
Suisun City	4

Yountville	4	
Belvedere Tiburon		4
Bodega	4	
Dillon Beach		4
Fairfax	4	
Lagunitas	4	
Penngrove	4	
Forks Of Salmon		4
San Geronimo		4
San Quentin	4	
Brookdale	4	
Castroville	4	
Mount Hermon		4
Paicines	4	
Scotts Valley	4	
Saratoga	4	
Soquel	4	
Mount Hamilton		4
Burson	4	
Copperopolis		4
Farmington		4
Mokelumne Hill		4
Kelseyville	4	
Little River	4	
Gazelle	4	
Ione	4	
Meridian	4	
Greenville	4	
Penn Valley	4	
Capay	4	
Courtland	4	
Esparto	4	
Goodyears Bar		4
Glenn	4	
Fiddletown	4	
Durham	4	
Foresthill	4	
Georgetown		4
Lincoln	4	
Lower Lake		4
North Highlands		4
Placerville	4	
River Pines	4	
Biggs	4	
Shingle Springs		4
Somerset	4	
Volcano	4	
Alta	4	
Gold Run		4

Berry Creek	4
Twin Bridges	4
El Dorado Hills	4
Leggett	4
Willow Creek	4
Weott	4
North San Juan	4
Manchester	4
Middletown	4
Monte Rio	4
Occidental	4
Potter Valley	4
Sebastopol	4
Upper Lake	4
Willits	4
Windsor	4
Blocksburg	4
Arcata	4
Carlotta	4
Fortuna	4
Kneeland	4
Stirling City	4
Mad River	4
Orick	4
Orleans	4
Smartville	4
Richvale	4
Phillipsville	4
Paradise	4
Scotia	4
Redcrest	4
Oregon House	4
Hercules	4
El Cerrito	4
Grand Terrace	4
Tehama	4
Lake Isabella	4
Lamont	4
Laton	4
Lost Hills	4
Mc Farland	4
Cedarville	4
Pixley	4
Springville	4
Three Rivers	4
Tupman	4
Yreka	4
Weed	4
Scott Bar	4

Creston	4	
Pioneer	4	
Mount Shasta	4	
Montgomery Creek		4
Millville	4	
Manton	4	
Macdoel	4	
Weldon	4	
Woodlake	4	
Arroyo Grande	4	
Atascadero	4	
Avila Beach	4	
Cambria	4	
Kettleman City	4	
Hanford	4	
Glennville	4	
Arvin	4	
Big Bear Lake	4	
Death Valley	4	
Essex	4	
Chilcoot	4	
Forest Falls	4	
Helendale	4	
Hesperia	4	
Lake Arrowhead		4
Loma Linda	4	
Needles	4	
Nipton	4	
Pinon Hills	4	
Mountain Center	4	
Menifee	4	
Wildomar	4	
Winchester	4	
Laguna Hills	4	
Aliso Viejo	4	
San Juan Capistrano		4
Laguna Niguel	4	
Westminster	4	
Fountain Valley	4	
Marysville	4	
Fillmore	4	
Goleta	4	
Cayucos	4	
Grover Beach	4	
Brentwood	4	
Soledad	4	
Hyampom	4	
Los Banos	4	
O Neals	4	

Orange Cove	4	
Raisin City	4	
Raymond	4	
Reedley	4	
Sultana	4	
Wishon	4	
Grenada	4	
Gonzales	4	
Monterey	4	
Spreckels	4	
Los Olivos	4	
La Honda	4	
Menlo Park	4	
Montara	4	
Moss Beach	4	
Pacifica	4	
San Carlos	4	
San Gregorio	4	
Stanford	4	
Gerber	4	
Alamo	4	
Benicia	4	
Bethel Island	4	
Lakeshore	4	
Fish Camp	4	
Junction City	4	
Firebaugh	4	
Paso Robles	4	
San Ardo	4	
San Miguel	4	
San Simeon	4	
Santa Margarita	4	
Mccloud	4	
Santa Ynez	4	
Shandon	4	
California City	4	
Acton	4	
Bishop	4	
Bridgeport	4	
Darwin	4	
June Lake	4	
Keeler	4	
Littlerock	4	
Llano	4	
Mammoth Lakes		4
Auberry	4	
Caruthers	4	
Chowchilla	4	
Coarsegold	4	

Lookout	4	
Del Rey	4	
Dos Palos	4	
Villa Park	4	
Calimesa	4	
Loomis	4	
Folsom	4	
Rio Dell	4	
Salyer	4	
Smith River	4	
Somes Bar	4	
Trinidad	4	
Whitethorn	4	
Amador City	4	
Carmichael	4	
Diamond Springs		4
Dixon	4	
Elmira	4	
Greenwood		4
Loleta	4	
Jackson	4	
Knights Landing		4
Madison	4	
Orangevale	4	
Penryn	4	
Pleasant Grove		4
Plymouth	4	
Rio Linda	4	
Sheridan	4	
Sloughhouse		4
Wheatland	4	
Miranda	4	
Korbel	4	
Colfax	4	
Fulton	4	
Riverbank		4
Salida	4	
Snelling	4	
Westley	4	
Yosemite National Park		4
Branscomb		4
Caspar	4	
Clearlake	4	
Cloverdale	4	
Comptche	4	
Eldridge	4	
Gualala	4	
Honeydew		4
Nice	4	

Rio Nido	4
Ukiah	4
Witter Springs	4
Alderpoint	4
Mckinleyville	4
Bayside	4
Blue Lake	4
Bridgeville	4
Crescent City	4
Ferndale	4
Winters	4
Meadow Vista	4
Mi Wuk Village	4
Topaz	4
Round Mountain	4
Seiad Valley	4
Shasta	4
Vina	4
Alturas	4
Davis Creek	4
Fort Bidwell	4
Lake City	4
Likely	4
Portola	4
Ravendale	4
Homewood	4
Nubieber	4
Tahoma	4
Tahoe City	4
South Lake Tahoe	4
Truckee	4
Baker	4
Cedar Glen	4
Colton	4
Fawnskin	4
Mentone	4
Sugarloaf	4
Anza	4
Palo Cedro	4
Lewiston	4
Soda Springs	4
Strawberry Valley	4
Antelope	4
Arbuckle	4
Bangor	4
Canyon Dam	4
Challenge	4
Dobbins	4
Dunnigan	4

Forest Ranch	4
Magalia	4
Nevada City	4
Princeton	4
Twain	4
Lakehead	4
Anderson	4
Big Bend	4
Callahan	4
Corning	4
Cottonwood	4
Douglas City	4
Fall River Mills	4
Fort Jones	4
Hayfork	4
Igo	4
Klamath River	4
Oakdale	4
Mariposa	4
Hood	4
Mojave	4
Lemon Cove	4
Lindsay	4
Maricopa	4
Onyx	4
Posey	4
Shafter	4
Tipton	4
Wofford Heights	4
Los Alamos	4
Oceano	4
Pismo Beach	4
Johannesburg	4
Huron	4
Keene	4
Pearblossom	4
Randsburg	4
Ridgecrest	4
Trona	4
Bass Lake	4
Biola	4
Five Points	4
Friant	4
Kerman	4
Mendota	4
Kernville	4
Fellows	4
Orosi	4
Idyllwild	4

Crestline	4	
Daggett	4	
Ludlow	4	
Lucerne Valley	4	
Lytle Creek	4	
Phelan	4	
Running Springs	4	
Tecopa	4	
Wrightwood	4	
March Air Reserve Base	4	
Homeland	4	
Lake Forest	4	
Exeter	4	
Norco	4	
Port Hueneme	4	
Summerland	4	
Alpaugh	4	
Armona	4	
Avenal	4	
Bodfish	4	
Camp Nelson	4	
Coalinga	4	
Delano	4	
Earlimart	4	
Miramonte	4	
San Joaquin	4	
Long Barn	4	
Freedom	4	
Forest Knolls	4	
Larkspur	4	
Marshall	4	
Nicasio	4	
San Anselmo	4	
Sausalito	4	
Tomales	4	
Valley Ford	4	
Alviso	4	
Boulder Creek	4	
Davenport	4	
Gilroy	4	
Bodega Bay	4	
San Martin	4	
Acampo	4	
Glencoe	4	
Linden	4	
Valley Springs	4	
West Point	4	
Atwater	4	
Big Oak Flat	4	

Columbia	4	
Delhi	4	
Hickman	4	
Cotati	4	
Greenbrae	4	
Selma	4	
Loma Mar	4	
South Dos Palos	4	
Tollhouse	4	
Squaw Valley	4	
Big Sur	4	
Carmel	4	
Jolon	4	
King City	4	
Lockwood	4	
Marina	4	
Pebble Beach	4	
Belmont	4	
Pescadero	4	
Albany	4	
San Bruno	4	
South San Francisco	4	
Antioch	4	
Birds Landing	4	
Byron	4	
Livermore	4	
Martinez	4	
Pinole	4	
San Lorenzo	4	
San Ramon	4	
Union City	4	
Nuevo	4	
Foothill Ranch	4	
Corona Del Mar	4	
Ojai	4	
Big Bear City	4	
Bloomington	4	
Green Valley Lake	4	
Hinkley	4	
Newberry Springs	4	
Oro Grande	4	
Silverado	4	
Rancho Santa Margarita	4	
Ladera Ranch	4	
Placentia	4	
Carpinteria	4	
Somis	4	
Westwood	4	
Ducor	4	

Lemoore	4	
Porterville	4	
Sequoia National Park		4
Strathmore	4	
Wasco	4	
Woody	4	
Casmalia	4	
Guadalupe	4	
Boron	4	
Edwards	4	
Tahoe Vista	4	
Sierraville	4	
Valyermo	4	
Burney	4	
Clipper Mills	4	
Colusa	4	
Downieville	4	
Grimes	4	
Palermo	4	
Quincy	4	
Rough And Ready		4
Sutter	4	
Willows	4	
Adin	4	
Bieber	4	
Dorris	4	
Sierra City	4	
Mineral	4	
Montague	4	
Oak Run	4	
Old Station	4	
Paskenta	4	
Red Bluff	4	
Weaverville	4	
Whitmore	4	
Blairsden Graeagle		4
Doyle	4	
Eagleville	4	
Lake Hughes		4
Ahwahnee	4	
Dana Point	4	
Elk	4	
Wallace	4	
Crows Landing		4
Gustine	4	
Hughson	4	
La Grange	4	
Lathrop	4	
Pinecrest	4	

Stevinson	4
Vernalis	4
Winton	4
Cobb	4
Glen Ellen	4
Lockeford	4
Mendocino	4
Redwood Valley	4
Sonoma	4
Fields Landing	4
Hoopa	4
Myers Flat	4
Samoa	4
Zenia	4
Clarksburg	4
Fair Oaks	4
Galt	4
Murphys	4
French Camp	4
Big Creek	4
Pittsburg	4
Helm	4
Kingsburg	4
Parlier	4
Sanger	4
Shaver Lake	4
Pacific Grove	4
Seaside	4
Half Moon Bay	4
Millbrae	4
Calistoga	4
Lafayette	4
Port Costa	4
Clements	4
Rio Vista	4
San Pablo	4
Bolinas	4
Corte Madera	4
Point Reyes Station	4
Capitola	4
Cupertino	4
Milpitas	4
Morgan Hill	4
Arnold	4
Campo Seco	4
Camptonville	4
Butte City	4
Beale Afb	4
Pleasant Hill	4

Hume	4
North Fork	4
Oakhurst	4
Prather	4
Tranquillity	4
Traver	4
Carmel Valley	4
San Lucas	4
Brisbane	4
Burlingame	4
Atherton	4
Crockett	4
Dunlap	4
Fairfield	4
Travis Afb	4
Moraga	4
Orinda	4
Pope Valley	4
Dublin	4
Rodeo	4
Saint Helena	4
Deer Park	4
Sunol	4
Emeryville	4
Fowler	4
Dinuba	4
Granite Bay	4
Los Osos	4
Midway City	4
Newport Coast	4
Trabuco Canyon	4
Moorpark	4
Oak View	4
Piru	4
Santa Paula	4
Buttonwillow	4
Mc Kittrick	4
Taft	4
Terra Bella	4
Bradley	4
Cutler	4
Buellton	4
Morro Bay	4
Nipomo	4
Templeton	4
Benton	4
Independence	4
Inyokern	4
Lee Vining	4

Rosamond	4
Tehachapi	4
Cantua Creek	4
El Sobrante	4
Inverness	4
Mill Valley	4
Mather	4
Klamath	4
Piercy	4
Brooks	4
El Dorado	4
Elverta	4
Garden Valley	4
Grizzly Flats	4
Guinda	4
Herald	4
Isleton	4
Lotus	4
Newcastle	4
Stinson Beach	4
Nicolaus	4
Pilot Hill	4
Pine Grove	4
Rio Oso	4
Thornton	4
Applegate	4
Camino	4
Dutch Flat	4
Echo Lake	4
Pollock Pines	4
Weimar	4
Hydesville	4
Gasquet	4
The Sea Ranch	4
Westport	4
Aromas	4
Moss Landing	4
San Juan Bautista	4
Angels Camp	4
Avery	4
Hathaway Pines	4
Mountain Ranch	4
Sheep Ranch	4
Vallecito	4
Ballico	4
Catheys Valley	4
Newman	4
Patterson	4
Planada	4

Soulsbyville	4
Waterford	4
Clearlake Oaks	4
Covelo	4
Guerneville	4
Healdsburg	4
Jenner	4
Philo	4
Point Arena	4
Olympic Valley	4

Column Name: **Gender**

Male	3555
Female	3488

Column Name: **Senior Citizen**

No	5901
Yes	1142

Column Name: **Partner**

No	3641
Yes	3402

Column Name: **Dependents**

No	5416
Yes	1627

Column Name: **Phone Service**

Yes	6361
No	682

Column Name: **Multiple Lines**

No	3390
Yes	2971
No phone service	682

Column Name: **Internet Service**

Fiber optic	3096
DSL	2421
No	1526

Column Name: **Online Security**

No	3498
Yes	2019
No internet service	1526

Column Name: **Online Backup**

No	3088
Yes	2429
No internet service	1526

Column Name: **Device Protection**

No	3095
Yes	2422
No internet service	1526

Column Name: **Tech Support**

No	3473
Yes	2044
No internet service	1526

Column Name: **Streaming TV**

No	2810
Yes	2707
No internet service	1526

Column Name: **Streaming Movies**

No	2785
Yes	2732
No internet service	1526

Column Name: **Contract**

Month-to-month	3875
Two year	1695
One year	1473

Column Name: **Paperless Billing**

Yes	4171
No	2872

Column Name: **Payment Method**

Electronic check	2365
Mailed check	1612
Bank transfer (automatic)	1544
Credit card (automatic)	1522

Column Name: **Churn Label**

No	5174
Yes	1869

Column Name: **Churn Reason**

Attitude of support person	192
Competitor offered higher download speeds	189
Competitor offered more data	162
Don't know	154
Competitor made better offer	140
Attitude of service provider	135
Competitor had better devices	130
Network reliability	103
Product dissatisfaction	102
Price too high	98
Service dissatisfaction	89
Lack of self-service on Website	88
Extra data charges	57
Moved	53
Limited range of services	44

Long distance charges	44
Lack of affordable download/upload speed	44
Poor expertise of phone support	20
Poor expertise of online support	19
Deceased	6

For the numerical data columns (Tenure Months, Monthly Charges, Total Charges), the minimum, maximum, mean, and median of each of these columns, respectively, are:

feature_name	feature_min	feature_max	feature_mean	feature_median
Tenure Months	0	72	32.37114865824223	29.0

feature_name	feature_min	feature_max	feature_mean	feature_median
Monthly Charges	18.25	118.75	64.76169246059918	70.35

feature_name	feature_min	feature_max	feature_mean	feature_median
Total Charges	18.8	8684.8	2283.3004408418656	1397.475

Three examples from the dataset (the first three rows) are (‘\’ denotes that row is continued on the next line):

Row	CustomerID	Count	Country	State	City	Zip Code \
0	3668-QPYBK	1	United States	California	Los Angeles	90003
1	9237-HQITU	1	United States	California	Los Angeles	90005
2	9305-CDSKC	1	United States	California	Los Angeles	90006

Row	Lat Long	Latitude	Longitude	Gender	Senior Citizen \
0	33.964131, -118.272783	33.964131	-118.272783	Male	No
1	34.059281, -118.30742	34.059281	-118.307420	Female	No
2	34.048013, -118.293953	34.048013	-118.293953	Female	No

Row	Partner	Dependents	Tenure Months	Phone Service	Multiple Lines \
0	No	No	2	Yes	No
1	No	Yes	2	Yes	No
2	No	Yes	8	Yes	Yes

Row	Internet Service	Online Security	Online Backup	Device Protection \
0	DSL	Yes	Yes	No
1	Fiber optic	No	No	No
2	Fiber optic	No	No	Yes

Row	Tech Support	Streaming TV	Streaming Movies	Contract \
0	No	No	No	Month-to-month
1	No	No	No	Month-to-month
2	No	Yes	Yes	Month-to-month

Row	Paperless Billing	Payment Method	Monthly Charges	Total Charges \
0	Yes	Mailed check	53.85	108.15
1	Yes	Electronic check	70.70	151.65
2	Yes	Electronic check	99.65	820.50

Row	Churn Label	Churn Value	Churn Score	CLTV	Churn Reason
0	Yes	1	86	3239	Competitor made better offer
1	Yes	1	67	2701	Moved
2	Yes	1	86	5372	Moved

The classifier I'd very likely use is: *Support Vector Machine*
 I might also try the Random Forest classifier, but I am not sure about it right now.