
Quiz 3 - DSC 10, Winter 2024

Full Name:

PID:

Discussion: ☐ A (5PM) ☐ B (6PM) ☐ C (7PM)

Instructions:

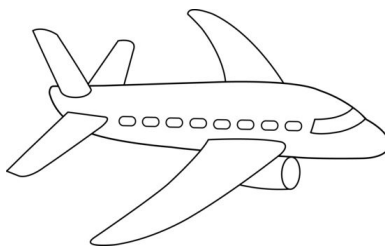
- This quiz consists of 5 questions. You have a total of 20 minutes to complete it.
 - Please write **clearly** in the provided answer boxes; we will not grade work that appears elsewhere. Completely fill in bubbles and square boxes; if we cannot tell which option(s) you selected, you may lose points.
 - ☐ A bubble means that you should only **select one choice**.
 - ☐ A square box means you should **select all that apply**.
 - If your answer is a string, make sure to put it in quotes. If your answer is a float, make sure to include a decimal point.
 - No aids are allowed (no notes, no calculators, and no computers).
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By signing below, you are agreeing that you will behave honestly and fairly during and after this quiz.

Signature:

Version A

Please do not open your quiz until instructed to do so.



In the DataFrame `flights`, each row corresponds to a recent flight. The columns are:

- `flight_num` (`str`): The unique code of the flight, consisting of a **two-character airline designator** followed by 1 to 4 digits (e.g. "UA1989").
- `airline` (`str`): The airline name (e.g. "United").
- `departure` (`str`): The code for the airport from which the flight departs (e.g. "SAN").
- `arrival` (`str`): The code for the airport at which the flight arrives (e.g. "LAX").

Question 1

Suppose the function `first_two` takes as input a string and returns a string with the first two characters only. For example `first_two("panda")` is "pa". Using this function, write an expression that evaluates to a Series containing the **two-character airline designator** for each flight in `flights`.

Question 2

- a) Fill in the blanks below so that `grouped` is a DataFrame showing how many flights on each airline departed from each airport.

```
grouped = flights.groupby(__(x)__).__(y)__.get(['flight_num'])
```

(x):

(y):

- b) Suppose the expression `grouped.shape[0] == flights.shape[0]` evaluates to `True`. Select all true statements below.

- ☐ No two flights in `flights` were on the same airline.
- ☐ No two flights in `flights` had the same departure and arrival airports.
- ☐ Among all flights in `flights` that were on the same airline, no two had the same departure airport.
- ☐ Among all flights in `flights` from the same departure airport, no two were on the same airline.

Question 3

Suppose we have another DataFrame `more_flights` which contains the same columns as `flights`, but different rows. Define `merged` as follows.

```
merged = flights.merge(more_flights, on = "airline")
```

Suppose that in `merged`, there are 108 flights where the airline is "United", and in `more_flights`, there are 12 flights where the airline is "United". If `flights` has 15 rows in total, how many of these rows are **not** for "United" flights? Give your answer as an integer.

Question 4

- a) Fill in the blanks below so that `prob` evaluates to the probability that a randomly selected flight from the `flights` DataFrame arrives at "SAN" given that it departs from "LAX".

```
san = flights.get("arrival") == "SAN"
lax = flights.get("departure") == "LAX"
prob = flights[san___(x)___lax].shape[0] / ___(y)___
```

(x):

(y):

- b) Write an expression that evaluates to the probability that a randomly selected flight from the `flights` DataFrame is **not** on the airline "Delta".

Question 5

Use the function defined below to answer the questions on the right.

```
def discount(duration, price):
    if duration > 6:
        price = price * 0.9
    if duration > 4:
        price = price * 0.95
    elif duration > 3:
        price = price * 0.98
    else:
        price = price * 0.99
    price = price - 5
    return price
```

- a) What is the output of `discount(7, 100)`?

- ☐ `100 * 0.9 * 0.95 * 0.98 - 5`
☐ `100 * 0.9 * 0.95 - 5`
☐ `100 * 0.9 - 5`
☐ `100 * 0.9`

- b) Find `x` and `y` such that `discount(x, y)` evaluates to `97 * 0.98 - 5`.

x:

y:

Before submitting your quiz, make sure your PID is on the front page and on the top right corner of page 3.