

Auswertung

Setup

Flughafen: EDDF

Minimum an Beobachtungen pro Linienflug: 20

Linienflüge: wichtige Lagemaße

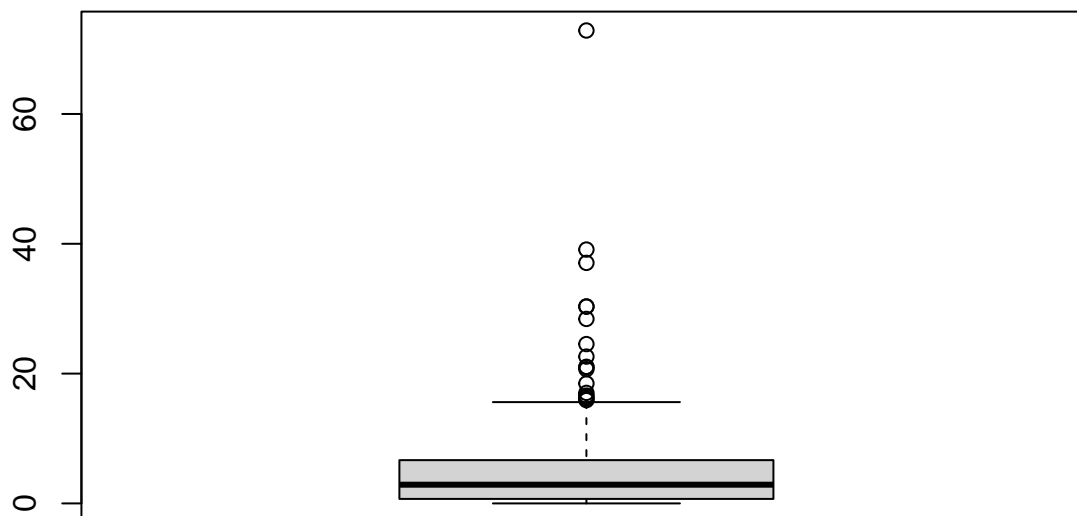
Zuerst wird eine Tabelle erstellt mit jenen Linienflügen, von denen mehr als 20 Beobachtungen verfügbar sind. Die Flüge werden gruppiert und es wird die durchschnittliche Abweichung vom geplanten Abflugszeitpunkt berechnet. Zudem wird der Median und verschiedene Quantile ermittelt.

##	linienfluege	mean	median	quantile75	quantile95	arrival_airport
## 1	4Y 10	10.857143	0	15	36.50	MMUN
## 2	4Y 132	2.638889	0	0	20.00	FYWH
## 3	4Y 2	30.348837	15	30	64.50	MDPC
## 4	4Y 302	8.333333	0	0	36.00	GCLP
## 5	4Y 306	7.083333	0	15	29.25	GCTS
## 6	A3 1400	1.212121	0	0	6.00	ESSA

Verteilung der arith. Mittel über alle Linienflüge

Um einen Gesamtüberblick über alle Flüge zu erhalten, werden im folgenden die arith. Mittel der Verspätung von allen Linienflügen dargestellt.

```
boxplot(flights$mean)
```

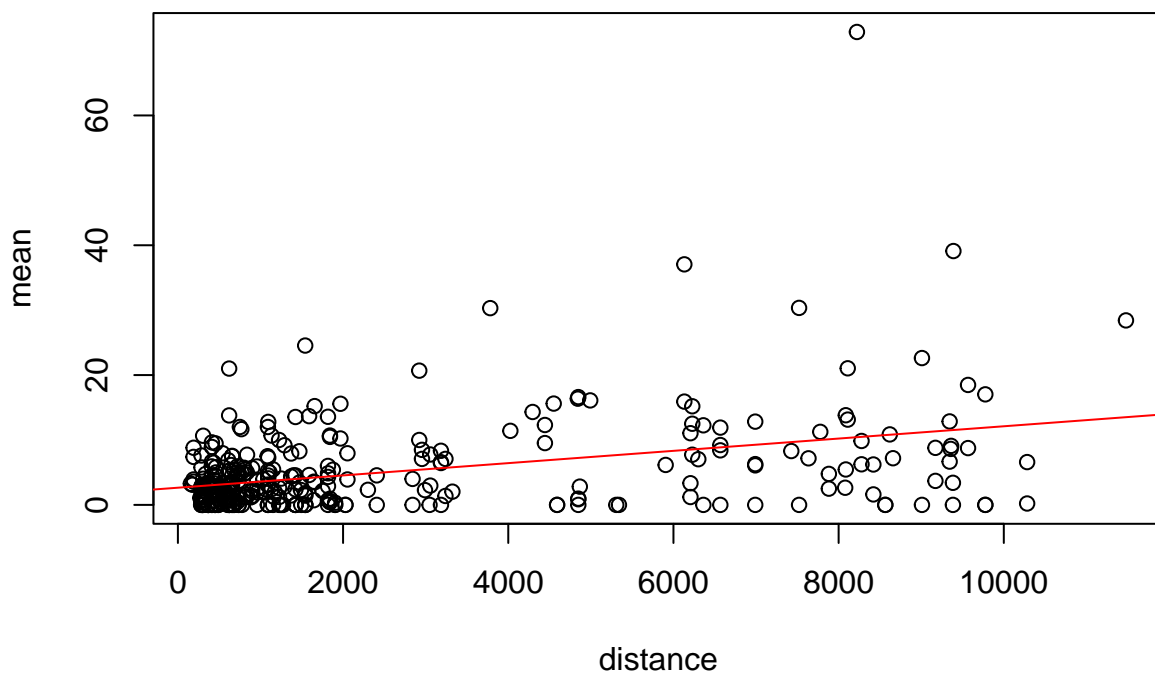


Man sieht hier, dass der Median bei 2.8846154 liegt. Das bedeutet, dass 50% der Linienflüge eine maximale durchschnittliche Abweichung von 2.8846154 aufweisen.

Distanz zum Zielflughafen: Regression

```
cor.test(distance, mean)
```

```
##  
## Pearson's product-moment correlation  
##  
## data: distance and mean  
## t = 7.7519, df = 337, p-value = 1.08e-13  
## alternative hypothesis: true correlation is not equal to 0  
## 95 percent confidence interval:  
## 0.2947036 0.4758139  
## sample estimates:  
## cor  
## 0.3890111
```



Gruppierung der Linienflüge (1500 km)

Weiters werden die Linienflüge aufgeteilt auf zwei Gruppen (über und unter 1500 km Distanz). Desweiteren wird definiert, dass ein Flug als verspätet gilt, wenn er mehr als 2.8846154 Minuten (Median, der durchschnittlichen Verspätung) verspätet ist.

Insgesamt sind auf Basis dieser Annahmen 41.26 Prozent der Kurzstreckenflüge verspätet. Von den Langstreckenflügen sind es 62.41 Prozent.

Bewertung der Relevanz eines Flugs

Um nun Bewertungen einzelner Flüge vornehmen zu können, wird der Median sowie das arith. Mittel herangezogen.

Jene drei Flüge, welche den höchsten Median aufweisen werden deshalb als unwichtig eingestuft. Im Gegensatz dazu werden jene drei Flüge, welche den niedrigsten Mittelwert haben, als wichtige Flüge bezeichnet.

important

```
##      linienfluege mean median quantile75 quantile95 arrival_airport
## 7      A3 1404      0      0              0              0          EKCH
## 16     A3 1466      0      0              0              0          EYVI
## 19     A3 1560      0      0              0              0          EDDH
##      relevant_distances
## 7              679.4592
## 16             1245.1360
## 19             411.9607
```

unimportant

```
##      linienfluege      mean median quantile75 quantile95 arrival_airport
## 106     CA 6251 17.02703      20          30          30          SBGR
## 83      AC 9598 20.68182      25          30          30          HECA
## 239     LH 510 28.42105      45          45          45          SAEZ
##      relevant_distances
## 106              9776.261
## 83              2922.441
## 239             11479.140
```

Anhang (wichtige und unwichtige Flüge im Detail)

```
## [1] "Aegean"
## [1] "A3 1404"
##      scheduledTime      actualTime      aircraft
## 1  2021-12-15 20:00:00 2021-12-15 20:00:00 Airbus A320-100/200
## 2  2021-10-29 17:30:00 2021-10-29 17:30:00 Airbus A321-100/200
## 3  2021-12-12 20:00:00 2021-12-12 20:00:00 Airbus A320-100/200
## 4  2021-12-18 20:00:00 2021-12-18 20:00:00 Airbus A320
## 5  2021-10-21 17:30:00 2021-10-21 17:30:00 Airbus A321-100/200
## 6  2021-11-02 20:00:00 2021-11-02 20:00:00 Airbus A320
## 7  2021-12-13 20:00:00 2021-12-13 20:00:00 Airbus A320 NEO
## 8  2021-11-05 20:00:00 2021-11-05 20:00:00 Airbus A320
## 9  2021-11-15 20:00:00 2021-11-15 20:00:00 Airbus A320
## 10 2021-11-17 20:00:00 2021-11-17 20:00:00 Airbus A320
## 11 2022-01-13 20:00:00 2022-01-13 20:00:00 Airbus A320
## 12 2021-11-21 20:00:00 2021-11-21 20:00:00 Airbus A321-100/200
## 13 2021-10-24 17:30:00 2021-10-24 17:30:00 Airbus A321
## 14 2021-11-24 20:00:00 2021-11-24 20:00:00 Airbus A320 NEO
## 15 2021-12-16 20:00:00 2021-12-16 20:00:00 Airbus A321
## 16 2021-11-26 20:00:00 2021-11-26 20:00:00 Airbus A321
## 17 2022-01-11 20:00:00 2022-01-11 20:00:00 Airbus A319
## 18 2021-12-19 20:00:00 2021-12-19 20:00:00 Airbus A320-100/200
## 19 2021-11-13 20:00:00 2021-11-13 20:00:00 Airbus A320-100/200
## 20 2021-10-25 17:30:00 2021-10-25 17:30:00 Airbus A321
## 21 2021-11-04 20:00:00 2021-11-04 20:00:00 Airbus A321
## 22 2021-10-26 17:30:00 2021-10-26 17:30:00 Airbus A321-100/200
```

```

## 23 2021-11-20 20:00:00 2021-11-20 20:00:00 Airbus A320 NEO
## 24 2021-10-31 20:00:00 2021-10-31 20:00:00 Airbus A320
## 25 2021-12-11 20:00:00 2021-12-11 20:00:00 Airbus A320-200 (Sharklets)
## 26 2021-10-28 17:30:00 2021-10-28 17:30:00 Airbus A321 NEO
## 27 2022-01-12 20:00:00 2022-01-12 20:00:00 Airbus A319
## 28 2021-11-12 20:00:00 2021-11-12 20:00:00 Airbus A320-100/200
## 29 2021-11-01 20:00:00 2021-11-01 20:00:00 Airbus A320-100/200
## 30 2021-11-23 20:00:00 2021-11-23 20:00:00 Airbus A321
## [1] "Aegean"
## [1] "A3 1466"
##      scheduledTime      actualTime      aircraft
## 1  2021-11-04 18:40:00 2021-11-04 18:40:00 Airbus A320-200 (Sharklets)
## 2  2021-12-18 18:40:00 2021-12-18 18:40:00 Airbus A320-200 (Sharklets)
## 3  2021-10-29 16:55:00 2021-10-29 16:55:00 Airbus A320
## 4  2021-11-25 18:40:00 2021-11-25 18:40:00 Airbus A320
## 5  2021-10-31 18:40:00 2021-10-31 18:40:00 Airbus A320-200 (Sharklets)
## 6  2021-10-21 16:55:00 2021-10-21 16:55:00 Airbus A320-100/200
## 7  2021-10-23 16:50:00 2021-10-23 16:50:00 Airbus A319
## 8  2021-11-05 18:40:00 2021-11-05 18:40:00 Airbus A321-100/200
## 9  2022-01-13 18:40:00 2022-01-13 18:40:00 Airbus A320-100/200
## 10 2021-10-24 16:50:00 2021-10-24 16:50:00 Airbus A320
## 11 2022-01-11 18:40:00 2022-01-11 18:40:00 Airbus A320-200 (Sharklets)
## 12 2021-11-11 18:40:00 2021-11-11 18:40:00 Airbus A320-200 (Sharklets)
## 13 2021-11-03 18:40:00 2021-11-03 18:40:00 Airbus A320-200 (Sharklets)
## 14 2021-12-12 18:40:00 2021-12-12 18:40:00 Airbus A320 NEO
## 15 2021-11-26 18:40:00 2021-11-26 18:40:00 Airbus A320-100/200
## 16 2022-01-12 18:40:00 2022-01-12 18:40:00 Airbus A320-200 (Sharklets)
## 17 2021-10-26 16:55:00 2021-10-26 16:55:00 Airbus A320-100/200
## 18 2021-11-16 18:40:00 2021-11-16 18:40:00 Airbus A320
## 19 2021-11-02 18:40:00 2021-11-02 18:40:00 Airbus A320 NEO
## 20 2021-10-28 16:55:00 2021-10-28 16:55:00 Airbus A321-100/200
## 21 2021-11-20 18:40:00 2021-11-20 18:40:00 Airbus A320
## 22 2021-11-14 18:40:00 2021-11-14 18:40:00 Airbus A321
## 23 2021-12-19 18:40:00 2021-12-19 18:40:00 Airbus A320
## 24 2021-11-21 18:40:00 2021-11-21 18:40:00 Airbus A320
## 25 2021-11-24 18:40:00 2021-11-24 18:40:00 Airbus A320-200 (Sharklets)
## [1] "Aegean"
## [1] "A3 1560"
##      scheduledTime      actualTime      aircraft
## 1  2022-01-12 16:00:00 2022-01-12 16:00:00 Airbus A320 NEO
## 2  2021-11-12 16:00:00 2021-11-12 16:00:00 Airbus A320
## 3  2021-12-18 16:00:00 2021-12-18 16:00:00 Airbus A319
## 4  2021-12-17 16:00:00 2021-12-17 16:00:00 Airbus A320 NEO
## 5  2021-10-23 15:00:00 2021-10-23 15:00:00 Canadair CRJ 900
## 6  2021-11-04 16:00:00 2021-11-04 16:00:00 Airbus A320
## 7  2021-10-27 15:00:00 2021-10-27 15:00:00 Airbus A320-200 (Sharklets)
## 8  2021-10-26 15:00:00 2021-10-26 15:00:00 Airbus A320-100/200
## 9  2021-11-13 16:00:00 2021-11-13 16:00:00 Airbus A320-100/200
## 10 2021-11-16 16:00:00 2021-11-16 16:00:00 Airbus A320 NEO
## 11 2021-11-18 16:00:00 2021-11-18 16:00:00 Airbus A320-100/200
## 12 2021-11-21 16:00:00 2021-11-21 16:00:00 Airbus A320
## 13 2021-11-25 16:00:00 2021-11-25 16:00:00 Airbus A320
## 14 2021-10-21 15:00:00 2021-10-21 15:00:00 Canadair CRJ 900
## 15 2021-10-31 16:00:00 2021-10-31 16:00:00 Airbus A320-100/200

```

## 16	2021-11-26	16:00:00	2021-11-26	16:00:00	Airbus A320
## 17	2021-11-02	16:00:00	2021-11-02	16:00:00	Airbus A320 NEO
## 18	2022-01-15	16:00:00	2022-01-15	16:00:00	Airbus A319
## 19	2021-10-22	15:00:00	2021-10-22	15:00:00	Canadair CRJ 900
## 20	2021-11-20	16:00:00	2021-11-20	16:00:00	Airbus A320
## 21	2021-11-22	16:00:00	2021-11-22	16:00:00	Airbus A320-100/200
## 22	2022-01-13	16:00:00	2022-01-13	16:00:00	Airbus A319
## 23	2021-12-19	16:00:00	2021-12-19	16:00:00	Airbus A320-100/200
## [1] "Air China LTD"					
## [1] "CA 6251"					
##		scheduledTime		actualTime	aircraft
## 1	2021-12-15	19:55:00	2021-12-15	19:25:00	Boeing 747-8 Intercontinental
## 2	2021-10-30	17:40:00	2021-10-30	17:40:00	Boeing 747-200
## 3	2021-10-29	17:40:00	2021-10-29	17:30:00	Boeing 747-8 Intercontinental
## 4	2021-12-12	19:55:00	2021-12-12	19:25:00	Boeing 747-8 Intercontinental
## 5	2021-12-18	19:55:00	2021-12-18	19:25:00	Boeing 747-8 Intercontinental
## 6	2021-11-02	19:55:00	2021-11-02	19:55:00	Boeing 747-8 Intercontinental
## 7	2021-12-13	19:55:00	2021-12-13	19:25:00	Boeing 747-200 Mixed Configuration
## 8	2021-11-05	19:55:00	2021-11-05	19:45:00	Boeing 747-200
## 9	2021-11-15	19:55:00	2021-11-15	19:35:00	Boeing 747-8 Intercontinental
## 10	2021-11-17	19:55:00	2021-11-17	19:35:00	Boeing 747-8 Intercontinental
## 11	2022-01-13	19:55:00	2022-01-13	19:25:00	Boeing 747-200 Mixed Configuration
## 12	2022-01-15	19:55:00	2022-01-15	19:25:00	Boeing 747-8 Intercontinental
## 13	2021-10-28	17:40:00	2021-10-28	18:45:00	Boeing 747-200
## 14	2021-10-25	17:40:00	2021-10-25	18:05:00	Boeing 747-8 Intercontinental
## 15	2021-11-21	19:55:00	2021-11-21	19:35:00	Boeing 747-8 Intercontinental
## 16	2021-10-21	17:40:00	2021-10-21	17:40:00	Boeing 747-8 Intercontinental
## 17	2021-10-24	17:40:00	2021-10-24	17:40:00	Boeing 747-8 Intercontinental
## 18	2021-11-24	19:55:00	2021-11-24	19:35:00	Boeing 747-8 Intercontinental
## 19	2021-12-16	19:55:00	2021-12-16	19:25:00	Boeing 747-8 Intercontinental
## 20	2021-11-03	19:55:00	2021-11-03	19:45:00	Boeing 747-8 Intercontinental
## 21	2021-11-26	19:55:00	2021-11-26	19:55:00	Boeing 747-8 Intercontinental
## 22	2022-01-11	19:55:00	2022-01-11	19:25:00	Boeing 747-8 Intercontinental
## 23	2021-12-19	19:55:00	2021-12-19	19:25:00	Boeing 747-200 Mixed Configuration
## 24	2021-11-13	19:55:00	2021-11-13	19:55:00	Boeing 747-8 Intercontinental
## 25	2021-10-25	17:40:00	2021-10-25	17:30:00	Boeing 747-8 Intercontinental
## 26	2021-11-04	19:55:00	2021-11-04	20:20:00	Boeing 747-8 Intercontinental
## 27	2021-10-26	17:40:00	2021-10-26	17:30:00	Boeing 747-8 Intercontinental
## 28	2021-11-20	19:55:00	2021-11-20	19:35:00	Boeing 747-8 Intercontinental
## 29	2021-10-31	19:55:00	2021-10-31	19:55:00	Boeing 747-8 Intercontinental
## 30	2021-12-11	19:55:00	2021-12-11	19:25:00	Boeing 747-8 Intercontinental
## 31	2021-10-28	17:40:00	2021-10-28	17:40:00	Boeing 747-200
## 32	2022-01-12	19:55:00	2022-01-12	19:25:00	Boeing 747-400
## 33	2021-11-12	19:55:00	2021-11-12	19:35:00	Boeing 747-8 Intercontinental
## 34	2021-11-01	19:55:00	2021-11-01	19:55:00	Boeing 747-8 Intercontinental
## 35	2021-10-27	17:40:00	2021-10-27	17:40:00	Boeing 747-8 Intercontinental
## 36	2021-11-23	19:55:00	2021-11-23	19:40:00	Boeing 747-8 Intercontinental
## 37	2021-10-23	17:40:00	2021-10-23	17:40:00	Boeing 747-8 Intercontinental
## [1] "Air Canada"					
## [1] "AC 9598"					
##		scheduledTime		actualTime	aircraft
## 1	2021-11-17	11:30:00	2021-11-17	11:45:00	Airbus A321 NEO
## 2	2021-12-13	11:30:00	2021-12-13	11:45:00	Airbus A320-100/200

## 3	2021-11-22	11:30:00	2021-11-22	11:55:00	Airbus A321
## 4	2021-11-12	11:30:00	2021-11-12	12:00:00	Airbus A321 NEO
## 5	2021-11-16	11:30:00	2021-11-16	12:00:00	Airbus A321 NEO
## 6	2021-11-01	11:30:00	2021-11-01	12:00:00	Airbus A321
## 7	2021-11-18	11:30:00	2021-11-18	12:00:00	Airbus A321
## 8	2021-11-23	11:30:00	2021-11-23	11:55:00	Airbus A321 NEO
## 9	2022-01-14	11:30:00	2022-01-14	12:00:00	Airbus A321 NEO
## 10	2021-12-19	11:30:00	2021-12-19	11:50:00	Airbus A321 NEO
## 11	2021-12-15	11:30:00	2021-12-15	11:50:00	Airbus A321 NEO
## 12	2021-11-04	11:30:00	2021-11-04	11:50:00	Airbus A321
## 13	2021-11-20	11:30:00	2021-11-20	12:00:00	Airbus A321 NEO
## 14	2021-11-27	11:30:00	2021-11-27	12:00:00	Airbus A321 NEO
## 15	2022-01-15	11:30:00	2022-01-15	11:30:00	Airbus A321 NEO
## 16	2022-01-13	11:30:00	2022-01-13	11:55:00	Airbus A321
## 17	2021-11-21	11:30:00	2021-11-21	12:00:00	Airbus A321
## 18	2022-01-12	11:30:00	2022-01-12	11:30:00	Airbus A321
## 19	2021-11-05	11:30:00	2021-11-05	11:30:00	Airbus A321-100/200
## 20	2021-12-18	11:30:00	2021-12-18	12:00:00	Airbus A321
## 21	2021-11-02	11:30:00	2021-11-02	11:50:00	Airbus A321
## 22	2021-12-12	11:30:00	2021-12-12	11:30:00	Airbus A321 NEO
## [1]	"Lufthansa"				
## [1]	"LH 510"				
##	scheduledTime		actualTime		aircraft
## 1	2021-12-17	20:15:00	2021-12-17	19:30:00	Boeing 747-8 Intercontinental
## 2	2021-11-11	20:15:00	2021-11-11	19:30:00	Boeing 747-8 Intercontinental
## 3	2021-12-16	20:15:00	2021-12-16	20:15:00	Boeing 747-200 Mixed Configuration
## 4	2021-12-12	20:15:00	2021-12-12	19:30:00	Boeing 747-8 Intercontinental
## 5	2021-11-25	20:15:00	2021-11-25	19:30:00	Boeing 747-8 Intercontinental
## 6	2021-12-18	20:15:00	2021-12-18	19:30:00	Boeing 747-8 Intercontinental
## 7	2021-10-29	18:15:00	2021-10-29	18:15:00	Boeing 747-200 Mixed Configuration
## 8	2021-10-24	18:15:00	2021-10-24	18:05:00	Boeing 747-8 Intercontinental
## 9	2021-11-02	20:15:00	2021-11-02	19:30:00	Boeing 747-8 Intercontinental
## 10	2021-11-27	20:15:00	2021-11-27	19:30:00	Boeing 747-200
## 11	2021-11-05	20:15:00	2021-11-05	19:30:00	Boeing 747-200 Mixed Configuration
## 12	2021-11-25	20:15:00	2021-11-25	20:15:00	Boeing 747-8 Intercontinental
## 13	2021-11-23	20:15:00	2021-11-23	20:15:00	Boeing 747-8 Intercontinental
## 14	2022-01-13	19:55:00	2022-01-13	19:30:00	Boeing 747-8 Intercontinental
## 15	2022-01-15	19:55:00	2022-01-15	19:30:00	Boeing 747-8 Intercontinental
## 16	2021-12-18	20:15:00	2021-12-18	20:15:00	Boeing 747-8 Intercontinental
## 17	2021-11-21	20:15:00	2021-11-21	19:30:00	Boeing 747-8 Intercontinental
## 18	2021-10-22	18:15:00	2021-10-22	18:05:00	Boeing 747-200
## 19	2021-12-19	20:15:00	2021-12-19	20:15:00	Boeing 747-8 Intercontinental
## 20	2021-11-26	20:15:00	2021-11-26	19:30:00	Boeing 747-8 Intercontinental
## 21	2022-01-11	19:55:00	2022-01-11	19:25:00	Boeing 747-200 Mixed Configuration
## 22	2021-12-14	20:15:00	2021-12-14	19:30:00	Boeing 747-200
## 23	2021-11-18	20:15:00	2021-11-18	19:30:00	Boeing 747-200
## 24	2021-11-13	20:15:00	2021-11-13	19:30:00	Boeing 747-8 Intercontinental
## 25	2021-11-04	20:15:00	2021-11-04	20:15:00	Boeing 747-8 Intercontinental
## 26	2021-11-16	20:15:00	2021-11-16	19:30:00	Boeing 747-200 Mixed Configuration
## 27	2021-11-20	20:15:00	2021-11-20	19:30:00	Boeing 747-8 Intercontinental
## 28	2021-11-19	20:15:00	2021-11-19	20:30:00	Boeing 747-8 Intercontinental
## 29	2021-10-31	19:50:00	2021-10-31	19:40:00	Boeing 747-8 Intercontinental
## 30	2021-12-11	20:15:00	2021-12-11	20:15:00	Boeing 747-8 Intercontinental
## 31	2021-12-11	20:15:00	2021-12-11	19:30:00	Boeing 747-8 Intercontinental

##	32	2021-11-14	20:15:00	2021-11-14	19:30:00	Boeing 747-200 Mixed Configuration
##	33	2022-01-12	19:55:00	2022-01-12	19:30:00	Boeing 747-8 Intercontinental
##	34	2021-11-12	20:15:00	2021-11-12	19:30:00	Boeing 747-8 Intercontinental
##	35	2021-10-27	18:15:00	2021-10-27	17:30:00	Boeing 747-200 Mixed Configuration
##	36	2021-11-23	20:15:00	2021-11-23	19:30:00	Boeing 747-8 Intercontinental
##	37	2022-01-14	19:55:00	2022-01-14	19:25:00	Boeing 747-8 Intercontinental
##	38	2021-11-26	20:15:00	2021-11-26	20:15:00	Boeing 747-8 Intercontinental