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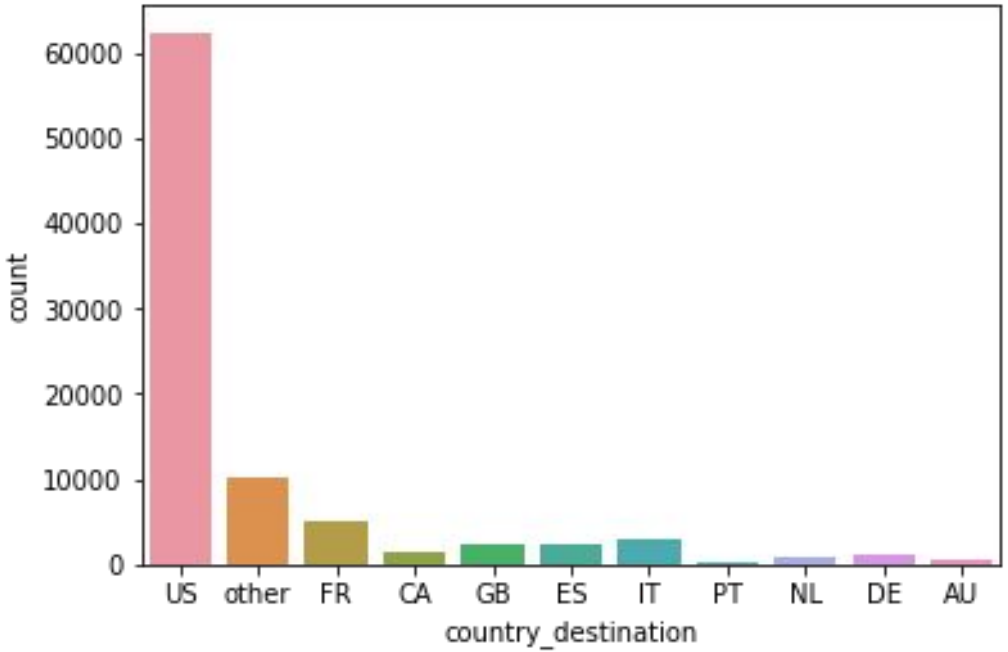
Dataset - New User Bookings Background

In this dataset, we have a list of users along with their demographics, web session records, and some summary statistics. All the users in this dataset are from the USA. Our group will focus on different web analytics questions.

There are 12 possible outcomes of the destination country:

‘US’	‘PT’
‘FR’	‘NL’
‘CA’	‘DE’
‘GB’	‘AU’
‘ES’	‘NDF’ (no destination found)
‘IT’	‘Other’

Where do users travel to?




```
country_destination
AU         0.006062
CA         0.016062
DE         0.011934
ES         0.025296
FR         0.056497
GB         0.026139
IT         0.031887
NL         0.008571
PT         0.002441
US         0.701579
other      0.113533
dtype: float64
```

Figure 1.1 - Bar Graph of where users travel to

Most first time users travel within the United States rather than international.

When do users book?

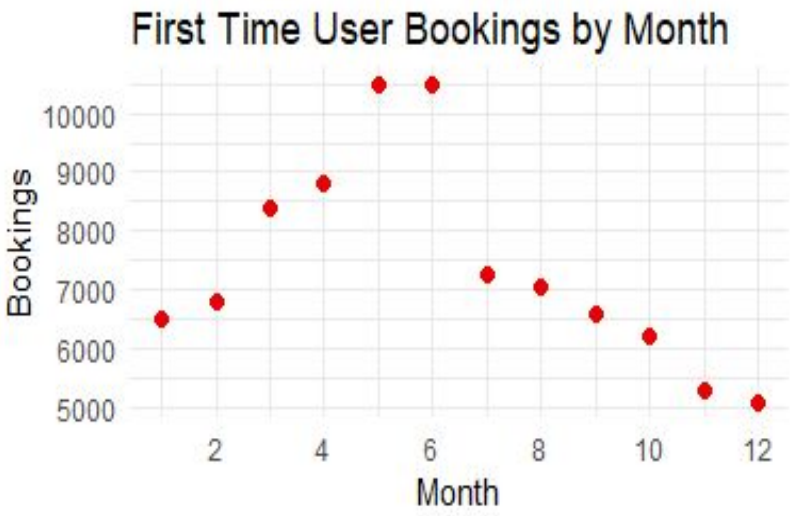


Figure 1.2 - First Time User Bookings by Month

Over the course of the year in the United States, we see a dramatic change in bookings over different months. May, April, and June show an increase in bookings and we suspect it is due to planning for summer vacation. Over the winter months (Nov-Feb), there are noticeable fewer bookings made.

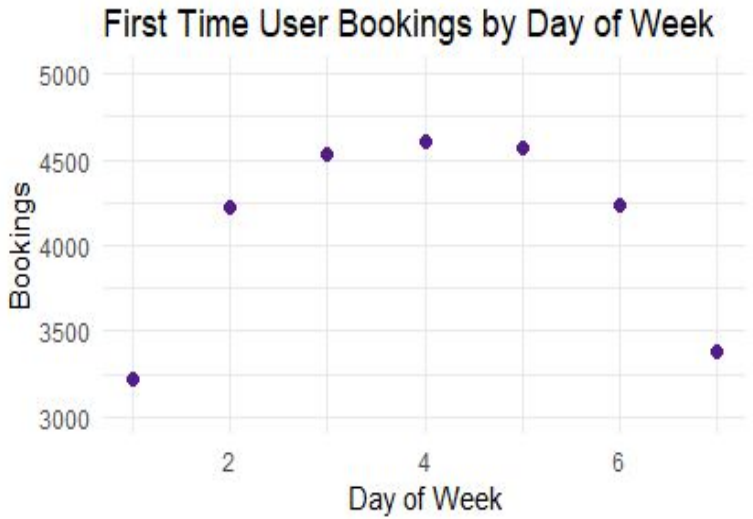
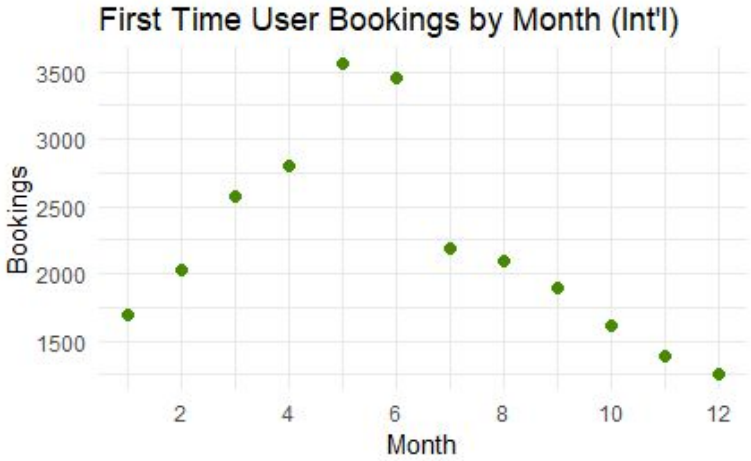


Figure 1.3 - First Time User Bookings by Day

The middle of the week is more popular for first time bookings when compared to the beginning or end of the week, likely to more people being on their computers during the weekday.

When do users book?



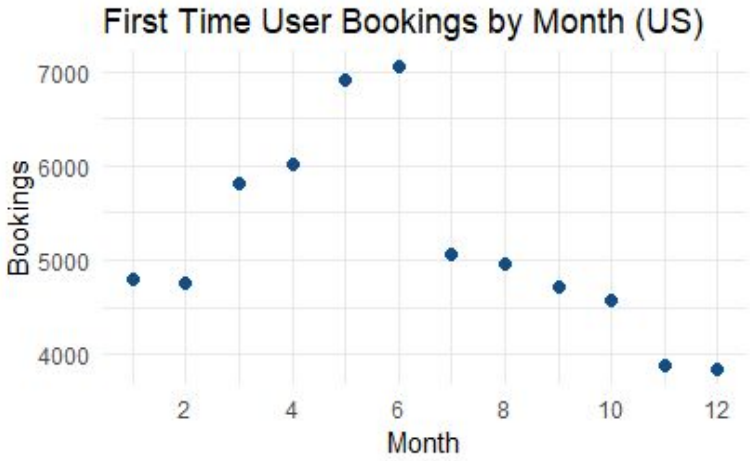


Figure 1.4a & 1.4b - Subset First Time User Bookings by Month

Booking behavior is similar for domestic and international trips across months, with peaks for both trip types peaking in the early summer months.

When do users book?

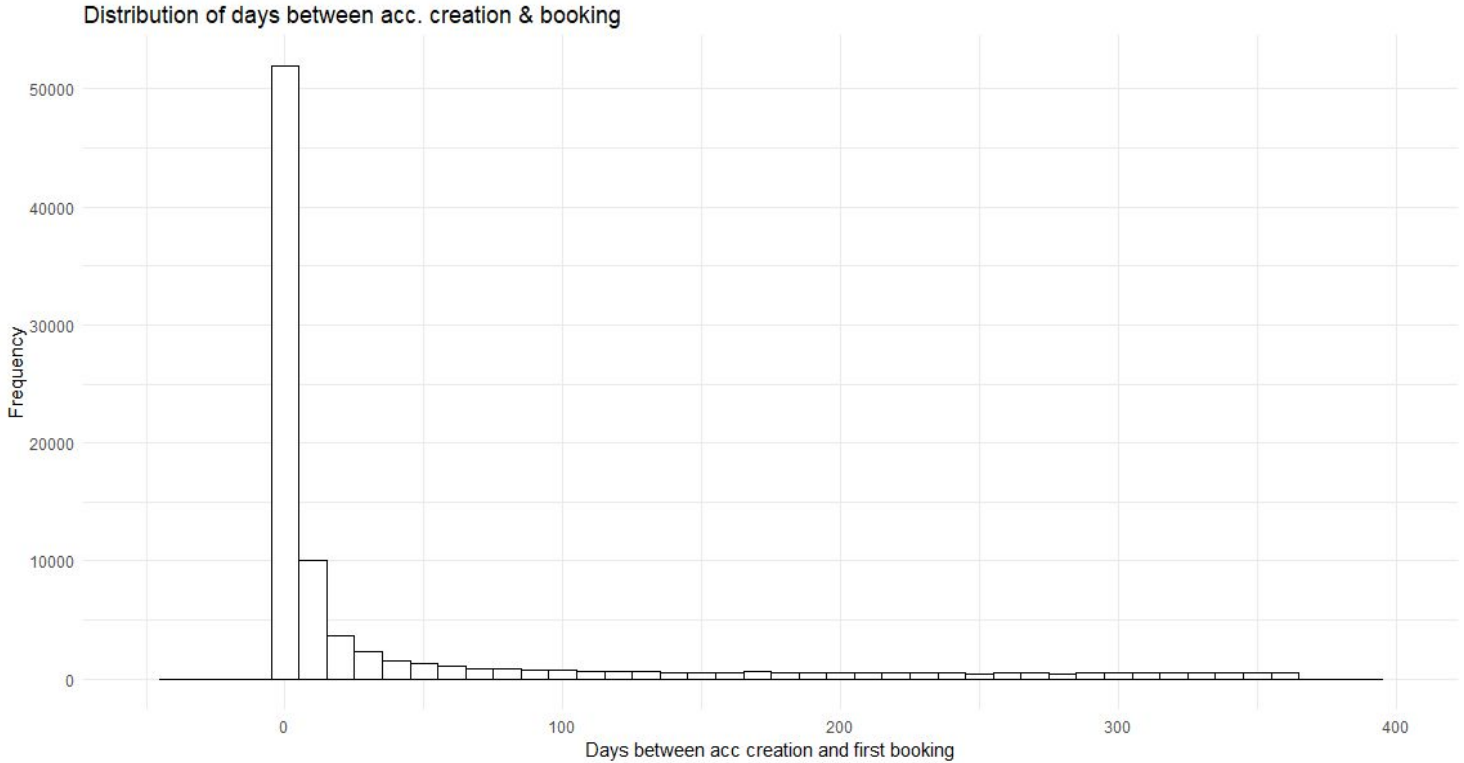


Figure 1.5 - Distribution of Days between account creation and booking

We observe that the majority of bookings happen within a few days, especially on the same day.

Business Questions

1. What are the sources of conversion for Airbnb first time users?
2. What kind of methods do new users use for their first bookings?
3. What is the difference between domestic and international bookings?
4. Can we identify different needs/preferences using K-Means clustering for domestic or international bookings?

Customer Journey

From signup to booking

Signups

affiliate_provider	sign_up_prop
direct	0.6438293
google	0.2421774
other	0.0587910
craigslist	0.0162613
bing	0.0109065
facebook	0.0106488
vast	0.0038838
padmapper	0.0035980

64% of new users signed up by way of Airbnb direct marketing.

24% through Google Search.

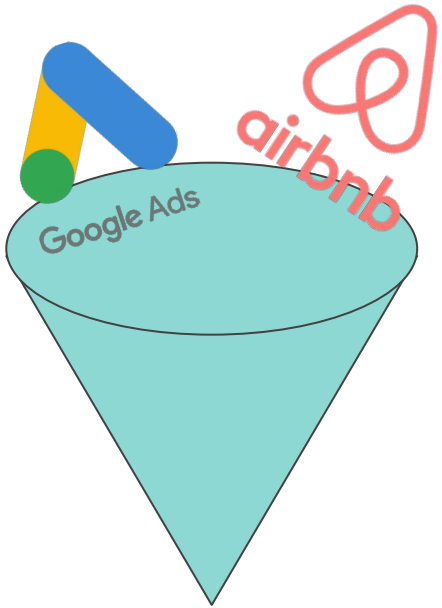
affiliate_provider	conv_rate
direct	0.2775063
google	0.0973479
other	0.0218458
craigslist	0.0075708
bing	0.0039025
facebook	0.0037105
vast	0.0012696
padmapper	0.0011806

27% of new users who actually booked a trip on Airbnb signed up by way of direct marketing.

Airbnb is doing a great job at marketing directly to its potential customers

Conversion Rate

When we look deeper into the top two sources of new user signups (Direct and Google), we find that both channels have similar conversion rates with respect to signups within each channel.



Modified conversion rate equation:

airbnb

$$\frac{(\#\ of\ people\ that\ booked\ a\ trip\ and\ came\ from\ Airbnb\ direct\ marketing)}{\#\ of\ people\ that\ came\ from\ Airbnb\ direct\ marketing} = 43\%$$

Google Ads

$$\frac{(\#\ of\ people\ that\ booked\ a\ trip\ and\ came\ from\ Google\ direct\ marketing)}{\#\ of\ people\ that\ came\ from\ Google\ direct\ marketing} = 40\%$$

Airbnb and Google Partnership Deep-Dive

What type of marketing techniques does Airbnb do with Google that result in most conversion rates?

Definitions:
SEM-Brand: Branded Search Engine Marketing
SEM-Non-Brand: Non-branded Search Engine Marketing
SEO: Search Engine Optimization

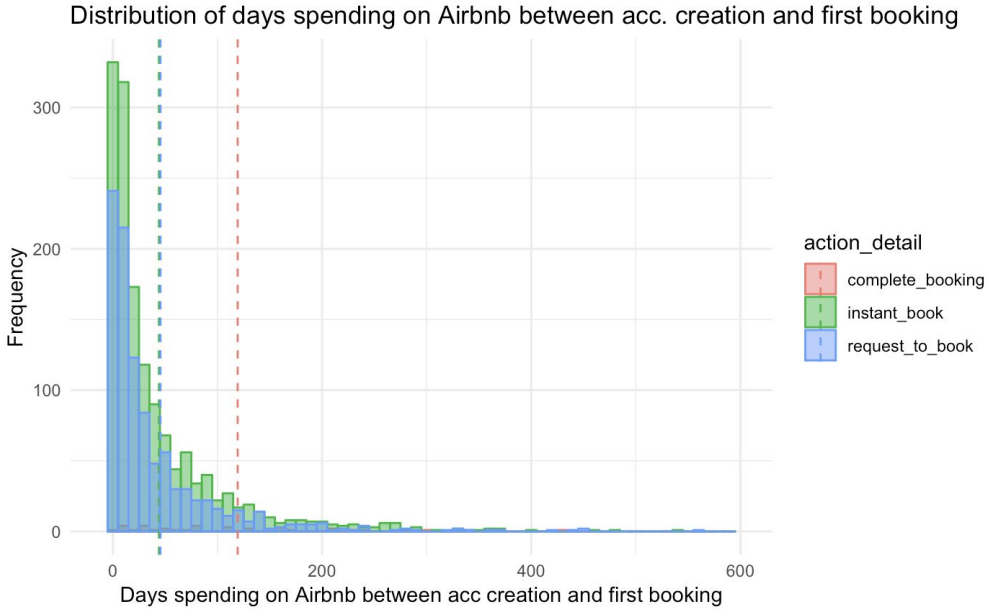
Results:

- SEM outperforms SEO in converting new users

affiliate_channel	channel_conv_rate
sem-brand	0.0501520
sem-non-brand	0.0305269
seo	0.0128320
content	0.0021129
remarketing	0.0017240

Business Questions

What kind of methods do new user use for their first orders?



Action	Mean	Number
Instant booking	**44.05756**	1468
Request booking	45.57009	985
Complete booking	**119.32957**	36

2.6%

"INSTANT BOOKING"
100% COMPLETION

There are two booking types for new users. But **the completion rate is lower and the period is longer for request-booking**.

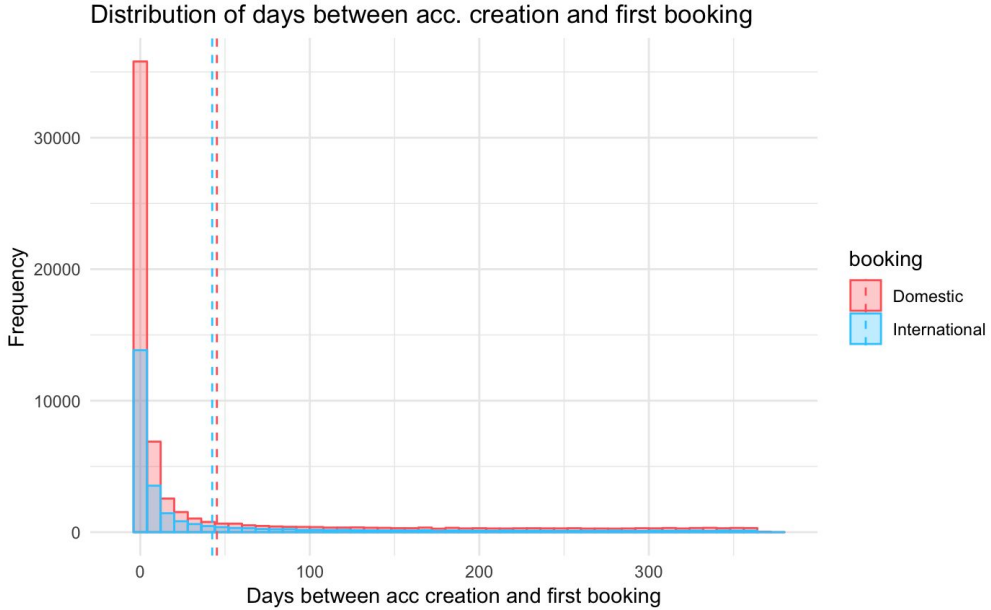
Airbnb should **prioritize the instant booking option** to new user and **simplified the booking process** for both the host and new user.

"REQUEST BOOKING"

No History Record
No Identity Confirmation
More Complicated Process

Business Questions

What is the different between domestic and international bookings?



Location	Mean	Amount
Domestic	45.18876	**62376**
International	**42.41849**	26532

Generally, Airbnb new users in USA are more likely to have domestic booking and thereby Airbnb should **promote the domestic trip packages and rooms** to new users.

The reaction period is shorter for foreign traveling users. Airbnb should have **more frequent follow-up emails to foreign traveling users**.

Clustering - International Destinations

Segment Clusters

cluster	0	1	2	3	4
age	38.425749	35.548330	33.850515	41.976418	33.441739
gender_-unknown-	0.172744	0.165489	0.212199	0.188018	0.088696
gender_FEMALE	0.473009	0.423926	0.402921	0.450605	0.410435
gender_MALE	0.354247	0.410585	0.384880	0.361377	0.500870
signup_method_basic	0.650642	0.647818	0.809278	0.748247	0.236522
signup_method_facebook	0.349358	0.352182	0.190722	0.251753	0.732174
signup_method_google	0.000000	0.000000	0.000000	0.000000	0.031304

Findings

- Cluster 4 does not like to use the basic signup and rather signup via Facebook and Google.

Segment Clusters - Signup Flow

What page do users sign up on?

cluster	0	1	2	3	4
signup_flow_0	0.896313	0.879749	0.022337	0.889739	0.000000
signup_flow_1	0.002037	0.002827	0.000000	0.000637	0.000000
signup_flow_2	0.040538	0.040732	0.000000	0.040153	0.000000
signup_flow_3	0.058464	0.068740	0.000000	0.065010	0.000000
signup_flow_6	0.000000	0.001679	0.009450	0.000000	0.000000
signup_flow_8	0.001833	0.003181	0.000000	0.001275	0.000000
signup_flow_12	0.000000	0.000353	0.020619	0.000000	1.000000
signup_flow_16	0.000000	0.000088	0.000000	0.000637	0.000000
signup_flow_21	0.000815	0.002386	0.000000	0.002549	0.000000
signup_flow_23	0.000000	0.000000	0.097079	0.000000	0.000000
signup_flow_24	0.000000	0.000265	0.167526	0.000000	0.000000
signup_flow_25	0.000000	0.000000	0.682990	0.000000	0.000000

Findings†

- Cluster 2 does not like to sign up immediately but rather on signup page 25.
- Cluster 4 is similar but signs up on page 12.
- Cluster 2 and 4 are the youngest groups so perhaps they search for rooms prior to signing up.

† **Note:** sign flow numbers do not signify the n^{th} page the user is on, but instead a specific page an unregistered visitor can view on the Airbnb website

Segment Clusters - Browsers

What browsers do new users use?

cluster	0	1	2	3	4
first_browser_Chromium	0.000611	0.000618	0.000000	0.000000	0.000000
first_browser_CoolNovo	0.000000	0.000088	0.000000	0.000000	0.000000
first_browser_Firefox	0.181707	0.224510	0.032646	0.001275	0.069565
first_browser_IE	0.000000	0.000000	0.013746	0.995539	0.033043
first_browser_IceWeasel	0.000000	0.000177	0.000000	0.000000	0.000000
first_browser_Iron	0.000204	0.000177	0.000859	0.000000	0.000000
first_browser_Kindle Browser	0.000000	0.000088	0.000000	0.000000	0.000000
first_browser_Maxthon	0.000000	0.000000	0.000000	0.001912	0.000000
first_browser_Mobile Firefox	0.000000	0.000088	0.000000	0.000000	0.000000
first_browser_Mobile Safari	0.103483	0.071302	0.139175	0.000000	0.125217
first_browser_Opera	0.001019	0.000972	0.000000	0.000000	0.000000
first_browser_RockMelt	0.000000	0.000177	0.000000	0.000000	0.001739
first_browser_Safari	0.281116	0.269924	0.055842	0.000000	0.109565
first_browser_SeaMonkey	0.000000	0.000265	0.000000	0.000000	0.000000
first_browser_Silk	0.000407	0.000177	0.000000	0.000000	0.000000

Findings

- Cluster 3, whom are a bit older, REALLY likes to use Internet Explorer for their browser.

Segment Clusters - Country Destination

What countries are international bookings in?

cluster	0	1	2	3	4
country_destination_AU	0.018741	0.022354	0.022337	0.026769	0.026087
country_destination_CA	0.050519	0.056724	0.056701	0.047164	0.043478
country_destination_DE	0.044001	0.043382	0.032646	0.045889	0.031304
country_destination_ES	0.083113	0.087648	0.079897	0.085405	0.086957
country_destination_FR	0.196578	0.189786	0.147766	0.183556	0.139130
country_destination_GB	0.089224	0.090475	0.071306	0.091141	0.086957
country_destination_IT	0.106946	0.101078	0.092784	0.107075	0.078261
country_destination_NL	0.033815	0.028892	0.030069	0.028043	0.031304
country_destination_PT	0.009574	0.007864	0.006873	0.006373	0.003478
country_destination_other	0.367488	0.371797	0.459622	0.378585	0.473043

Findings

- Not that much variation across clusters besides France and “other” destinations being popular.

Clustering - Domestic Destinations

Segment Clusters

cluster	0	1	2	3	4
age	35.450644	33.082808	33.072529	40.471154	38.028627
gender_-unknown-	0.177704	0.242724	0.095648	0.125000	0.168944
gender_FEMALE	0.427305	0.410141	0.413418	0.500000	0.478999
gender_MALE	0.394992	0.347135	0.490934	0.375000	0.352057
signup_method_basic	0.653992	0.831083	0.316863	0.894231	0.664353
signup_method_facebook	0.346008	0.168917	0.653672	0.105769	0.335647
signup_method_google	0.000000	0.000000	0.029465	0.000000	0.000000

Findings

- Clusters 1 and 2 are similar ages but prefer different signup methods.

Segment Clusters - Signup Flow

What page do users sign up on?

cluster	0	1	2	3	4
signup_flow_0	0.906537	0.023702	0.000453	0.000000	0.864888
signup_flow_1	0.000000	0.000000	0.000000	1.000000	0.000000
signup_flow_2	0.031320	0.000000	0.000000	0.000000	0.062315
signup_flow_3	0.056468	0.000000	0.000000	0.000000	0.070628
signup_flow_5	0.000000	0.000000	0.000000	0.000000	0.000145
signup_flow_6	0.001490	0.007801	0.000000	0.000000	0.000000
signup_flow_8	0.001241	0.000000	0.000453	0.000000	0.000217
signup_flow_10	0.000000	0.000000	0.000000	0.000000	0.000072
signup_flow_12	0.000248	0.031503	0.830009	0.000000	0.000072
signup_flow_15	0.000000	0.000000	0.000000	0.000000	0.000217
signup_flow_20	0.000035	0.000000	0.000000	0.000000	0.000072
signup_flow_21	0.001029	0.000000	0.000000	0.000000	0.001301
signup_flow_23	0.000071	0.000000	0.169084	0.000000	0.000000
signup_flow_24	0.001312	0.244224	0.000000	0.000000	0.000072
signup_flow_25	0.000248	0.692769	0.000000	0.000000	0.000000

Findings†

- Clusters 0 and 4 usually signup on the first page compared to the others.
- Clusters 1, 2, and 3 like signing up on different respective pages.

† **Note:** sign flow numbers do not signify the n^{th} page the user is on, but instead a specific page an unregistered visitor can view on the Airbnb website

Segment Clusters - Browsers

What browsers do new users use?

cluster	0	1	2	3	4
first_browser_Android Browser	0.001915	0.009001	0.014506	0.000000	0.001880
first_browser_Apple Mail	0.000142	0.000300	0.000000	0.000000	0.000361
first_browser_BlackBerry Browser	0.000248	0.000000	0.000453	0.000000	0.000361
first_browser_Camino	0.000035	0.000000	0.000000	0.009615	0.000217
first_browser_Chrome	0.388784	0.079808	0.137806	0.230769	0.391961
first_browser_Chrome Mobile	0.003476	0.021302	0.009519	0.000000	0.003253
first_browser_Chromium	0.000745	0.000000	0.000453	0.000000	0.000506
first_browser_CoolNovo	0.000035	0.000000	0.000000	0.000000	0.000072
first_browser_Firefox	0.200865	0.034803	0.059383	0.307692	0.177257
first_browser_IE	0.080800	0.020102	0.031732	0.067308	0.089062
first_browser_Mobile Firefox	0.000106	0.000300	0.001360	0.000000	0.000145
first_browser_Mobile Safari	0.061611	0.210321	0.110607	0.105769	0.079737
first_browser_Mozilla	0.000035	0.000000	0.000000	0.000000	0.000000

Findings

- We have decent resolution with browsers such as Chrome and Safari.

Managerial Recommendation

1. *Keep investing in SEM branding*
    - We know it is more effective in converting new users than SEO
    - Investigate further why SEO is underperforming
2. *Follow up with users making international trips sooner and more frequently*
3. *Offer "instant booking" option to new users*
    - Encourages new users to book first trip
    - May require A/B testing
4. *Airbnb has heterogeneous segments with distinct preferences*
    - Figure out why certain attributes of Airbnb's platform work better for some segments and improve in that respect
    - Further investigate domestic destinations at state/city level to really understand segments