

## **DS\_Mod1\_Operators**

## R Markdown

Here, we are going to have a look at different types of operators in R.

1.Assignment Operators: "->": This is an assignment operator, which will help us store a file into an object. Here we are storing the "customer\_churn" dataset into an object called "churn".

```
read.csv("C:/Users/INTELLIPAAT/Desktop/customer churn.csv")->churn
```

"<-": This is another assignment operator. Again we are storing the "customer\_churn" dataset into an object called "churn1"

```
churn1 <-read.csv("C:/Users/INTELLIPAAT/Desktop/customer_churn.csv")</pre>
```

"=": This is also an assignment operator. Here we are storing the "customer\_churn" dataset into an object called "churn2"

```
churn2 =read.csv("C:/Users/INTELLIPAAT/Desktop/customer_churn.csv")
```

2. Arithmetic Operators: Now we are going to use the arithmetic operators on "customer\_churn" dataset. Let's say we want to update the value of MonthlyCharges.

Let's say, We want to subtract 1 from the cell[1] of the MonthlyCharges column and store it in the same cell using the minus operator ("-").

```
churn1$MonthlyCharges[1]-1 ->churn1$MothlyCharges[1]
head(churn1)
     customerID gender SeniorCitizen Partner Dependents tenure PhoneService
## 1 7590-VHVEG Female
                                    0
                                          Yes
                                                       No
                                                               1
                                                                            No
## 2 5575-GNVDE
                  Male
                                    0
                                           No
                                                       No
                                                              34
                                                                           Yes
## 3 3668-QPYBK
                  Male
                                    0
                                           No
                                                               2
                                                                           Yes
                                                       No
## 4 7795-CFOCW
                                    0
                                                              45
                  Male
                                           No
                                                       No
                                                                            No
## 5 9237-HQITU Female
                                    0
                                           No
                                                       No
                                                               2
                                                                           Yes
## 6 9305-CDSKC Female
                                    0
                                           No
                                                       No
                                                                           Yes
        MultipleLines InternetService OnlineSecurity OnlineBackup
## 1 No phone service
                                   DSL
                                                    No
                                                                Yes
                                   DSL
                                                   Yes
```



```
## 3
                                     DSL
                    No
                                                     Yes
                                                                   Yes
## 4 No phone service
                                     DSL
                                                     Yes
                                                                    No
## 5
                    No
                            Fiber optic
                                                      No
                                                                    No
## 6
                   Yes
                            Fiber optic
                                                      No
                                                                    No
     DeviceProtection TechSupport StreamingTV StreamingMovies
##
                                                                          Contract
## 1
                    No
                                 No
                                               No
                                                                No Month-to-month
## 2
                   Yes
                                 No
                                               No
                                                                No
                                                                          One year
## 3
                    No
                                 No
                                               No
                                                                No Month-to-month
## 4
                   Yes
                                Yes
                                              No
                                                                          One year
## 5
                                 No
                                              No
                                                                No Month-to-month
                    No
## 6
                   Yes
                                 No
                                             Yes
                                                               Yes Month-to-month
                                     PaymentMethod MonthlyCharges TotalCharges
##
     PaperlessBilling
## 1
                   Yes
                                 Electronic check
                                                              29.85
                                                                            29.85
## 2
                    No
                                      Mailed check
                                                              56.95
                                                                          1889.50
## 3
                   Yes
                                      Mailed check
                                                              53.85
                                                                           108.15
## 4
                    No Bank transfer (automatic)
                                                              42.30
                                                                          1840.75
## 5
                   Yes
                                 Electronic check
                                                              70.70
                                                                           151.65
                                 Electronic check
## 6
                                                              99.65
                                                                           820.50
                   Yes
##
     Churn MothlyCharges
## 1
        No
                    28.85
## 2
        No
                    28.85
       Yes
                    28.85
## 3
## 4
                    28.85
        No
## 5
       Yes
                    28.85
## 6
       Yes
                    28.85
```

Again with the help of plus operator ("+") we are going to add 1 to the cell[2] of TotalCharges column. Again store the updated value in the same cell.

```
churn1$TotalCharges[2]+1 ->churn1$TotalCharges[2]
head(churn1)
     customerID gender SeniorCitizen Partner Dependents tenure PhoneService
##
## 1 7590-VHVEG Female
                                     0
                                            Yes
                                                         No
                                                                  1
                                                                              No
## 2 5575-GNVDE
                   Male
                                     0
                                             No
                                                         No
                                                                34
                                                                             Yes
                                     0
                                                                  2
## 3 3668-OPYBK
                   Male
                                             No
                                                         No
                                                                             Yes
                                     0
                                                                45
## 4 7795-CFOCW
                   Male
                                             No
                                                         No
                                                                              No
## 5 9237-HQITU Female
                                     0
                                                                  2
                                             No
                                                         No
                                                                             Yes
## 6 9305-CDSKC Female
                                     0
                                             No
                                                                  8
                                                                             Yes
                                                         No
##
        MultipleLines InternetService OnlineSecurity OnlineBackup
## 1 No phone service
                                    DSL
                                                     No
                                                                  Yes
                                    DSL
## 2
                                                    Yes
                                                                    No
## 3
                    No
                                    DSL
                                                     Yes
                                                                   Yes
## 4 No phone service
                                    DSL
                                                     Yes
                                                                    No
                            Fiber optic
## 5
                    No
                                                      No
                                                                    No
## 6
                            Fiber optic
                   Yes
                                                      No
                                                                    No
##
     DeviceProtection TechSupport StreamingTV StreamingMovies
                                                                         Contract
## 1
                    No
                                 No
                                              No
                                                               No Month-to-month
## 2
                   Yes
                                 No
                                              No
                                                               No
                                                                         One year
```



##	3		No		No		No	No	Month-to-month
##	4		Yes		Yes		No	No	One year
##	5		No		No		No	No	Month-to-month
##	6		Yes		No		Yes	Yes	Month-to-month
##		Paper]	lessBilling		Pa	yment!	1ethod	MonthlyCharges	TotalCharges
##	1		Yes		Elect	ronic	check	29.85	29.85
##	2		No		M	lailed	check	56.95	1890.50
##	3		Yes		M	lailed	check	53.85	108.15
##	4		No	Bank	transfer	(autor	natic)	42.30	1840.75
##	5		Yes		Elect	ronic	check	70.70	151.65
##	6		Yes		Elect	ronic	check	99.65	820.50
##		Churn	MothlyCharg	ges					
##	1	No	28.	.85					
##	2	No	28.	.85					
##	3	Yes	28.	.85					
##	4	No	28.	.85					
##	5	Yes	28.	.85					
##	6	Yes	28.	.85					

If we want to give a discount of 10% to the cell[9] of Total Charges i.e. we will be multiplying the value of cell[9] with 0.9. Again store it in the same cell.

```
churn1$TotalCharges[9]*0.9 ->churn1$TotalCharges[9]
head(churn1)
##
     customerID gender SeniorCitizen Partner Dependents tenure PhoneService
## 1 7590-VHVEG Female
                                                                 1
                                                                              No
## 2 5575-GNVDE
                                     0
                                                                34
                   Male
                                             No
                                                         No
                                                                             Yes
## 3 3668-QPYBK
                                     0
                   Male
                                             No
                                                         No
                                                                 2
                                                                             Yes
## 4 7795-CFOCW
                   Male
                                     0
                                                                45
                                             No
                                                         No
                                                                              No
## 5 9237-HQITU Female
                                     0
                                                         No
                                                                 2
                                             No
                                                                             Yes
## 6 9305-CDSKC Female
                                     0
                                             No
                                                         No
                                                                 8
                                                                             Yes
        MultipleLines InternetService OnlineSecurity OnlineBackup
##
## 1 No phone service
                                    DSL
                                                     No
                                                                  Yes
## 2
                                    DSL
                                                    Yes
                                                                   No
## 3
                                    DSL
                                                    Yes
                                                                  Yes
## 4 No phone service
                                    DSL
                                                    Yes
                                                                   No
## 5
                           Fiber optic
                                                     No
                                                                   No
                    No
## 6
                   Yes
                           Fiber optic
                                                     No
                                                                   No
     DeviceProtection TechSupport StreamingTV StreamingMovies
##
                                                                         Contract
## 1
                    No
                                 No
                                              No
                                                               No Month-to-month
                                 No
## 2
                   Yes
                                              No
                                                               No
                                                                         One year
## 3
                    No
                                 No
                                              No
                                                               No Month-to-month
## 4
                   Yes
                                Yes
                                              No
                                                                         One year
                                                               No
## 5
                    No
                                 No
                                              No
                                                               No Month-to-month
## 6
                                                              Yes Month-to-month
                   Yes
                                 No
                                             Yes
##
     PaperlessBilling
                                    PaymentMethod MonthlyCharges TotalCharges
## 1
                   Yes
                                 Electronic check
                                                             29.85
                                                                           29.85
## 2
                    No
                                     Mailed check
                                                             56.95
                                                                         1890.50
```

## 3

Yes

26.925



##	3		Yes	Mailed check	53.85	108.15
##	4		No Bank	transfer (automatic)	42.30	1840.75
##	5		Yes	Electronic check	70.70	151.65
##	6		Yes	Electronic check	99.65	820.50
##		Churn	MothlyCharges			
##	1	No	28.85			
##	2	No	28.85			
##	3	Yes	28.85			
##	4	No	28.85			
##	5	Yes	28.85			
##	6	Yes	28.85			

Say, a customer gets a discount of 50% i.e. we are going to divide the value with 2.

```
churn1$MonthlyCharges[3]/2->churn1$MothlyCharges[3]
head(churn1)
##
     customerID gender SeniorCitizen Partner Dependents tenure PhoneService
## 1 7590-VHVEG Female
                                                         No
                                                                 1
                                            Yes
                                                                              No
## 2 5575-GNVDE
                   Male
                                     0
                                             No
                                                         No
                                                                34
                                                                             Yes
## 3 3668-QPYBK
                   Male
                                     0
                                             No
                                                         No
                                                                 2
                                                                             Yes
## 4 7795-CFOCW
                                     0
                                                                45
                   Male
                                             No
                                                         No
                                                                              No
## 5 9237-HQITU Female
                                             No
                                                         No
                                                                 2
                                                                             Yes
## 6 9305-CDSKC Female
                                     0
                                             No
                                                         No
                                                                 8
                                                                             Yes
        MultipleLines InternetService OnlineSecurity OnlineBackup
## 1 No phone service
                                    DSL
                                                     No
                                                                  Yes
## 2
                                    DSL
                                                    Yes
                                                                    No
## 3
                    No
                                    DSL
                                                    Yes
                                                                   Yes
## 4 No phone service
                                    DSL
                                                    Yes
                                                                    No
                            Fiber optic
## 5
                    No
                                                     No
                                                                    No
## 6
                   Yes
                            Fiber optic
                                                      No
                                                                    No
     DeviceProtection TechSupport StreamingTV StreamingMovies
##
                                                                         Contract
## 1
                    No
                                 No
                                              No
                                                               No Month-to-month
## 2
                   Yes
                                 No
                                              No
                                                               No
                                                                         One year
## 3
                    No
                                 No
                                              No
                                                               No Month-to-month
## 4
                   Yes
                                Yes
                                              No
                                                               No
                                                                         One year
                                                               No Month-to-month
## 5
                    No
                                 No
                                              No
                                             Yes
## 6
                   Yes
                                 No
                                                              Yes Month-to-month
                                    PaymentMethod MonthlyCharges TotalCharges
##
     PaperlessBilling
## 1
                   Yes
                                 Electronic check
                                                             29.85
                                                                           29.85
## 2
                    No
                                     Mailed check
                                                             56.95
                                                                         1890.50
                                     Mailed check
                                                             53.85
## 3
                   Yes
                                                                          108.15
                    No Bank transfer (automatic)
## 4
                                                             42.30
                                                                         1840.75
## 5
                   Yes
                                 Electronic check
                                                             70.70
                                                                          151.65
## 6
                                 Electronic check
                                                             99.65
                                                                          820.50
                   Yes
##
     Churn MothlyCharges
## 1
                   28.850
        No
## 2
        No
                   28.850
```



```
## 4 No 28.850
## 5 Yes 28.850
## 6 Yes 28.850
```

3. Relational Operators: Now we are going to have a look at the relational operators.

Using the greater than (>) operator we are going to find out all of those customers whose ""tenure" is greater than 60.

```
churn1$tenure>60 ->c_tenure
head(c_tenure)
## [1] FALSE FALSE FALSE FALSE FALSE
```

In the previous example values are shown in TRUE/FALSE, To have a look at the actual values we can use a function called subset()

```
subset(churn1,c_tenure=T)->c_tenure
head(c tenure)
     customerID gender SeniorCitizen Partner Dependents tenure PhoneService
##
## 1 7590-VHVEG Female
                                     0
                                           Yes
                                                        No
                                                                 1
                                                                              No
## 2 5575-GNVDE
                                     0
                   Male
                                             No
                                                        No
                                                                34
                                                                             Yes
## 3 3668-QPYBK
                   Male
                                     0
                                             No
                                                        No
                                                                 2
                                                                             Yes
## 4 7795-CFOCW
                   Male
                                     0
                                             No
                                                        No
                                                                45
                                                                              No
## 5 9237-HQITU Female
                                     0
                                             No
                                                        No
                                                                 2
                                                                             Yes
## 6 9305-CDSKC Female
                                     0
                                             No
                                                        No
                                                                 8
                                                                             Yes
##
        MultipleLines InternetService OnlineSecurity OnlineBackup
## 1 No phone service
                                    DSL
                                                     No
                                                                  Yes
## 2
                    No
                                    DSL
                                                    Yes
                                                                   No
## 3
                    No
                                    DSL
                                                    Yes
                                                                  Yes
                                    DSL
## 4 No phone service
                                                    Yes
                                                                   No
## 5
                    No
                           Fiber optic
                                                     No
                                                                   No
## 6
                           Fiber optic
                   Yes
                                                     No
                                                                   No
     DeviceProtection TechSupport StreamingTV StreamingMovies
##
                                                                        Contract
## 1
                    No
                                 No
                                              No
                                                               No Month-to-month
## 2
                   Yes
                                 No
                                              No
                                                               No
                                                                        One year
## 3
                    No
                                 No
                                              No
                                                               No Month-to-month
## 4
                   Yes
                                Yes
                                              No
                                                               No
                                                                         One vear
## 5
                    No
                                 No
                                              No
                                                               No Month-to-month
                                                              Yes Month-to-month
## 6
                   Yes
                                 No
                                             Yes
                                    PaymentMethod MonthlyCharges TotalCharges
##
     PaperlessBilling
## 1
                   Yes
                                 Electronic check
                                                             29.85
                                                                           29.85
                                     Mailed check
                                                             56.95
## 2
                    No
                                                                        1890.50
                                     Mailed check
                                                             53.85
## 3
                   Yes
                                                                         108.15
## 4
                    No Bank transfer (automatic)
                                                             42.30
                                                                         1840.75
## 5
                   Yes
                                 Electronic check
                                                             70.70
                                                                          151.65
## 6
                   Yes
                                 Electronic check
                                                             99.65
                                                                         820.50
     Churn MothlyCharges
```



```
## 1
        No
                   28.850
## 2
        No
                   28.850
## 3
       Yes
                   26.925
                   28.850
## 4
        No
## 5
       Yes
                   28.850
## 6
       Yes
                   28.850
```

Using the less than (>) operator we are going to find out all of those customers whose "MonthlyCharges" is less than 30.

```
churn1$MonthlyCharges<30->c_mon
head(c_mon)
## [1] TRUE FALSE FALSE FALSE FALSE
```

4. Logical Operators. These type of operators help us give multiple conditions.

AND operator: We will be selecting all the customers whose gender is "Male" and also are senior citizens.

```
churn1$gender == "Male"&churn1$SeniorCitizen==1 ->c_ms
head(c_ms)
## [1] FALSE FALSE FALSE FALSE FALSE
```

Use the subset function to have a look at the values.

```
subset(churn1, c_ms ==T) ->c_ms
head(c_ms)
      customerID gender SeniorCitizen Partner Dependents tenure PhoneService
##
## 21 8779-QRDMV
                  Male
                                    1
                                          No
                                                      No
                                                              1
                                                                          No
## 32 4929-XIHVW
                                    1
                                                              2
                  Male
                                          Yes
                                                      No
                                                                         Yes
                  Male
## 35 3413-BMNZE
                                    1
                                                              1
                                          No
                                                      No
                                                                         Yes
## 56 1658-BYGOY
                 Male
                                    1
                                          No
                                                      No
                                                             18
                                                                         Yes
## 58 5067-XJQFU
                  Male
                                    1
                                         Yes
                                                     Yes
                                                             66
                                                                         Yes
## 73 1891-QRQSA
                  Male
                                    1
                                         Yes
                                                     Yes
                                                                         Yes
         MultipleLines InternetService OnlineSecurity OnlineBackup
## 21 No phone service
                                  DSL
                                                   No
                                                                No
                           Fiber optic
## 32
                                                   No
                    No
                                                                No
## 35
                   No
                                   DSL
                                                   No
                                                                No
                           Fiber optic
## 56
                  Yes
                                                   No
                                                                No
## 58
                  Yes
                           Fiber optic
                                                   No
                                                               Yes
                           Fiber optic
## 73
                  Yes
                                                  Yes
                                                                No
##
      DeviceProtection TechSupport StreamingTV StreamingMovies
                                                                     Contract
## 21
                               No
                                           No
                                               Yes Month-to-month
```



```
## 32
                    Yes
                                             Yes
                                                              Yes Month-to-month
                                  No
## 35
                                  No
                                                                No Month-to-month
                     No
                                              No
                                                              Yes Month-to-month
## 56
                     No
                                  No
                                             Yes
## 58
                    Yes
                                 Yes
                                             Yes
                                                              Yes
                                                                         One year
## 73
                    Yes
                                 Yes
                                             Yes
                                                              Yes
                                                                         Two year
      PaperlessBilling
                                     PaymentMethod MonthlyCharges TotalCharges
##
                                  Electronic check
## 21
                    Yes
                                                             39.65
                                                                           39.65
## 32
                          Credit card (automatic)
                                                             95.50
                    Yes
                                                                          181.65
## 35
                     No Bank transfer (automatic)
                                                             45.25
                                                                           45.25
                                  Electronic check
                                                                         1752.55
## 56
                    Yes
                                                             95.45
## 58
                                  Electronic check
                    Yes
                                                            108.45
                                                                         7076.35
## 73
                    Yes Bank transfer (automatic)
                                                            111.60
                                                                         7099.00
      Churn MothlyCharges
##
## 21
        Yes
                     28.85
## 32
         No
                     28.85
## 35
         No
                     28.85
## 56
        Yes
                     28.85
## 58
                     28.85
         No
## 73
         No
                     28.85
```

OR Operator: We will be selecting all the customers whose Internet Service is DSL or Fiber optic.

```
churn1$InternetService == "DSL" | churn1$InternetService == "Fiber optic" -
>c_internet
head(c_internet)
## [1] TRUE TRUE TRUE TRUE TRUE
```

Use the subset function to have a look at the values.

```
subset(churn1, c_internet ==T) ->c_internet
head(c_internet)
##
     customerID gender SeniorCitizen Partner Dependents tenure PhoneService
## 1 7590-VHVEG Female
                                     0
                                           Yes
                                                        No
                                                                1
                                                                             No
## 2 5575-GNVDE
                                     0
                                                               34
                  Male
                                            No
                                                        No
                                                                            Yes
## 3 3668-QPYBK
                  Male
                                     0
                                            No
                                                        No
                                                                2
                                                                            Yes
## 4 7795-CFOCW
                  Male
                                     0
                                                               45
                                                                             No
                                            No
                                                        No
                                                                2
## 5 9237-HQITU Female
                                     0
                                            No
                                                        No
                                                                            Yes
## 6 9305-CDSKC Female
                                     0
                                            No
                                                        No
                                                                8
                                                                            Yes
##
        MultipleLines InternetService OnlineSecurity OnlineBackup
## 1 No phone service
                                   DSL
                                                    No
                                                                 Yes
                                   DSL
                                                   Yes
## 2
                                                                  No
## 3
                    No
                                   DSL
                                                   Yes
                                                                 Yes
## 4 No phone service
                                   DSL
                                                   Yes
                                                                  No
                           Fiber optic
                                                    No
## 5
                   No
                                                                  No
```



```
## 6
                   Yes
                           Fiber optic
                                                     No
                                                                    No
##
     DeviceProtection TechSupport StreamingTV StreamingMovies
                                                                         Contract
## 1
                    No
                                 No
                                              No
                                                               No Month-to-month
## 2
                   Yes
                                 No
                                              No
                                                               No
                                                                         One year
## 3
                    No
                                 No
                                              No
                                                               No Month-to-month
## 4
                   Yes
                                Yes
                                              No
                                                               No
                                                                         One year
## 5
                    No
                                 No
                                              No
                                                               No Month-to-month
## 6
                   Yes
                                 No
                                             Yes
                                                              Yes Month-to-month
     PaperlessBilling
                                    PaymentMethod MonthlyCharges TotalCharges
##
## 1
                   Yes
                                 Electronic check
                                                             29.85
                                                                           29.85
                                                             56.95
## 2
                    No
                                     Mailed check
                                                                         1890.50
                                     Mailed check
## 3
                   Yes
                                                             53.85
                                                                          108.15
## 4
                    No Bank transfer (automatic)
                                                             42.30
                                                                         1840.75
## 5
                   Yes
                                 Electronic check
                                                             70.70
                                                                          151.65
                   Yes
                                 Electronic check
                                                             99.65
                                                                          820.50
## 6
##
     Churn MothlyCharges
## 1
        No
                   28.850
## 2
        No
                   28.850
## 3
       Yes
                   26.925
## 4
        No
                   28.850
## 5
       Yes
                   28.850
## 6
       Yes
                   28.850
```

NOT Operator: We will be selecting all the customers who are not senior citizens.

```
churn1$SeniorCitizen==!1 ->c_not_senior
head(c_not_senior)
## [1] TRUE TRUE TRUE TRUE TRUE
```

Again we will be using subset() to have a look at the values.

```
subset(churn1, c not senior ==T) ->c not senior
head(c not senior)
     customerID gender SeniorCitizen Partner Dependents tenure PhoneService
##
## 1 7590-VHVEG Female
                                     0
                                            Yes
                                                        No
                                                                 1
                                                                              No
## 2 5575-GNVDE
                   Male
                                     0
                                                                34
                                                                             Yes
                                             No
                                                        No
## 3 3668-QPYBK
                   Male
                                     0
                                             No
                                                        No
                                                                 2
                                                                             Yes
                                     0
## 4 7795-CFOCW
                   Male
                                             No
                                                        No
                                                                45
                                                                              No
                                     0
## 5 9237-HQITU Female
                                             No
                                                        No
                                                                 2
                                                                             Yes
## 6 9305-CDSKC Female
                                     0
                                             No
                                                        No
                                                                 8
                                                                             Yes
        MultipleLines InternetService OnlineSecurity OnlineBackup
## 1 No phone service
                                    DSL
                                                     No
                                                                  Yes
## 2
                    No
                                    DSL
                                                    Yes
                                                                   No
## 3
                    No
                                    DSL
                                                    Yes
                                                                  Yes
## 4 No phone service
                                    DSL
                                                    Yes
                                                                   No
```



##	5	No	Fiber opt	ic	No	No
##	6	Yes	Fiber opt	ic	No	No
##		DeviceProtection	TechSupport S	treamingTV S	StreamingMovies	Contract
##	1	No	No	No	No	Month-to-month
##	2	Yes	No	No	No	One year
##	3	No	No	No	No	Month-to-month
##	4	Yes	Yes	No	No	One year
##	5	No	No	No	No	Month-to-month
##	6	Yes	No	Yes	Yes	Month-to-month
##		PaperlessBilling	Р	aymentMethod	d MonthlyCharges	: TotalCharges
##	1	Yes	Elec	tronic check	k 29.85	29.85
##	2	No		Mailed check	k 56.95	1890.50
##	3	Yes		Mailed check	k 53.85	108.15
##	4	No	Bank transfer	(automatic	) 42.30	1840.75
##	5	Yes	Elec	tronic check	k 70.70	151.65
##	6	Yes	Elec	tronic check	k 99.65	820.50
##		Churn MothlyCharges				
##	1	No 28.	850			
##	2	No 28.	850			
##	3	Yes 26.	925			
##	4	No 28.	850			
##	5	Yes 28.	850			
##	6	Yes 28.	850			