```
library(tidyverse)
library(dplyr)
```

```
flights <- read.csv("flights.csv")
airlines <- read.csv("airlines.csv")
airports <- read.csv("airports.csv")
weather <- read.csv("weather.csv")
```

```
glimpse(flights)
```

```
Rows: 336,776
Columns: 19
$ year          <int> 2013, 2013, 2013, 2013, 2013, 2013, 2013, 2013, 2013, 2
$ month         <int> 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1
$ day           <int> 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1
$ dep_time      <int> 517, 533, 542, 544, 554, 554, 555, 557, 557, 558, 558,
$ sched_dep_time <int> 515, 529, 540, 545, 600, 558, 600, 600, 600, 600, 600,
$ dep_delay     <int> 2, 4, 2, -1, -6, -4, -5, -3, -3, -2, -2, -2, -2, -2, -1
$ arr_time      <int> 830, 850, 923, 1004, 812, 740, 913, 709, 838, 753, 849,
$ sched_arr_time <int> 819, 830, 850, 1022, 837, 728, 854, 723, 846, 745, 851,
$ arr_delay     <int> 11, 20, 33, -18, -25, 12, 19, -14, -8, 8, -2, -3, 7, -1
$ carrier       <chr> "UA", "UA", "AA", "B6", "DL", "UA", "B6", "EV", "B6", "
$ flight        <int> 1545, 1714, 1141, 725, 461, 1696, 507, 5708, 79, 301, 4
$ tailnum       <chr> "N14228", "N24211", "N619AA", "N804JB", "N668DN", "N394
$ origin        <chr> "EWR", "LGA", "JFK", "JFK", "LGA", "EWR", "EWR", "LGA",
$ dest          <chr> "IAH", "IAH", "MIA", "BQN", "ATL", "ORD", "FLL", "IAD",
$ air_time      <int> 227, 227, 160, 183, 116, 150, 158, 53, 140, 138, 149, 1
$ distance      <int> 1400, 1416, 1089, 1576, 762, 719, 1065, 229, 944, 733,
$ hour          <int> 5, 5, 5, 5, 6, 5, 6, 6, 6, 6, 6, 6, 6, 6, 6, 5, 6, 6, 6
$ minute        <int> 15, 29, 40, 45, 0, 58, 0, 0, 0, 0, 0, 0, 0, 0, 58, 0
```

Q1: Which route had the longest distance?

```
flights %>%
```

```
select(origin, dest, distance) %>%
arrange(desc(distance)) %>%
head(1)
```

A data.frame: 1 × 3

	origin	dest	distance
	<chr>	<chr>	<int>
1	JFK	HNL	4983

A1: JFK-HNL

Q2: Top 5 flight arrived delay

```
flights %>%
  select(carrier, arr_delay) %>%
  arrange(desc(arr_delay)) %>%
  left_join(airlines, by="carrier") %>%
  head(20)
```

A data.frame: 20 × 3

	carrier	arr_delay	name
	<chr>	<int>	<chr>
1	HA	1272	Hawaiian Airlines Inc.
2	MQ	1127	Envoy Air
3	MQ	1109	Envoy Air
4	AA	1007	American Airlines Inc.
5	MQ	989	Envoy Air
6	DL	931	Delta Air Lines Inc.
7	DL	915	Delta Air Lines Inc.
8	DL	895	Delta Air Lines Inc.
9	AA	878	American Airlines Inc.
10	MQ	875	Envoy Air
11	DL	856	Delta Air Lines Inc.
12	AA	852	American Airlines Inc.
13	MQ	851	Envoy Air
14	DL	850	Delta Air Lines Inc.
15	DL	847	Delta Air Lines Inc.
16	AA	846	American Airlines Inc.
17	F9	834	Frontier Airlines Inc.
18	DL	821	Delta Air Lines Inc.
19	AA	802	American Airlines Inc.
20	DL	796	Delta Air Lines Inc.

1. Hawaiian Airlines

2. Envoy Air

3. American Airlines Inc.

4. Delta Airlines Inc

5. Frontier Airlines Inc.

Top 1 route for longest flight

```
flights %>%
  select(year, month, day, origin, dest, air_time) %>%
  arrange(desc(air_time)) %>%
  head(1)
```

A data.frame: 1 × 6

	year	month	day	origin	dest	air_time
	<int>	<int>	<int>	<chr>	<chr>	<int>
1	2013	3	17	EWR	HNL	695

A2: EWR - HNL

Q3: Top 5 flying airlines on Christmas

```
flights %>%
  filter(month == 12, day == 25) %>%
  count(carrier) %>%
  group_by(carrier) %>%
  arrange(desc(n)) %>%
  left_join(airlines, by="carrier") %>%
  head(5)
```

A grouped_df: 5 × 3

carrier	n	name
<chr>	<int>	<chr>
B6	159	JetBlue Airways
UA	121	United Air Lines Inc.
DL	105	Delta Air Lines Inc.
AA	78	American Airlines Inc.
EV	75	ExpressJet Airlines Inc.

Q4: Top 5 route busy on Christmas by JetBlue Airways

```
flights %>%
  select(month, day, carrier, origin, dest) %>%
  filter(month == 12, day ==25, carrier == "B6") %>%
  head(5)
```

A data.frame: 5 × 5

	month	day	carrier	origin	dest
	<int>	<int>	<chr>	<chr>	<chr>
1	12	25	B6	JFK	BQN
2	12	25	B6	LGA	FLL
3	12	25	B6	EWR	FLL
4	12	25	B6	JFK	MCO
5	12	25	B6	JFK	PBI

A4: 1. JFK-BQN

2. LGA-FLL

3. EWR-FLL

4. JFK-MCO

5. JFK-PBI**

Q5: Which airlines delayed on Christmas?****

```
flights %>%
  select(month, day, carrier, arr_delay) %>%
  filter(month == 12, day == 25) %>%
  arrange(desc(arr_delay)) %>%
  left_join(airlines, by="carrier")
```

A data.frame: 719 × 5

month	day	carrier	arr_delay	name
<int>	<int>	<chr>	<int>	<chr>
12	25	EV	292	ExpressJet Airlines Inc.
12	25	EV	250	ExpressJet Airlines Inc.
12	25	DL	222	Delta Air Lines Inc.
12	25	B6	194	JetBlue Airways
12	25	DL	182	Delta Air Lines Inc.
12	25	EV	180	ExpressJet Airlines Inc.
12	25	UA	175	United Air Lines Inc.
12	25	B6	139	JetBlue Airways
12	25	DL	120	Delta Air Lines Inc.
12	25	UA	117	United Air Lines Inc.
12	25	MQ	116	Envoy Air
12	25	UA	108	United Air Lines Inc.
12	25	DL	97	Delta Air Lines Inc.
12	25	DL	96	Delta Air Lines Inc.
12	25	DL	93	Delta Air Lines Inc.
12	25	EV	92	ExpressJet Airlines Inc.
12	25	9E	86	Endeavor Air Inc.
12	25	DL	83	Delta Air Lines Inc.
12	25	B6	83	JetBlue Airways
12	25	UA	79	United Air Lines Inc.
12	25	DL	77	Delta Air Lines Inc.
12	25	MQ	75	Envoy Air
12	25	US	74	US Airways Inc.
12	25	DL	71	Delta Air Lines Inc.
12	25	DL	66	Delta Air Lines Inc.
12	25	B6	65	JetBlue Airways
12	25	B6	63	JetBlue Airways
12	25	EV	60	ExpressJet Airlines Inc.
12	25	UA	59	United Air Lines Inc.
12	25	AA	53	American Airlines Inc.
⋮	⋮	⋮	⋮	⋮
12	25	UA	-32	United Air Lines Inc.
12	25	EV	-32	ExpressJet Airlines Inc.
12	25	UA	-32	United Air Lines Inc.
12	25	EV	-32	ExpressJet Airlines Inc.
12	25	AA	-32	American Airlines Inc.
12	25	UA	-32	United Air Lines Inc.
12	25	UA	-33	United Air Lines Inc.
12	25	EV	-33	ExpressJet Airlines Inc.
12	25	UA	-34	United Air Lines Inc.
12	25	VX	-34	Virgin America

12	25	AA	-35	American Airlines Inc.
12	25	DL	-35	Delta Air Lines Inc.
12	25	AA	-35	American Airlines Inc.
12	25	UA	-36	United Air Lines Inc.
12	25	9E	-38	Endeavor Air Inc.
12	25	DL	-39	Delta Air Lines Inc.
12	25	9E	-41	Endeavor Air Inc.
12	25	WN	-41	Southwest Airlines Co.
12	25	UA	-42	United Air Lines Inc.
12	25	UA	-43	United Air Lines Inc.
12	25	UA	-43	United Air Lines Inc.
12	25	UA	-43	United Air Lines Inc.
12	25	AS	-46	Alaska Airlines Inc.
12	25	UA	-48	United Air Lines Inc.
12	25	VX	-49	Virgin America
12	25	AA	-51	American Airlines Inc.
12	25	DL	NA	Delta Air Lines Inc.
12	25	MQ	NA	Envoy Air
12	25	MQ	NA	Envoy Air
12	25	MQ	NA	Envoy Air

A5: ExpressJet Airlines Inc.