

# Excel

Data transformation in power query

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Created by	Creation Date	Last Updated
Surojeet Dey	Aug 28, 2024	Aug 28, 2024

## STEP 1

# Raw Data [Denormalized Form]

Raw data of telecommunication company in excel. In this file contains 32 columns.

Customer			Subscription			Usage			Billing			Service			Churn			Complaints			Feedback		
Customer ID	Gender	Age	State	Service Type	Plan	Usage (GB)	Usage (Min)	Usage (Sec)	Billing Cycle	Billing Amount	Service Fee	Churn Status	Churn Reason	Churn Date	Churn Category	Complaints	Complaints Reason	Feedback Score	Feedback Text	Feedback Date	Feedback Category		
19877-DEL	Male	57	Delhi	Basic	Unlimited	10	1000	100	12	1000	100	Yes	Service Fee	2023-01-01	Service Fee	1	Service Fee	4.5	Service Fee is too high	2023-01-01	Service Fee		
58353-MAH	Female	45	Maharashtra	Basic	Unlimited	10	1000	100	12	1000	100	No				0		5.0	Service is great	2023-01-01	Service		
25063-WES	Male	51	West Bengal	Basic	Unlimited	10	1000	100	12	1000	100	No				0		5.0	Service is great	2023-01-01	Service		
59787-KAR	Male	79	Karnataka	Basic	Unlimited	10	1000	100	12	1000	100	No				0		5.0	Service is great	2023-01-01	Service		
28544-TAM	Female	60	Tamil Nadu	Basic	Unlimited	10	1000	100	12	1000	100	No				0		5.0	Service is great	2023-01-01	Service		
32750-TEL	Male	54	Telangana	Basic	Unlimited	10	1000	100	12	1000	100	No				0		5.0	Service is great	2023-01-01	Service		
84741-MAH	Female	66	Maharashtra	Basic	Unlimited	10	1000	100	12	1000	100	No				0		5.0	Service is great	2023-01-01	Service		
65618-GUJ	Male	51	Gujarat	Basic	Unlimited	10	1000	100	12	1000	100	No				0		5.0	Service is great	2023-01-01	Service		
64233-GUJ	Female	53	Gujarat	Basic	Unlimited	10	1000	100	12	1000	100	No				0		5.0	Service is great	2023-01-01	Service		
23612-UTT	Female	41	Uttar Pradesh	Basic	Unlimited	10	1000	100	12	1000	100	No				0		5.0	Service is great	2023-01-01	Service		
19877-DEL	Male	57	Delhi	Basic	Unlimited	10	1000	100	12	1000	100	Yes	Service Fee	2023-01-01	Service Fee	1	Service Fee	4.5	Service Fee is too high	2023-01-01	Service Fee		
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65618-GUJ	Male	51	Gujarat	Basic	Unlimited	10	1000	100	12	1000	100	No				0		5.0	Service is great	2023-01-01	Service		
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59787-KAR	Male	79	Karnataka	Basic	Unlimited	10	1000	100	12	1000	100	No				0		5.0	Service is great</				

## STEP 2

# Normalized Form

1. Here we take a small portion of data and convert it into normalized form.  
Normalization helps to avoid --  
*Data redundancy*  
*Data duplication*

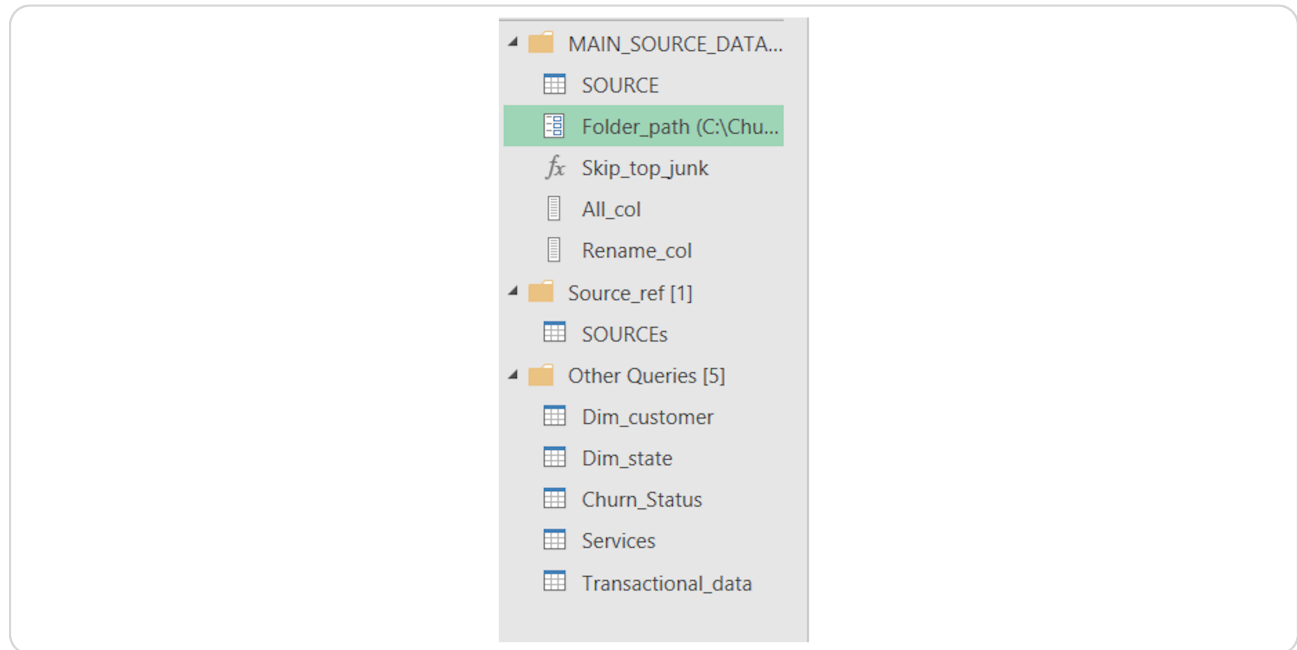
*It also helps to avoid following anomalies --*  
*Update*  
*Insertion*  
*Deletion*

Dim_customer				Transactional_data																Churn_Details				Services													
Customer_ID	Gender	Age	Married	State	Customer_ID	Number of Referrals	Years in Service	Value of Deal	Monthly Charges	Total Charges	Total Refunds	Total Extra Data	Total Long Distance	Total Revenue	Contract	Payment Method	Churn Status	Churn Reason	Churn Date	Churn Category	Churn Reason	Churn Date	Churn Category	Customer_ID	Phone Service	Multiple-Is	Internet Service	Internet Type	Online Security	Online Backup	Device Protection	Premium Support	Streaming TV	Streaming Movies	Streaming Music	Unlimited Data	
19877-DEL	Male	55	No	Delhi	19877-DEL	7	27	55.6	593.3	0	0	0	581.51	974.81	One Year	Yes	Credit Card							19877-DEL	Yes	Yes	Yes	Cable	No	Yes	No	No	No	Yes	No	No	Yes
58353-MAH	Female	45	Yes	Maharashtra	58353-MAH	14	13	73.9	542.2	58.33	10	0	96.21	610.28	Month-to-Month	No	Credit Card							58353-MAH	Yes	Yes	Yes	Cable	No	No	No	No	No	Yes	Yes	No	No
25063-WES	Male	51	No	West Bengal	25063-WES	4	5	73.9	262.85	0	0	0	534.6	435.45	Month-to-Month	Yes	Bank Withdrawal							25063-WES	Churned	Competitor	Competitor had better devices	Fiber Optic	No	Yes	No	No	No	Yes	No	Yes	No
59787-KAR	Male	79	No	Karnataka	59787-KAR	5	21	58	1237.85	0	0	0	561.66	559.51	Month-to-Month	Yes	Bank Withdrawal							59787-KAR	Churned	Dissatisfaction	Product dissatisfaction	Fiber Optic	No	Yes	No	No	Yes	Yes	No	Yes	
28544-TAM	Female	60	No	Tamil Nadu	28544-TAM	4	5	83.9	267.4	0	0	0	52.14	289.54	Month-to-Month	Yes	Credit Card							28544-TAM	Churned	Dissatisfaction	Network reliability	Fiber Optic	No	No	No	No	Yes	Yes	No	Yes	
32750-TEL	Male	54	No	Telangana	32750-TEL	6	5	69.4	511.45	0	0	0	550.93	722.38	Month-to-Month	Yes	Credit Card							32750-TEL	Stayed			Cable	No	No	No	No	Yes	Yes	No	Yes	
84741-MAH	Female	66	Yes	Maharashtra	84741-MAH	9	23	109.7	7904.25	0	0	0	707.16	6611.41	Two Year	Yes	Bank Withdrawal							84741-MAH	Stayed			Fiber Optic	Yes	Yes	Yes	Yes	Yes	Yes	No	No	
65618-GUJ	Male	51	Yes	Gujarat	65618-GUJ	12	24	84.65	5377.8	0	20	0	816.48	6214.28	Two Year	Yes	Credit Card							65618-GUJ	Stayed			Fiber Optic	Yes	No	No	No	Yes	No	No	No	
64233-GUJ	Female	53	No	Gujarat	64233-GUJ	4	10	58.2	240.35	0	0	0	75.71	414.06	Two Year	Yes	Bank Withdrawal							64233-GUJ	Stayed			DSL	Yes	No	No	No	No	No	No	Yes	
23612-UTT	Female	41	No	Uttar Pradesh	23612-UTT	5	5	50.45	599.9	0	0	0	549.9	780.8	Two Year	Yes	Credit Card							23612-UTT	Stayed			Cable	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	
Churn_Details				Services																																	
Customer_ID	Customer Status	Churn Category	Churn Reason	Customer_ID	Phone Service	Multiple-Is	Internet Service	Internet Type	Online Security	Online Backup	Device Protection	Premium Support	Streaming TV	Streaming Movies	Streaming Music	Unlimited Data																					
19877-DEL	Stayed			19877-DEL	Yes	No	Yes	Cable	No	Yes	No	No	Yes	No	No	Yes																					
58353-MAH	Stayed			58353-MAH	Yes	Yes	Yes	Cable	No	No	No	No	No	Yes	No	Yes																					
25063-WES	Churned	Competitor	Competitor had better devices	25063-WES	Yes	Yes	Yes	Fiber Optic	No	Yes	No	No	No	Yes	No	Yes																					
59787-KAR	Churned	Dissatisfaction	Product dissatisfaction	59787-KAR	Yes	No	Yes	Fiber Optic	No	Yes	No	Yes	Yes	Yes	No	Yes																					
28544-TAM	Churned	Dissatisfaction	Network reliability	28544-TAM	Yes	No	Yes	Fiber Optic	No	No	No	No	Yes	Yes	No	Yes																					
32750-TEL	Stayed			32750-TEL	Yes	No	Yes	Cable	No	No	No	No	Yes	Yes	No	Yes																					
84741-MAH	Stayed			84741-MAH	Yes	No	Yes	Fiber Optic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes																					
65618-GUJ	Stayed			65618-GUJ	Yes	Yes	Yes	Fiber Optic	Yes	No	No	No	Yes	Yes	No	No																					
64233-GUJ	Stayed			64233-GUJ	Yes	No	Yes	DSL	Yes	No	No	No	No	Yes	No	Yes																					
23612-UTT	Stayed			23612-UTT	Yes	Yes	Yes	Cable	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes																					

### STEP 3

#### Power Query - {M language}

Here we use the power query in order to extract and transform the raw data.



### STEP 4

#### Elaborate the queries

**1 - Firstly, I create a folder pathway. this pathway is a directly reference where all files are kept in the file manager.**

pathway is - "C:\Churn\_analysis\_telecom\Data" meta [IsParameterQuery=true, Type="Any", IsParameterQueryRequired=true]

**2 - Secondly i create a custom function which help to clean the top junk rows of the table and help to set the headers.**

```
Function - (input_data as table)=>
let
    Skip_top_junk_rows =
        Table.PromoteHeaders(
            Table.Skip(input_data,
                each
                    List.MatchesAny(
                        Record.ToList(_),each = null or = "" )
                ))
in
```

Created with *Tango*

Skip\_top\_junk\_rows

**3 - Finally, we rename the columns so that all related columns are append in a correct manner whenever new data set added.**

```
Function -  
let  
Source = Table.TransformColumns(Folder.Files(Folder_path), {"Content",each Csv.Docu-  
ment(_)}),  
#"Added Custom" = Table.AddColumn  
(Source, "skip_top_junks",  
each  
Table.RenameColumns(  
Skip_top_junk([Content]),Rename_col, MissingField.Ignore)  
),  
req_col_list = List.Transform(  
Rename_col, each _{1}  
),  
Req_cols = Table.Combine(#"Added Custom"[skip_top_junks],req_col_list),  
Dynamic_datatype_list = Table.ToColumns(  
Table.DemoteHeaders(  
Table.TransformColumns(  
Table.FirstN(Req_cols,1),{ }, each Value.Type(_))),  
Changed_type_dynamically = Table.TransformColumnTypes(Req_cols,Dynam-  
ic_datatype_list),  
Distinct_table = Table.Distinct(Changed_type_dynamically)  
in  
Distinct_table
```

## STEP 5

**After deep understanding of the dataset, we categorized it into two categories called - 1 - Dimensional Table 2 - Factual Table**

## STEP 6

### Dim\_customer

Customer_id	Gender	Age	Married	Cust_id_index	State_id_index
19877-DEL	Male	35	No	1	1
58353-MAH	Female	45	Yes	2	2
84741-MAH	Female	66	Yes	7	2
71897-MAH	Female	36	Yes	14	2
11925-MAH	Female	78	Yes	21	2
86818-MAH	Female	29	Yes	23	2
25063-WES	Male	51	No	3	3
59787-KAR	Male	79	No	4	4
28544-TAM	Female	80	No	5	5
32750-TEL	Male	24	No	6	6
65618-GUJ	Male	51	Yes	8	7
64233-GUJ	Female	63	No	9	7
49302-GUJ	Female	47	No	17	7
93520-GUJ	Female	67	No	18	7
23612-UTT	Female	41	No	10	8
53023-UTT	Male	26	Yes	12	8
13717-UTT	Male	56	Yes	13	8
15776-UTT	Female	38	Yes	15	8
45397-RAJ	Male	48	Yes	11	9
56731-BIH	Female	53	Yes	16	10

## STEP 7

### Dim\_state

State	State_id_index
Delhi	1
Maharashtra	2
West Bengal	3
Karnataka	4
Tamil Nadu	5
Telangana	6
Gujarat	7
Uttar Pradesh	8
Rajasthan	9
Bihar	10
Andhra Pradesh	11
Madhya Pradesh	12
Chhattisgarh	13
Punjab	14
Jharkhand	15
Haryana	16
Jammu & Kashmir	17
Assam	18
Uttarakhand	19
Odisha	20
Kerala	21
Puducherry	22

## STEP 8

### Churn Status

Cust_id_index	Customer_Status	Churn_Category	Churn_Reason
1	Stayed	Not_Available	Not_Available
2	Stayed	Not_Available	Not_Available
3	Churned	Competitor	Competitor had better devices
7	Stayed	Not_Available	Not_Available
4	Churned	Dissatisfaction	Product dissatisfaction
14	Stayed	Not_Available	Not_Available
5	Churned	Dissatisfaction	Network reliability
21	Stayed	Not_Available	Not_Available
6	Stayed	Not_Available	Not_Available
23	Stayed	Not_Available	Not_Available
8	Stayed	Not_Available	Not_Available
9	Stayed	Not_Available	Not_Available
10	Stayed	Not_Available	Not_Available
11	Stayed	Not_Available	Not_Available
12	Stayed	Not_Available	Not_Available
13	Stayed	Not_Available	Not_Available
17	Stayed	Not_Available	Not_Available

## STEP 9

### Service offered

Cust_id_index	Unlimited_Data	Streaming_Music	Streaming_Movies	Streaming_TV	Premium_Support	Device_Protection_Plan	Online_Backup	Online_Security	Internet_Type	Internet_Service	Multiple_Line	Phone_Service
1	Yes	No	No	Yes	Yes	No	Yes	No	Cable	Yes	No	Yes
2	No	Yes	Yes	No	No	No	No	No	Cable	Yes	Yes	Yes
3	Yes	No	No	No	No	Yes	No	No	Fiber Optic	Yes	No	Yes
4	Yes	No	Yes	Yes	No	Yes	Yes	No	Fiber Optic	Yes	No	Yes
5	Yes	No	No	Yes	Yes	No	No	No	Fiber Optic	Yes	No	Yes
6	Yes	Yes	Yes	Yes	Yes	No	No	No	Cable	Yes	No	Yes
7	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Fiber Optic	Yes	No	Yes
8	No	No	No	No	Yes	No	No	Yes	Fiber Optic	Yes	Yes	Yes
9	Yes	No	No	No	No	No	No	Yes	DSL	Yes	No	Yes
10	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Cable	Yes	Yes	Yes
11	Yes	No	No	Yes	Yes	No	No	Yes	Cable	Yes	N/A	No
12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Fiber Optic	Yes	Yes	Yes
13	Yes	No	No	No	No	No	No	No	Fiber Optic	Yes	No	Yes
14	Yes	No	No	Yes	No	Yes	Yes	Yes	Fiber Optic	Yes	Yes	Yes
15	Yes	No	No	No	Yes	Yes	Yes	No	DSL	Yes	N/A	No
16	Yes	Yes	Yes	No	No	Yes	Yes	No	Fiber Optic	Yes	Yes	Yes
17	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	DSL	Yes	N/A	No
18	Yes	No	No	No	No	No	No	No	Fiber Optic	Yes	Yes	Yes
19	Yes	No	Yes	No	No	Yes	No	Yes	DSL	Yes	No	Yes
20	Yes	No	No	No	No	No	No	No	Cable	Yes	N/A	No
21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	Yes	Yes
22	Yes	No	No	Yes	No	Yes	No	No	Fiber Optic	Yes	Yes	Yes
23	Yes	No	No	Yes	No	No	No	No	Fiber Optic	Yes	Yes	Yes
24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No	Yes
25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No	Yes
26	Yes	No	No	No	No	No	No	Yes	DSL	Yes	N/A	No
27	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Fiber Optic	Yes	No	Yes
28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No	Yes
29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No	Yes
30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No	Yes
31	Yes	Yes	Yes	Yes	No	No	No	No	Fiber Optic	Yes	No	Yes
32	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No	Yes
33	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Fiber Optic	Yes	Yes	Yes
34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No	Yes
35	Yes	No	No	No	Yes	Yes	No	Yes	Cable	Yes	N/A	No
36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	Yes	Yes
37	Yes	No	No	Yes	No	No	No	Yes	Fiber Optic	Yes	Yes	Yes

## STEP 10

## Transactionnal

Cust_Id_Index	Contract	Payment_Method	Paperless_Billing	Value_Deal	Number_of_Referrals	Tenure_in_Months	Monthly_Charge	Total_Charges	Total_Refunds	Total_Extra_Data_Charges	Total_Long_Distance_Charges	Total_Revenue
1	One Year	Credit Card	Yes	Not_Available	7	27	65.6	593.3	0	0	381.51	974.81
2	Month-to-Month	Credit Card	No	Not_Available	14	13	-4	542.4	38.33	10	96.21	610.28
3	Month-to-Month	Bank Withdrawal	Yes	Deal 5	4	35	73.9	280.85	0	0	134.6	415.45
4	Month-to-Month	Bank Withdrawal	Yes	Deal 4	3	21	98	1237.85	0	0	361.66	1599.51
5	Month-to-Month	Credit Card	Yes	Not_Available	3	8	83.9	267.4	0	0	22.14	289.54
6	Month-to-Month	Credit Card	Yes	Deal 5	9	2	69.4	571.45	0	0	150.93	722.38
7	Two Year	Bank Withdrawal	Yes	Deal 1	9	23	109.7	7904.25	0	0	707.16	8611.41
8	Two Year	Credit Card	Yes	Deal 2	12	24	84.65	5377.8	0	-20	816.48	6214.28
9	Two Year	Bank Withdrawal	Yes	Deal 5	4	10	48.2	340.35	0	0	73.71	414.06
10	Two Year	Credit Card	Yes	Not_Available	3	1	90.45	5957.9	0	0	1849.9	7807.8
11	Two Year	Credit Card	No	Not_Available	0	1	45.2	2460.55	0	0	0	2460.55
12	Two Year	Credit Card	Yes	Not_Available	6	22	116.8	8456.75	0	0	1152.72	9609.47
13	Month-to-Month	Bank Withdrawal	Yes	Not_Available	15	26	68.95	351.5	0	0	93.25	444.75
14	Two Year	Bank Withdrawal	Yes	Deal 1	8	6	101.3	7261.25	0	0	162	7423.25
15	Two Year	Bank Withdrawal	No	Not_Available	1	19	45.05	2560.1	0	0	0	2560.1
16	Two Year	Credit Card	Yes	Deal 1	5	8	95.75	6849.4	0	0	1935.46	8784.86
17	One Year	Credit Card	No	Not_Available	14	4	61.25	1993.2	0	0	0	1993.2
18	One Year	Bank Withdrawal	Yes	Deal 5	13	19	72.1	72.1	0	0	7.77	79.87
19	One Year	Credit Card	No	Not_Available	0	30	62.7	2791.5	0	0	480.15	3271.65
20	Month-to-Month	Bank Withdrawal	Yes	Not_Available	15	33	25.1	25.1 *	0	0	0	25.1
21	One Year	Bank Withdrawal	No	Not_Available	12	12	25.2	1306.3	0	0	1571.5	2877.8
22	Month-to-Month	Bank Withdrawal	No	Not_Available	12	20	94.1	1215.6	0	0	566.28	1781.88
23	Month-to-Month	Bank Withdrawal	Yes	Deal 4	8	22	83.75	1849.95	0	0	802.93	2652.88
24	Month-to-Month	Credit Card	No	Not_Available	9	7	19.85	57.2	0	0	9.36	66.56
25	Month-to-Month	Credit Card	No	Deal 5	12	24	20.35	76.35	0	0	49.72	126.07
26	Month-to-Month	Bank Withdrawal	No	Not_Available	12	26	30.5	30.5	0	0	0	30.5
27	One Year	Bank Withdrawal	Yes	Not_Available	14	18	103.7	5656.75	0	20	1927.2	7603.95
28	Two Year	Credit Card	No	Not_Available	0	23	20.4	1090.6	0	0	1063.8	2154.4
29	One Year	Bank Withdrawal	Yes	Deal 3	6	3	19.6	471.85	21.25	0	980.2	1430.8
30	Two Year	Bank Withdrawal	No	Not_Available	8	2	19.7	1396.9	0	0	2648.91	4045.81
31	One Year	Credit Card	No	Deal 3	4	8	91.2	3247.55	0	0	1591.37	4838.92
32	One Year	Bank Withdrawal	No	Deal 2	2	18	20.45	900.9	0	0	2429.42	3330.32
33	One Year	Bank Withdrawal	No	Not_Available	7	8	-2	7942.15	0	0	2888.82	10830.97
34	One Year	Bank Withdrawal	No	Not_Available	12	20	20.55	1343.4	30.53	0	1549.04	2861.91
35	Two Year	Credit Card	Yes	Not_Available	14	2	39.4	825.4	0	0	0	825.4
36	Two Year	Bank Withdrawal	Yes	Not_Available	10	8	25.1	1070.15	0	0	1317.52	2387.67

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