

# **Project documentation**

## ➤ **Dataset:**

- ❖ It describes data of customers in bank in many categories as age, marital, education and soon.
- ❖ And use this to analysis it for make decision for achieve profit for a bank by making relation between columns.
- ❖ It's contained 12000 rows
- ❖ It's contained 17 Columns
  - I. Age
  - II. Job
  - III. Loan
  - IV. Marital
  - V. Education
  - VI. Default
  - VII. Balance
  - VIII. Housing
  - IX. Contact
  - X. Day
  - XI. Month
  - XII. Duration
  - XIII. Campaign
  - XIV. Pdays
  - XV. Previous
  - XVI. Pout come
  - XVII. Deposit

# Before Modification:

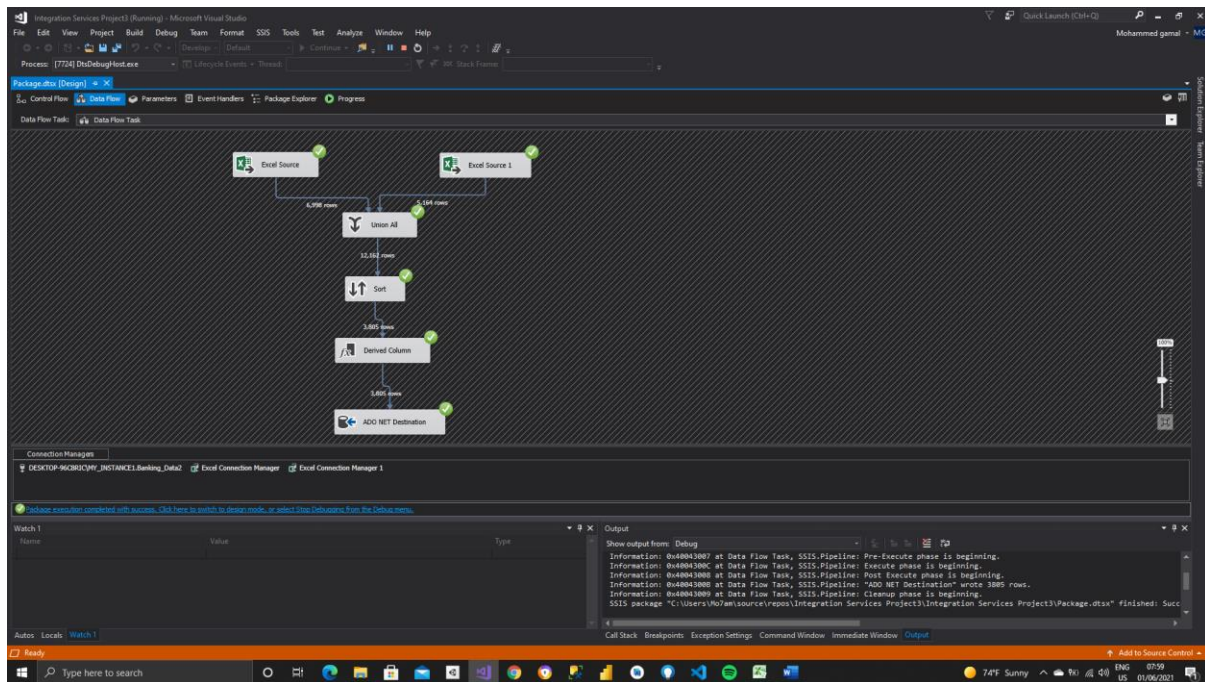
## • First file:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
age	job	MARITAL	education	default	balance	housing	loan	contact	day	month	duration	campaign	pdays	previous	poutcome	deposit
59	admin.	MARRIED	secondary	no	2343	yes	no	unknown	5	may	1042	1	-1	0	unknown	yes
56	admin.	MARRIED	secondary	no	45	no	no	unknown	5	may	1467	1	-1	0	unknown	yes
41	technician	MARRIED	secondary	no	1270	yes	no	unknown	5	may	1389	1	-1	0	unknown	yes
55	services	MARRIED	secondary	no	2476	yes	no	unknown	5	may	579	1	-1	0	unknown	yes
54	admin.	MARRIED	secondary	no	184	no	no	unknown	5	may	673	2	-1	0	unknown	yes
42	management	SINGLE	tertiary	no	0	yes	yes	unknown	5	may	562	2	-1	0	unknown	yes
56	management	MARRIED	tertiary	no	830	yes	yes	unknown	6	may	1201	1	-1	0	unknown	yes
60	retired	DIVORCED	secondary	no	545	yes	no	unknown	6	may	1030	1	-1	0	unknown	yes
37	technician	MARRIED	secondary	no	1	yes	no	unknown	6	may	608	1	-1	0	unknown	yes
28	services	SINGLE	secondary	no	5090	yes	no	unknown	6	may	1297	3	-1	0	unknown	yes
38	admin.	SINGLE	secondary	no	100	yes	no	unknown	7	may	786	1	-1	0	unknown	yes
30	blue-collar	MARRIED	secondary	no	309	yes	no	unknown	7	may	1574	2	-1	0	unknown	yes
29	management	MARRIED	tertiary	no	139	yes	yes	unknown	7	may	1689	4	-1	0	unknown	yes
46	blue-collar	SINGLE	secondary	no	460	yes	no	unknown	7	may	1102	2	-1	0	unknown	yes
31	technician	SINGLE	tertiary	no	703	yes	no	unknown	8	may	943	2	-1	0	unknown	yes
35	management	DIVORCED	tertiary	no	3837	yes	no	unknown	8	may	1084	1	-1	0	unknown	yes
32	blue-collar	SINGLE	primary	no	611	yes	no	unknown	8	may	541	3	-1	0	unknown	yes
49	services	MARRIED	secondary	no	-8	yes	no	unknown	8	may	1119	1	-1	0	unknown	yes
41	admin.	MARRIED	secondary	no	55	yes	no	unknown	8	may	1120	2	-1	0	unknown	yes
49	admin.	DIVORCED	secondary	no	168	yes	yes	unknown	8	may	513	1	-1	0	unknown	yes
28	admin.	DIVORCED	secondary	no	785	yes	no	unknown	8	may	442	2	-1	0	unknown	yes
43	management	SINGLE	tertiary	no	2067	yes	no	unknown	8	may	756	1	-1	0	unknown	yes
43	management	DIVORCED	tertiary	no	388	yes	no	unknown	8	may	2087	2	-1	0	unknown	yes
43	blue-collar	MARRIED	primary	no	-152	yes	no	unknown	8	may	1120	2	-1	0	unknown	yes
37	unemployed	SINGLE	secondary	no	381	yes	no	unknown	8	may	985	2	-1	0	unknown	yes
35	blue-collar	SINGLE	secondary	no	40	yes	no	unknown	9	may	617	4	-1	0	unknown	yes
31	technician	SINGLE	tertiary	no	22	yes	no	unknown	9	may	483	3	-1	0	unknown	yes
42	blue-collar	SINGLE	secondary	no	3	yes	no	unknown	9	may	529	3	-1	0	unknown	yes
31	admin.	MARRIED	secondary	no	307	yes	no	unknown	9	may	538	1	-1	0	unknown	yes
28	blue-collar	SINGLE	secondary	no	759	yes	no	unknown	9	may	710	1	-1	0	unknown	yes
32	blue-collar	MARRIED	secondary	yes	-1	yes	no	unknown	9	may	653	1	-1	0	unknown	yes
60	technician	MARRIED	primary	no	85	yes	no	unknown	9	may	1028	2	-1	0	unknown	yes
26	blue-collar	SINGLE	secondary	no	82	yes	no	unknown	9	may	654	1	-1	0	unknown	yes
40	blue-collar	MARRIED	secondary	no	30	yes	no	unknown	9	may	1692	2	-1	0	unknown	yes
33	blue-collar	DIVORCED	primary	no	390	yes	no	unknown	9	may	665	2	-1	0	unknown	yes
32	management	SINGLE	tertiary	no	311	no	no	unknown	12	may	757	2	-1	0	unknown	yes
35	blue-collar	MARRIED	primary	no	414	no	no	unknown	13	may	504	4	-1	0	unknown	yes
33	management	DIVORCED	secondary	no	5	yes	no	unknown	13	may	1346	1	-1	0	unknown	yes
38	management	MARRIED	tertiary	no	119	yes	no	unknown	13	may	568	4	-1	0	unknown	yes
23	entrepreneur	SINGLE	primary	no	4	yes	no	unknown	13	may	395	2	-1	0	unknown	yes

## • Second file:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
age	job	MARITAL	education	default	balance	housing	loan	contact	day	month	duration	campaign	pdays	previous	poutcome	deposit
51	housemaid	MARRIED	unknown	no	2317	yes	no	cellular	27	may	133	2	41	5	success	no
32	technician	SINGLE	tertiary	no	514	yes	yes	cellular	7	may	138	1	168	1	failure	no
59	blue-collar	MARRIED	primary	no	6212	yes	no	cellular	5	may	574	2	-1	0	unknown	no
31	management	SINGLE	tertiary	no	424	no	yes	cellular	7	aug	224	2	-1	0	unknown	no
52	management	MARRIED	tertiary	no	499	no	no	cellular	6	aug	115	4	-1	0	unknown	no
26	technician	MARRIED	tertiary	no	8	yes	yes	unknown	13	may	262	2	-1	0	unknown	no
40	services	MARRIED	secondary	no	1305	no	no	cellular	22	jul	255	1	-1	0	unknown	no
35	technician	SINGLE	secondary	no	300	yes	no	unknown	9	may	338	4	-1	0	unknown	no
54	admin.	MARRIED	primary	no	976	yes	no	unknown	3	jun	137	3	-1	0	unknown	no
36	entrepreneur	MARRIED	tertiary	no	2700	no	no	cellular	4	feb	99	3	-1	0	unknown	no
45	self-emp	MARRIED	tertiary	no	-497	yes	yes	cellular	20	nov	260	1	-1	0	unknown	no
29	unemployed	SINGLE	secondary	no	2424	no	no	cellular	6	feb	93	1	-1	0	unknown	no
49	management	DIVORCED	tertiary	no	-2049	yes	no	unknown	30	may	169	3	-1	0	unknown	no
52	services	MARRIED	secondary	no	2081	yes	no	unknown	29	may	150	1	-1	0	unknown	no
52	management	MARRIED	secondary	no	189	no	no	cellular	22	aug	90	2	-1	0	unknown	no
47	unemployed	DIVORCED	secondary	no	0	no	yes	cellular	30	jan	127	2	233	8	other	no
33	services	DIVORCED	secondary	no	327	yes	no	unknown	7	may	109	1	-1	0	unknown	no
30	technician	SINGLE	secondary	no	426	yes	no	telephone	17	nov	127	4	111	6	failure	no
52	self-emp	DIVORCED	secondary	no	1291	yes	no	cellular	19	nov	559	1	169	2	failure	no
54	management	DIVORCED	tertiary	no	3473	yes	no	cellular	12	aug	306	2	-1	0	unknown	no
59	retired	MARRIED	secondary	no	434	yes	no	unknown	12	may	63	3	-1	0	unknown	no
35	management	MARRIED	tertiary	no	105	yes	no	cellular	6	may	36	1	365	3	failure	no
29	blue-collar	MARRIED	secondary	no	975	yes	no	unknown	27	may	265	2	-1	0	unknown	no
33	technician	SINGLE	secondary	no	-479	no	no	cellular	7	aug	235	1	-1	0	unknown	no
32	technician	MARRIED	primary	no	62	yes	yes	unknown	13	may	120	1	-1	0	unknown	no
50	blue-collar	MARRIED	primary	no	0	no	no	unknown	9	jun	199	4	-1	0	unknown	no
54	entrepreneur	MARRIED	secondary	no	0	no	no	unknown	9	jun	96	1	-1	0	unknown	no
49	technician	SINGLE	secondary	no	1202	yes	no	unknown	18	jun	122	1	-1	0	unknown	no
39	admin.	SINGLE	secondary	no	2804	yes	no	unknown	2	jun	64	1	-1	0	unknown	no
34	management	SINGLE	tertiary	no	9	no	no	cellular	11	jul	439	2	-1	0	unknown	no
31	self-emp	SINGLE	secondary	no	203	no	yes	cellular	19	nov	177	1	-1	0	unknown	no
46	technician	DIVORCED	tertiary	no	0	yes	no	cellular	11	aug	249	5	-1	0	unknown	no
59	retired	MARRIED	secondary	no	2467	no	no	cellular	20	nov	972	2	-1	0	unknown	no
32	technician	MARRIED	tertiary	no	3850	yes	no	cellular	20	apr	63	4	-1	0	unknown	no
39	admin.	MARRIED	secondary	no	47	yes	no	cellular	16	aug	143	2	371	6	failure	no
54	blue-collar	MARRIED	primary	no	3855	yes	no	cellular	17	apr	345	1	-1	0	unknown	no
33	technician	DIVORCED	secondary	no	532	no	yes	cellular	7	jul	559	4	-1	0	unknown	no
59	blue-collar	MARRIED	secondary	yes	-918	yes	no	unknown	16	jun	253	2	-1	0	unknown	no
28	blue-collar	SINGLE	secondary	no	-193	no	no	cellular	18	jul	580	7	-1	0	unknown	no
48	blue-collar	MARRIED	secondary	no	48	yes	yes	unknown	29	may	144	1	-1	0	unknown	no

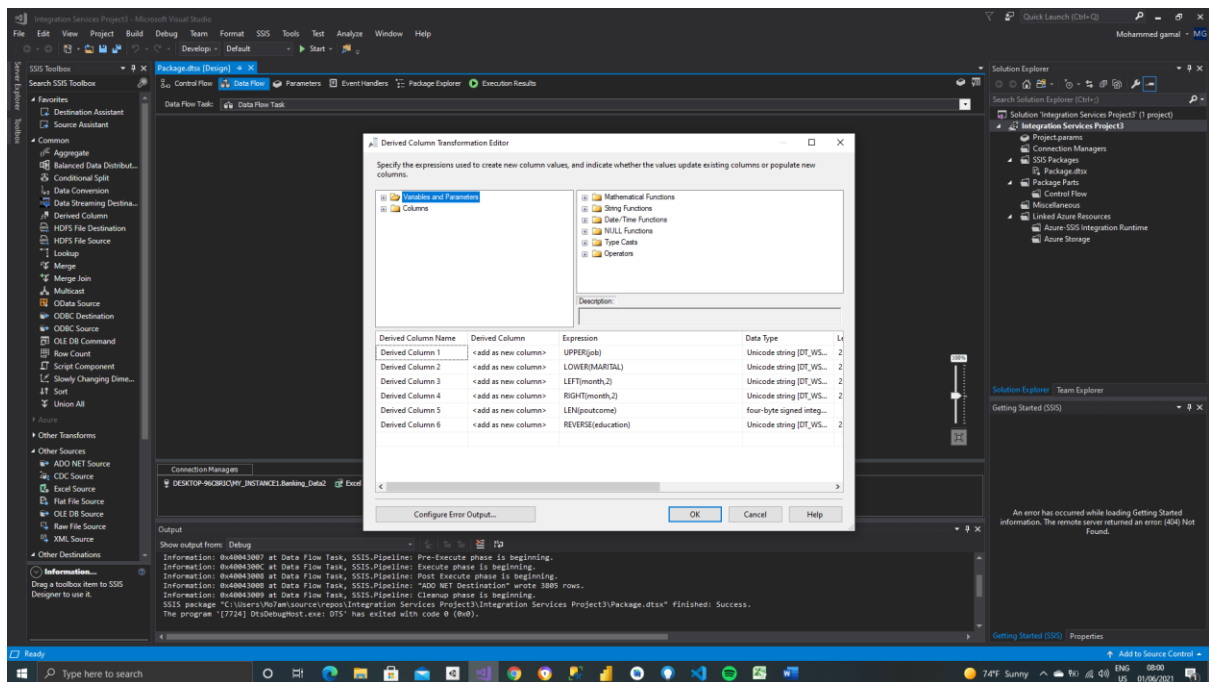
## • Functions executed:



## ➤ Transformation:

- First derived column in job column to change into upper word.
- second derived column in marital column to change into lower word.
- third derived column to take first two letter in month column by left function.
- Fourth derived column to take last two letter in month column by right function.

- Fifth derived column to count number of letters in contact column and put its size by Len function.
- Sixth derived column to reverse word in education column by using reverse function.
- Sort by balance column and remove Duplication of all rows.

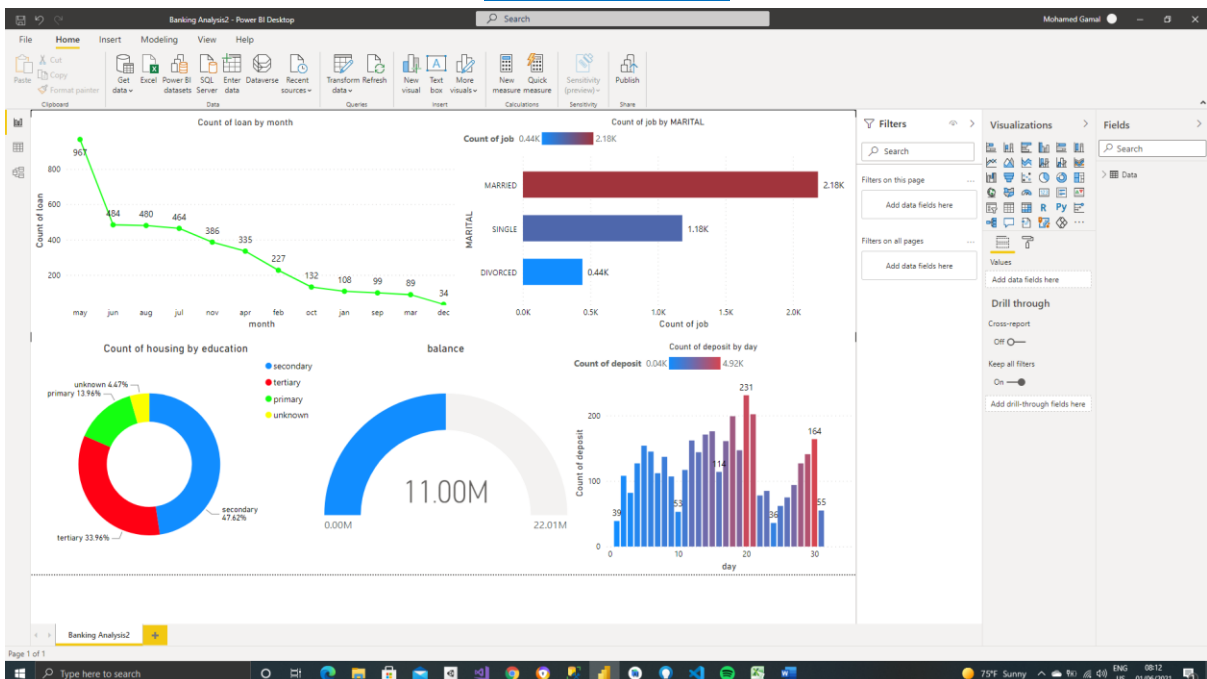


## • After modification:

loan	contact	day	month	duration	campaign	idays	previous	postcome	deposit	Derived Colu...	Derived Colu...	Derived Colu...	Derived Colu...	Derived Colu...	Derived Colu...
cellular	21	jul	206	1	-1	0	unknown	no	MANAGEMENT	married	ju	ul	7	yratnet	
cellular	17	apr	882	3	-1	0	unknown	yes	SELF-EMPLOYED	married	ap	pr	7	yratnet	
cellular	2	apr	253	1	-1	0	unknown	no	MANAGEMENT	married	ap	pr	7	yratnet	
cellular	14	jul	301	6	-1	0	unknown	no	MANAGEMENT	divorced	ju	ul	7	yratnet	
unknown	30	may	169	3	-1	0	unknown	no	MANAGEMENT	divorced	ma	ay	7	yratnet	
telephone	10	jul	317	2	-1	0	unknown	no	ENTREPRENEUR	married	ju	ul	7	yratnet	
cellular	7	may	603	1	-1	0	unknown	yes	TECHNICIAN	married	ma	ay	7	yratnet	
unknown	26	may	285	1	-1	0	unknown	no	TECHNICIAN	married	ma	ay	7	yratnet	
cellular	11	may	257	1	-1	0	unknown	no	MANAGEMENT	married	ma	ay	7	yratnet	
cellular	31	jul	156	8	-1	0	unknown	no	HOUSEMAID	married	ju	ul	7	yratnet	
unknown	29	may	177	1	-1	0	unknown	no	BLUE-COLLAR	married	ma	ay	7	yratnet	
cellular	30	jul	65	5	-1	0	unknown	no	TECHNICIAN	married	ju	ul	7	yratnet	
cellular	17	nov	135	1	-1	0	unknown	no	MANAGEMENT	married	no	ov	7	yratnet	
cellular	15	jul	56	4	-1	0	unknown	no	ADMIN	married	ju	ul	7	yratnet	
cellular	15	jun	382	2	-1	0	unknown	yes	RETIRED	married	ju	ul	7	yratnet	
cellular	7	jul	201	1	-1	0	unknown	no	SERVICES	single	ju	ul	7	yratnet	
telephone	11	may	567	3	325	1	failure	no	ADMIN	married	ma	ay	7	yratnet	
unknown	2	jun	555	5	-1	0	unknown	yes	TECHNICIAN	single	ju	un	7	yratnet	
cellular	21	jul	357	3	-1	0	unknown	no	TECHNICIAN	married	ju	ul	7	yratnet	
unknown	2	jun	548	2	-1	0	unknown	no	BLUE-COLLAR	married	ju	un	7	yratnet	
unknown	6	jun	712	2	-1	0	unknown	yes	MANAGEMENT	single	ju	un	7	yratnet	
cellular	18	jul	174	2	-1	0	unknown	no	MANAGEMENT	single	ju	ul	7	yratnet	
cellular	13	may	62	3	-1	0	unknown	no	MANAGEMENT	divorced	ma	ay	7	yratnet	
cellular	13	aug	130	4	-1	0	unknown	no	MANAGEMENT	married	au	ug	7	yratnet	
unknown	29	may	146	1	-1	0	unknown	no	BLUE-COLLAR	married	ma	ay	7	yratnet	
unknown	28	may	104	2	-1	0	unknown	no	SERVICES	married	ma	ay	7	yratnet	
cellular	4	feb	489	1	-1	0	unknown	yes	MANAGEMENT	married	fe	eb	7	yratnet	
cellular	7	may	134	1	344	2	failure	no	TECHNICIAN	married	ma	ay	7	yratnet	
cellular	18	nov	80	1	-1	0	unknown	no	ENTREPRENEUR	divorced	no	ev	7	yratnet	
cellular	14	may	786	1	-1	0	unknown	yes	ADMIN	single	ma	ay	7	yratnet	
unknown	16	jun	253	2	-1	0	unknown	no	BLUE-COLLAR	married	ju	un	7	yratnet	
cellular	21	jul	260	1	-1	0	unknown	no	TECHNICIAN	married	ju	ul	7	yratnet	
cellular	21	jul	298	1	-1	0	unknown	no	TECHNICIAN	married	ju	ul	7	yratnet	
cellular	18	may	827	2	-1	0	unknown	yes	BLUE-COLLAR	single	ma	ay	7	yratnet	
cellular	24	jul	77	3	-1	0	unknown	no	ENTREPRENEUR	single	ju	ul	7	yratnet	
cellular	28	jul	53	2	-1	0	unknown	no	MANAGEMENT	married	ju	ul	7	yratnet	
unknown	27	may	187	1	-1	0	unknown	no	TECHNICIAN	married	ma	ay	7	yratnet	

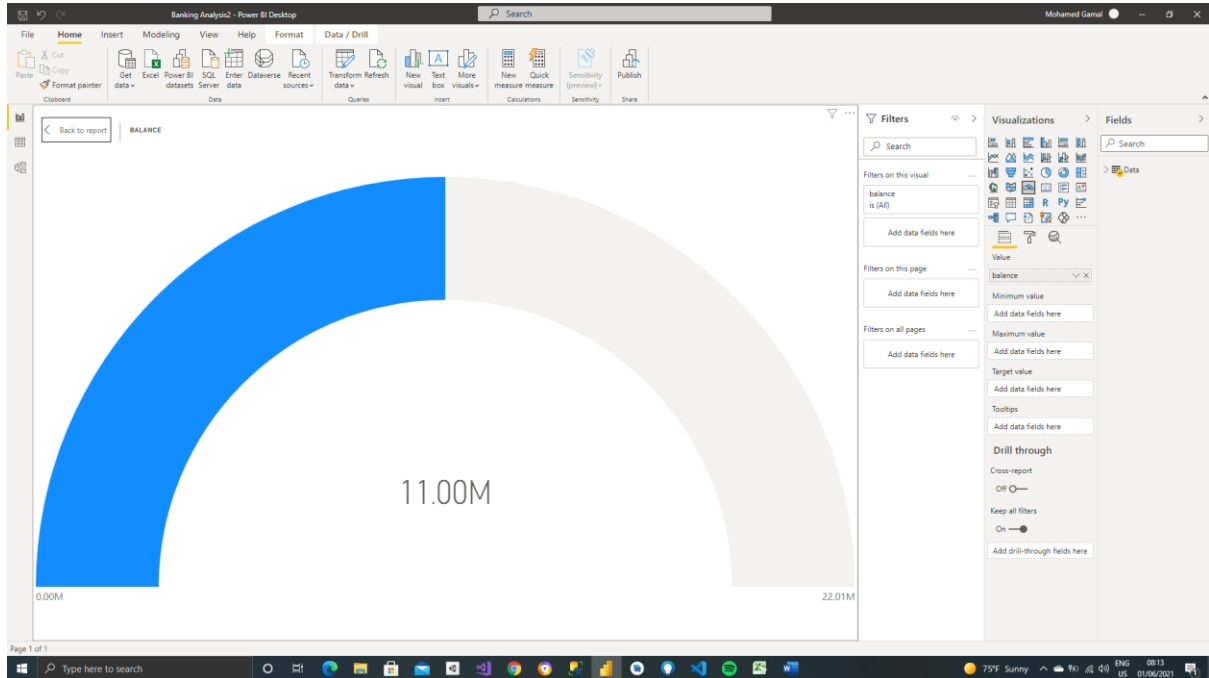
## ➤ Analysis and charts:

### Dashboard:



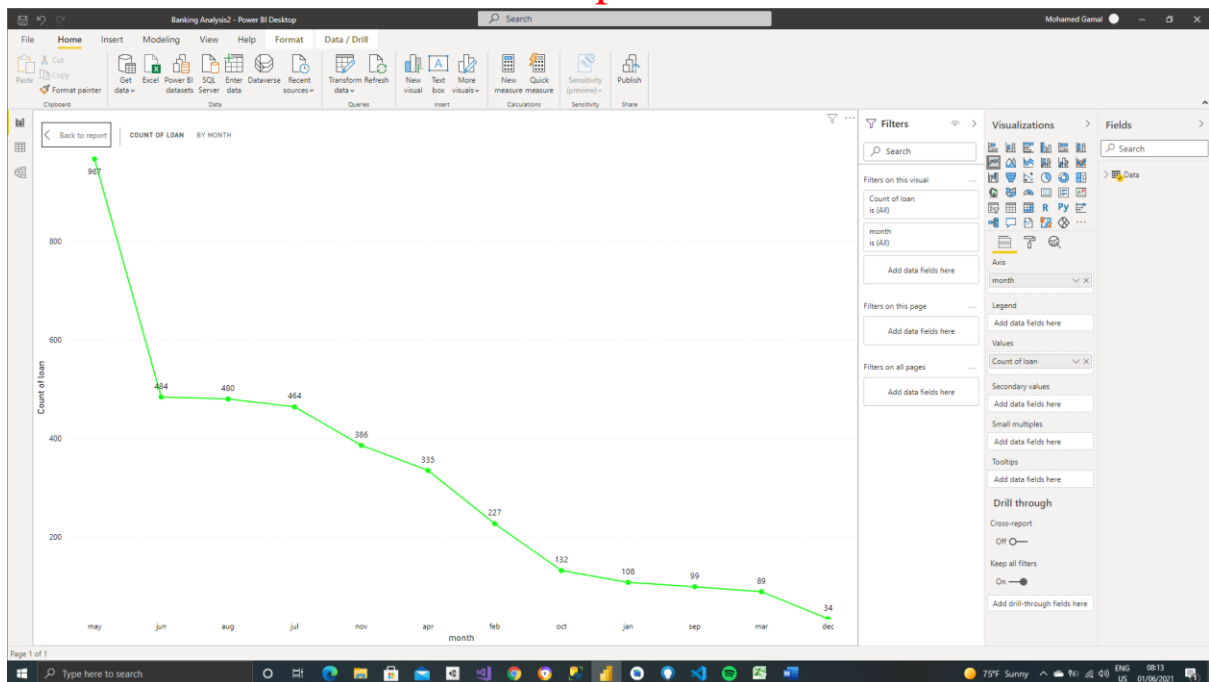
## ✓ Balances of Clients:

- Describes average balances in their accounts of clients.



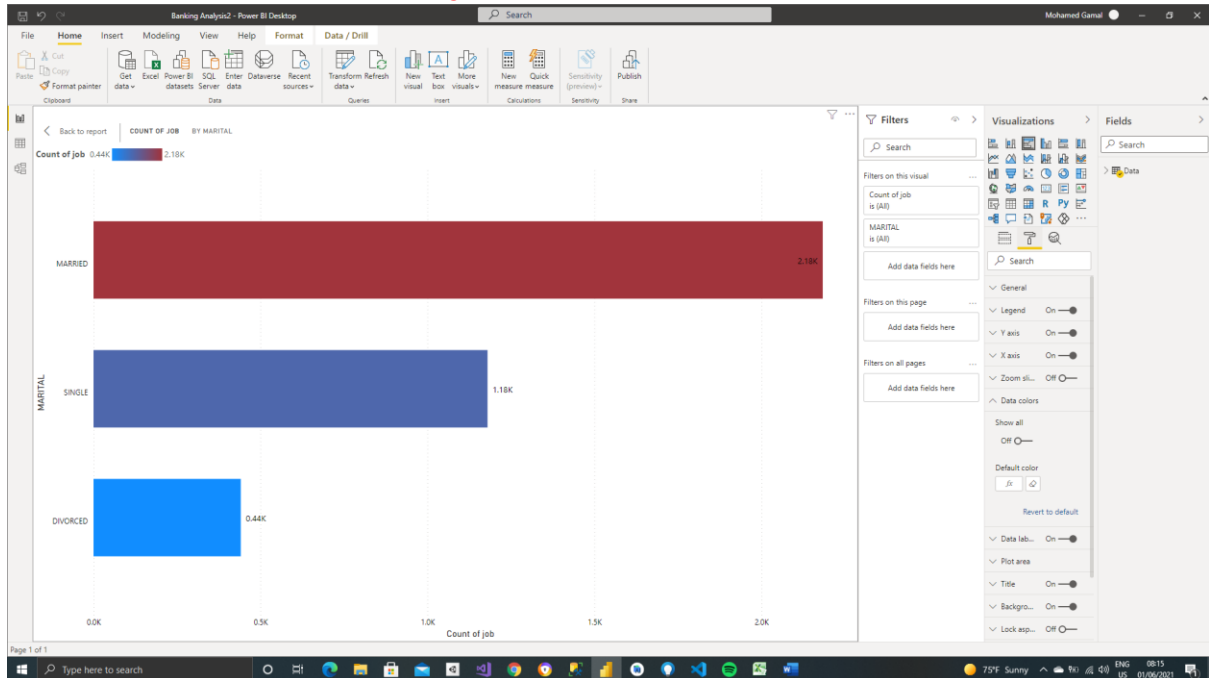
## ✓ Loan of Clients by month:

- it describes average loans that clients borrow per month to know if bank is achieved profit or not.



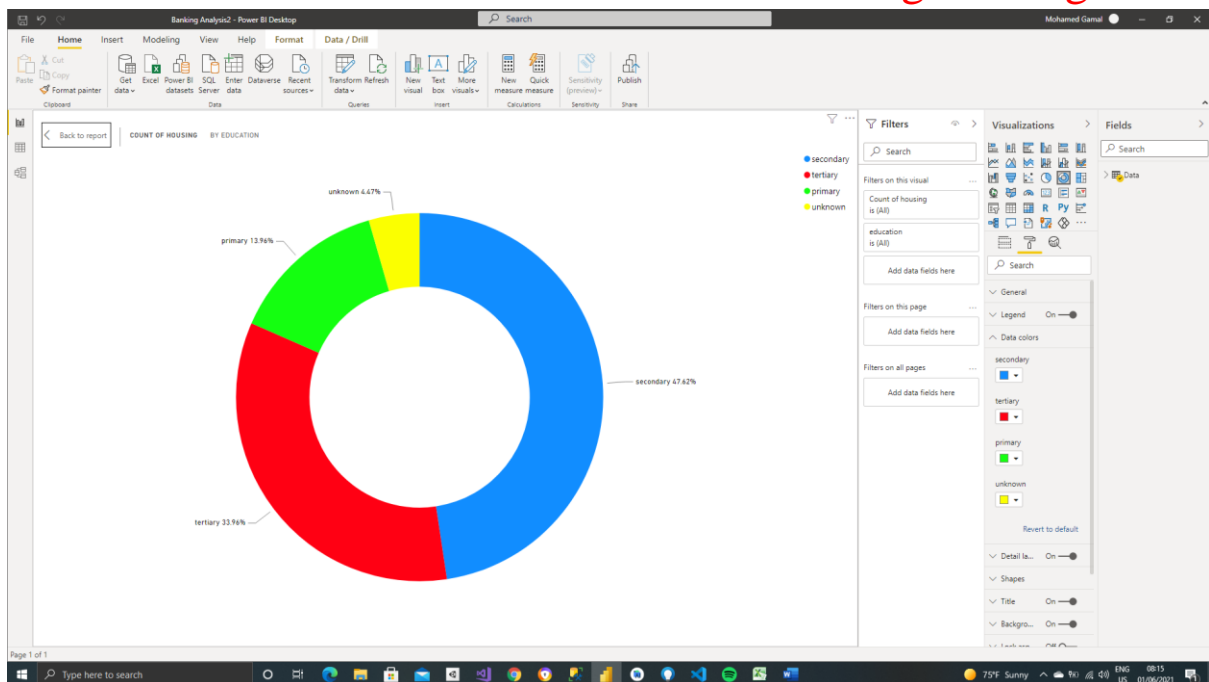
## ✓ Marital with Job:

- It describes ratio between marital status and job for
- it noticed most of jobs married from relation



## ✓ Housing by education:

- this relation between education and having housing



## ✓ Count of deposit by day:

- Its ratio between average deposits that is putted in a bank per day.

