Stroke Binary Classification Problem Project

**Context:**

- There is a big competition between Internet providers. If a providers want to increase its  
 revenue they needs more subscriber but keep existing customer is more important than  
 having new ones. So, providers want to know which customer should cancel his service. If  
 the provider cancel the service, that is called churn.

- All industries suffer from voluntary churn -- the loss of customers to some other company.  
 The survival of any business is based on its ability to retain customers. This is particularly  
 true for phone, cable TV, satellite TV and wireless companies. How do you reduce churn?  
 There are many ways: better products, better delivery methods, lower prices, building  
 satisfactory customer relationships, better marketing and, above all, successful customer  
 communications.

- Wireless companies today measure voluntary churn by a monthly figure, such as 1.9  
 percent or 2.1 percent. This is the average number of customers who quit their service per  
 month. Annual churn rates for telecommunications companies average between 10 percent  
 and 67 percent.

- Industry retention surveys have shown that while price and product are important, most  
 people leave any service because of dissatisfaction with the way they are treated. They  
 would not be looking around if they were happy with their current provider, its service and  
 employees.

- Churn reduction in the telecom industry is a serious problem, but there are many things that  
 can be done to reduce it, and, with a customer database, many ways of measuring your  
 success.

### Attribute Information:

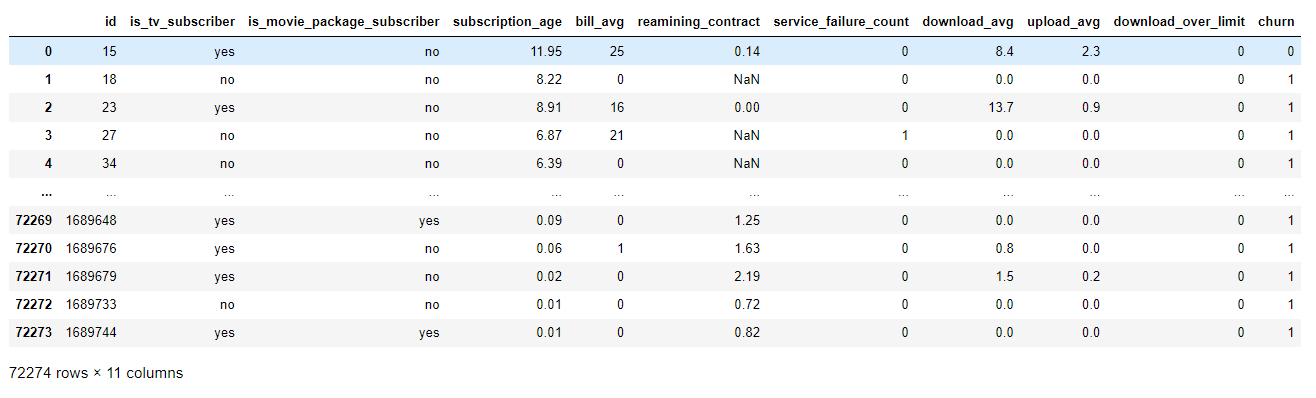
1) id: unique identifier  
2) is\_tv\_subscriber: customer has a tv subscription ?  
3)   is\_movie\_package\_subscriber?  
4) subscription\_age : how many year has the customer use our service5) bill\_avg : last 3 months bill avg  
6) reamining\_contract : how many year remaining for customer contract. If null; customer didn't have a  
 contract. The customer who has a contract time have to use their service until contract end.if they  
 canceled their service before contract time end they pay a penalty fare.  
 Two ways in which a customer could be using the services. One through a time-bound contract  
 which costs less and another through a normal monthly subscription which obviously costs more. So,   
 even if a person is not in a contract, he's still a user who's paying monthly fees.7) service\_failure\_count customer : call count to call center for service failure for last 3 months  
8) download\_avg : last 3 months internet usage (GB)  
9) upload\_avg last : 3 months upload avg (GB)  
10) download\_over\_limit : most of customer has a download limit. if they reach this limit they have to pay for  
 this. this column contain "limit over count" for last 9 months  
11) churn : this is the target column. if 1 customer canceled his service

### Data Information:

**Data Information (Cont.):**

* data with (72274) observations & (11) features (columns).
* Data with (4) float columns & (5) int & (2) object.
* (remaining\_contract) feature has (21572) missing record
* (download\_avg & upload\_avg) features have (381) missing record

**Data overview:**

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