

Marketing Data A/B Testing Results

Presented by:

Angin Mgrdunts



The Objective of the Testing

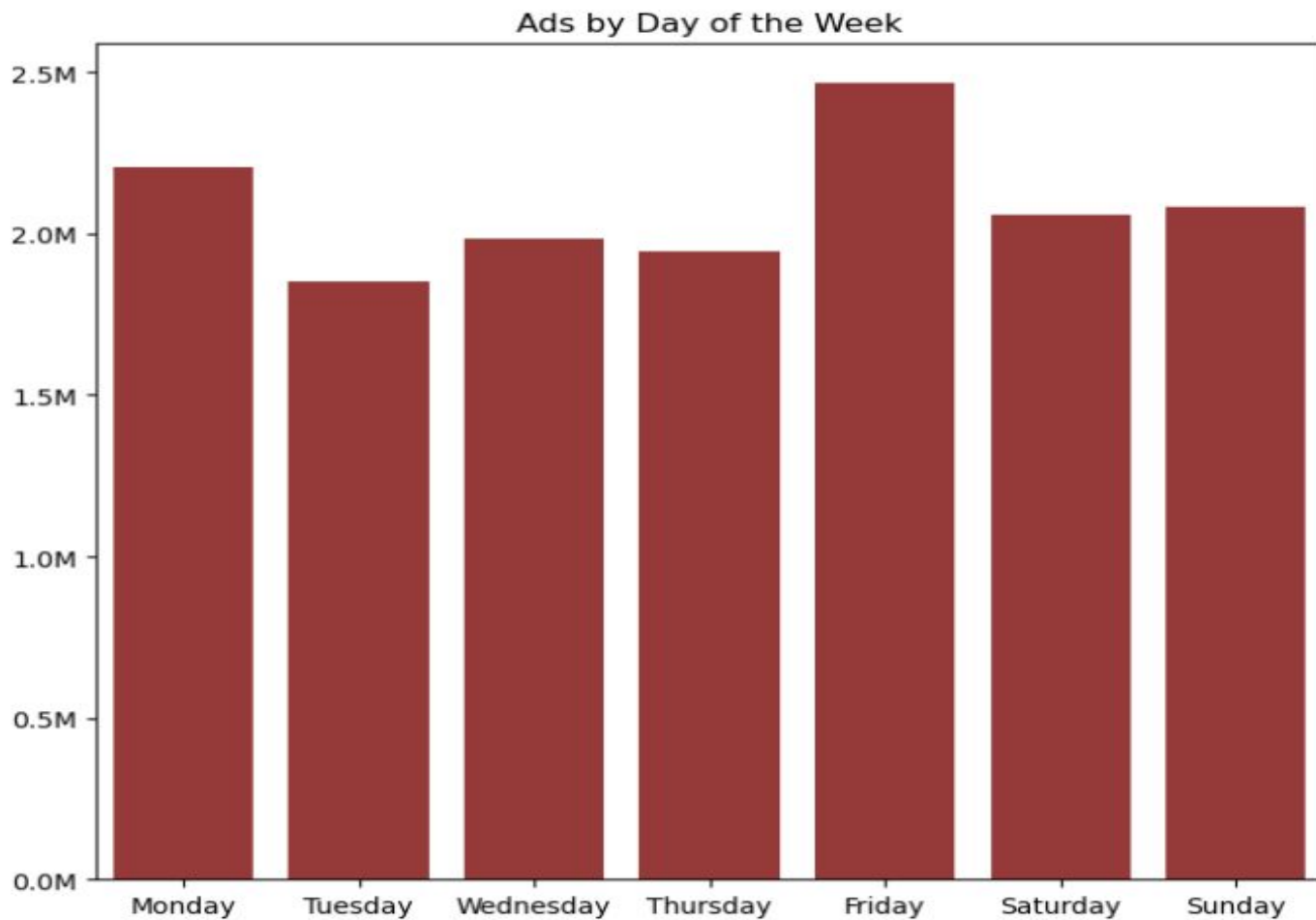
Comparing two versions of a marketing campaign to determine which one performs better



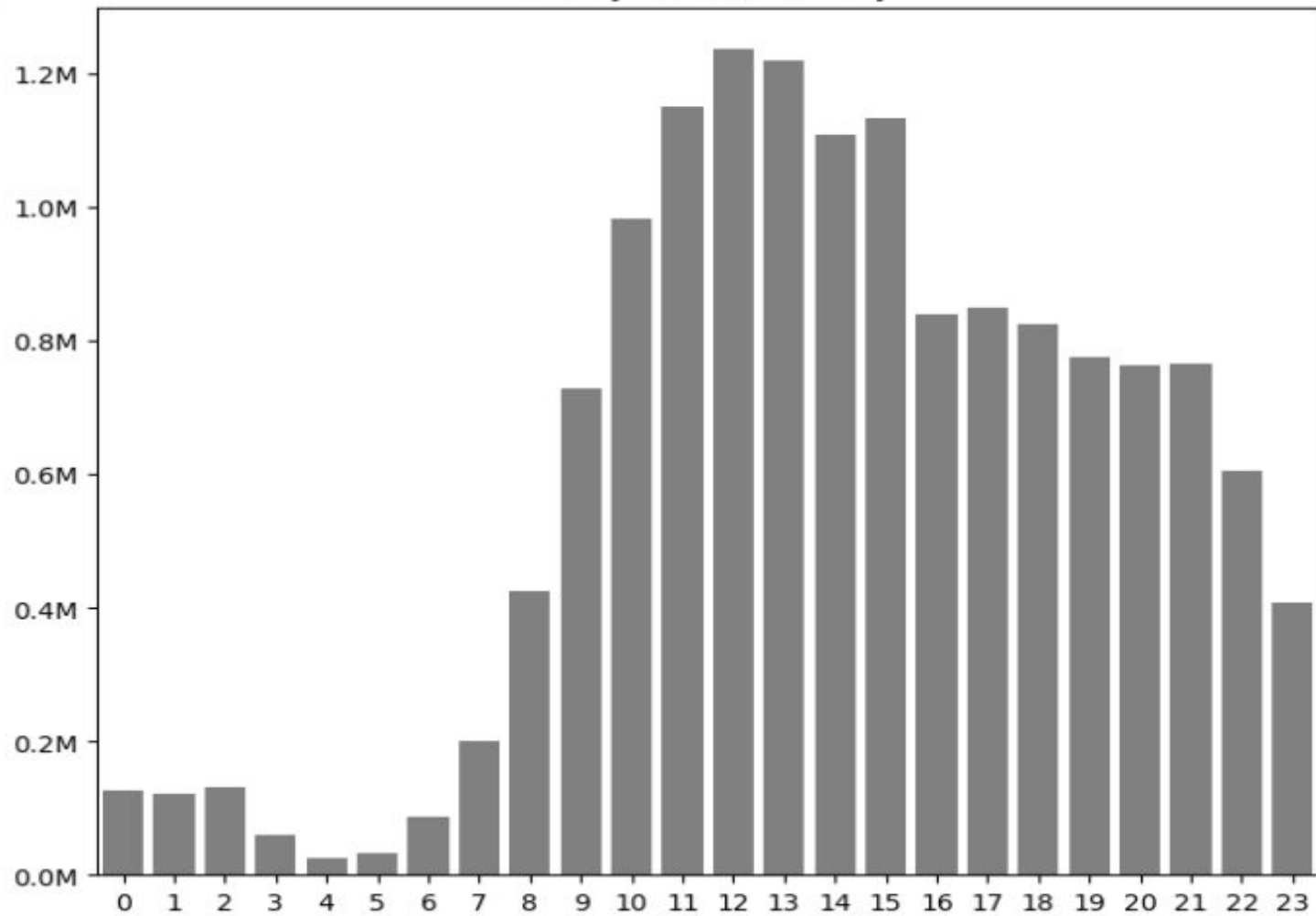
Data Used for the Testing

Column1	user id	test group	converted	total ads	most ads day	most ads hour
0	1069124	ad	FALSE	130	Monday	20
1	1119715	ad	FALSE	93	Tuesday	22
2	1144181	ad	FALSE	21	Tuesday	18
3	1435133	ad	FALSE	355	Tuesday	10
4	1015700	ad	FALSE	276	Friday	14
5	1137664	ad	FALSE	734	Saturday	10
6	1116205	ad	FALSE	264	Wednesday	13
7	1496843	ad	FALSE	17	Sunday	18
8	1448851	ad	FALSE	21	Tuesday	19
9	1446284	ad	FALSE	142	Monday	14
10	1257223	ad	FALSE	209	Wednesday	11
11	1637531	ad	FALSE	47	Wednesday	13
12	1081965	ad	FALSE	61	Tuesday	20
13	1037215	ad	FALSE	40	Friday	13
14	1535652	ad	FALSE	20	Tuesday	19
15	1461774	ad	TRUE	9	Wednesday	18
16	1492276	ad	FALSE	64	Tuesday	12
17	1118924	ad	FALSE	26	Wednesday	11
18	900681	psa	FALSE	248	Saturday	19
19	1053783	ad	FALSE	73	Friday	19
20	1381767	ad	FALSE	281	Wednesday	11
21	1478526	ad	FALSE	389	Saturday	19
22	1436823	ad	FALSE	136	Sunday	16

Total Amount of Ads: 14,597,182



Ads by Hour of the Day





Statistical information

Day of the week with most ads: Friday

Day of the week with least ads: Tuesday

Hour of the day with most ads: 12

Hour of the day with least ads: 4

Max total ads for Ad Group in one day: 2065

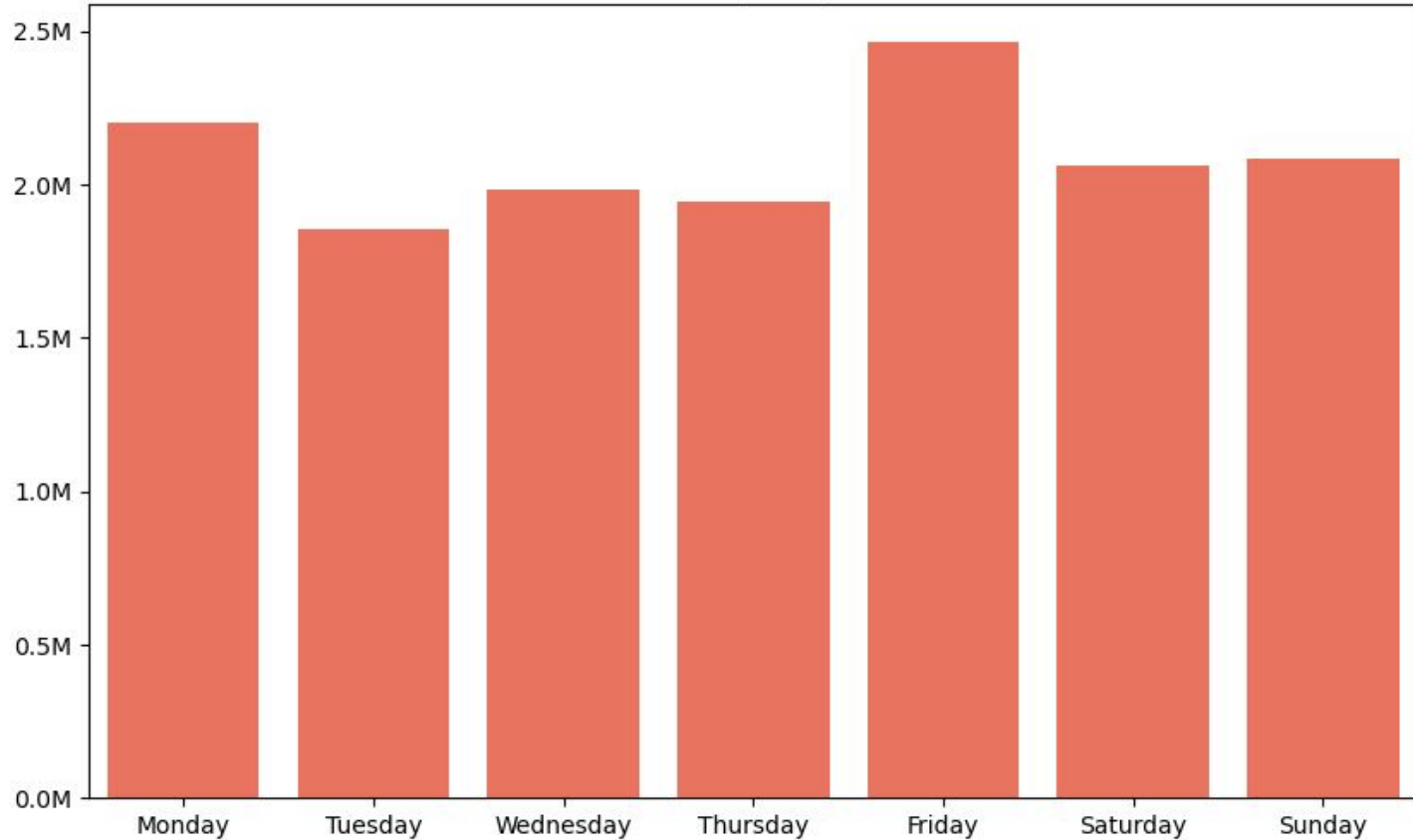
Min total ads for Ad Group in one day: 1

Max total ads for PSA Group in one day: 907

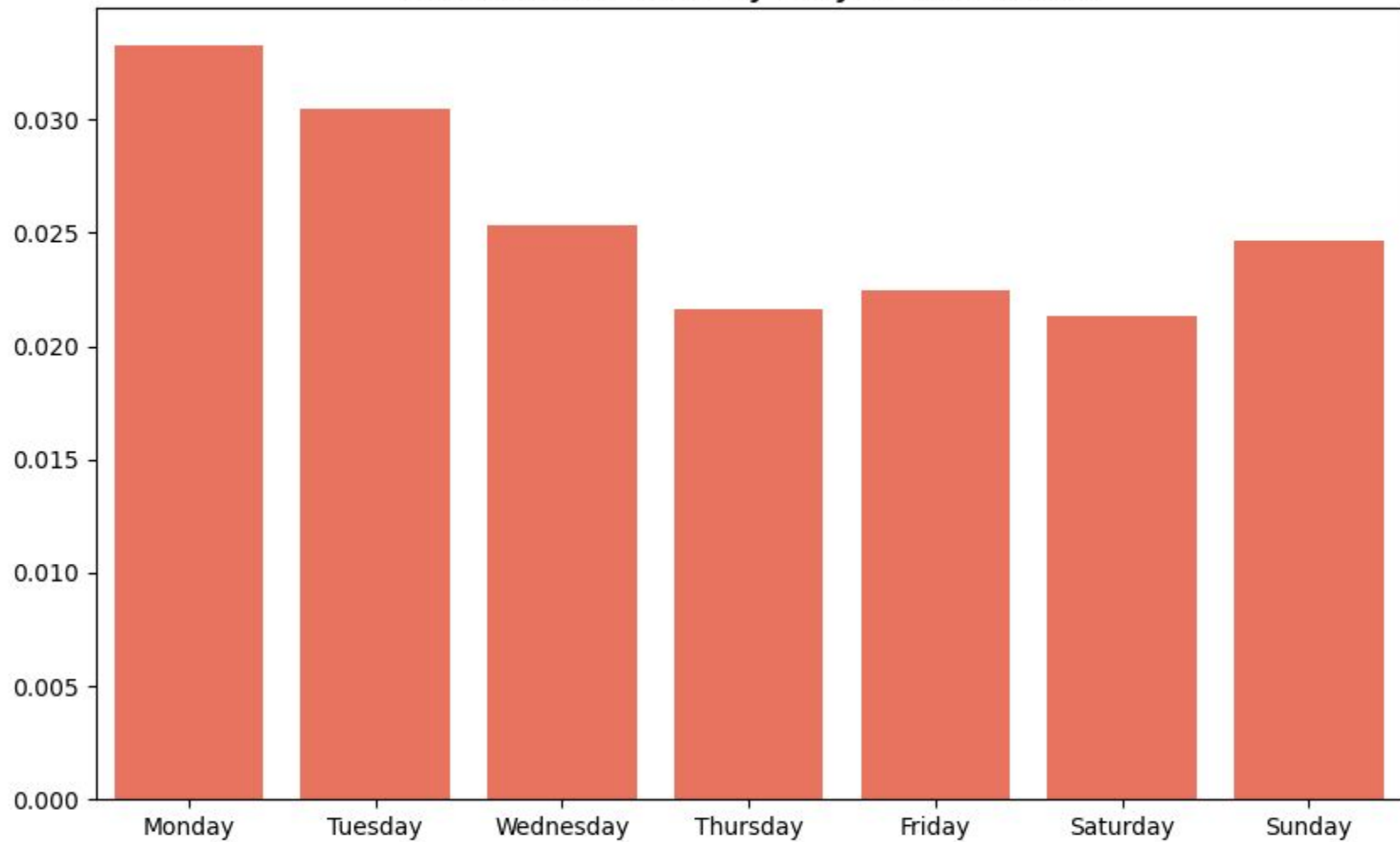
Min total ads for PSA Group in one day: 1

AD Group Conversion Rate by the Day of Week

Total Ads Seen by Day of the Week

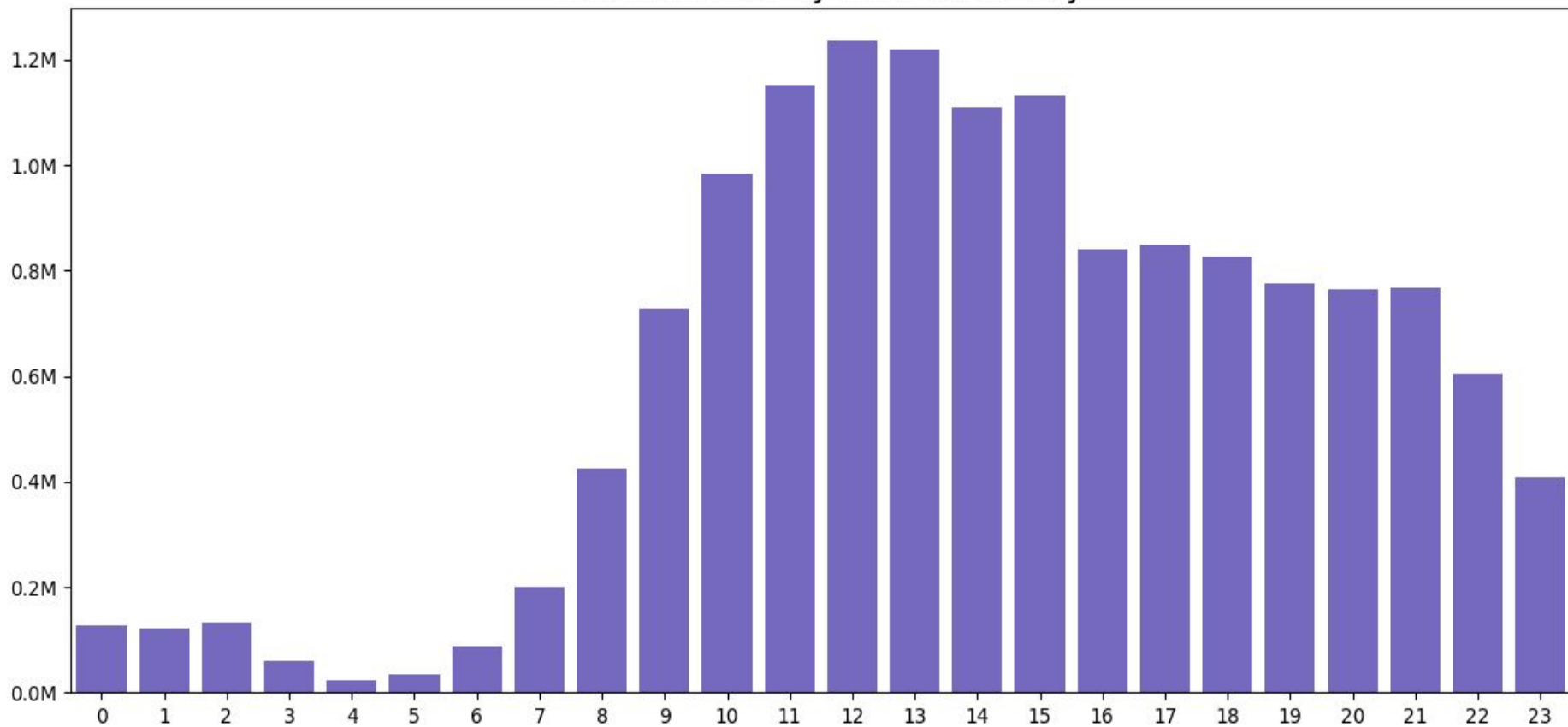


Conversion Rate by Day of the Week

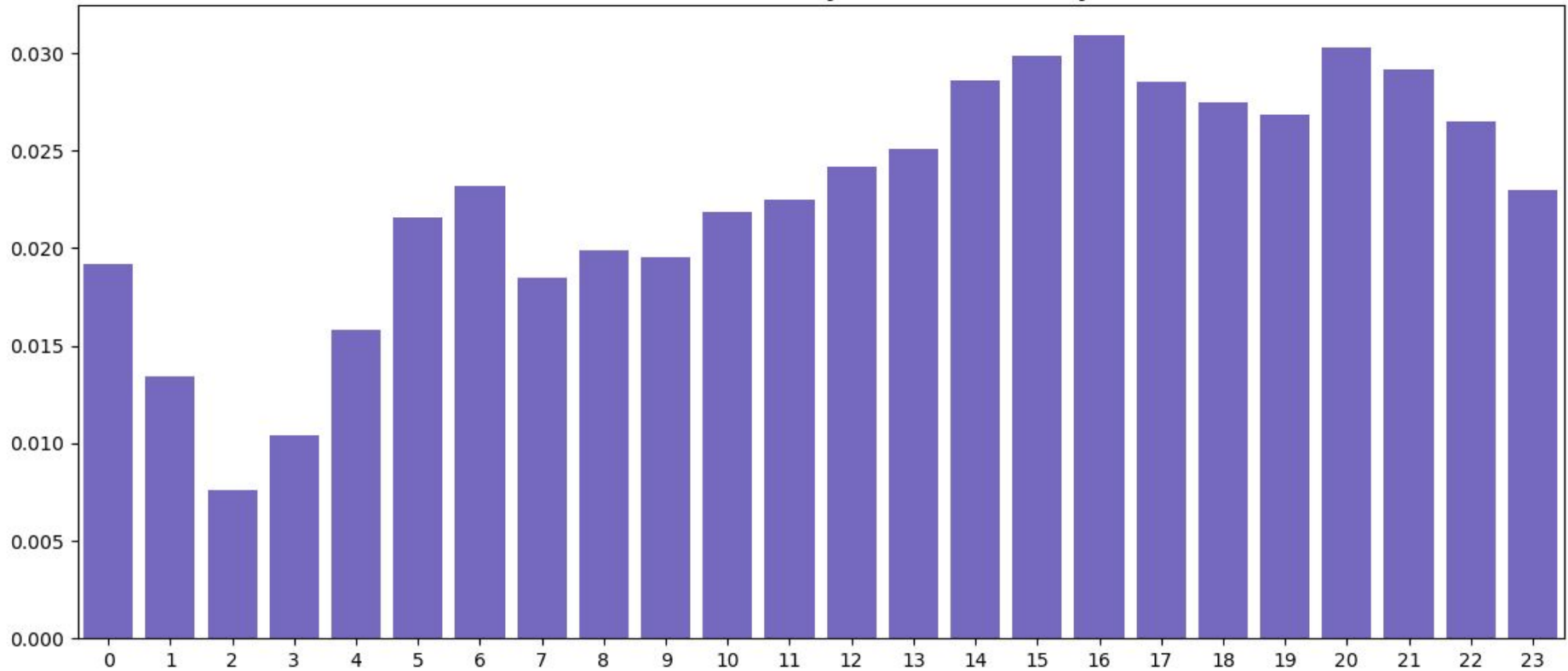


AD Group Conversion Rate by Hour

Total Ads Seen by Hour of the Day



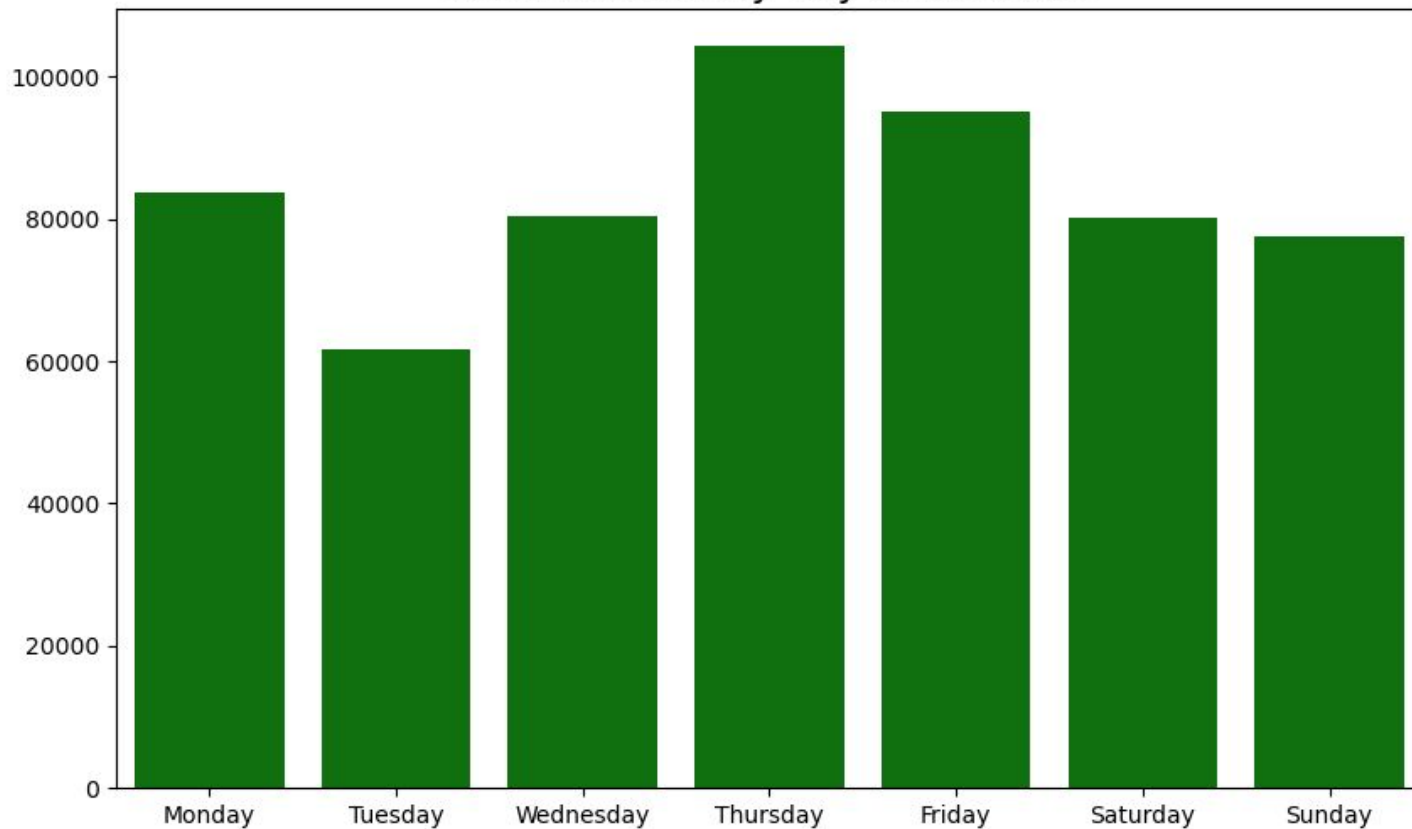
Conversion Rate by Hour of the Day



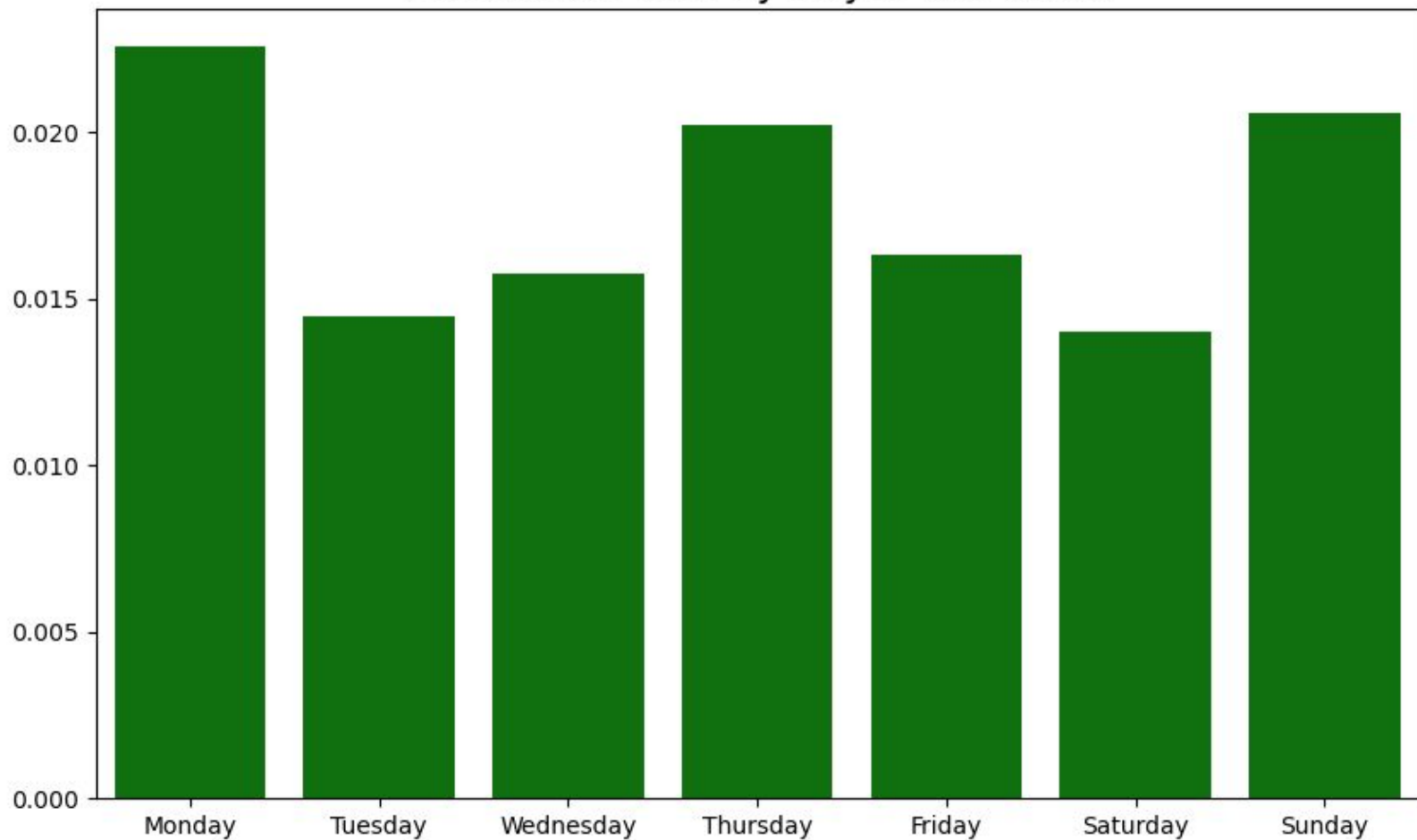
PSA Group Conversion Rate by the Day of Week



Total Ads Seen by Day of the Week

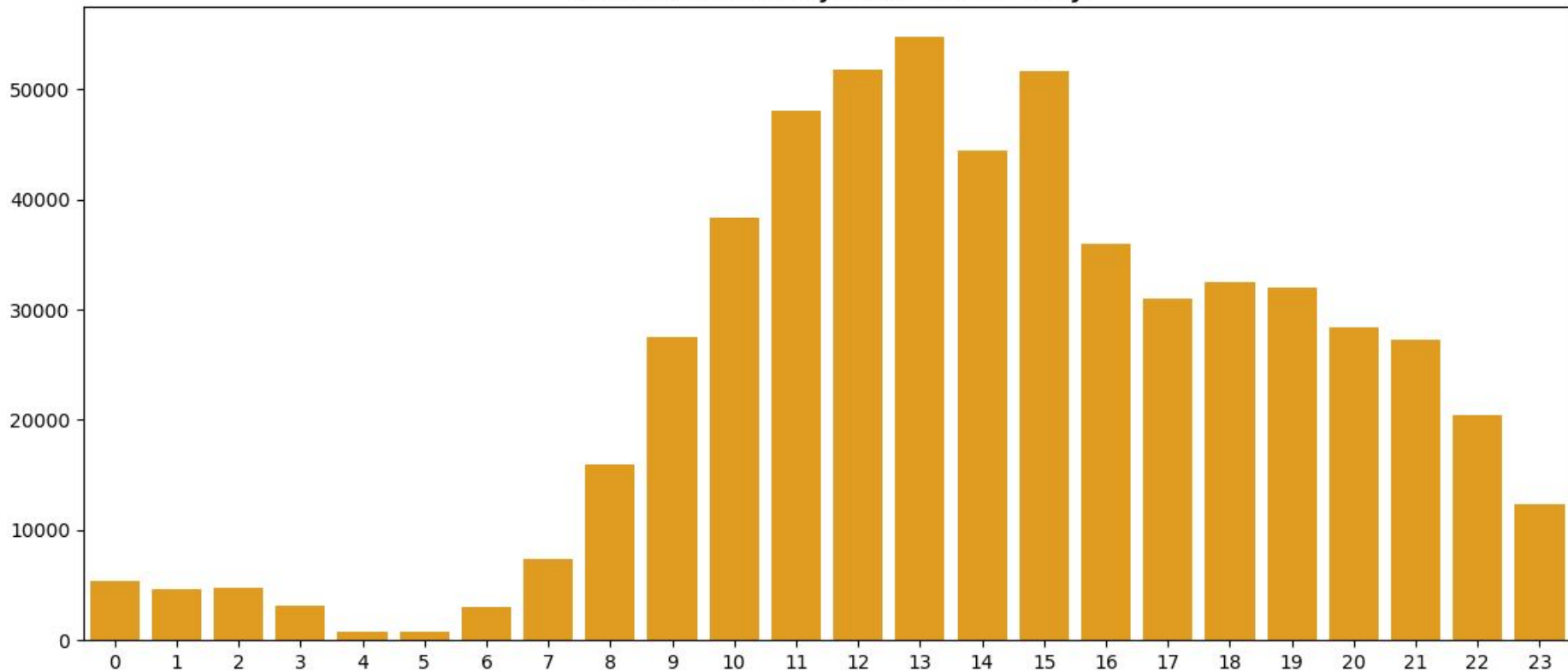


Conversion Rate by Day of the Week

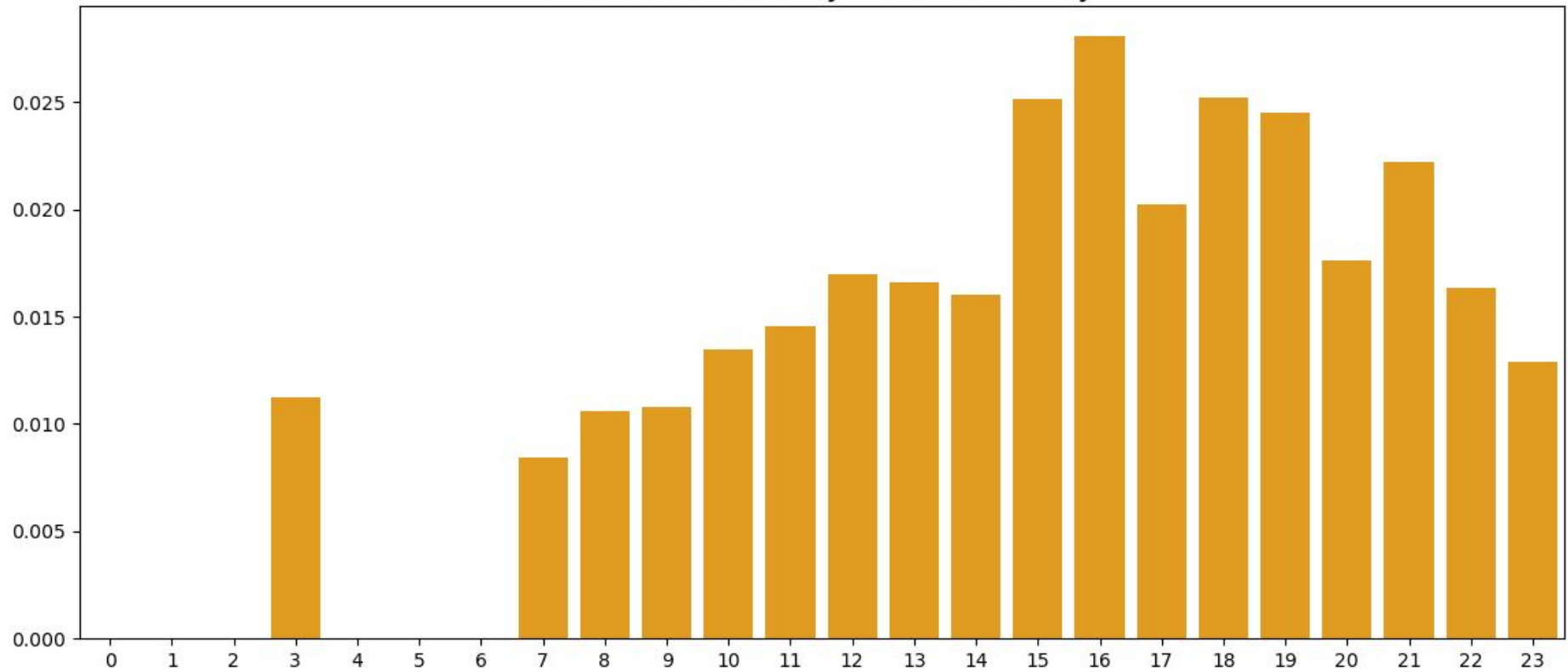


PSA Group Conversion Rate by Hour

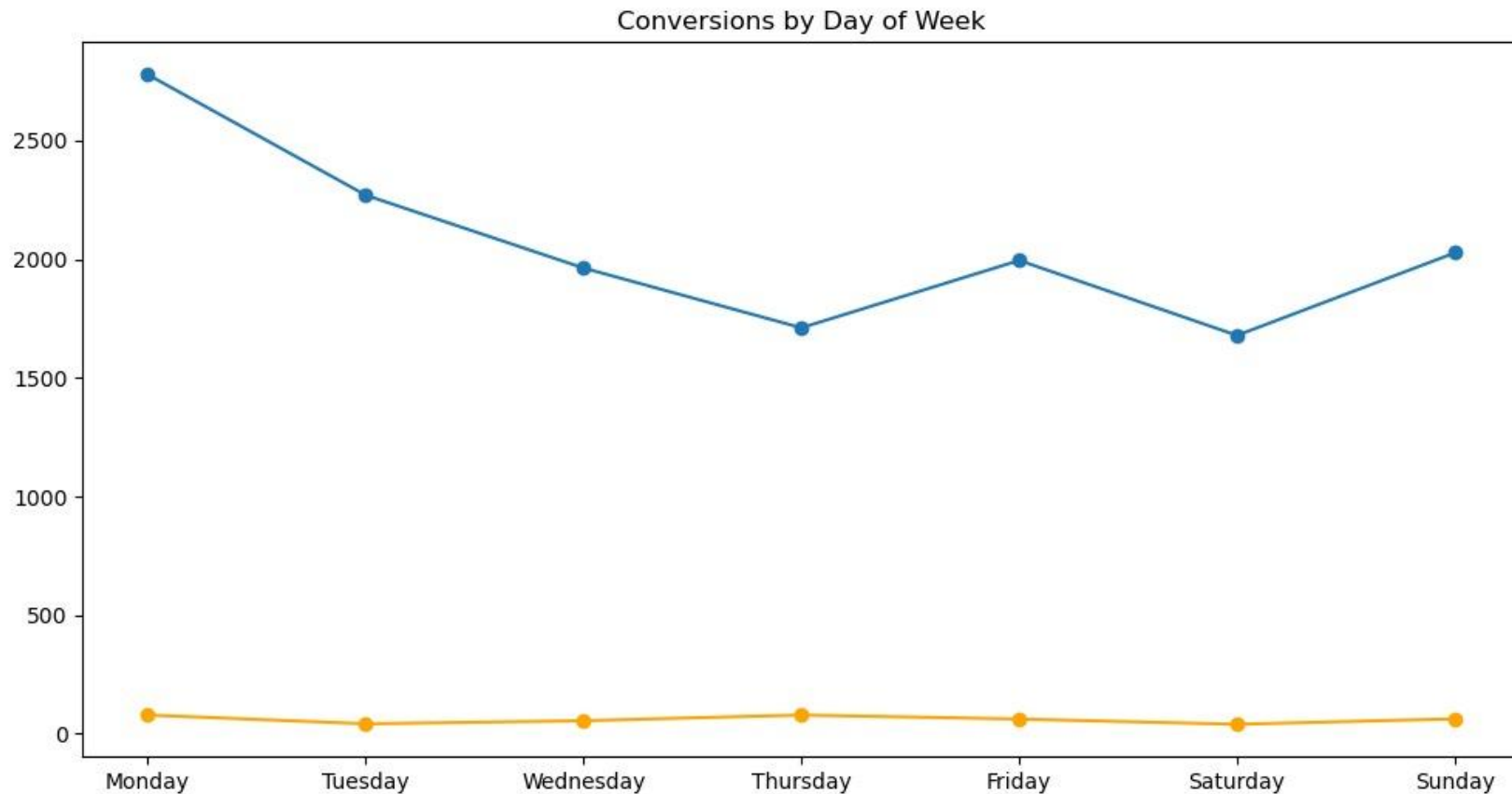
Total Ads Seen by Hour of the Day



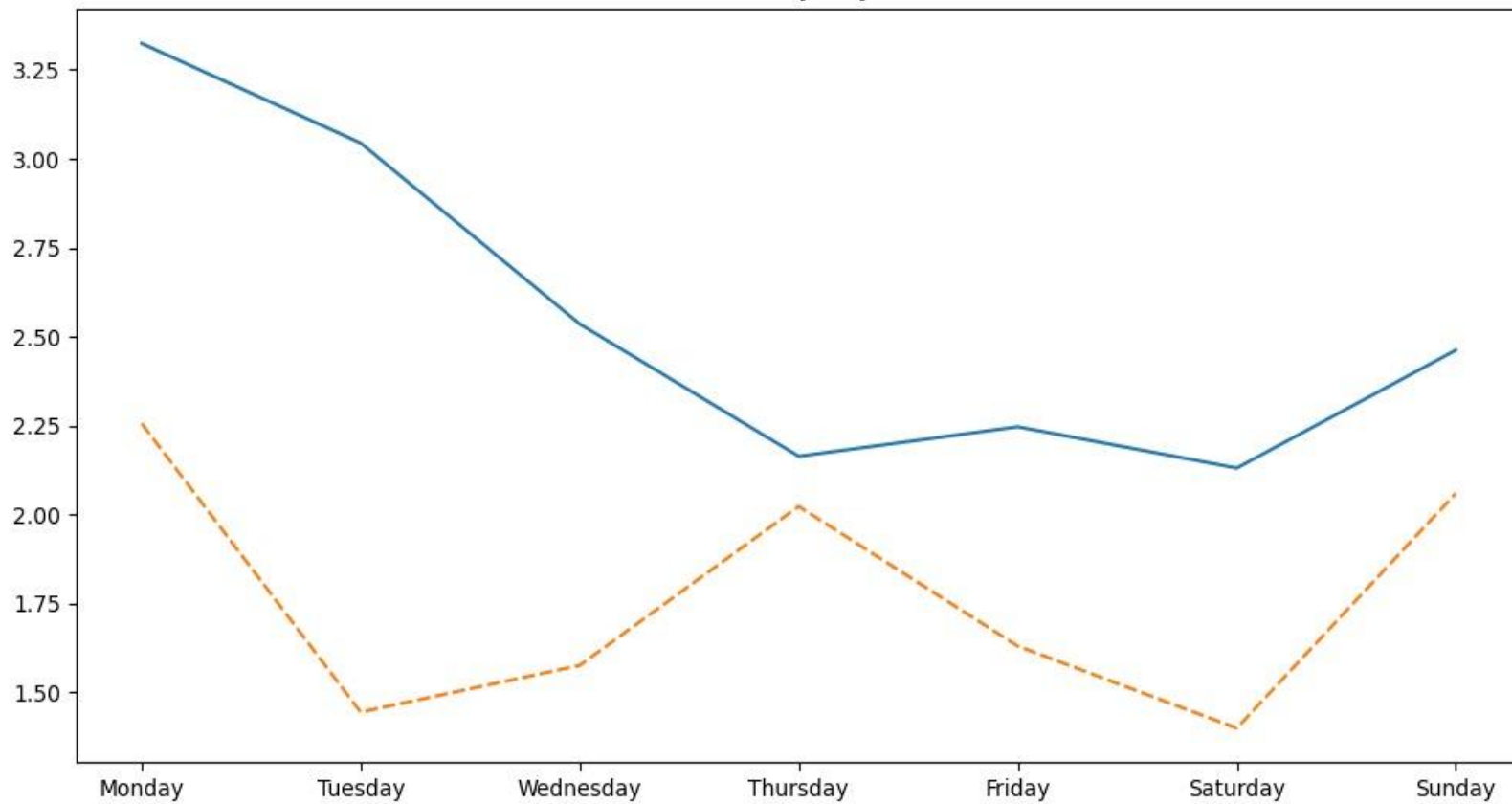
Conversion Rate by Hour of the Day



Comparison of Conversion Amounts and Rates of AD and PSA Groups by Day of the Week



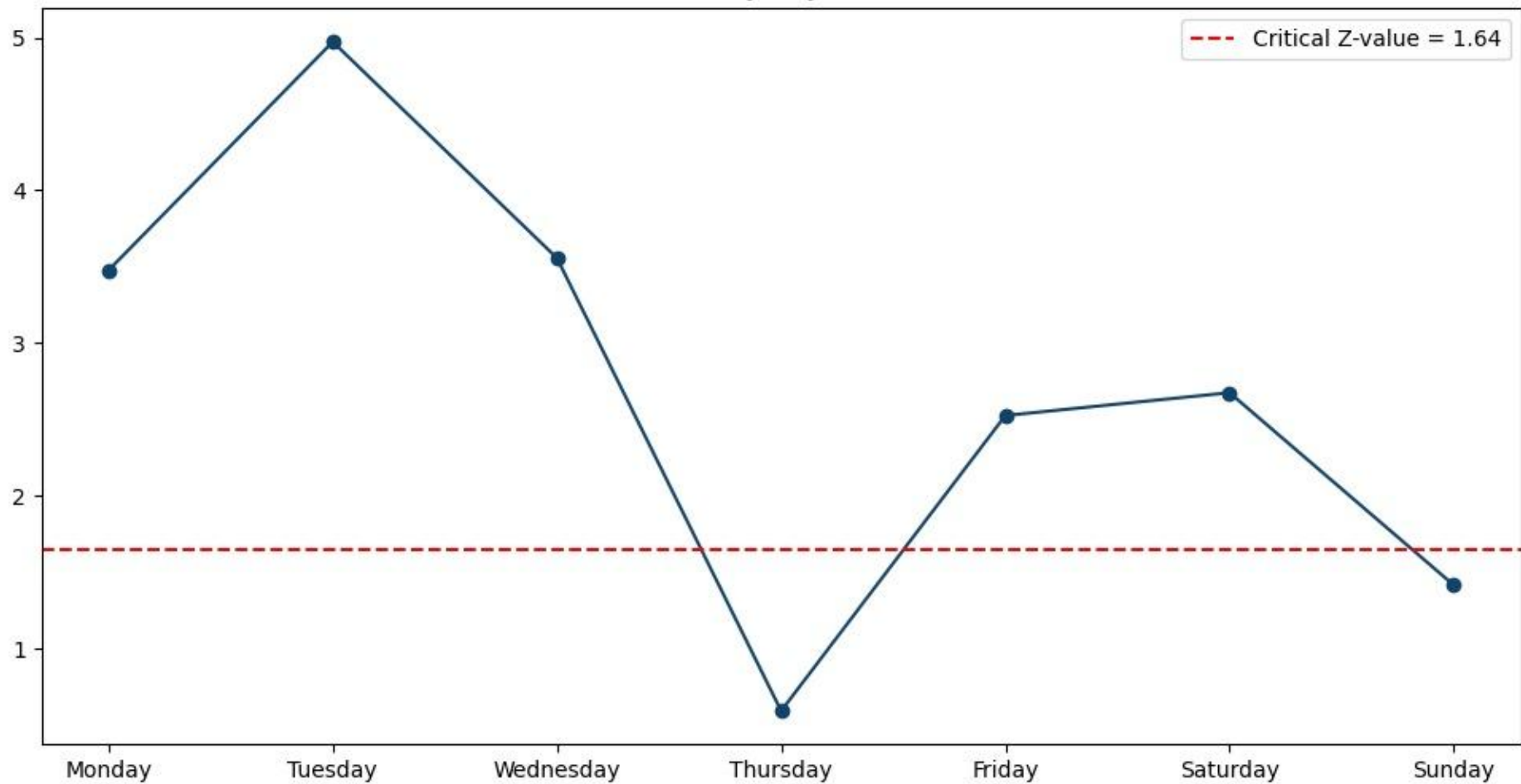
Conversion Rates by Days of the Week



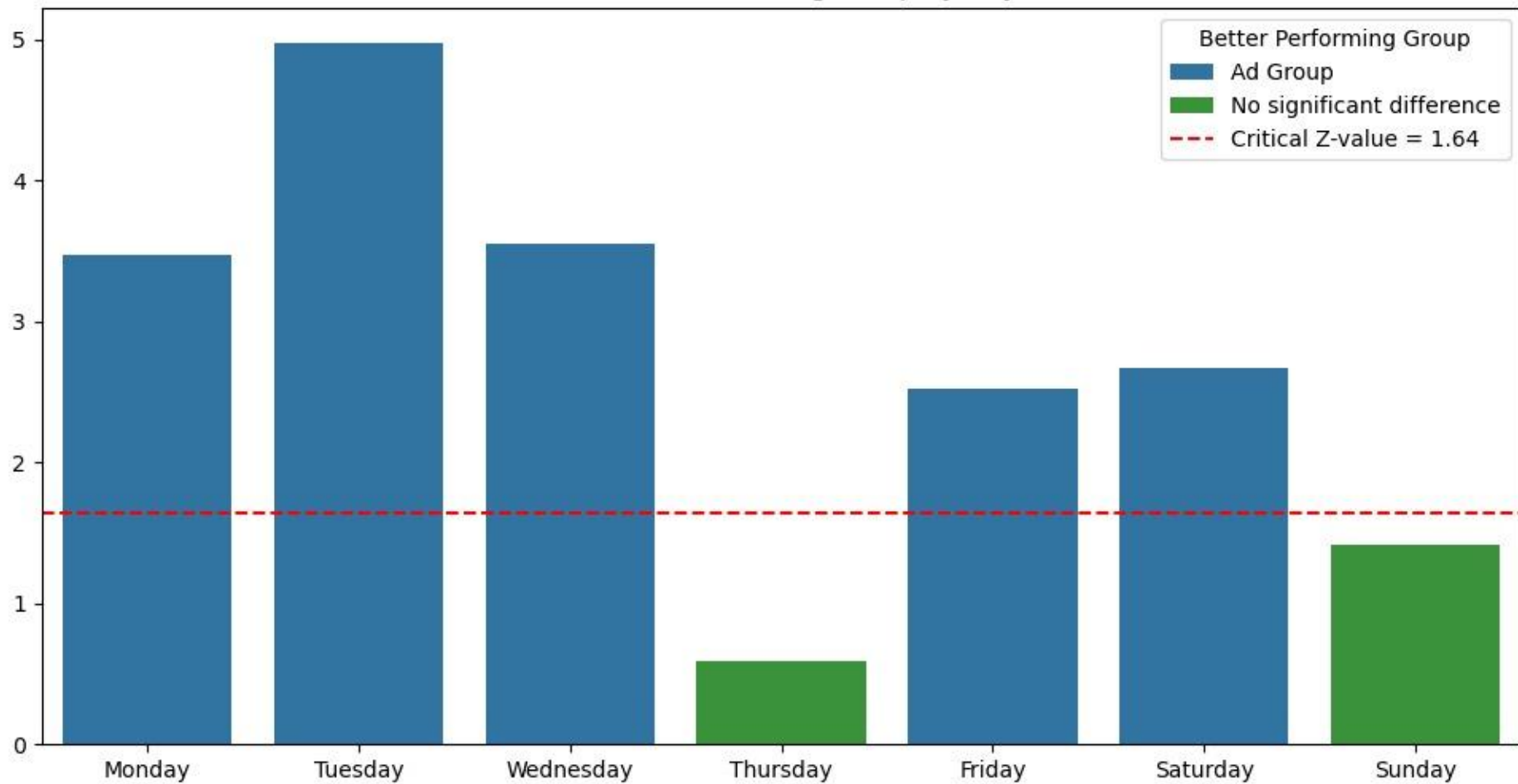
The Results of Z-Test for the Conversion Rates by Week

Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
→	Ad Group Conversion Rate: 0.0332 (3.32%)	→	Ad Group Conversion Rate: 0.0304 (3.04%)	→	Ad Group Conversion Rate: 0.0254 (2.54%)	→	Ad Group Conversion Rate: 0.0216 (2.16%)	→	Ad Group Conversion Rate: 0.0225 (2.25%)	→	Ad Group Conversion Rate: 0.0213 (2.13%)	→	Ad Group Conversion Rate: 0.0246 (2.46%)
→	PSA Group Conversion Rate: 0.0226 (2.26%)	→	PSA Group Conversion Rate: 0.0144 (1.44%)	→	PSA Group Conversion Rate: 0.0158 (1.58%)	→	PSA Group Conversion Rate: 0.0202 (2.02%)	→	PSA Group Conversion Rate: 0.0163 (1.63%)	→	PSA Group Conversion Rate: 0.0140 (1.40%)	→	PSA Group Conversion Rate: 0.0206 (2.06%)
→	Z-statistic: 3.48	→	Z-statistic: 4.97	→	Z-statistic: 3.56	→	Z-statistic: 0.59	→	Z-statistic: 2.53	→	Z-statistic: 2.67	→	Z-statistic: 1.41
→	p-value: 2.5391e-04	→	p-value: 3.3172e-07	→	p-value: 1.8821e-04	→	p-value: 2.7738e-01	→	p-value: 5.7844e-03	→	p-value: 3.7419e-03	→	p-value: 7.8593e-02
→	Critical Z-value: 1.64	→	Critical Z-value: 1.64	→	Critical Z-value: 1.64	→	Critical Z-value: 1.64	→	Critical Z-value: 1.64	→	Critical Z-value: 1.64	→	Critical Z-value: 1.64
→	Better Performing Group: Ad Group	→	Better Performing Group: Ad Group	→	Better Performing Group: Ad Group	→	Better Performing Group: No significant difference	→	Better Performing Group: Ad Group	→	Better Performing Group: Ad Group	→	Better Performing Group: No significant difference

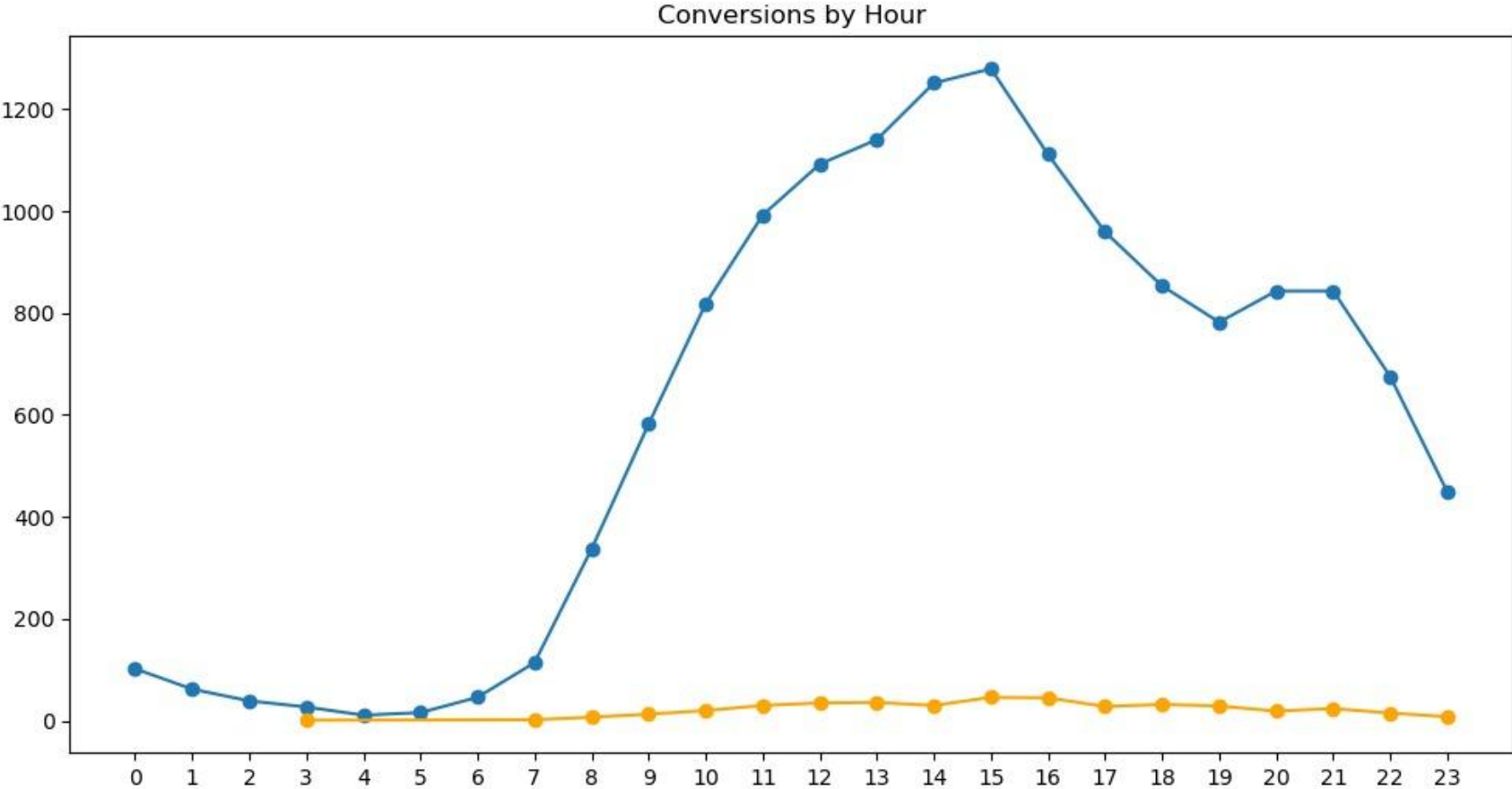
Z-statistics by Day of the Week



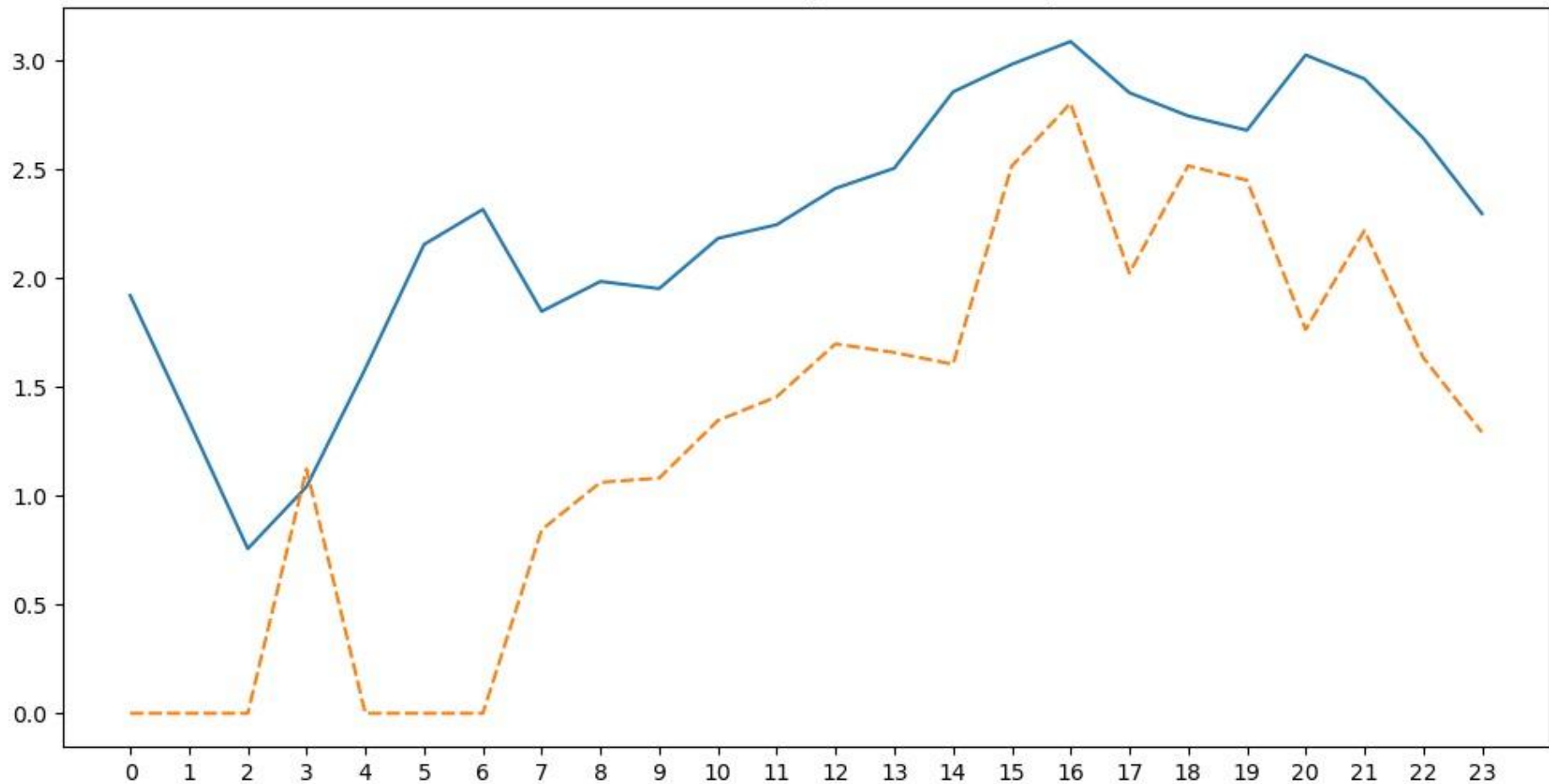
Z-statistics and Better Performing Group by Day of the Week



Comparison of Conversion Amounts and Rates of AD and PSA Groups by Hours



Conversion Rates by Hours of the Day



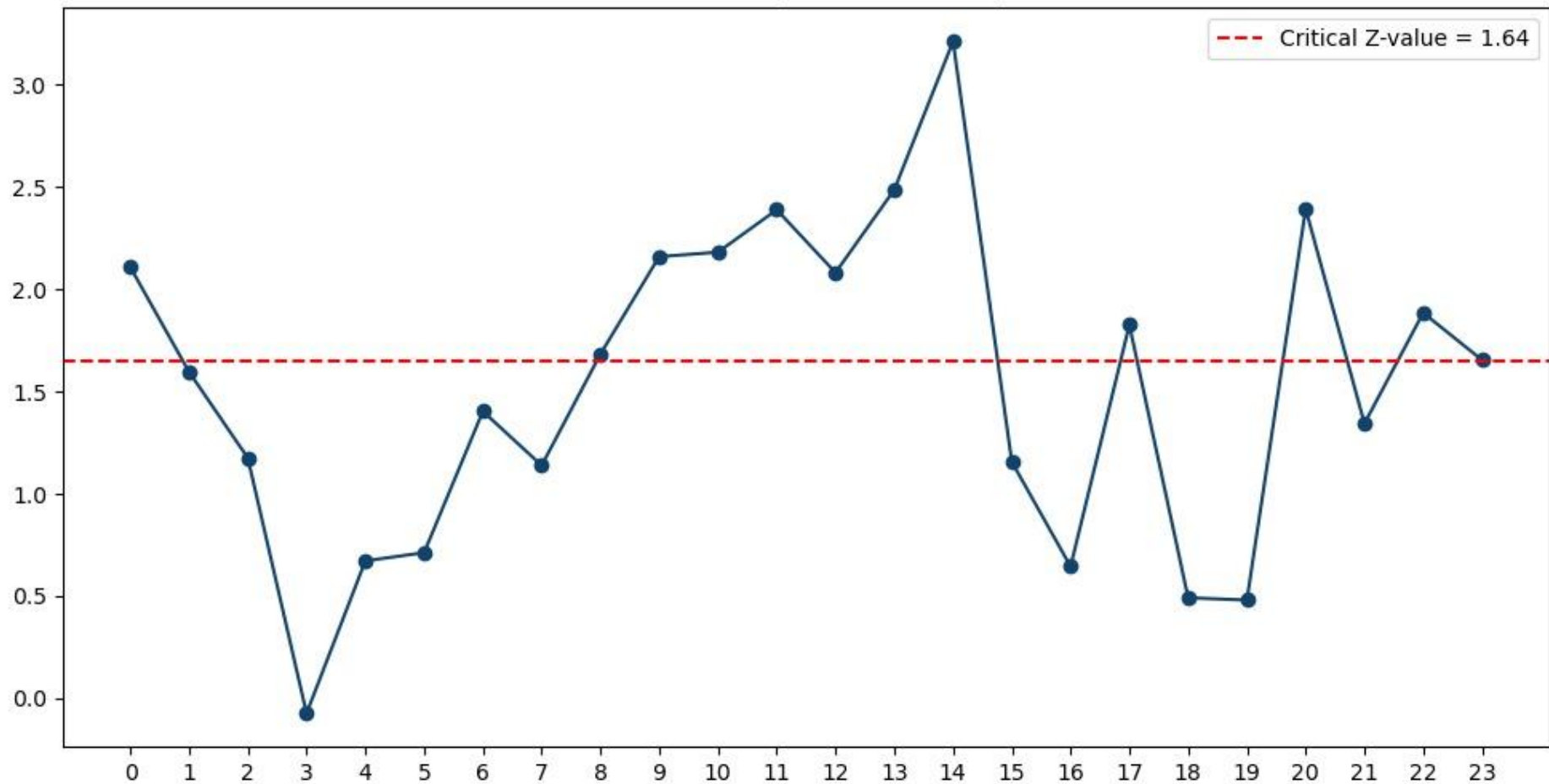
The Results of Z-Test for the Conversion Rates by Hour

0	Ad Group Conversion Rate: 0.0192 (1.92%) PSA Group Conversion Rate: 0.0000 (0.00%) Z-statistic: 2.11 p-value: 1.7521e-02 Critical Z-value: 1.64 Better Performing Group: Ad Group
1	Ad Group Conversion Rate: 0.0134 (1.34%) PSA Group Conversion Rate: 0.0000 (0.00%) Z-statistic: 1.60 p-value: 5.5318e-02 Critical Z-value: 1.64 Better Performing Group: No significant difference
2	Ad Group Conversion Rate: 0.0076 (0.76%) PSA Group Conversion Rate: 0.0000 (0.00%) Z-statistic: 1.17 p-value: 1.2003e-01 Critical Z-value: 1.64 Better Performing Group: No significant difference
3	Ad Group Conversion Rate: 0.0104 (1.04%) PSA Group Conversion Rate: 0.0112 (1.12%) Z-statistic: -0.07 p-value: 5.2949e-01 Critical Z-value: 1.64 Better Performing Group: No significant difference
4	Ad Group Conversion Rate: 0.0159 (1.59%) PSA Group Conversion Rate: 0.0000 (0.00%) Z-statistic: 0.67 p-value: 2.5101e-01 Critical Z-value: 1.64 Better Performing Group: No significant difference
5	Ad Group Conversion Rate: 0.0216 (2.16%) PSA Group Conversion Rate: 0.0000 (0.00%) Z-statistic: 0.71 p-value: 2.3832e-01 Critical Z-value: 1.64 Better Performing Group: No significant difference
6	Ad Group Conversion Rate: 0.0232 (2.32%) PSA Group Conversion Rate: 0.0000 (0.00%) Z-statistic: 1.40 p-value: 8.0374e-02 Critical Z-value: 1.64 Better Performing Group: No significant difference
7	Ad Group Conversion Rate: 0.0185 (1.85%) PSA Group Conversion Rate: 0.0084 (0.84%) Z-statistic: 1.14 p-value: 1.2760e-01 Critical Z-value: 1.64 Better Performing Group: No significant difference
8	Ad Group Conversion Rate: 0.0199 (1.99%) PSA Group Conversion Rate: 0.0106 (1.06%) Z-statistic: 1.68 p-value: 4.6267e-02 Critical Z-value: 1.64 Better Performing Group: Ad Group
9	Ad Group Conversion Rate: 0.0195 (1.95%) PSA Group Conversion Rate: 0.0108 (1.08%) Z-statistic: 2.16 p-value: 1.5431e-02 Critical Z-value: 1.64 Better Performing Group: Ad Group

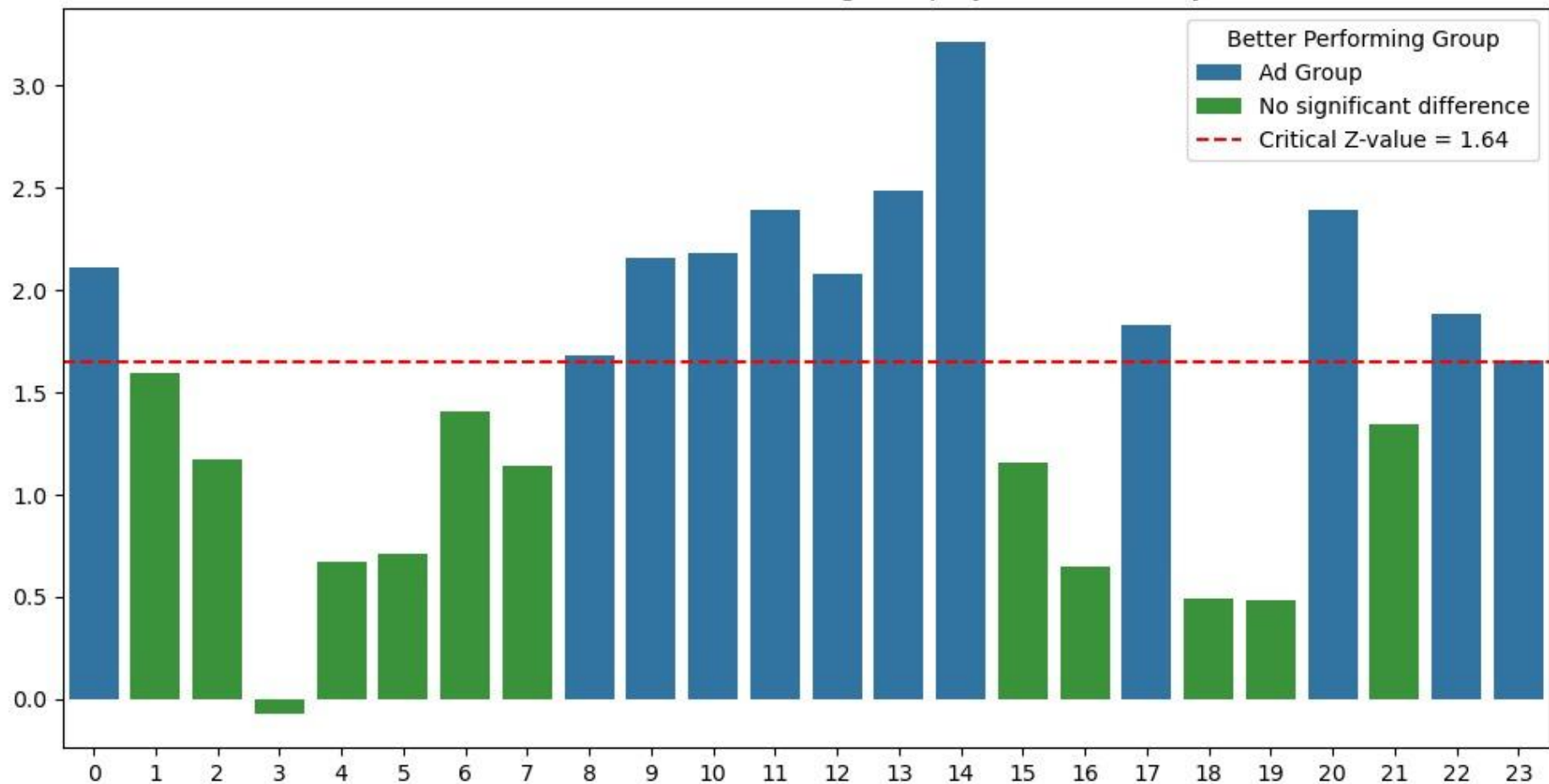
10	Ad Group Conversion Rate: 0.0218 (2.18%) PSA Group Conversion Rate: 0.0135 (1.35%) Z-statistic: 2.18 p-value: 1.4611e-02 Critical Z-value: 1.64 Better Performing Group: Ad Group
11	Ad Group Conversion Rate: 0.0225 (2.25%) PSA Group Conversion Rate: 0.0146 (1.46%) Z-statistic: 2.39 p-value: 8.4759e-03 Critical Z-value: 1.64 Better Performing Group: Ad Group
12	Ad Group Conversion Rate: 0.0241 (2.41%) PSA Group Conversion Rate: 0.0170 (1.70%) Z-statistic: 2.08 p-value: 1.8735e-02 Critical Z-value: 1.64 Better Performing Group: Ad Group
13	Ad Group Conversion Rate: 0.0251 (2.51%) PSA Group Conversion Rate: 0.0166 (1.66%) Z-statistic: 2.49 p-value: 6.4656e-03 Critical Z-value: 1.64 Better Performing Group: Ad Group
14	Ad Group Conversion Rate: 0.0286 (2.86%) PSA Group Conversion Rate: 0.0161 (1.61%) Z-statistic: 3.21 p-value: 6.6229e-04 Critical Z-value: 1.64 Better Performing Group: Ad Group
15	Ad Group Conversion Rate: 0.0298 (2.98%) PSA Group Conversion Rate: 0.0252 (2.52%) Z-statistic: 1.16 p-value: 1.2396e-01 Critical Z-value: 1.64 Better Performing Group: No significant difference
16	Ad Group Conversion Rate: 0.0309 (3.09%) PSA Group Conversion Rate: 0.0281 (2.81%) Z-statistic: 0.64 p-value: 2.5980e-01 Critical Z-value: 1.64 Better Performing Group: No significant difference

17	Ad Group Conversion Rate: 0.0285 (2.85%) PSA Group Conversion Rate: 0.0202 (2.02%) Z-statistic: 1.83 p-value: 3.3987e-02 Critical Z-value: 1.64 Better Performing Group: Ad Group
18	Ad Group Conversion Rate: 0.0275 (2.75%) PSA Group Conversion Rate: 0.0252 (2.52%) Z-statistic: 0.49 p-value: 3.1171e-01 Critical Z-value: 1.64 Better Performing Group: No significant difference
19	Ad Group Conversion Rate: 0.0268 (2.68%) PSA Group Conversion Rate: 0.0245 (2.45%) Z-statistic: 0.48 p-value: 3.1564e-01 Critical Z-value: 1.64 Better Performing Group: No significant difference
20	Ad Group Conversion Rate: 0.0303 (3.03%) PSA Group Conversion Rate: 0.0176 (1.76%) Z-statistic: 2.39 p-value: 8.3761e-03 Critical Z-value: 1.64 Better Performing Group: Ad Group
21	Ad Group Conversion Rate: 0.0292 (2.92%) PSA Group Conversion Rate: 0.0222 (2.22%) Z-statistic: 1.34 p-value: 8.9622e-02 Critical Z-value: 1.64 Better Performing Group: No significant difference
22	Ad Group Conversion Rate: 0.0265 (2.65%) PSA Group Conversion Rate: 0.0164 (1.64%) Z-statistic: 1.88 p-value: 2.9774e-02 Critical Z-value: 1.64 Better Performing Group: Ad Group
23	Ad Group Conversion Rate: 0.0230 (2.30%) PSA Group Conversion Rate: 0.0129 (1.29%) Z-statistic: 1.65 p-value: 4.9114e-02 Critical Z-value: 1.64 Better Performing Group: Ad Group

Z-statistics by Hour of the Day



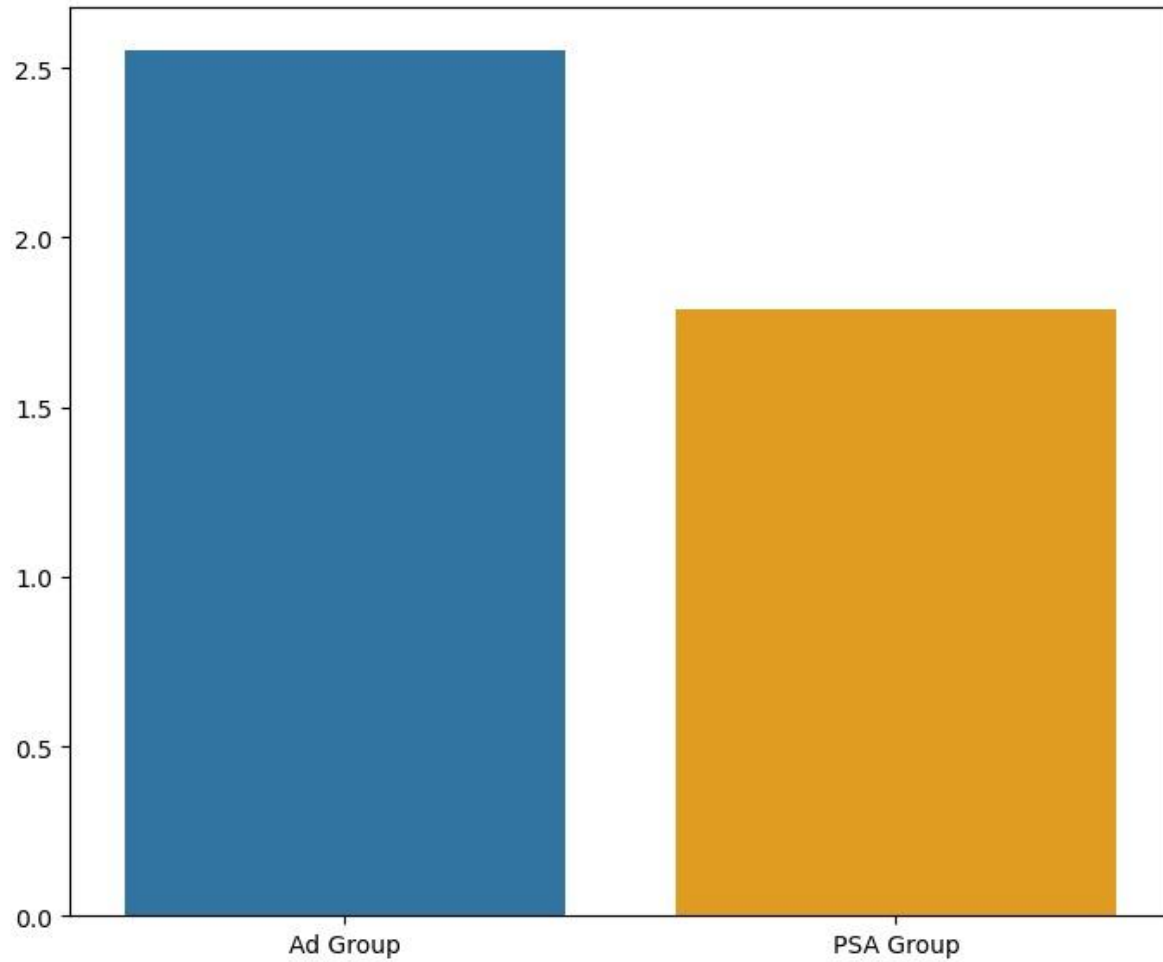
Z-statistics and Better Performing Group by Hour of the Day



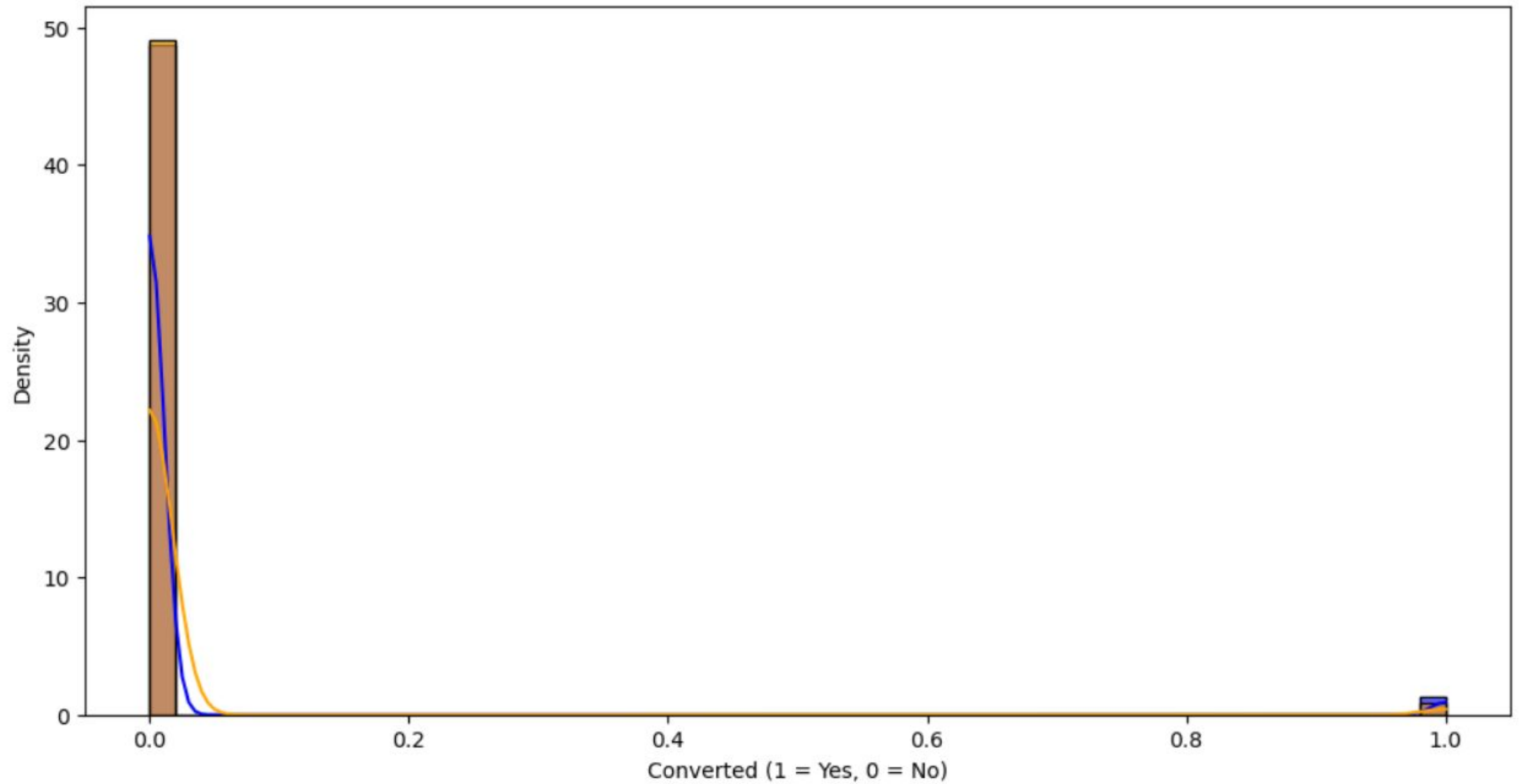
Total Conversions for AD and PSA Groups

Visitors in Ad Group: 564577	Visitors in PSA Group: 23524
Conversions in Ad Group: 14423	Conversions in PSA Group: 420

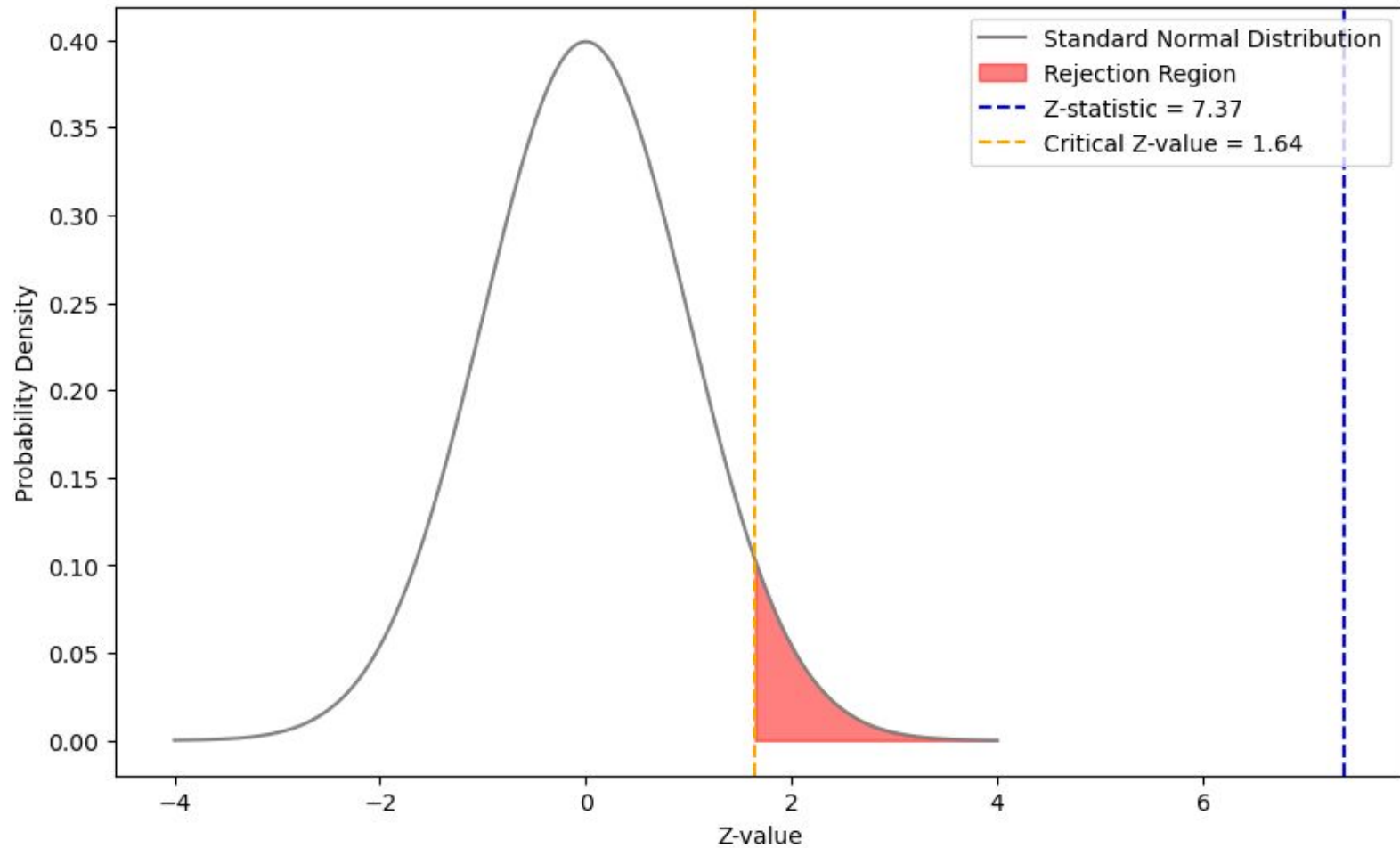
Conversion Rates



Distribution of Conversions



Z-test Result Visualization



Conclusion

Ad Group Conversion Rate: 0.0255 (2.55%)

Organic Group Conversion Rate: 0.0179 (1.79%)

Z-statistic: 7.37

p-value: 8.5265e-14

Critical Z-value: 1.64

Based on the Z-Test, the Ad group performs significantly better than the PSA group and is considered the better-performing group.

Thank you for your attention.....