Angus Ratcliffe

Exploratory Analysis of 2Market's Customer Purchasing Behviour

How can we account for the varying purchasing behaviours of 2Market's customers?

This question concerns a few key areas, which are: what are the different demographics of the customers? Which products are the most popular? Which marketing channels are the most popular?

Questions that we want to ask about the data:

- Which countries sell the most?
- What is the average age of 2Market's customers?
- Which age groups have the highest number of purchases?
- Which products are the most popular?
- Which marketing channels are the most popular?
- What patterns can we see based on marital status?
- What patterns can we see based on the number of kids and teens at home?

Data cleaning and analysis approach in Excel and PostgreSQL

There are a few different types of errors in the marketing_data dataset, which include: duplicate values, misspelled text or incorrect text, incorrect formatting and gaps in the data.

Firstly, the ID column should have unique values, and when we use 'remove duplicates' it returns none were found. However, if we use conditional formatting on the income values, we can see a pattern of duplicate data entries.

*Figure.*1

We need to delete these values as some of the surrounding information will skew the results and could lead to spurious relationships. To make the marketing_data consistent with the ad_data, we need to delete the matching rows in the ad_data.

G	H	I	J	K	L	
ɛnhɔ ▾	Sum_Ki ▾	Dt_Custom ▾	Recenc ▾	AmtLiq ▾	AmtVe ▾	Amt
0	0	6/16/14	0	189	104	
0	0	6/15/14	0	464	5	
1	1	5/13/14	0	134	11	
1	2	11/5/14	0	10	0	
0	1	8/4/14	0	6	16	
0	0	3/17/14	0	336	130	
0	0	1/29/14	0	769	80	
1	1	1/18/14	0	78	0	
0	0	12/27/13	0	450	26	
0	1	9/12/13	0	140	4	
0	0	7/12/13	0	431	82	
0	0	10/16/13	0	3	10	
1	1	5/10/13	0	16	4	
1	1	1/8/13	0	18	0	
1	1	7/23/13	0	53	1	
1	3	1/7/13	0	5	0	
1	1	5/28/13	0	213	9	
1	1	3/26/13	0	275	11	
0	1	3/15/13	0	40	2	

Figure. 2

Some values are registered as text, whereas other values are registered as numbers. In the Income column, we can use 'find and replace' to replace the $ symbol with a blank. We can then set the column to US currency values. Additionally, we format the date to US MM/DD/YY to match the text values.
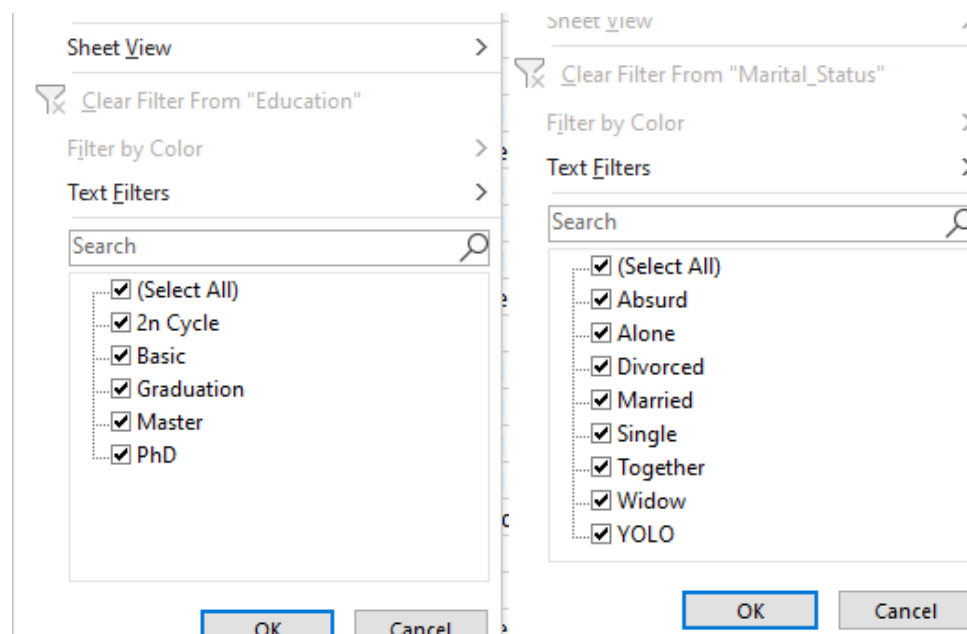

Figure. 3

Spelling errors or incorrect text in Marital_Status include, 'Absurd', 'Alone' and 'YOLO'.We should delete these values and replace with '#N/A.'

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As for Education there are: 'Basic', 'Graduation' and '2n Cycle'. In this case, we have removed the column based on the question: is education indicative of purchasing behaviours?

The columns Age, Sum_Kid_Teen and Sum_Purchases have been created. While this has been done in Excel, we could also achieve the same result in PostgreSQL by aggregating the values.The age value represents the customer's current age. Since the max value of the recency of purchases (Figure 5) is 99, the current age of the customers is still indicative of their purchasing behaviour.

1	Age			Sum_Kid_Teen			Sum_Purchases	
2	Mean	53.26101		Mean	0.950991		Mean	607.4791
3	Standard Error	0.281088		Standard Error	0.017406		Standard Error	14.14746
4	Median	52		Median	1		Median	396
5	Mode	46		Mode	1		Mode	55
6	Standard Deviation	11.97845		Standard Deviation	0.741764		Standard Deviation	602.8878
7	Sample Variance	143.4833		Sample Variance	0.550214		Sample Variance	363473.8
8	Kurtosis	1.058491		Kurtosis	-0.21665		Kurtosis	-0.36449
9	Skewness	0.415971		Skewness	0.40279		Skewness	0.859089
10	Range	103		Range	3		Range	2519
11	Minimum	26		Minimum	0		Minimum	5
12	Maximum	129		Maximum	3		Maximum	2524
13	Sum	96722		Sum	1727		Sum	1103182
14	Count	1816		Count	1816		Count	1816
15								

Figure.4

Z	AA	AB	AC	A
cess	Recency Max			
	99			

Figure.5

The max age is in the dataset is 129 years old. We can omit anomalies such as this, as it does not represent the customer population. We can see that the range of kids and teens for the customer population is between 0 and 3 and the most common number of kids or teens is 1. Sum_Purchases has wide range of 2519 purchases. This is an indication that popularity of 2Market varies dramatically depending on the demographic.

In PostgreSQL, we need to create the tables for the cleaned marketing and advert data:

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```
 1   -- Create the tables
 2   --1st table: marketing data
 3
 4   create table marketing_data_cleaned (
 5   ID integer primary key,
 6   Year_Birth integer,
 7   Age integer,
 8   Marital_Status varchar(50),
 9   Income integer,
10   Kidhome integer,
11   Teenhome integer,
12   Sum_Kid_Teen integer,
13   Recency integer,
14   AmtLiq integer,
15   AmtVege integer,
16   AmtMeat integer,
17   AmtFish integer,
18   AmtChocolates integer,
19   AmtComm integer,
20   Sum_Purchases integer,
21   NumDeals integer,
22   NumWebBuy integer,
23   NumWalkinPur integer,
24   NumVisits integer,
25   Response boolean,
26   Complain boolean,
27   Country varchar(50),
28   Count_Success integer);
29
```

Figure. 6

```
.9
0    --2nd table: ad data
1    create table ad_data_cleaned (
2    ID integer primary key,
3    Bulkmail_ad boolean,
4    Twitter_ad boolean,
5    Instagram_ad boolean,
6    Facebook_ad boolean,
7    Brochure_ad boolean);
8    */
```

Figure. 7

Next, we need to import the cleaned Excel CSV files into the tables, checking the columns and their respective data types to ensure we don't receive an error when importing.

We have updated the country column so that the tables display the country names rather than country code, to make the results more readable.

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```
39
40   --Update country names
41   update "marketing_data_cleaned"
42   set "country" = replace("country", 'AUS', 'Australia');
43
44   update "marketing_data_cleaned"
45   set "country" = replace("country", 'CA', 'Canada');
46
47   update "marketing_data_cleaned"
48   set "country" = replace("country", 'GER', 'Germany');
49
50   update "marketing_data_cleaned"
51   set "country" = replace("country", 'IND', 'India');
52
53   update "marketing_data_cleaned"
54   set "country" = replace("country", 'ME', 'Montenegro');
55
56   update "marketing_data_cleaned"
57   set "country" = replace("country", 'SA', 'South Africa');
58
59   update "marketing_data_cleaned"
60   set "country" = replace("country", 'SP', 'Spain');
61
62   update "marketing_data_cleaned"
63   set "country" = replace("country", 'US', 'USA');
64   */
```

Figure.8

Another step taken to clean the data is to remove the remaining #N/A values left in the Marital_Status column.

```
93   --Remove #N/A from marketing data table
94   delete from "marketing_data_cleaned"
95   where "marital_status" = '#N/A';
96   */
```

Figure.9

Before we begin interrogating the data, it is useful to carry out sense-checks.

```
121  select "country",
122  conversion,
123  sum(bulkmail + twitter + instagram + facebook + brochure),
124  bulkmail,
125  twitter,
126  instagram,
127  facebook,
128  brochure
129  from (
130      select mar."country",
131      sum(mar."sum_purchases") as country_spend,
132      sum((mar."count_success")::int) as conversion,
133      sum((ad."bulkmail_ad")::int) as bulkmail,
134      sum((ad."twitter_ad")::int) as twitter,
135      sum((ad."instagram_ad")::int) as instagram,
136      sum((ad."facebook_ad")::int) as facebook,
137      sum((ad."brochure_ad")::int) as brochure
138      from public."marketing_data_cleaned" mar
139      inner join public."ad_data_cleaned" ad using ("id")
140      group by mar."country"
141      ) as a
142  group by a."country",
143  a.conversion,
144  a.bulkmail,
145  a.twitter,
146  a.instagram,
147  a.facebook,
148  a.brochure,
149  a.country_spend
150  order by country_spend desc;
```

*Figure.*10

	country character varying (50)	conversion bigint	sum numeric	bulkmail bigint	twitter bigint	instagram bigint	facebook bigint	brochure bigint
1	Spain	301	259	69	65	59	55	11
2	South Africa	67	78	23	20	17	17	1
3	Canada	71	78	19	13	23	21	2
4	Australia	23	37	6	9	11	8	3
5	India	31	35	6	12	7	6	4
6	Germany	32	31	8	5	9	8	1
7	USA	21	30	6	9	7	5	3
8	Montenegro	0	0	0	0	0	0	0

*Figure.*11

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From the table above, we can see that the total number of successful conversions is inconsistent with the sum of the lead conversions of the different marketing channels. Therefore, we shouldn't use the Count_Success column as a comparison.

To analyse the data in SQL, the queries that have been written are responses to the questions that we asked earlier:

```sql
65  --How much does each country spend?
66
67  select "country",
68  country_spend,
69  to_char(country_spend*100/sum(country_spend) over(), 'fm00D00') as percent
70  from (
71      select "country",
72      sum("sum_purchases") as country_spend
73      from public."marketing_data_cleaned"
74      group by "country"
75      order by country_spend desc
76      ) as c;
```

Figure. 12

```sql
78  --How much does each country spend on each product?
79
80  select "country",
81  sum("amtliq") as liq,
82  sum("amtvege") as veg,
83  sum("amtmeat") as meat,
84  sum("amtfish") as fish,
85  sum("amtchocolates") as choc,
86  sum("amtcomm") as comm
87  from public."marketing_data_cleaned"
88  group by "country"
89  order by sum("sum_purchases") desc;
90  */
```

Figure. 13

```sql
--Which products are the most popular based on marital status?
select "marital_status",
sum("amtliq") as liq,
sum("amtvege") as veg,
sum("amtmeat") as meat,
sum("amtfish") as fish,
sum("amtchocolates") as choc,
sum("amtcomm") as comm
from public."marketing_data_cleaned"
group by "marital_status";
*/
```

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Figure. 14

```
      */
107   --Which products are the most popular depending on how many kids are at home?
108
109   select "sum_kid_teen",
110   sum("amtliq") as liq,
111   sum("amtvege") as veg,
112   sum("amtmeat") as meat,
113   sum("amtfish") as fish,
114   sum("amtchocolates") as choc,
115   sum("amtcomm") as comm
116   from public."marketing_data_cleaned"
117   group by "sum_kid_teen";
118   */
```

Figure. 15

```
---   /
152   --Which social media platform is the most effective per country?
153
154   select "country",
155   twitter,
156   instagram,
157   facebook
158   from (
159       select mar."country",
160       sum(mar."sum_purchases") as country_spend,
161       sum((ad."twitter_ad")::int) as twitter,
162       sum((ad."instagram_ad")::int) as instagram,
163       sum((ad."facebook_ad")::int) as facebook
164       from public."marketing_data_cleaned" mar
165       inner join public."ad_data_cleaned" ad using ("id")
166       group by mar."country") as a
167       order by country_spend desc;
168   */
```

Figure. 16

```
---
170   --Which social media platforms are associated with the highest sales per country?
171   select mar."country",
172   sum(mar."sum_purchases") as country_spend,
173   sum((ad."twitter_ad")::int) as twitter,
174   sum((ad."instagram_ad")::int) as instagram,
175   sum((ad."facebook_ad")::int) as facebook
176   from public."marketing_data_cleaned" mar
177   left join public."ad_data_cleaned" ad using ("id")
178   group by mar."country"
179   order by country_spend desc;
180   */
```

Figure. 17

```
181   --Which marketing channel is the most effective based on marital status?
182
183   select mar."marital_status",
184   sum((ad."twitter_ad")::int) as twitter,
185   sum((ad."instagram_ad")::int) as instagram,
186   sum((ad."facebook_ad")::int) as facebook
187   from public."marketing_data_cleaned" mar
188   left join public."ad_data_cleaned" ad using ("id")
189   group by mar."marital_status";
190   */
```

*Figure.*18

Dashboard

Metrics used in the visualisations:

- The total purchases of each country.
- The total purchases of different age groups.
- Average age of the customer population.
- Total purchases of each product type.
- Number of lead conversions for each marketing channels.

The rationale behind the design of the dashboard is that we can filter the data, such as the popularity of the products and the popularity of marketing channels, depending on which country we select. The country symbols are displayed at the top, acting as tabs.

In the middle of the dashboard is the total purchases of each age group, represented as a bar chart. We can also filter the data depending on the age range. To do this we can select an age group or highlight a range of age groups. Additionally, we can combine the age filter with the country filter to display the popularity of certain products based on both country and age. The average age is displayed in the top right corner, which changes based on the demographic selected.

For the purpose of functionality over visualisation, the decision was made to keep the size of the country tabs consistent, while displaying their respective total purchases. This is because we are focusing on the volume of purchases for each country and the values of the larger markets, such as Spain, would visually overwhelm the values of smaller markets, such as Montenegro.

The colour scheme is set up to differentiate the countries and average age from the rest of the screen. Countries are set to the automatic colour scheme, while the bar charts have the colour-blind setting applied to it. This is to emphasise the product types and marketing channels, to make them more identifiable.

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Insights

	country character varying (50)	country_spend bigint	percent text
1	Spain	547652	49.75
2	South Africa	169656	15.41
3	Canada	140362	12.75
4	Australia	65619	05.96
5	India	61017	05.54
6	Germany	58113	05.28
7	USA	57044	05.18
8	Montenegro	1258	00.11

Figure. 19

	country character varying (50)	liq bigint	veg bigint	meat bigint	fish bigint	choc bigint	comm bigint
1	Spain	278541	23361	149134	32912	25378	38326
2	South Africa	84811	7213	47206	11064	7279	12083
3	Canada	71625	6473	38146	7899	6557	9662
4	Australia	31892	2952	17239	4553	3292	5691
5	India	29590	2759	18440	3422	2386	4420
6	Germany	29746	2485	16002	3694	2095	4091
7	USA	25983	2714	18025	3725	2520	4077
8	Montenegro	420	0	452	182	64	140

Figure. 20

From the tables above, we can see that Spain has by far the most amount of total purchases of the customer population. The Spanish market accounts for 49.75% of the total purchases. As for product purchases, alcohol and meat are consistently within the top 2 most popular products by quite large margins.

	marital_status character varying (50)	liq bigint	veg bigint	meat bigint	fish bigint	choc bigint	comm bigint
1	Together	144412	11955	79400	17138	12151	19195
2	Married	212105	19074	121007	28343	19567	29551
3	Divorced	56488	5066	30745	6475	5029	9053
4	Single	120009	10328	62575	13256	10770	18061
5	Widow	19594	1534	10917	2239	2054	2630

Figure. 21

Figure 21, shows the total purchases of each product based on marital status. We can see that married couples have the highest number of purchases among the different groups. Furthermore, within each group we can see a similar pattern reoccurring with the total purchases of alcohol and meat.

Data Output   Messages   Notifications
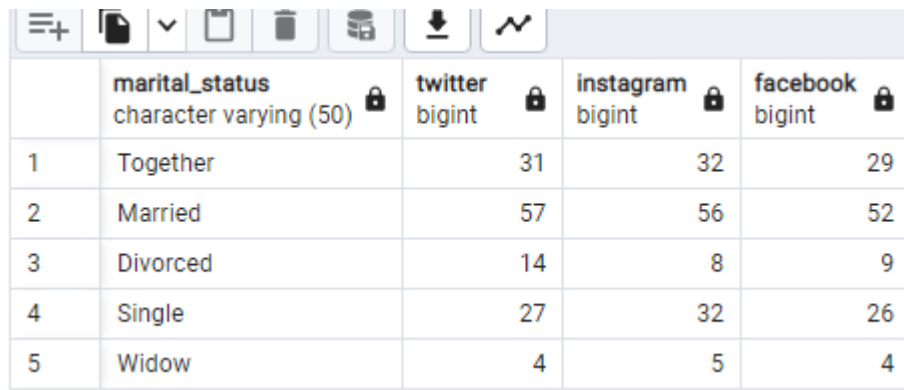
	sum_kid_teen integer	liq bigint	veg bigint	meat bigint	fish bigint	choc bigint	comm bigint
1	0	253244	26896	191653	38222	27331	32018
2	1	245226	18023	93062	25015	19032	36962
3	3	6421	287	2561	220	246	764
4	2	47717	2751	17368	3994	2962	8746

Figure. 22

Figure 22, above, show the purchases of different products depending on the total number of kids and teens at home. We can see that a smaller family size tends to purchase more.

	country character varying (50)	country_spend bigint	twitter bigint	instagram bigint	facebook bigint
1	Spain	547652	65	59	55
2	South Africa	169656	20	17	17
3	Canada	140362	13	23	21
4	Australia	65619	9	11	8
5	India	61017	12	7	6
6	Germany	58113	5	9	8
7	USA	57044	9	7	5
8	Montenegro	1258	0	0	0

Figure. 23

	marital_status character varying (50) 🔒	twitter bigint 🔒	instagram bigint 🔒	facebook bigint 🔒
1	Together	31	32	29
2	Married	57	56	52
3	Divorced	14	8	9
4	Single	27	32	26
5	Widow	4	5	4

Figure. 24

Figure 23 shows the lead conversions from different social media compared to the total purchases in different countries. We can see Twitter has been the most effective in Spain, South Africa, India and USA. Additionally, social media has not affected the market in Montenegro.

In Figure 24, the different social media channels have approximately the same influence as each other.

Recommendations

An area of great interest to 2Market is Spain, as they have nearly half the total purchases of the entire customer population. We know that alcohol and meat are consistently among the top 2 total purchases, which may be an indication that the customers prefer these products over their competitors alternatives. We also know that Twitter is the most effective form of social media. The marketing team can use this to tailor more Twitter ads to the Spanish market. Moreover, the same principle can be used to try and gain outreach in other markets, such as Montenegro. Alcohol and meat could feature more often in the advertising to entice more customers to register with 2Market.

Family packages could also be considered in the marketing. We also know that 2Market is less popular for bigger families. To incentivise more people to register and buy more products, 2Market can sell package deals or 'family size' versions of their products. For example, deals on meat hampers.

Appendix

d	$65,504.00	0	0	1/29/14	0	769	80	252	15	34	65	1	10	7	0	1	0	C
ner	$44,931.00	0	1	1/18/14	0	78	0	11	0	0	7	1	2	3	5	0	0	S
d	$65,324.00	0	1	11/1/14	0	384	0	102	21	32	5	3	6	9	4	0	0	U
d	$65,324.00	0	1	11/1/14	0	384	0	102	21	32	5	3	6	9	4	0	0	I
d	$81,044.00	0	0	12/27/13	0	450	26	535	73	98	26	1	5	10	1	0	0	U
ner	$62,499.00	1	0	9/12/13	0	140	4	61	0	13	4	2	3	6	4	0	0	S
v	$67,786.00	0	0	7/12/13	0	431	82	441	80	20	102	1	3	6	1	1	0	I
d	$26,872.00	0	0	10/16/13	0	3	10	8	3	16	32	1	1	2	6	0	0	C
d	$4,428.00	0	1	5/10/13	0	16	4	12	2	4	321	0	25	0	1	0	0	S
d	$54,809.00	1	1	11/9/13	0	63	6	57	13	13	22	4	2	5	4	0	0	S
d	$54,809.00	1	1	11/9/13	0	63	6	57	13	13	22	4	2	5	4	1	0	S
ed	$32,173.00	0	1	1/8/13	0	18	0	2	0	0	2	1	1	3	4	0	0	S
	$47,823.00	0	1	7/23/13	0	53	1	5	2	1	10	2	2	3	8	0	0	C
	$30,523.00	2	1	1/7/13	0	5	0	3	0	0	5	1	1	2	7	0	0	C
ner	$36,634.00	0	1	5/28/13	0	213	9	76	4	3	30	3	5	5	7	0	0	S
	$43,456.00	0	1	3/26/13	0	275	11	68	25	7	7	3	5	8	5	0	0	I
d	$40,662.00	1	0	3/15/13	0	40	2	23	0	4	23	2	2	3	4	0	0	C
d	$49,544.00	1	0	12/2/13	0	308	0	73	0	0	23	2	5	8	7	0	0	S
	$57,731.00	0	1	11/23/12	0	266	21	300	65	8	44	4	8	6	6	0	0	I
	$33,168.00	0	1	10/13/12	0	80	1	37	0	1	3	3	2	4	7	0	0	S
ner	$54,450.00	1	1	9/14/12	0	454	0	171	8	19	32	12	9	8	8	0	0	S
ner	$54,450.00	1	1	9/14/12	0	454	0	171	8	19	32	12	9	8	8	0	0	S
v	$35,340.00	1	1	6/29/14	1	27	0	12	0	1	5	2	2	3	5	0	0	S
	$73,170.00	0	0	5/31/14	1	184	174	256	50	30	32	1	5	6	2	0	0	C

Figure. 1

G enho	H Sum_K	I Dt_Custom	J Recenc	K AmtLiq	L AmtVe	Amt
0	0	6/16/14	0	189	104	
0	0	6/15/14	0	464	5	
1	1	5/13/14	0	134	11	
1	2	11/5/14	0	10	0	
0	1	8/4/14	0	6	16	
0	0	3/17/14	0	336	130	
0	0	1/29/14	0	769	80	
1	1	1/18/14	0	78	0	
0	0	12/27/13	0	450	26	
0	1	9/12/13	0	140	4	
0	0	7/12/13	0	431	82	
0	0	10/16/13	0	3	10	
1	1	5/10/13	0	16	4	
1	1	1/8/13	0	18	0	
1	1	7/23/13	0	53	1	
1	3	1/7/13	0	5	0	
1	1	5/28/13	0	213	9	
1	1	3/26/13	0	275	11	
0	1	3/15/13	0	40	2	

Figure. 2

Figure. 3

	Age			Sum_Kid_Teen			Sum_Purchases	
1	Age			Sum_Kid_Teen			Sum_Purchases	
2	Mean	53.26101		Mean	0.950991		Mean	607.4791
3	Standard Error	0.281088		Standard Error	0.017406		Standard Error	14.14746
4	Median	52		Median	1		Median	396
5	Mode	46		Mode	1		Mode	55
6	Standard Deviation	11.97845		Standard Deviation	0.741764		Standard Deviation	602.8878
7	Sample Variance	143.4833		Sample Variance	0.550214		Sample Variance	363473.8
8	Kurtosis	1.058491		Kurtosis	-0.21665		Kurtosis	-0.36449
9	Skewness	0.415971		Skewness	0.40279		Skewness	0.859089
10	Range	103		Range	3		Range	2519
11	Minimum	26		Minimum	0		Minimum	5
12	Maximum	129		Maximum	3		Maximum	2524
13	Sum	96722		Sum	1727		Sum	1103182
14	Count	1816		Count	1816		Count	1816
15								

Figure. 4

Z	AA	AB	AC	A
cess	Recency Max			
	99			

Figure. 5

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```sql
 1  -- Create the tables
 2  --1st table: marketing data
 3
 4  create table marketing_data_cleaned (
 5  ID integer primary key,
 6  Year_Birth integer,
 7  Age integer,
 8  Marital_Status varchar(50),
 9  Income integer,
10  Kidhome integer,
11  Teenhome integer,
12  Sum_Kid_Teen integer,
13  Recency integer,
14  AmtLiq integer,
15  AmtVege integer,
16  AmtMeat integer,
17  AmtFish integer,
18  AmtChocolates integer,
19  AmtComm integer,
20  Sum_Purchases integer,
21  NumDeals integer,
22  NumWebBuy integer,
23  NumWalkinPur integer,
24  NumVisits integer,
25  Response boolean,
26  Complain boolean,
27  Country varchar(50),
28  Count_Success integer);
29
```

Figure. 6

```sql
29
30  --2nd table: ad data
31  create table ad_data_cleaned (
32  ID integer primary key,
33  Bulkmail_ad boolean,
34  Twitter_ad boolean,
35  Instagram_ad boolean,
36  Facebook_ad boolean,
37  Brochure_ad boolean);
38  */
```

Figure. 7

```
39
40   --Update country names
41   update "marketing_data_cleaned"
42   set "country" = replace("country", 'AUS', 'Australia');
43
44   update "marketing_data_cleaned"
45   set "country" = replace("country", 'CA', 'Canada');
46
47   update "marketing_data_cleaned"
48   set "country" = replace("country", 'GER', 'Germany');
49
50   update "marketing_data_cleaned"
51   set "country" = replace("country", 'IND', 'India');
52
53   update "marketing_data_cleaned"
54   set "country" = replace("country", 'ME', 'Montenegro');
55
56   update "marketing_data_cleaned"
57   set "country" = replace("country", 'SA', 'South Africa');
58
59   update "marketing_data_cleaned"
60   set "country" = replace("country", 'SP', 'Spain');
61
62   update "marketing_data_cleaned"
63   set "country" = replace("country", 'US', 'USA');
64   */
```

Figure. 8

```
93   --Remove #N/A from marketing data table
94   delete from "marketing_data_cleaned"
95   where "marital_status" = '#N/A';
96   */
```

Figure. 9

```
121  select "country",
122  conversion,
123  sum(bulkmail + twitter + instagram + facebook + brochure),
124  bulkmail,
125  twitter,
126  instagram,
127  facebook,
128  brochure
129  from (
130      select mar."country",
131      sum(mar."sum_purchases") as country_spend,
132      sum((mar."count_success")::int) as conversion,
133      sum((ad."bulkmail_ad")::int) as bulkmail,
134      sum((ad."twitter_ad")::int) as twitter,
135      sum((ad."instagram_ad")::int) as instagram,
136      sum((ad."facebook_ad")::int) as facebook,
137      sum((ad."brochure_ad")::int) as brochure
138      from public."marketing_data_cleaned" mar
139      inner join public."ad_data_cleaned" ad using ("id")
140      group by mar."country"
141      ) as a
142  group by a."country",
143  a.conversion,
144  a.bulkmail,
145  a.twitter,
146  a.instagram,
147  a.facebook,
148  a.brochure,
149  a.country_spend
150  order by country_spend desc;
151
```

Figure. 10

	country character varying (50) 🔒	conversion 🔒 bigint	sum 🔒 numeric	bulkmail 🔒 bigint	twitter 🔒 bigint	instagram 🔒 bigint	facebook 🔒 bigint	brochure 🔒 bigint
1	Spain	301	259	69	65	59	55	11
2	South Africa	67	78	23	20	17	17	1
3	Canada	71	78	19	13	23	21	2
4	Australia	23	37	6	9	11	8	3
5	India	31	35	6	12	7	6	4
6	Germany	32	31	8	5	9	8	1
7	USA	21	30	6	9	7	5	3
8	Montenegro	0	0	0	0	0	0	0

Figure. 11

```
65   --How much does each country spend?
66
67   select "country",
68   country_spend,
69   to_char(country_spend*100/sum(country_spend) over(), 'fm00D00') as percent
70   from (
71       select "country",
72       sum("sum_purchases") as country_spend
73       from public."marketing_data_cleaned"
74       group by "country"
75       order by country_spend desc
76       ) as c;
```

Figure. 12

```
78   --How much does each country spend on each product?
79
80   select "country",
81   sum("amtliq") as liq,
82   sum("amtvege") as veg,
83   sum("amtmeat") as meat,
84   sum("amtfish") as fish,
85   sum("amtchocolates") as choc,
86   sum("amtcomm") as comm
87   from public."marketing_data_cleaned"
88   group by "country"
89   order by sum("sum_purchases") desc;
90   */
```

Figure. 13

```
--Which products are the most popular based on marital status?
select "marital_status",
sum("amtliq") as liq,
sum("amtvege") as veg,
sum("amtmeat") as meat,
sum("amtfish") as fish,
sum("amtchocolates") as choc,
sum("amtcomm") as comm
from public."marketing_data_cleaned"
group by "marital_status";
*/
```

Figure. 14

```
100  */
107  --Which products are the most popular depending on how many kids are at home?
108
109  select "sum_kid_teen",
110  sum("amtliq") as liq,
111  sum("amtvege") as veg,
112  sum("amtmeat") as meat,
113  sum("amtfish") as fish,
114  sum("amtchocolates") as choc,
115  sum("amtcomm") as comm
116  from public."marketing_data_cleaned"
117  group by "sum_kid_teen";
118  */
```

Figure. 15

```
---      /
152  --Which social media platform is the most effective per country?
153
154  select "country",
155  twitter,
156  instagram,
157  facebook
158  from (
159      select mar."country",
160      sum(mar."sum_purchases") as country_spend,
161      sum((ad."twitter_ad")::int) as twitter,
162      sum((ad."instagram_ad")::int) as instagram,
163      sum((ad."facebook_ad")::int) as facebook
164      from public."marketing_data_cleaned" mar
165      inner join public."ad_data_cleaned" ad using ("id")
166      group by mar."country") as a
167      order by country_spend desc;
168  */
```

Figure. 16

```
---
170  --Which social media platforms are associated with the highest sales per country?
171  select mar."country",
172  sum(mar."sum_purchases") as country_spend,
173  sum((ad."twitter_ad")::int) as twitter,
174  sum((ad."instagram_ad")::int) as instagram,
175  sum((ad."facebook_ad")::int) as facebook
176  from public."marketing_data_cleaned" mar
177  left join public."ad_data_cleaned" ad using ("id")
178  group by mar."country"
179  order by country_spend desc;
180  */
```

Figure. 17

```
181   --Which marketing channel is the most effective based on marital status?
182
183   select mar."marital_status",
184   sum((ad."twitter_ad")::int) as twitter,
185   sum((ad."instagram_ad")::int) as instagram,
186   sum((ad."facebook_ad")::int) as facebook
187   from public."marketing_data_cleaned" mar
188   left join public."ad_data_cleaned" ad using ("id")
189   group by mar."marital_status";
190   */
```

Figure.18

	country character varying (50)	country_spend bigint	percent text
1	Spain	547652	49.75
2	South Africa	169656	15.41
3	Canada	140362	12.75
4	Australia	65619	05.96
5	India	61017	05.54
6	Germany	58113	05.28
7	USA	57044	05.18
8	Montenegro	1258	00.11

Figure.19

	country character varying (50)	liq bigint	veg bigint	meat bigint	fish bigint	choc bigint	comm bigint
1	Spain	278541	23361	149134	32912	25378	38326
2	South Africa	84811	7213	47206	11064	7279	12083
3	Canada	71625	6473	38146	7899	6557	9662
4	Australia	31892	2952	17239	4553	3292	5691
5	India	29590	2759	18440	3422	2386	4420
6	Germany	29746	2485	16002	3694	2095	4091
7	USA	25983	2714	18025	3725	2520	4077
8	Montenegro	420	0	452	182	64	140

Figure.20

	marital_status character varying (50)	liq bigint	veg bigint	meat bigint	fish bigint	choc bigint	comm bigint
1	Together	144412	11955	79400	17138	12151	19195
2	Married	212105	19074	121007	28343	19567	29551
3	Divorced	56488	5066	30745	6475	5029	9053
4	Single	120009	10328	62575	13256	10770	18061
5	Widow	19594	1534	10917	2239	2054	2630

Figure. 21

Data Output   Messages   Notifications

	sum_kid_teen integer	liq bigint	veg bigint	meat bigint	fish bigint	choc bigint	comm bigint
1	0	253244	26896	191653	38222	27331	32018
2	1	245226	18023	93062	25015	19032	36962
3	3	6421	287	2561	220	246	764
4	2	47717	2751	17368	3994	2962	8746

Figure. 22

	country character varying (50)	country_spend bigint	twitter bigint	instagram bigint	facebook bigint
1	Spain	547652	65	59	55
2	South Africa	169656	20	17	17
3	Canada	140362	13	23	21
4	Australia	65619	9	11	8
5	India	61017	12	7	6
6	Germany	58113	5	9	8
7	USA	57044	9	7	5
8	Montenegro	1258	0	0	0

Figure. 23

	marital_status character varying (50)	twitter bigint	instagram bigint	facebook bigint
1	Together	31	32	29
2	Married	57	56	52
3	Divorced	14	8	9
4	Single	27	32	26
5	Widow	4	5	4

Figure. 24