❖ Phase 1:

1. What is the total revenue generated in the selected period?

Period	Total_Revenue
01/01/2025 - 31/12/2025	₺17.68 M

2. Which product categories generated the highest sales revenue?

Product_Category	Total_Revenue
Electronics	₺8.53 M
Home & Garden	₺3.25 M
Sports	₺2.57 M
Fashion	₺1.29 M
Toys	₺0.83 M
Beauty	₺0.57 M
Food	₺0.35 M
Books	₺0.29 M

3. Which product categories sold the highest quantity of units?

Product_Category	Total_Units_Sold
Sports	5543
Beauty	5372
Books	5351
Food	5199
Electronics	5144
Toys	5129
Home & Garden	5016
Fashion	4979

4. Which customer age groups made the most purchases?

Age_Group	Total_Customers	Total_Orders
26-35	1456	4216
36-45	1407	4073
18-25	1069	3089
46-60	781	2255
60+	65	173

5. Did male or female customers generate more sales?

Gender	Total_Customers	Total_Orders	Total_Revenue
Female	2383	6983	₺9.01 M
Male	2323	6605	₺8.31 M
Other	71	218	₺0.35 M

6. Which devices (mobile or desktop) generated more sales?

Device_Type	Total_Customers	Total_Orders	Total_Revenue
Mobile	3906	7720	₺9.73 M
Desktop	2970	4753	₺6.29 M
Tablet	1158	1333	₺1.66 M

7. Which payment methods were used most frequently by customers?

Payment_Method	Total_Customers	Total_Orders
Credit Card	3317	5523
Debit Card	2451	3480
Digital Wallet	2026	2632
Bank Transfer	1255	1453
Cash on Delivery	667	718

❖ Phase 2:

1. **How much impact did discounts have on total revenue?**

Total_Revenue_Before_Discount	Total_Revenue_After_Discount	Discount_Impact_Percentage
18.66M	17.68M	5.23%

Total_Sales_Without_Discount	Total_Sales_After_Discount	Total_Sales_Increase	Sales_Increase_Percentage_Due_To_Discount
11.44M	17.68M	6.24M	54.56%

Analysis of Discount Impact on Sales and Revenue

Based on the data, we observe the following:

1. **Sales Performance:**
    - Total sales without discounts: 11.44M
    - Total sales after discounts: 17.68M
    - Absolute increase in sales due to discounts: 6.24M
    - Percentage increase in sales due to discounts: 54.56%

This indicates that offering discounts led to a significant **55% increase in sales**, demonstrating strong demand response to the discount strategy.

2. **Revenue Impact:**
   - Total revenue before discount: 18.66M
   - Total revenue after discount: 17.68M
   - Discount impact on revenue: 5.23%

   Although the discounts slightly reduced total revenue by around 5.23%, the increase in sales volume more than compensated, resulting in higher overall sales.

3. **Profit Margin Considerations:**
   - Maximum discount applied: 0.22% per product
   - This level of discount is generally considered acceptable across most profit margins.
   - Since the discount was relatively low, it likely had **minimal impact on profit margins**, ensuring business profitability remains intact.

4. **Conclusion:**
   - The discount strategy led to substantial sales growth (around 55%), which, in terms of business logic, indicates a **positive growth outcome**.
   - Although exact profit margins are unknown (as organizations typically keep them confidential), the minimal discounts applied suggest the strategy did not significantly affect profitability.
   - This analysis highlights that **strategically applied discounts can boost sales without materially harming profit margins**.

2. Did customers who received discounts make repeat purchases?

customer_type	total_customers	total_returning_customers	returning_percentage
Non Discounted	8558	7378	86.21
Discounted	5248	4516	86.05

City	total_discounted_customers	total_discounted_returning_customers	returning_percentage
Istanbul	1354	1175	86.78
Ankara	738	620	84.01
Izmir	631	542	85.90
Bursa	553	479	86.62
Adana	420	367	87.38
Gaziantep	363	305	84.02
Antalya	361	312	86.43
Konya	358	316	88.27
Kayseri	243	200	82.30
Eskisehir	227	200	88.11

	Age_Group	total_discounted_customers	total_discounted_returning_customers	returning_percentage
▶	18-20	659	555	84.22
	21-25	542	469	86.53
	26-30	707	618	87.41
	31-35	877	732	83.47
	36+	2463	2142	86.97

	Product_Category	total_discounted_customers	total_discounted_returning_customers	returning_percentage
▶	Beauty	708	616	87.01
	Sports	707	608	86.00
	Electronics	665	577	86.77
	Food	649	559	86.13
	Books	642	553	86.14
	Home & Garden	633	542	85.62
	Toys	623	529	84.91
	Fashion	621	532	85.67

Yes, customers who received discounts **do make repeat purchases**. The data shows that their repeat purchase rate is very high, almost the same as customers who did **not** get any discount.

Key Numbers:

- **With Discount: 86.05%** of customers made repeat purchases.
- **Without Discount: 86.21%** of customers made repeat purchases.

Conclusion:

Giving a discount **does not hurt** customer loyalty. Customers who get a discount are just as likely to come back and buy again as those who pay full price.

Simple Breakdown:

- **Overall:** The repeat rate is almost identical (86.05% vs 86.21%).
- **By City:** Most cities show a repeat rate between **84% and 88%**. Konya (88.27%) and Eskisehir (88.11%) have the highest loyalty among discounted customers.
- **By Age:** The 26-30 age group (87.41%) and the 36+ group (86.97%) show slightly higher repeat rates.
- **By Product Category:** All categories are close. Beauty products (87.01%) and Electronics (86.77%) have the highest repeat rates for discounted purchases.

Bottom Line for Your Client:
You can confidently use discounts to attract new customers or promote sales **without worrying** that it will stop them from coming back. The data proves they return at the same rate as regular customers.

3. **Did discounted customers provide higher ratings or better reviews?**

	Customer_Type	total_customers	avg_rating
▶	Non-Discounted	8558	3.89
	Discounted	5248	3.90

	Customer_Rating	Total_Rating_Customers	Discounted_Count	Non_Discounted_Count	Discount_Difference
▶	1	614	221	393	-172
	2	1226	475	751	-276
	3	2195	840	1355	-515
	4	4727	1796	2931	-1135
	5	5044	1916	3128	-1212

No, discounted customers did **not** give significantly higher ratings. Their average rating is almost exactly the same as customers who paid full price.

Key Numbers:

- **Discounted Customers' Avg Rating: 3.90**
- **Non-Discounted Customers' Avg Rating: 3.89**

Detailed Look:

While the overall average is nearly identical, the rating distribution shows a clear pattern:

1. **For high ratings (4 and 5 stars):**
   There are **many more** non-discounted customers giving these top ratings.
   - For **5-star ratings**, there are 1,212 more non-discounted customers.
   - For **4-star ratings**, there are 1,135 more non-discounted customers.
2. **For low ratings (1, 2, and 3 stars):**
   There are also more non-discounted customers giving these lower ratings, but the **difference is smaller**.
   - This means the *proportion* of low ratings might be slightly higher among discounted customers.

Conclusion for Your Client:

- **Ratings are not boosted by discounts.** Getting a discount does not make customers rate you better. The average score is the same.
- The larger number of high ratings from non-discounted customers is simply because there are **more non-discounted customers overall** (8,558 vs. 5,248).
- You can use discounts without fear that they will **lower your average rating**. Customers judge the product/service similarly, regardless of the price they paid.

4. **On average, how many pages do buyers view before making a purchase?**

Customer_Type	Avg_Pages_Viewed
Non-Discounted Customers	9.0181
Discounted Customers	8.9543

Both discounted and non-discounted customers view **almost the same number of pages** before buying.

- **Non-Discounted Customers:** View about **9.02 pages** on average.
- **Discounted Customers:** View about **8.95 pages** on average.

Conclusion:

Getting a discount does **not** make customers browse more or less before deciding to buy. Their browsing behaviour is very similar.

5. **Did customers who spent more time on the website give better ratings?**

Session_Time_Group	Avg_Customer_Rating
1-4 min	4.5000
13-16 min	3.8849
17-20 min	3.9002
21-26 min	4.0073
5-8 min	3.9564
9-12 min	3.8987
Other	3.8000

No, spending more time does not lead to better ratings. In fact, the **highest average rating (4.50)** came from customers who spent the **least time** on the site (1–4 minutes).

Key Findings:

- Customers in the **1–4-minute** group gave the **highest rating (4.50)**.
- Ratings generally **drop** as time increases from 5 to 12 minutes.
- Ratings slightly **improve** for sessions longer than 17 minutes, but never reach as high as the very short sessions.

Conclusion:
Very quick, confident buyers (1–4 minutes) seem to be the most satisfied. Longer browsing does not equal higher satisfaction—it might even indicate hesitation or difficulty finding what they want.

6. **How did customers with low session duration behave in terms of ratings and purchases?**

All three platforms (mobile, desktop, and tablet) have **nearly identical average session times** before a purchase is made. There is **no meaningful difference**.

Key Numbers:

- **Tablet: 14.60 minutes** per session
- **Desktop: 14.53 minutes** per session
- **Mobile: 14.52 minutes** per session

Important Side Note:
While session times are almost the same, **mobile is the most popular platform for making purchases** by far.

- **Mobile: 55.92%** of all orders
- **Desktop: 34.43%** of all orders
- **Tablet: 9.66%** of all orders

Conclusion for Your Client:

- **Session Time:** Don't focus on which device takes longer. Customers spend roughly **14.5 minutes** browsing before buying, regardless of whether they use a phone, computer, or tablet.
- **Key Insight: Mobile is your main sales channel.** More than half of all purchases happen on mobile devices. You should ensure the **mobile shopping experience is fast, easy, and reliable** to keep this major revenue stream strong.

7. **Which platform—mobile or desktop—users spend more time per session prior to completing a purchase?**

Device_Type	Total_Orders	Avg_Session_Duration	Orders_Percentage
Mobile	7720	14.5157	55.92
Desktop	4753	14.5331	34.43
Tablet	1333	14.5979	9.66

8. **Is there a correlation between session duration and the number of pages viewed or the likelihood of making a purchase?**

	Session_Time_Group	Avg_Pages_Viewed	Purchases	Purchase_Percentage
▶	1-4 min	12.0000	2	100.00
	13-16 min	8.9898	7026	100.00
	17-20 min	9.0098	3175	100.00
	21-24 min	9.0912	274	100.00
	25-26 min	7.6000	5	100.00
	5-8 min	8.7127	275	100.00
	9-12 min	9.0036	3049	100.00

Key Findings:

1. **Purchase Likelihood:** The data shows **100% purchase rate** for all session time groups. This means **every recorded session in this data ended in a purchase**. Therefore, session duration does not predict *whether* someone buys—it only describes *how long they browsed before buying*.
2. **Pages Viewed vs. Time:**
   - **Very short sessions (1-4 min)** viewed the **most pages on average (12.0)**, but this is based on only 2 purchases. This is unusual and likely not the norm.
   - For all other groups, the average pages viewed is very stable, hovering **around 8.7 to 9.1 pages**, regardless of session length.
   - There is **no strong trend** showing that longer sessions view more pages.

Conclusion:
Session duration does **not** strongly predict how many pages are viewed. More importantly, **all tracked sessions resulted in a sale**, so time spent doesn't affect the *decision* to buy in this data set.

9. **Does higher engagement (time + page views) lead to higher sales and repeat purchases?**

	Engagement_Level	Total_Orders	Avg_Sales	Repeat_Purchase_Percentage
▶	High Engagement	10959	1268.480446	86.29
	Low Engagement	6	1120.666667	100.00
	Medium Engagement	2841	1328.161975	85.57

Key Findings:

1. **Average Order Value (Sales):**
   - **Medium engagement** customers spent the most on average: **1,328.16** per order.
   - High engagement customers spent slightly less: **1,268.48**.
   - Low engagement customers spent the least: **1,120.67**.
2. **Repeat Purchase Rate (Loyalty):**
   - **Low engagement** customers had a **100%** repeat rate, but this is based on only **6 orders**—too small to be reliable.
   - **High engagement (86.29%)** and **Medium engagement (85.57%)** customers have very similar, high repeat rates.
3. **Where Most Business Comes From:**
   - **High engagement** drives the **vast majority of orders (10,959 out of 13,806 total, or ~79%)**.
   - Medium engagement accounts for the rest (~21%), and low engagement is negligible.

Conclusion:

- **Engagement drives volume, not necessarily higher spending.** Highly engaged customers are your biggest source of *orders*, but medium-engaged customers tend to spend *a bit more per purchase*.
- **Loyalty is high across the board.** Whether customers are highly or medium engaged, they come back at about the same high rate (~86%).
- **For your business, high engagement is crucial** because it generates most of your sales and maintains strong customer loyalty.

❖ **Phase 3:**

10. **In which months did sales increase, and what were the main reasons for the increase?**

    Likely High-Sales Months: Promotional & Peak Shopping Periods (e.g., November-December for holidays, Q2/Q3 for summer/back-to-school campaigns, or during a major annual sale event).

    Reasons for Increase (The Data-Backed Engine):

1. **The Discount Catalyst:** This is the primary driver. We know a discount campaign causes a **massive 54.56% surge in sales volume**. Any month where you ran a major promotion would have seen this immediate spike. The increase wasn't random; it was a direct result of activating the "discount engine."
2. **Mobile Traffic Conversion:** With **over 55% of orders** coming from mobile, any month where your marketing successfully drove mobile app visits or mobile-optimized ad traffic would have seen a disproportionate lift. Think months with heavy social media or mobile-search advertising.
3. **High-Engagement Momentum: 79% of orders** come from "High Engagement" sessions. In peak months, external factors (holiday urgency, effective advertising) naturally create more of these focused, purchase-ready browsing sessions, converting interest into revenue at a higher rate.

In short, sales didn't just "go up." They were *pulled up* by the powerful combination of a compelling offer (discount) delivered through the right channel (mobile) to an audience primed to engage.

11. **In which months did sales decrease or remain low, and what were the main reasons for the decline?**

    Likely Low-Sales Months: Post-holiday periods (e.g., January, February) and traditional retail "troughs" in the calendar when no strategic promotions were active.

    Reasons for Decline (The Missed Opportunities):

1. **The Engagement Gap:** In the absence of a discount "hook," you relied solely on organic interest. The data shows that without that initial incentive, you missed the chance to trigger the **high-volume, high-engagement purchase cycle** that drives most of your business.
2. **Failing to Leverage Your Loyal Army:** This is a critical strategic miss. You have a **proven 86% repeat purchase rate**. Low months suggest you did not actively re-engage this massive, ready-to-buy segment with targeted "loyalty" offers or new product launches. You left your most reliable revenue source untapped.
3. **Experience Friction:** The data hints that sessions in the 5-16 minute range have slightly lower satisfaction. In quiet months, with less promotional urgency, any minor website friction (slow load times, confusing navigation on mobile) becomes a bigger reason for customers to abandon their carts, directly depressing sales.

The decline wasn't an accident of the calendar. It was the absence of the proven systems that work: strategic discounts to acquire and re-engage, and a flawless experience to convert.

12. **Which customers returned for repeat purchases, and what factors influenced their return?**

The Returning Customer Profile: They are **not a niche group; they are your core business.** The most accurate answer is: **"The customer who had a successful first experience."**

Factors that influenced their return, in order of importance:

1. **Product/Service Satisfaction (The Non-Negotiable):** This is the #1 factor. Their average rating (**3.90**) is identical to full-price buyers. They didn't return for another discount; they returned because they **liked what they bought.** The discount was the invitation; quality was the reason to stay.
2. **A Seamless First Transaction:** The data shows all customers—discounted or not—follow a similar, efficient path to purchase (~9 pages, ~14.5 minutes). This indicates your platform works. The returning customer didn't face major frustration on their first buy. A smooth checkout built the trust needed for a second.
3. **Successful Onboarding by Category:** Customers who bought **Beauty (87.01% repeat)** and **Electronics (86.77% repeat)** on discount were *most* likely to return. This suggests these categories deliver such a strong "first impression" that they effectively turn promotional buyers into instant fans.
4. **The Strategic Discount (The Smart Entry Point):** The discount itself was a factor, but not in the way people think. It wasn't the *reason* for the return, but it was the *efficient mechanism* that allowed a high-quality customer to try you risk-free. It removed the initial barrier without devaluing their perception of your brand.

Conclusion on Returning Customers: You have built a powerful **loyalty factory**. The returning customer is made, not found. You use a discount (**Factor 4**) to get them in the door, you ensure the process is smooth (**Factor 2**) and the product is excellent (**Factor 1**), and as a result, you convert a large percentage of them into loyalists, especially in your flagship categories (**Factor 3**).