

Analysis of Price Movement as Date Approaches Check-in Date

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Background

Most of the time, the primary goal of launching a new feature on Agoda website is to increase the number of bookings. One way to increase the number of bookings and conversion rate is to encourage customers to complete their booking as fast as possible. The call to action message that helps us to achieve that is internally known as an ‘urgency message’.

A Product Owner (PO) would like to implement an urgency message on the website such as

- * “Prices have been rising. Book now to lock in your rates!”
- * “Your check-in is fast approaching. Book now to lock in your rates!”

In order to know when and where to implement urgency message, analysis is needed. By analyzing the price movement as date approaches the check-in date, we can get business insights on the relationships of different factors, and therefore, use the results to increase the number of booking.

Assumptions

- Assuming that the 5 cities are independent and uncorrelated.

Key Findings

- The number of records in each city varies.

	Number of Records
City A	22366
City B	4932
City C	6797
City D	10152
City E	4817

- The distribution of number of records over different booking date has the same pattern in all 5 cities.
- Booking increases very fast around the end of September.

Figure 1A: Number of Booking Records by Booking Date in City A

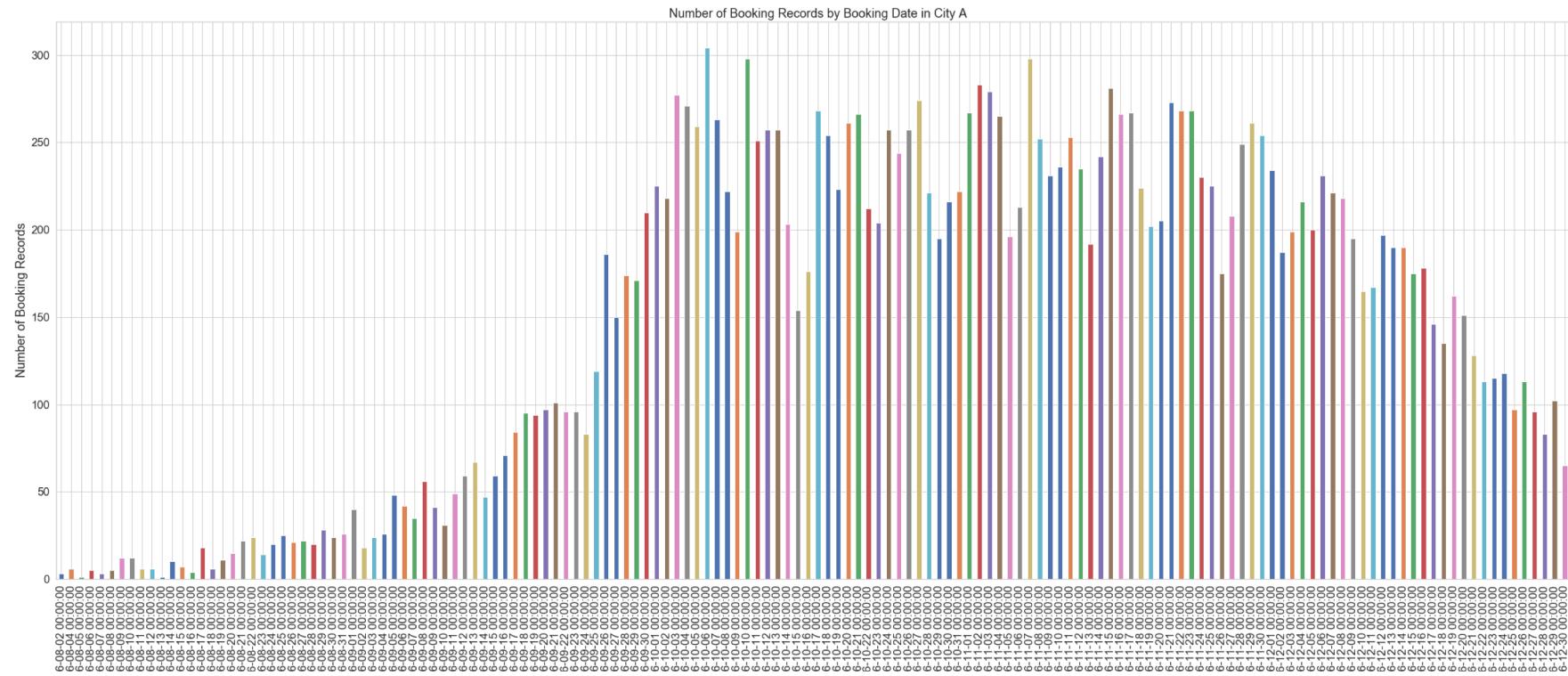


Figure 1B: Number of Booking Records by Booking Date in City B

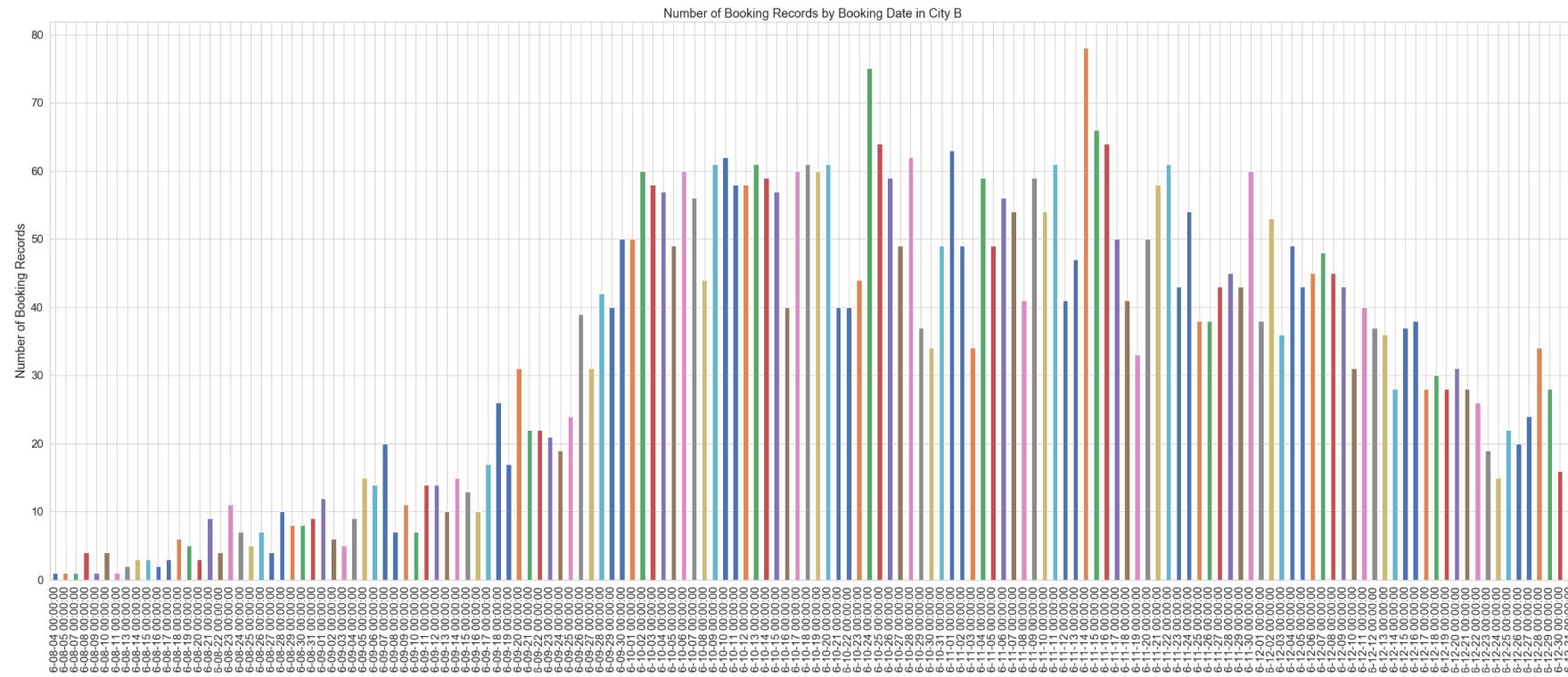


Figure 1C: Number of Booking Records by Booking Date in City C

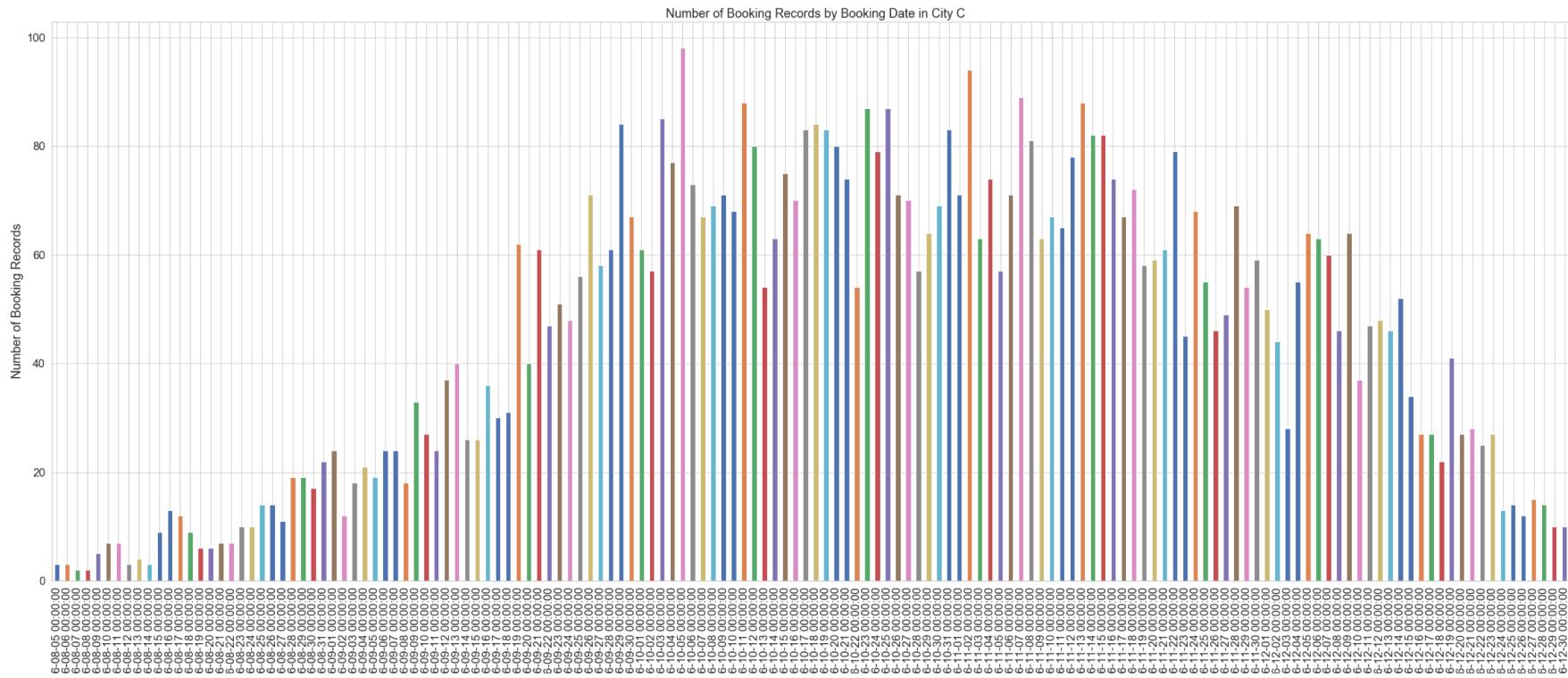


Figure 1D: Number of Booking Records by Booking Date in City D

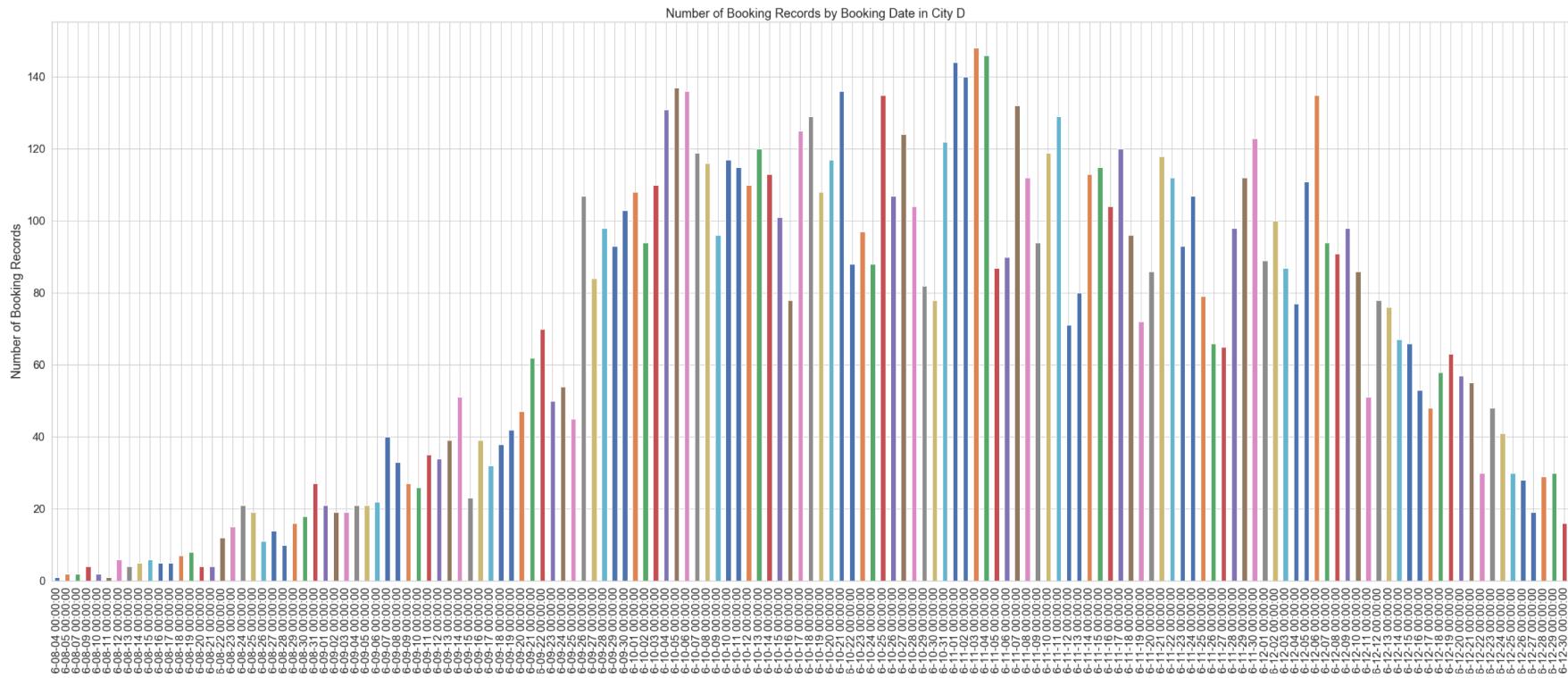
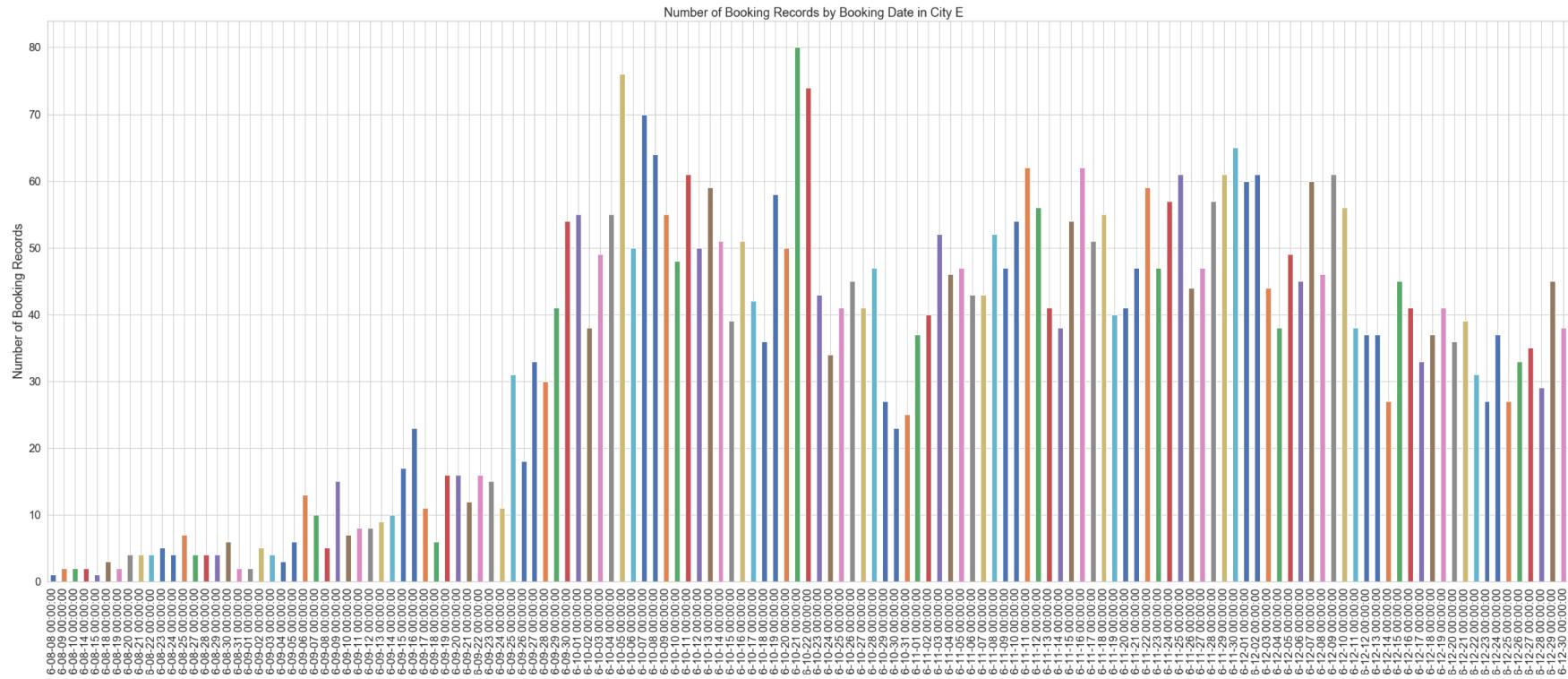
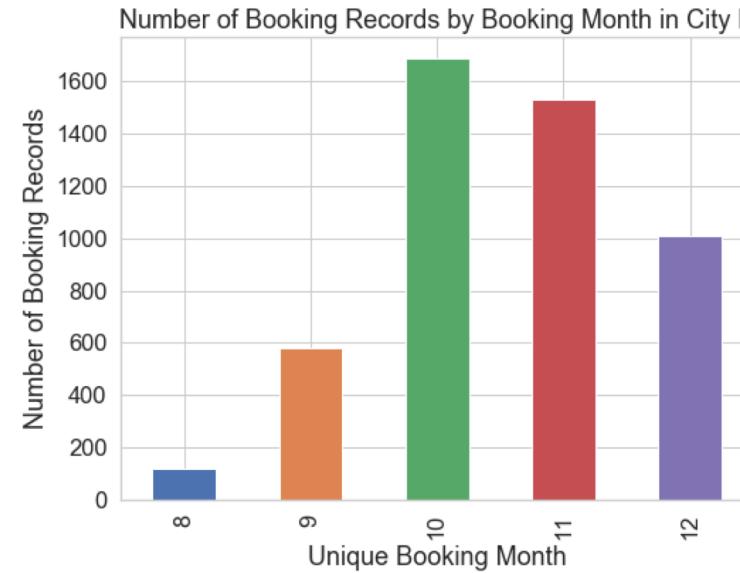
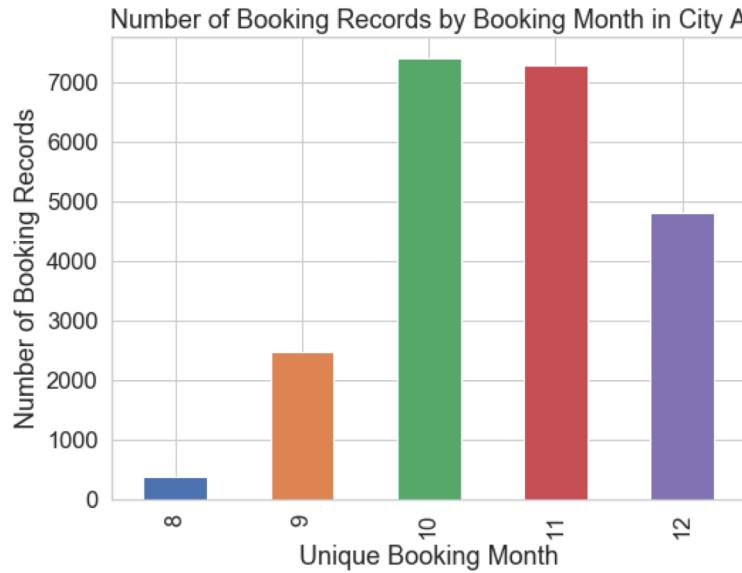


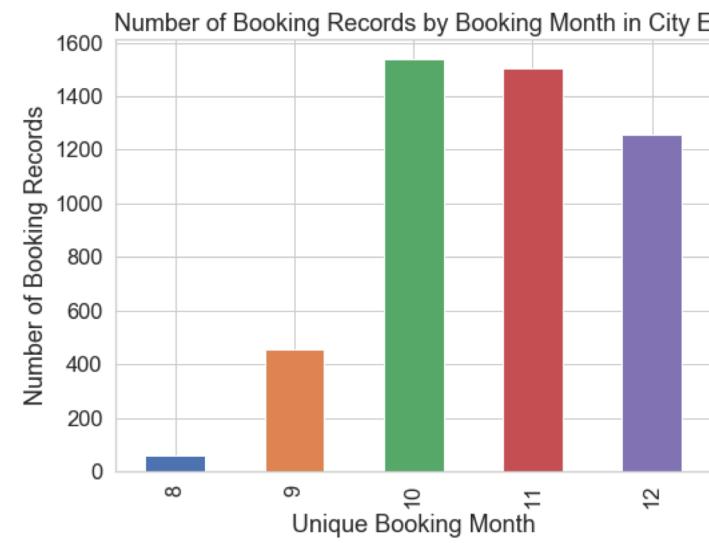
Figure 1E: Number of Booking Records by Booking Date in City E



- Most of the bookings are made in October, November and December

Figure 2: Number of Booking Records by Booking Month





- The check-in records oscillate by the cycle of a week. More check-in records in the weekends.

Figure 3A: Number of Records by Check-in Date in City A

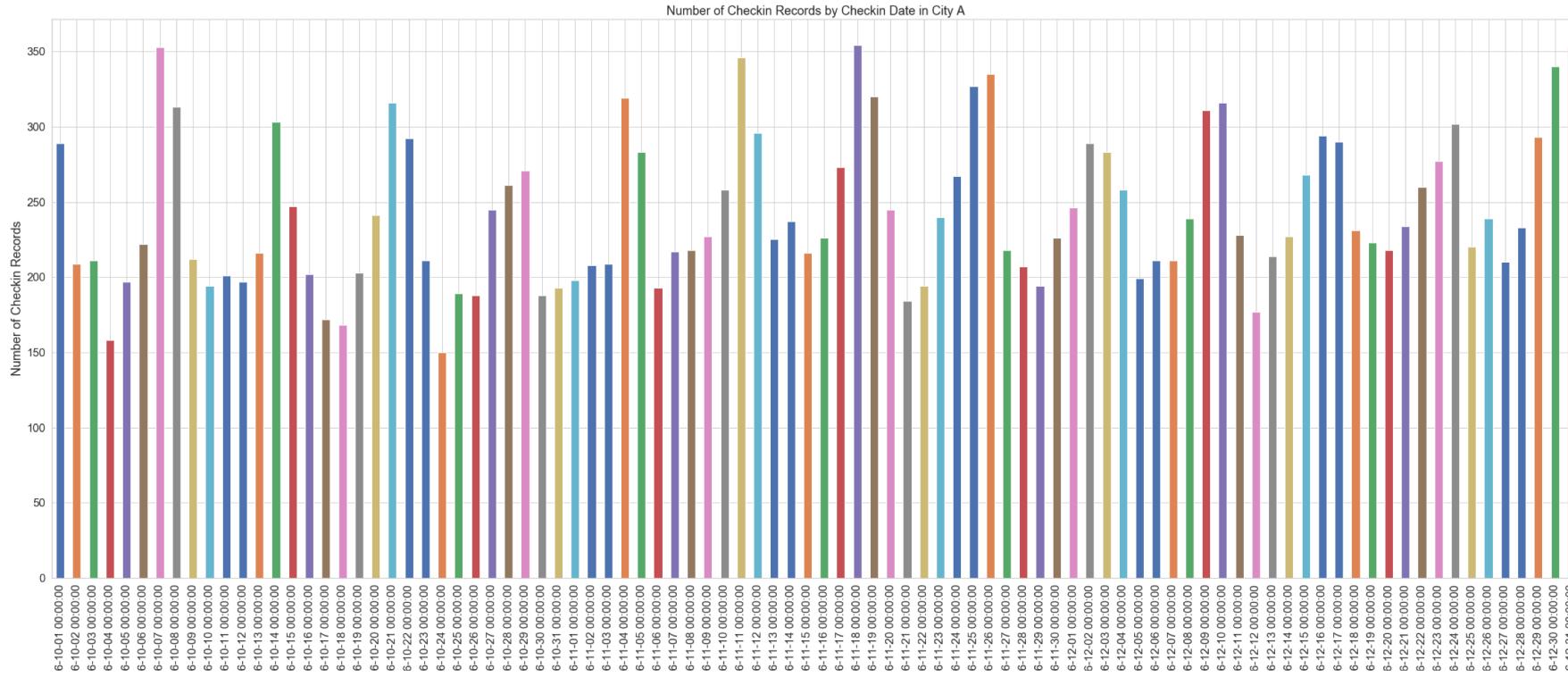


Figure 3B: Number of Records by Check-in Date in City B

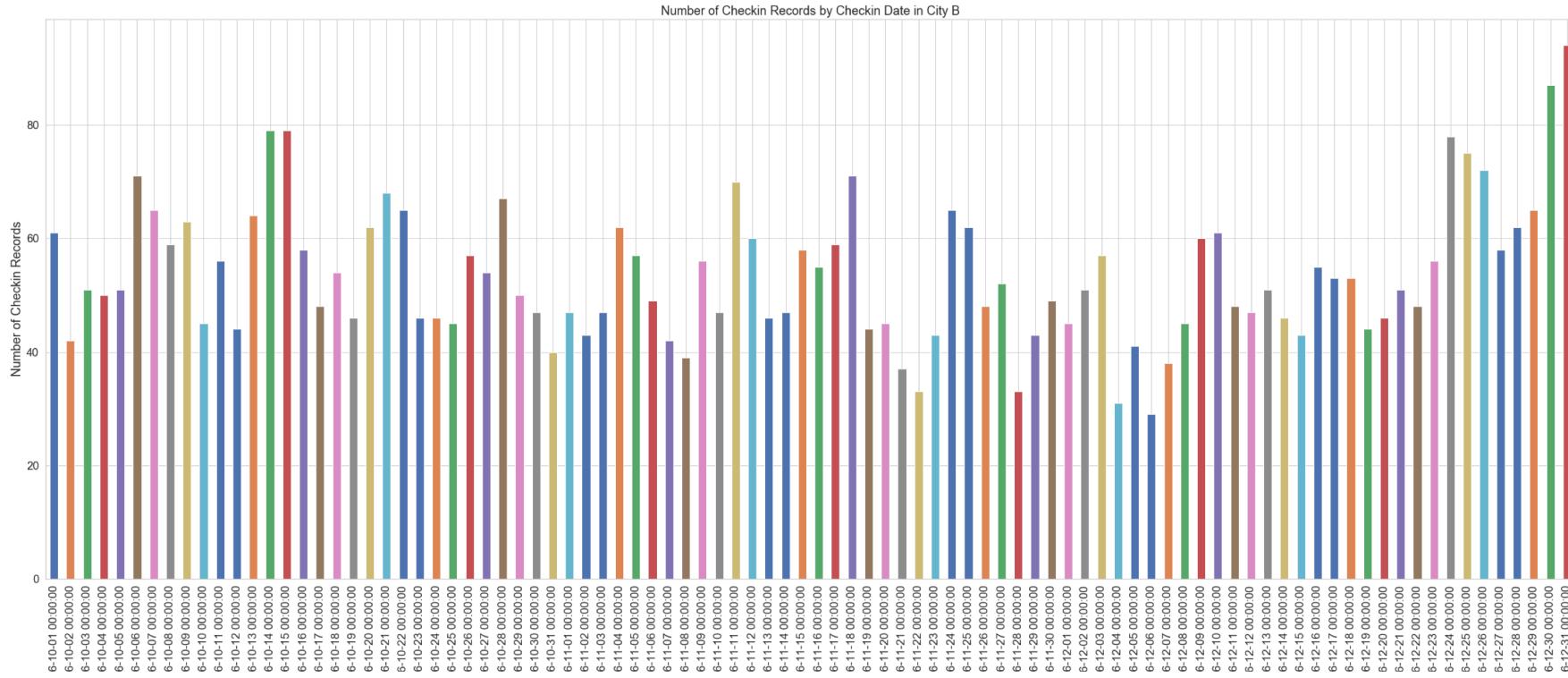


Figure 3C: Number of Records by Check-in Date in City C

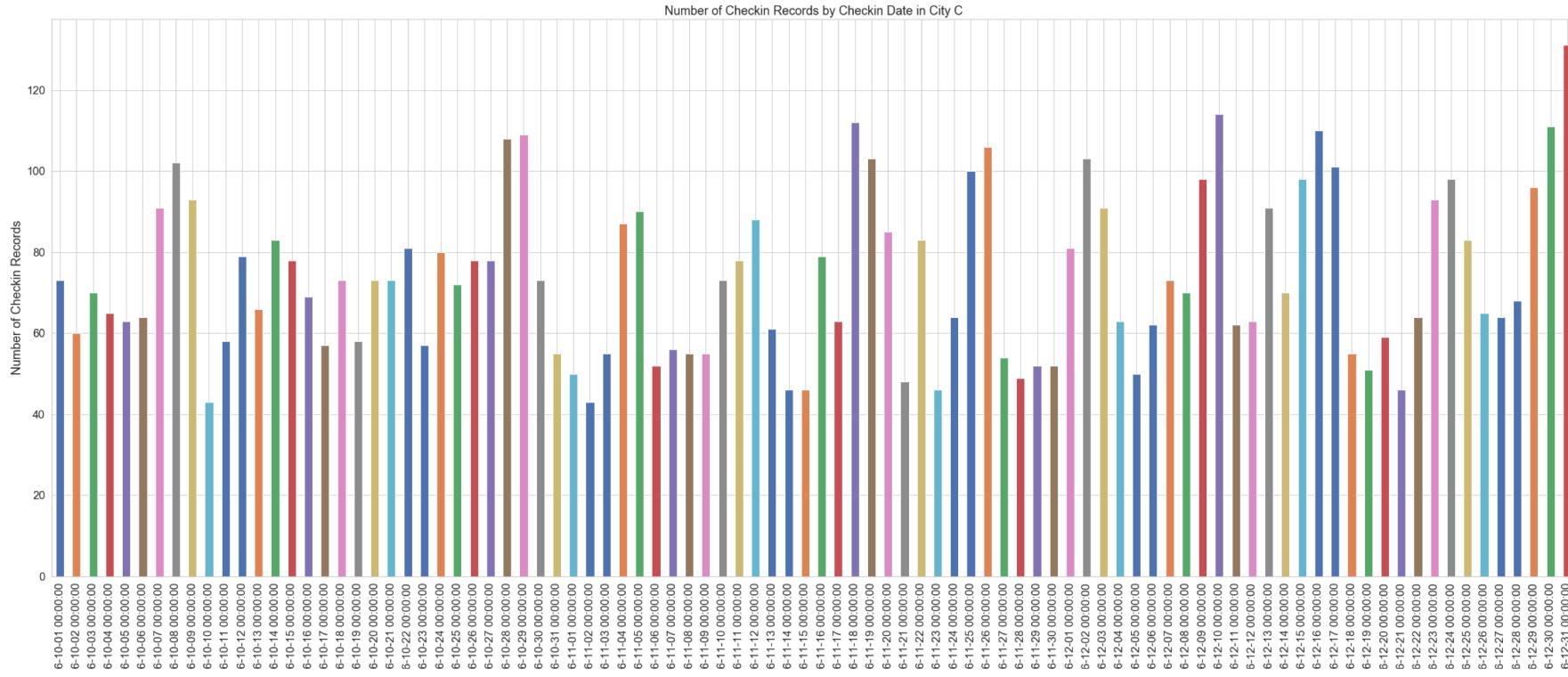


Figure 3D: Number of Records by Check-in Date in City D

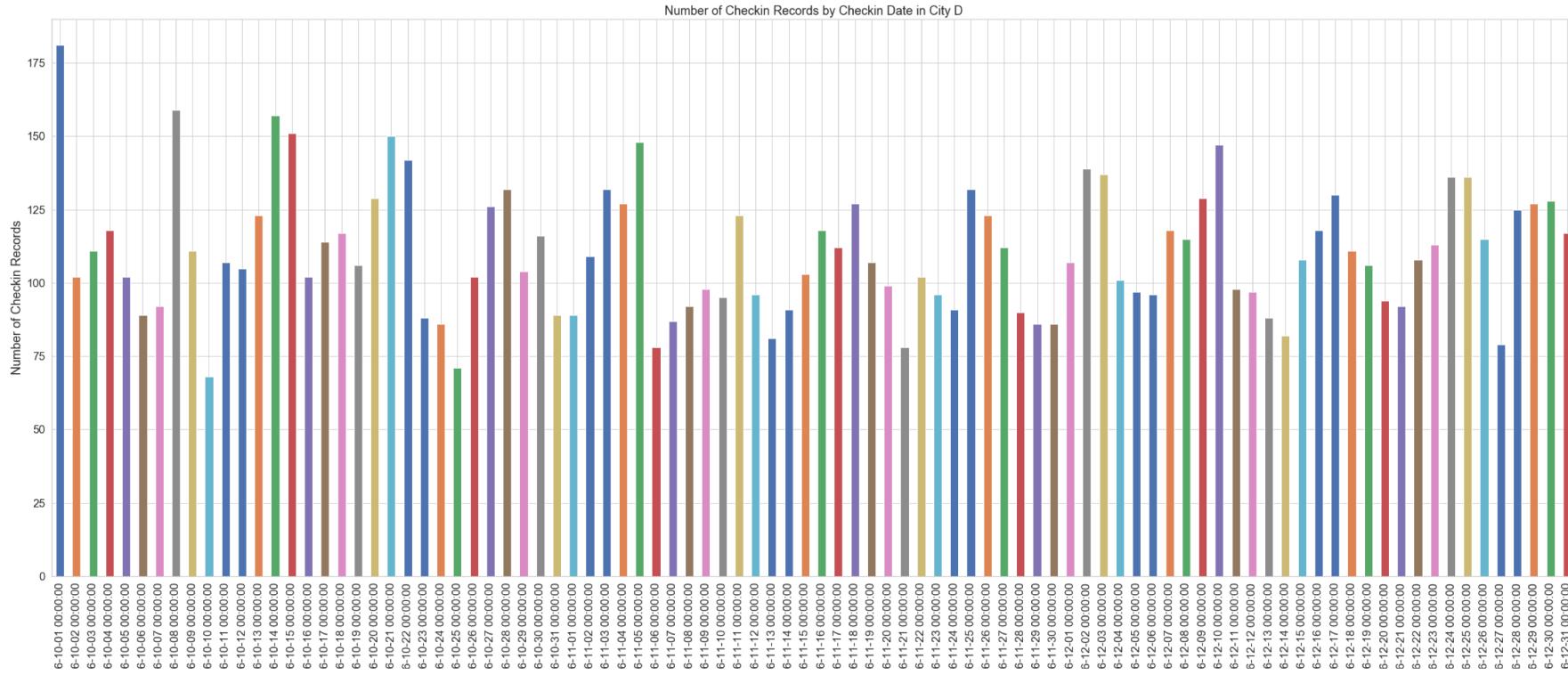
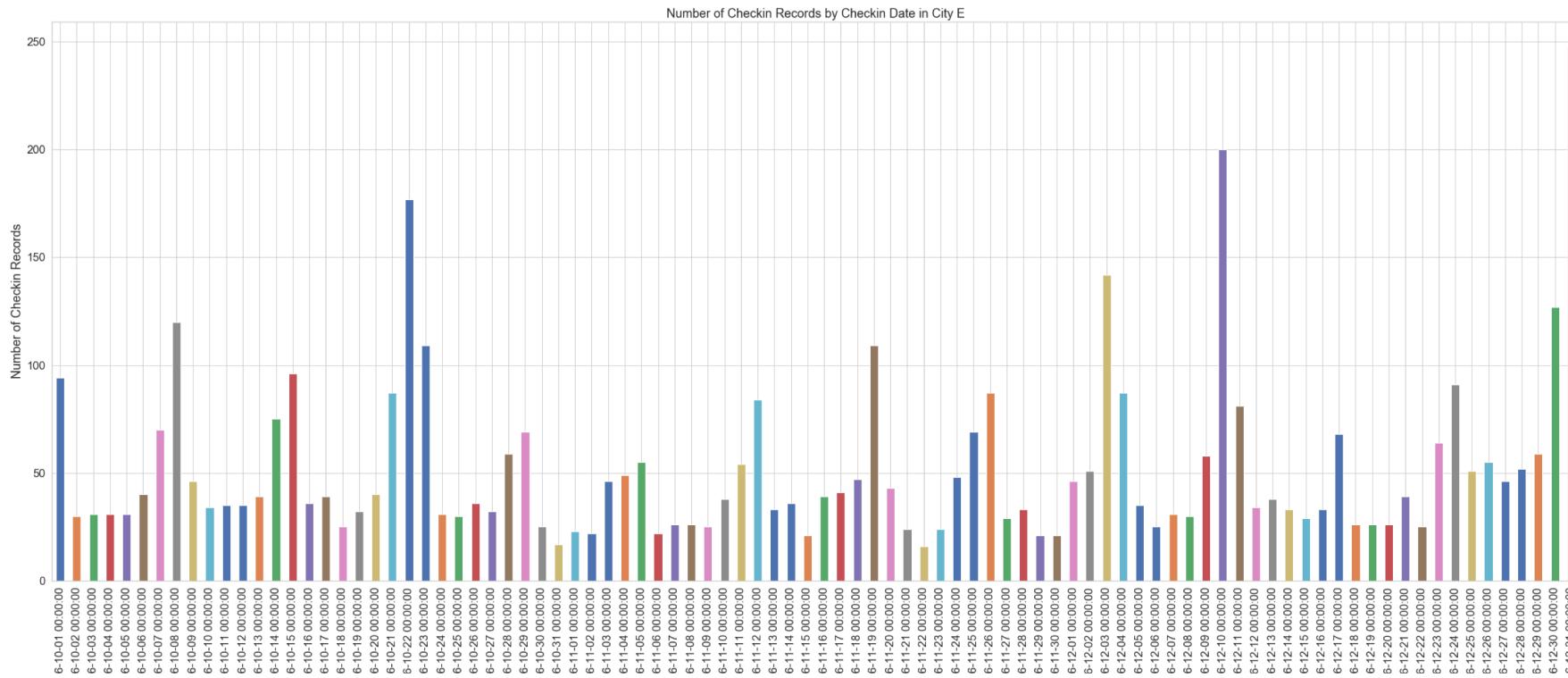


Figure 3E: Number of Records by Check-in Date in City E



The average ADR is also higher in the weekends.
(Fridays, Saturdays)

ADR_USD	
day_of_week	
Friday	110.088949
Saturday	109.838897
Thursday	109.225913
Monday	103.224777
Wednesday	102.752676
Sunday	100.743228
Tuesday	100.065832

The average ADR reaches the highest in August and starts to decrease all the way to December.

- (Except for City D, City E) City D is the opposite, and City E doesn't have a clear pattern.

	City A	City B	City C	City D	City E
booking_month	ADR	ADR	ADR	ADR	ADR
8	109.20	171.68	262.30	198.11	111.14
9	110.83	134.97	225.83	211.86	151.70
10	99.96	112.22	221.96	212.87	139.24
11	97.99	115.13	223.45	221.49	128.23
12	99.19	117.27	224.00	232.78	160.11

The structure of the accommodation type in each city is different.

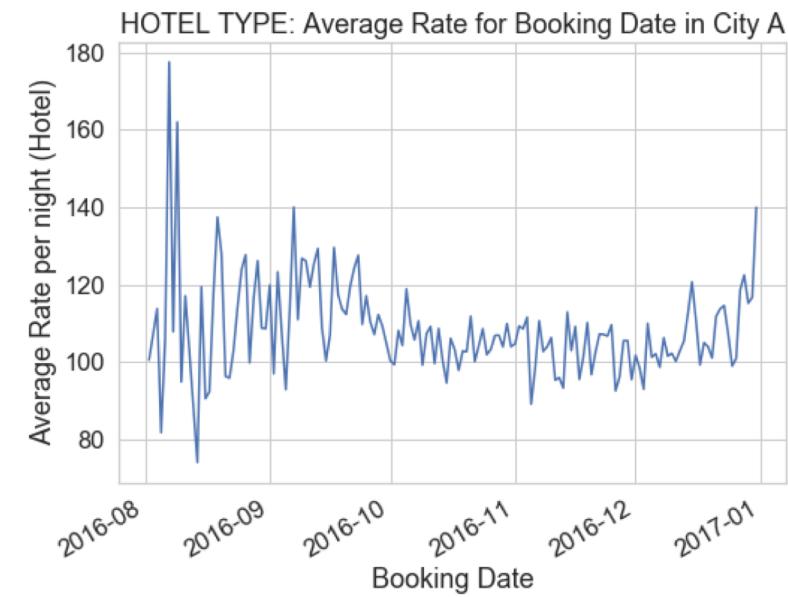
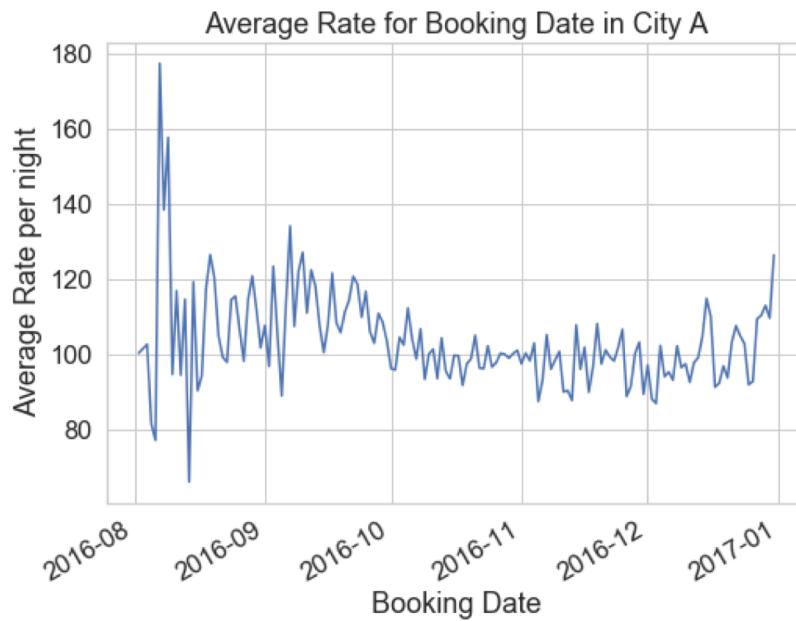
- For City A, C, D, E, most of the bookings were made for the “hotel” type. On the other hand, City B seems to be a Resort City.

Top 5 Accommodation Type in Each City																									
Total Records	City A					City B					City C					City D					City E				
	Rank (top 5)	type	records	percentage	type	records	percentage	type	records	percentage	type	records	percentage	type	records	percentage	type	records	percentage	type	records	percentage			
	1	Hotel	18398	82.26%	Resort	1930	39.13%	Hotel	4830	71.06%	Hotel	7783	76.66%	Hotel	2540	52.73%					4817				
	2	Serviced Apartment	2326	10.40%	Hotel	1890	38.32%	Capsule Hotel	822	12.09%	Hostel	1269	12.50%	Resort	1436	29.81%									
	3	Hostel	1002	4.48%	Guest House	532	10.79%	Hostel	408	6.00%	Guest House	991	9.76%	Guest House	341	7.08%									
	4	Guest House	520	2.32%	Resort Villa	299	6.06%	Guest House	374	5.50%	Serviced Apartment	97	0.96%	Serviced Apartment	302	6.27%									
	5	Apartment	51	0.23%	Bungalow	141	2.86%	Apartment	137	2.02%	Home	12	0.12%	Resort Villa	98	2.03%									

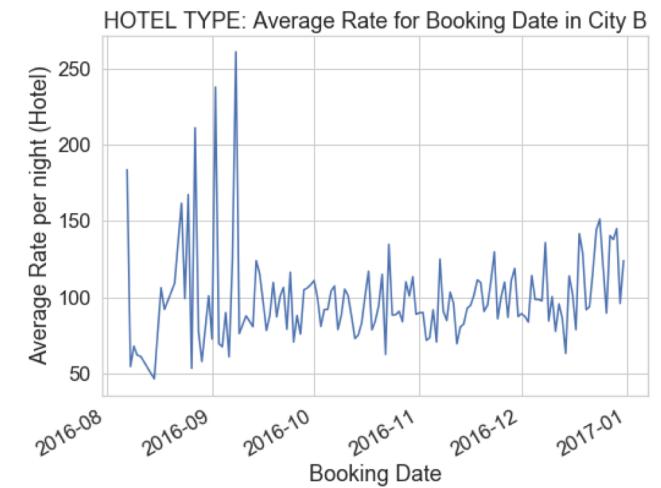
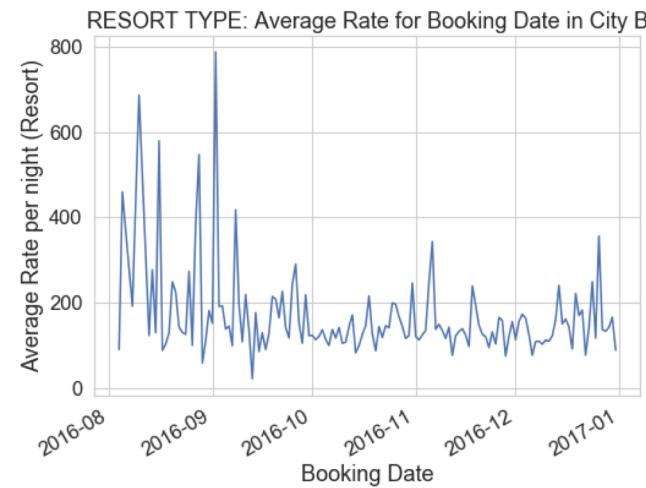
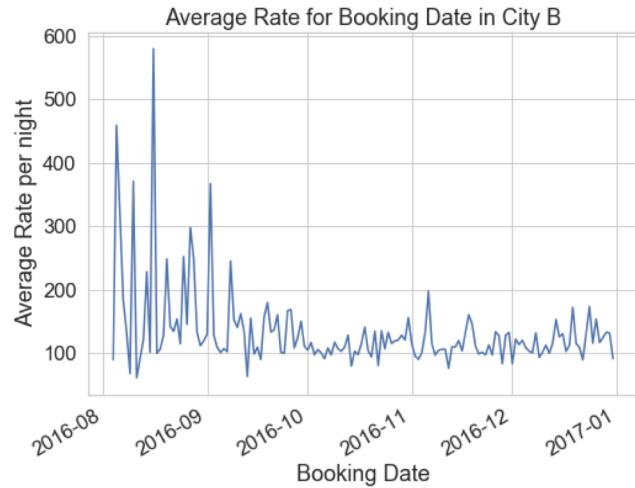
Over 50%

Over 30%

“Hotel type” is the biggest factor that contributes to the average ADR in the city as a whole.



For city B, the “resort type” contributes more



- When the check-in dates are approaching the end of the year, people tend to book earlier.
- Also, the average ADR increases as it moves toward the end of the year.

Average Days to book ahead and the average ADR in each check-in month in each city

	ADR_USD	bookdays_int
checkin_month		
10	100.946781	12.019395
11	99.527142	13.442493
12	101.046473	14.213453

	ADR_USD	bookdays_int
checkin_month		
10	116.339792	12.591460
11	108.699471	12.980782
12	128.936437	15.992899

	ADR_USD	bookdays_int
checkin_month		
10	220.981385	19.057406
11	212.940606	20.889217
12	238.112597	21.814815

	ADR_USD	bookdays_int		ADR_USD	bookdays_int		
	checkin_month			checkin_month			
	10	217.392117	14.127887		10	143.920543	9.895215
	11	210.230484	14.607465		11	120.648375	11.023121
	12	227.993227	16.616772		12	153.772868	12.415857

SEGMENTATION: "HOLIDAYS"

- *Important Holidays (in United States):*

Veterans Day(Regional) 11/11/2016 Friday

Thanksgiving(National) 11/24/2016 Thursday

Black Friday 11/25/2016 Friday

Christmas Day(National) 12/26/2016 Mon

The 3 Main Long Weekends

Taking the idea of long weekend into account, it is reasonable to add in the weekends (Fri, Sat, Sun) that comes right before and right after the important holidays, the following will be the 11 main dates for "long weekend" (that might have a higher travel rate):

- **Veterans**

11/11/2016 Fri

11/12/2016 Sat

11/13/2016 Sun

- **Thanksgiving + Black Friday**

11/24/2016 Thu

11/25/2016 Fri

11/26/2016 Sat

11/27/2016 Sun

- **Christmas**

12/23/2016 Fri

12/24/2016 Sat

12/25/2016 Sun

12/26/2016 Mon

The average ADR, Book Ahead Days of Veterans Long Weekend

	ADR_USD	booking_month	bookdays_int
checkin_date			
2016-11-11	101.710909	10.416185	15.202312
2016-11-12	100.342072	10.503378	14.108108
2016-11-13	96.701630	10.564444	13.671111

The average ADR, Book Ahead Days of Thanksgiving Long Weekend

checkin_date	ADR_USD	booking_month	bookdays_int
2016-11-24	101.703793	10.711610	15.247191
2016-11-25	104.705535	10.804281	12.214067
2016-11-26	102.865134	10.829851	12.695522
2016-11-27	94.346269	10.857798	11.775229

The average ADR, Book Ahead Days of Christmas Long Weekend

checkin_date	ADR_USD	booking_month	bookdays_int
2016-12-23	103.539386	11.628159	17.931408
2016-12-24	114.733284	11.688742	15.149007
2016-12-25	97.536682	11.745455	13.950000
2016-12-26	106.873919	11.690377	16.410042

The average ADR of 3 long weekend holidays

All seems to be around \$100/night.

- Veterans: \$99.58
- Thanksgiving: \$100.91
- Christmas: \$105.67

The average ADR for a random normal day

10/03/2016 is a normal day (Monday, not weekend, not holiday)

- The average of ADR for this day is \$93.23

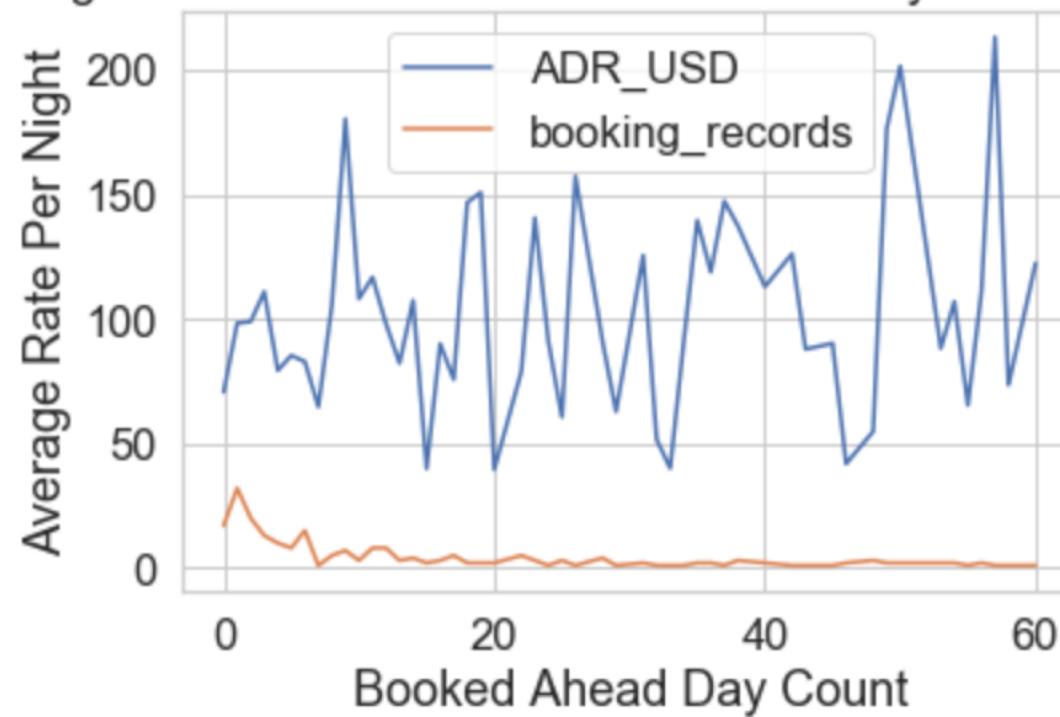
We can see a big difference in the price for a holiday compare to a normal day

Set up a fixed Check-date

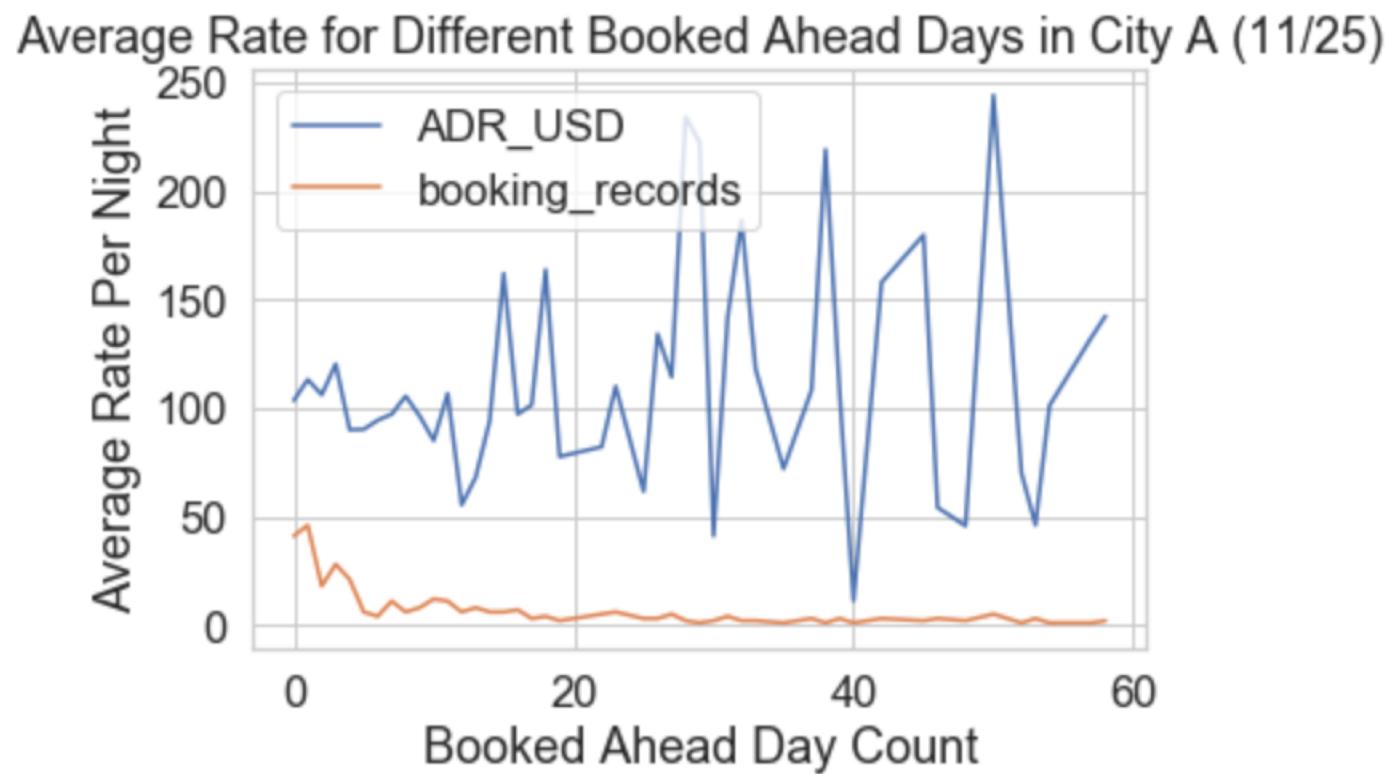
Let's set up a **FIXED check-in date**, and take a look at the distribution of the days booking ahead and the average ADR.

Fixed Check-in Date on holiday (11/13)

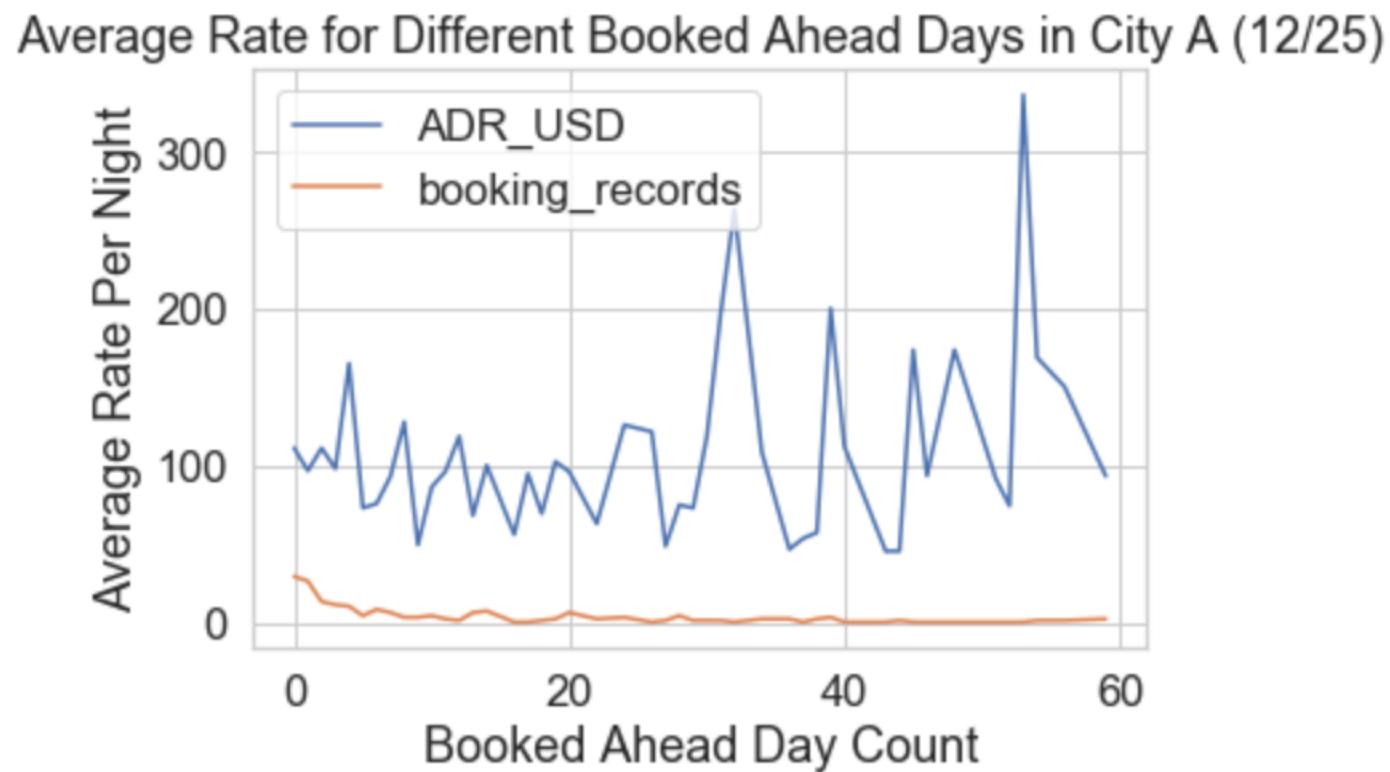
Average Rate for Different Booked Ahead Days in City A (11/13)



Fixed Check-in Date on holiday (11/25)



Fixed Check-in Date on holiday (12/25)



Conclusion

- The distribution of the number of records over different booking date has the same pattern in all 5 cities.
- The number of booking increases very fast around the end of September.
- Most of the bookings were made in October, November and December.
- The check-in records oscillate by the cycle of a week.
- More check-in records in the weekends.
- The average ADR is higher in the weekends. (Fridays, Saturdays)
- The average ADR is higher on holidays.

- In general, the average ADR reaches the highest in August and starts to decrease all the way to December.
- When the check-in dates are approaching the end of the year, people tend to book earlier. (Holiday Seasons)
- The average ADR increases as the check-in date moves toward the end of the year. (Holiday Seasons)

Recommendation (what time to implement)

- Start implementing urgency messages around the end of September or the beginning of October.
- When user search for check-in dates that are weekends (Fridays, Saturdays), implement the urgency messages, and provide discounts to increase the chance of booking.

Recommendation (Urgency Messages)

- Implement urgency messages at the search results page, feature page and booking form.
- Add numbers to the urgency messages because people are more sensitive to numbers.
 - “11 people are considering this hotel right now!”
 - “Someone booked 46 minutes ago!”
 - “Our last 3 rooms!”
- Add ratings to the urgency messages.
 - “Good ratings 8.5! Book fast!”
 - “Great choice of property with average review score of 9.2!”

Missing Factors that might influence the analysis

- Missing the customer review column.
 - If this factor is provided, we can perform cross examination on the relationship between booking numbers and the ratings in order to implement promotion strategies accordingly.
- Missing the total number of room available column.
 - If this factor is provided, we could know the occupancy rate per night. If the occupancy rate is not as expected, more marketing promotion can be implemented.