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Write your answers below and paste the formulas you used to solve the problems, if applicable.

**Customers**

1. What’s the average amount of your customers’ yearly income?

Formula used: =AVERAGE(customer!B:B)

Answer:$151551.3527

2. What’s the most common marital status of your customers?

Formulas used:

=COUNTIF(Table1[Divorced],$R$4)

=INDEX(S3:W3,MATCH(MAX(S4:W4),S4:W4,0))

Answer: Married (860)

3. What’s the most common educational level? What’s the least common?

Formulas used:

=COUNTIF(Table1[Basic],$R$8)

=INDEX($S$7:$V$7,MATCH(MAX($S$8:$V$8),$S$8:$V$8,0)) =INDEX($S$7:$V$7,MATCH(MIN($S$8:$V$8),$S$8:$V$8,0))

Answers: The most common: Graduate (1122) and the least common: Basic (54)

4. What’s the oldest age of your customers? What is the youngest? How about the average? Are there any concerns with the data?

Formulas used:

1. =MAX(customer!E:E)
2. =MIN(customer!E:E)
3. =AVERAGE(customer!E:E)

Answers:

1. 80
2. -65
3. 50.99189🡪51
4. Yes, The concern is that we are facing the challenge of an aging population, where the number of elderly people exceeds that of the younger generation, potentially leading to a decline in purchasing power and the data is not clean; the age contains a negative value .

5. Do customer households tend to have more kids or teenagers?

Formulas used: =IF(SUM(C2:C2221)=MAX(SUM(C2:C2221),SUM(D2:D2221)),"Kids","Teens")

Answers: Households tend to have more **teenagers** (1127.5)

6. Based on your understanding of the customer data, how would you describe the typical customer for your company?

Answer: Based on the available data, the typical customer is someone in their early 50s, married with children (most of whom are teenagers), holds a university degree, and earns an income of around $150,000.

**Products**

7. Which product generates the most sales?

Formulas: =XLOOKUP(MAX(SUM(C2:C2221),SUM(D2:D2221),SUM(E2:E2221),SUM(F2:F2221),SUM(G2:G2221)),C2223:G2223,C2222:G2222,"NF",0)

Answers: Teas(1,734,336)

8. Do customers buy more standard or premium products?

Formulas: =IF(SUM(I2:I2221)>SUM(H2:H2221),"Standard","premium")

Answers: Standard /Regular product (2,961,904)

9. What is the distribution of sales by distribution channel?

Formulas:

=SUM(Table1[[#All],[Website]])/SUM(Table1[[#All],[Catalog]],Table1[[#All],[Store]],Table1[[#All],[Website]])

=SUM(Table1[[#All],[Catalog]])/SUM(Table1[[#All],[Catalog]],Table1[[#All],[Store]],Table1[[#All],[Website]])

=SUM(Table1[[#All],[Store]])/SUM(Table1[[#All],[Catalog]],Table1[[#All],[Store]],Table1[[#All],[Website]])

Answers:

**Website**: 9,108 🡪32.67%

**Catalog**: 5,862.2🡪21.03%

**Store**: 12,905🡪46.30%

10. What's the average time since the last purchase?

Formula: =AVERAGE(B:B)

Answer: 49.02 days

11. Based on your understanding of the sales data, do you have an idea of what products the company may want to focus on?

Answer: They should focus on teas products or The company need to focus on four low-selling products categories **sweets, fruits, seafood and premium items** and try to increase sales.

**Marketing**

1.The ID column is Ranked / Sort from lowest to highest

2. use Formula =VLOOKUP($A1;'marketing (1)'!A1:I2221;5;FALSE)/=VLOOKUP($A1;[sales\_update.csv]sales\_update!$A$1:$N$2221;11;FALSE)/=VLOOKUP($A1;'[customer (1).csv]customer (1)'!$A$2:$O$2221;2;FALSE)

Or we can format each sheet to table and then sort it by the ID then copy them in one sheet.

12. Which campaigns generated the most and least interest?

Formulas: =INDEX(AC1:AG1,1,MATCH(MAX(SUM(AC2:AC2221),SUM(AD2:AD2221),SUM(AE2:AE2221),SUM(AF2:AF2221),SUM(AG2:AG2221)),AC2222:AG2222,0))

=INDEX(AC1:AG1,1,MATCH(MIN(SUM(AC2:AC2221),SUM(AD2:AD2221),SUM(AE2:AE2221),SUM(AF2:AF2221),SUM(AG2:AG2221)),AC2222:AG2222,0))

Answers: The most campaigns generated interest are 3 and 4(165) and the least is 2(30)

13. For campaign 4, what is the typical marital status of a customer?

Formulas: =SUMIF(Table1[[#All],[MC4]],"=1",Table1[[#All],[Married]])

=SUMIF(Table1[[#All],[MC4]],"=1",Table1[[#All],[Divorced]]) =SUMIF(Table1[[#All],[MC4]],"=1",Table1[[#All],[Single]]) =SUMIF(Table1[[#All],[MC4]],"=1",Table1[[#All],[Together]]) =SUMIF(Table1[[#All],[MC4]],"=1",Table1[[#All],[Widow]])

Or

=IF(COUNTIF(AL2#;"Divorced")=MAX(COUNTIF(AL2#;"Divorced");COUNTIF(AL2#;"Marriad");COUNTIF(AL2#;"Single");COUNTIF(AL2#;"Together");COUNTIF(AL2#;"Widowed"));"Divorced";IF(COUNTIF(AL2#;"Marriad")=MAX(COUNTIF(AL2#;"Divorced");COUNTIF(AL2#;"Marriad");COUNTIF(AL2#;"Single");COUNTIF(AL2#;"Together");COUNTIF(AL2#;"Widowed"));"Marriad";IF(COUNTIF(AL2#;"Single")=MAX(COUNTIF(AL2#;"Divorced");COUNTIF(AL2#;"Marriad");COUNTIF(AL2#;"Single");COUNTIF(AL2#;"Together");COUNTIF(AL2#;"Widowed"));"Single";IF(COUNTIF(AL2#;"Together")=MAX(COUNTIF(AL2#;"Divorced");COUNTIF(AL2#;"Marriad");COUNTIF(AL2#;"Single");COUNTIF(AL2#;"Together");COUNTIF(AL2#;"Widowed"));"Together";"Widowed"))))

Answer: Married (62)

14. For campaign 2, what product category sold the most? *(Note: Premium & Regular are product quality categories and not separate product categories. Do not directly use in your calculations for this question.)*

Formulas: =IF(MAX(Q2222:U2222)=SUM(Q2:Q2221),"Teas",IF(MAX(Q2222:U2222)=SUM(R2:R2221),"Fruits",IF(MAX(Q2222:U2222)=SUM(S2:S2221),"Meats",IF(MAX(Q2222:U2222)=SUM(T2:T2221),"Seafood","Sweets"))))

OR

=SUMIF(Table1[[#All],[MC2]],"=1",Table1[[#All],[Teas]]), =SUMIF(Table1[[#All],[MC2]],"=1",Table1[[#All],[Meats]]), =SUMIF(Table1[[#All],[MC2]],"=1",Table1[[#All],[Fruits]]), =SUMIF(Table1[[#All],[MC2]],"=1",Table1[[#All],[Sweets]]), =SUMIF(Table1[[#All],[MC2]],"=1",Table1[[#All],[Seafood]])

Answer: Teas (65,527)

15. What level of education do customers have who typically complain?

Formulas: =IF(COUNTIF(AM2#;"Basic")=MAX(COUNTIF(AM2#;"Basic");COUNTIF(AM2#;"Master");COUNTIF(AM2#;"PhD");COUNTIF(AM2#;"Graduate"));"Basic";IF(COUNTIF(AM2#;"Mster")=MAX(COUNTIF(AM2#;"Basic");COUNTIF(AM2#;"Master");COUNTIF(AM2#;"PhD");COUNTIF(AM2#;"Graduate"));"Master";IF(COUNTIF(AM2#;"PhD")=MAX(COUNTIF(AM2#;"Basic");COUNTIF(AM2#;"Master");COUNTIF(AM2#;"PhD");COUNTIF(AM2#;"Graduate"));"PhD";"Graduate")))

OR

=SUMIF(Table1[[#All],[Complaint]],"=1",Table1[[#All],[Basic]]), =SUMIF(Table1[[#All],[Complaint]],"=1",Table1[[#All],[Graduate]]), =SUMIF(Table1[[#All],[Complaint]],"=1",Table1[[#All],[Master]]), =SUMIF(Table1[[#All],[Complaint]],"=1",Table1[[#All],[PhD]])

Answers: Graduate (14)

16. What additional information would you need to better understand the success or failure of the company's marketing campaigns? (*This could be formulas, or suggestions for other types of data to collect.)*

Answers:

* How much the campaigns cost? And revenue generated by each campaign.
* **Speed ​​of solving problems:**  
  1. **Measure the time it takes the company to respond to and resolve complaints**  
  2. **Reasons for complaints.- Classification of complaints according to:**
* **Product problems.**
* **Delays or errors in delivery.**
* **Objections to prices.**
* **Complaints related to the quality of service.**

**- Regarding geographical areas**:

* **Identify the areas that witnessed the most successful deals.**

**- For the age groups of children and adolescents:**

* **Age analysis (for example, 5-10 for kids, 11-18 for teens) Identify the most attractive products or offers for each age group.**

Bonus Question (Optional):

A. Write a small paragraph that explains the difference between quantitative data and qualitative data in your own words.

Quantitative = Quantity

Quantitative data is numerical and can be measured or counted. It answers questions such as "how much," "how many," or "to what extent." This type of data allows for statistical analysis and can be represented graphically through charts or graphs.

Qualitative = Quality

Qualitative data, in contrast, is descriptive and non-numerical. It provides insights into the underlying reasons behind behaviors or trends, answering questions like "why" or "how." This type of data is often derived from:

* **Customer feedback**: Open-ended survey responses detailing user experiences.
* **Interviews**: Conversations with customers to understand their perceptions.
* **Observational notes**: Insights gathered from watching user interactions with a product.

B. Using the website www.kaggle.com, find a business problem that is interesting to you and review the quantitative data provided to be analyzed. Can you differentiate the quantitative data from the qualitative data the business may have also used? Be inspired by MP1 questions and try to do the same thing with your new dataset.

Given the tables you have been provided, what type of analysis do you foresee performing that will help you inform management as to the next steps to improve business results?

C. In addition to the data you have been provided in this case, is there additional information you believe would be helpful in your analysis that has not been provided to you?

D. As a data analyst, your job is to be the subject matter expert in data analytics; however, you also need to understand how your business performs and the objectives of management. If you were part of the management team asking a business analyst to solve this business problem, what are the questions you would ask of your data scientists, and what deliverables would you expect from them?