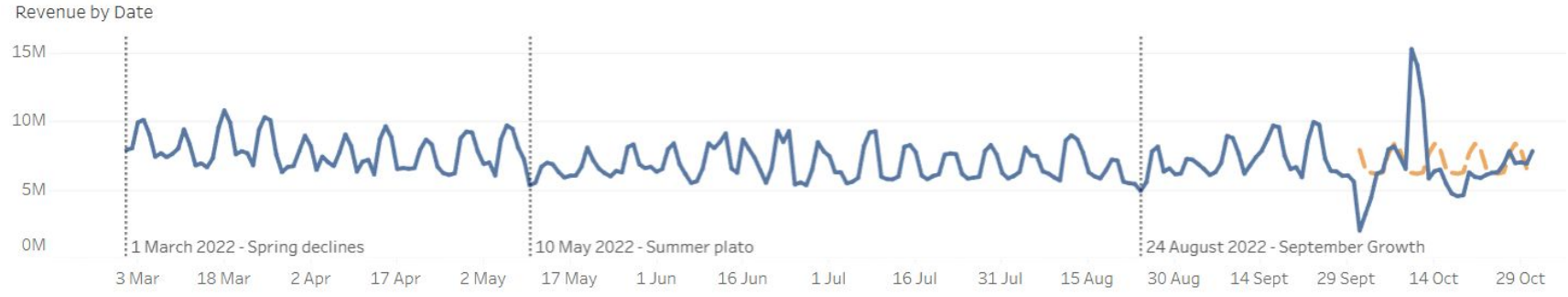
Task 1



Avg Revenue per Day

Period (Task 1)	
After discount	$6.2M
After release	$7.1M
Discount	$13.6M
Release	$3.2M
September	$7.3M
Spring	$7.5M
Summer	$6.8M

Revenue Analysis:

Seasonality: The daily chart shows weekly seasonality. Sales peak on Fridays and Saturdays.

Declines in Spring-Summer Months: During the March-May period, there was a significant drop in revenue (-17.3% in May compared to March). Starting from May 10, 2022, as well as in June, July, and August, there were days when revenue dropped below $5.5M. This can be due to the holiday season, but more detailed information can be obtained from customer analysis and year-over-year analysis.

Growth in September: Starting in late August, there was an increase, with daily revenue typically in the range of $6–$9M.

October:

- A new version of the app was released on **October 1, 2022**. The release was accompanied by a sharp drop in revenue. This could be due to bugs in the app or a sudden change in the user experience. The situation became stable after October 4, 2022.
- From **October 10 to 12, 2022**, users could purchase a subscription at a discount. This decision was likely made to bring customers back to the app and retain them in the product.
- **Since October 13**, average revenue has been below the previous month ($6.2M per day vs $7.3M per day in September). A more detailed analysis can be made after taking into account the annual seasonality effect.
- Overall, **Revenue in October** was in line with the summer months and 2.9% below the baseline forecast.

Task 2

Below is a summary table with A/B test data. We ***assume*** the banner was shown to both groups an equal number of times, meaning that Groups A and B were split 50/50.

As we can see, for the Target group (US), the "Customers" and "Revenue" metrics are higher. This indicates that the target group is more successful.
Using a Python script, we can evaluate whether the test result is significant. $p < 0.001$ means the test result is significant.

We can also check the significance of the test using the following websites:

1. https://abtestguide.com/calc/
2. https://www.evanmiller.org/ab-testing/chi-squared.html

		Country											
		EU			NA			SEA			US		
Period	Group	AVG Revenue	Customers	Revenue	AVG Revenue	Customers	Revenue	AVG Revenue	Customers	Revenue	AVG Revenue	Customers	Revenue
AB test	Control	$ 31.7	6,763	214,595	$ 31.5	6,663	209,691	$ 31.5	6,769	213,194	$ 32.0	6,798	217,350
	Target	$ 31.9	7,911	252,326	$ 31.8	7,901	251,077	$ 31.8	7,912	251,680	$ 31.7	8,008	253,652
after test	Control	$ 31.6	16,505	521,603	$ 31.7	16,698	529,670	$ 31.8	16,491	525,186	$ 31.6	16,660	525,978
	Target	$ 31.5	16,559	521,504	$ 31.5	16,693	525,009	$ 31.6	16,677	527,187	$ 31.6	16,806	531,675
before test	Control	$ 31.7	23,451	742,656	$ 31.8	23,400	743,082	$ 31.7	23,370	741,377	$ 31.9	23,256	741,539
	Target	$ 31.7	23,418	741,371	$ 31.9	23,164	739,880	$ 31.6	23,288	736,643	$ 31.8	23,363	741,862

Task 3

According to the Python calculation script, the LTV24 value equals:

LTV12 = $ 7.62
LTV24 = $ 8.97

Visual interpretation of the calculations is shown below in the following GoggleSheet.

During the calculation process, two options for calculating Retention for each month were considered:
1. The average Retention value for each month across all cohorts
2. A weighted Retention value as the result of dividing sum(Subscribers) by sum(Trial Size) across all cohorts
The second option was selected for the calculation.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
Active	Date	Trial	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24
	4/1/2020	1501	711	437	286	206	142	116	95	78	65	58	47	44	40	36	32	27	21	18	15	14	11	9		
	5/1/2020	1253	544	338	246	178	138	109	89	71	57	49	39	37	31	27	21	19	16	15	15	13	13	0,994		
	6/1/2020	1226	522	319	228	169	133	99	82	72	62	53	49	44	38	35	27	26	25	23	21	19	0,991	0,006		
	7/1/2020	1484	538	297	201	147	112	85	77	64	56	51	49	40	34	33	32	30	23	20	18	0,988	0,009			
	8/1/2020	2009	775	449	317	257	198	170	148	126	99	89	76	67	58	57	51	41	38	36	0,987	0,012				
	9/1/2020	2132	940	580	384	289	225	177	146	125	106	89	70	62	56	47	44	39	37	0,985	0,013					
	10/1/2020	1231	467	279	196	148	103	84	62	53	47	45	39	33	26	23	21	15	0,983	0,015						
	11/1/2020	1035	392	194	128	118	80	65	65	48	44	42	35	31	29	22	20	0,982	0,017							
	12/1/2020	511	241	127	94	87	57	51	47	33	30	28	24	22	20	17	0,979	0,018								
	1/1/2021	2167	756	439	311	244	186	140	119	94	81	75	62	56	51	0,976	0,021									
	2/1/2021	930	367	210	141	117	78	66	65	49	42	40	35	30	0,974	0,024										
	3/1/2021	1140	478	249	168	155	91	86	71	55	54	49	33	0,970	0,026											
	4/1/2021	961	413	190	144	130	80	70	64	46	45	37	0,966	0,030												
	5/1/2021	1018	400	195	144	132	76	74	70	48	37	0,960	0,034													
	6/1/2021	1009	336	178	116	107	66	59	58	36	0,956	0,040														
	7/1/2021	5507	1607	898	631	485	367	298	251	0,949	0,044															
	8/1/2021	15545	4001	2144	1445	1063	840	671	0,940	0,051																
	9/1/2021	4504	1498	859	588	437	343	0,940	0,060																	
	10/1/2021	7335	1598	865	594	439	0,927	0,060																		
	11/1/2021	6890	1806	931	611	0,907	0,073																			
	12/1/2021	1425	711	352	0,883	0,093																				
	1/1/2022	1793	626	0,827	0,117																					
			0,685	0,173																						
		Retention	0,315																							
		Apple Charges	0,7	0,7	0,7	0,7	0,7	0,7	0,7	0,7	0,7	0,7	0,7	0,7	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85
		Month Incom	137950,91	75807,37	51404,42	40929,96	32135,14	26057,82	26305,88	22284,29	19420,80	17556,98	14699,71	13180,22	13994,78	12751,64	11106,18	9664,91	8855,70	7967,52	6713,34	6144,34	4632,84	3187,59	0,00	0,00
		Размер Trial	62606																							
			1st year	2nd year																						
		Incom	477733,50	85018,84																						
		LTV	7,63	1,36																						
		LTV24	8,99																							

Task 4

Events for Amplitude

Minimal set of events in Amplitude would cover the described user flow:

app_install: Track the initial installation of the application. **Properties**: event_id, device_id, device_type, session_id, user_id, timestamp, platform, region, language, app_version.
app_opened: Triggers when the user launches the application. **Properties**: event_id, device_id, device_type, session_id, user_id, timestamp, platform, region, language, app_version.
home_screen_viewed: Log when the user views the main home screen. **Properties**: event_id, device_id, device_type, session_id, user_id, timestamp, platform, region, language, app_version, screen, has_prior_history (boolean), subscription_type.
input_field_tapped: Record when the user taps on the input field. **Properties**: event_id, device_id, device_type, session_id, user_id, timestamp, platform, region, language, app_version, screen, subscription_type, input_method (keyboard, voice, add file).
premium_features_tapped: Record when the user taps on the 'Premium Features' view. **Properties**: event_id, device_id, device_type, session_id, user_id, timestamp, platform, region, language, app_version, screen, subscription_type, premium_feature_id.
get_help_tapped: Record when the user taps on the 'Get Help with Any Task' view. **Properties**: event_id, device_id, device_type, session_id, user_id, timestamp, platform, region, language, app_version, screen, subscription_type, get_help_task_id.
themed_tapped: Record when the user taps on the 'Themed' view. **Properties**: event_id, device_id, device_type, session_id, user_id, timestamp, platform, region, language, app_version, screen, subscription_type, theme_view_id.
model_choose_tapped: Record when the user taps on the model type field. **Properties**: event_id, device_id, device_type, session_id, user_id, timestamp, platform, region, language, app_version, screen, subscription_type, initial_ai_model_type.
back_button_tapped: Record when the user taps on the back button. **Properties**: event_id, device_id, device_type, session_id, user_id, timestamp, platform, region, language, app_version, screen, subscription_type, ai_model_type.
question_sent: Record when the user sends their question to the AI chat. **Properties**: event_id, device_id, device_type, session_id, user_id, timestamp, platform, region, language, app_version, screen, message_length, task_type (work, social media, gaming, health, summarizing, email, generate picture), is_free_mode (boolean), subscription_type, is_file_attached, file_type, file_size, ai_model_type.
answer_received: Log when the AI's response is displayed to the user. **Properties**: event_id, device_id, device_type, session_id, user_id, timestamp, platform, region, language, app_version, screen, response_length, response_time_ms, success_status (success, error, timeout), subscription_type.
error_displayed: If the user receives an error message instead of a response, log this event. **Properties**: event_id, device_id, device_type, session_id, user_id, timestamp, platform, region, language, app_version, screen, error_type (network_error, processing_error), error_message, subscription_type.
answer_action_tapped (optional): If the user copies, shares, or provides feedback on the answer. **Properties**: event_id, device_id, device_type, session_id, user_id, timestamp, platform, region, language, app_version, screen, response_action_type (copy, share, like, compare models), subscription_type.

Task 4

Metrics for the Flow

Key metrics to calculate within this flow are:

Conversion Rate: The percentage of users who visit the home screen (or open the app) and successfully received at least one answer.

Flow Conversion Rate (funnel): The percentage of users who start the flow (home screen view) and drop off at each step of the flow (home screen -> tap input -> send question -> receive answer) to identify bottlenecks and finally successfully receive an answer.

Engagement Rate: The percentage of users who send at least one question to the all number of daily active users.

Average Messages Per Session (or Day): The average number of question_sent events within a single user session (or Day).

Daily active users (DAU): the number of users who trigger a specific event in a day.

Time to Answer: The average time (in milliseconds or seconds) from question_sent to answer_received.

Error Rate: The percentage of question_sent events that result in an error_displayed event.

Time to Message Sent: The average time (in seconds) from the input_field_tapped to question_sent.

Average Message Length: The mean character count of the message_length property to understand user query complexity.

Task 4

Hypothesis & Experiment Design

Hypothesis: Adding a banner on the home screen that allows users to select different AI models with brief feature descriptions will increase user satisfaction, as users feel more control over the application's output and discover advanced functionalities sooner.
Experiment Design (A/B Test)
Target Audience: Users who have opened the app at least once and have a trial subscription.
Groups:
Control Group (Group A - 50% of users): The current home screen layout is maintained, without the AI model selection banner.
Test Group (Group B - 50% of users): A new, tappable AI model selection banner is added below the "Premium Features" section. Tapping this banner opens chat screen as usual.
Randomization: Users are randomly assigned to either Group A or Group B upon their first app launch.
Key Metrics: The percentage of users in each group who successfully trigger the question_sent event (Conversion Rate).
Duration: Run the experiment until statistical significance is achieved. It is better to collection data across different days and times.
Analysis: Compare the conversion rates of the two groups. If Group B has a statistically significant higher conversion rate, the hypothesis is confirmed, and the new design is successful.

Hypothesis: Replacing the empty chat screen with a display of several clickable suggested prompts ('Write a social media post', 'Paraphrase a paragraph', 'Explain a term') will increase the conversion rate for sending the first message, as it reduces 'blank page syndrome' and immediately showcases the app's capabilities.
Experiment Design (A/B Test)
Target Audience: First-time users who have reached the chat screen but have not yet submitted a question.
Groups:
Control Group (Group A - 50% of users): Sees the current empty chat screen or simple input field placeholder (‘Type your message...’).
Test Group (Group B - 50% of users): Sees a redesigned chat screen featuring 3-4 visible, clickable buttons/cards, each with a prompt idea ('Write a social media post', 'Paraphrase a paragraph', 'Explain a term'). Tapping a card pre-fills the input field with the text and moves the cursor to the end of the message.
Randomization: Users are randomly assigned to either Group A or Group B upon their first app launch.
Key Metric: The percentage of users in each group who successfully trigger the question_sent event (Conversion Rate). Secondary metrics include average messages per session and time to first message.
Duration: Run the experiment until statistical significance is achieved. It is better to collection data across different days and times.
Analysis: Compare the conversion rates of the two groups. If Group B has a statistically significant higher conversion rate, the hypothesis is confirmed, and the new design is successful.