BANA 6043 PROJECT

Name: UCID:

Background: Flight landing.

Motivation: To reduce the risk of landing overrun.

Goal: To study what factors and how they would impact the landing distance of a commercial flight.

Data: Landing data (landing distance and other parameters) from 950 commercial flights (not real data set but simulated from statistical models). See two Excel files 'FAA-1.xls' (800 flights) and 'FAA-2.xls' (150 flights).

Notes about the variables:

Aircraft: The make of an aircraft (Boeing or Airbus).

Duration (in minutes): Flight duration between taking off and landing. The duration of a normal flight should always be greater than 40min.

No_pasg: The number of passengers in a flight.

Speed_ground (in miles per hour): The ground speed of an aircraft when passing over the threshold of the runway. If its value is less than 30MPH or greater than 140MPH, then the landing would be considered as abnormal.

Speed_air (in miles per hour): The air speed of an aircraft when passing over the threshold of the runway. If its value is less than 30MPH or greater than 140MPH, then the landing would be considered as abnormal.

Height (in meters): The height of an aircraft when it is passing over the threshold of the runway. The landing aircraft is required to be at least 6 meters high at the threshold of the runway.

Pitch (in degrees): Pitch angle of an aircraft when it is passing over the threshold of the runway.

Distance (in feet): The landing distance of an aircraft. More specifically, it refers to the distance between the threshold of the runway and the point where the aircraft can be fully stopped. The length of the airport runway is typically less than 6000 feet.

Suppose that you are asked by the FAA to

1. **Do statistical analysis of the given data sets and**
2. **Write a report to summarize your findings.**

Requirement of your report:

- It does not have to be formal. Short but clear sentences are fine. Make sure the readers can understand what you write.

- I would suggest that you write the report by piecing together "chapters". Each chapter is devoted to a specific goal or function. Each chapter should lay out the following things:
    - The specific goal (why are you doing this?)
    - The SAS code (how do you realize it?)
    - The SAS output (Copy and paste only those being relevant)
    - Your observations (What do you observe from the output?)
    - Your conclusion/decision

- Once you finish those chapters and have a complete "story", write a summary (one paragraph) on the cover page of your report.

Hint: General procedures of data analysis

1. Data exploration and data cleaning
2. Data visualization
3. Modeling
4. Model checking
5. Re-exploration of data
6. Re-modeling
7. Modeling checking
8. ….
9. Finalizing the model

Write your short answers to these questions:

1. How many observations (flights) do you use to fit your **final** model? If not all 950 flights, why?

2. What factors and how they impact the landing distance of a flight?

3. Is there any difference between the two makes Boeing and Airbus?