

## Homework 3

### Data Description

#### Equine Death and Breakdown in New York State 2009 - 2019

Injuries and deaths happen on equine racetrack more often than they should. Within the state of New York, any incident, death, or breakdown of any horse at any facility under the Gaming Commission's jurisdiction is reported to the Presiding Judge or Stewart at that facility. The details of the incident are forwarded to the Commission's main office in Schenectady, New York. Once the details of the incident have been verified, they are entered into a database. This data reflects all incidents, deaths, or breakdowns at New York State equine racetracks between 2009 and 2019.

### Data Structure

The structure of the data is as follows:

```
'data.frame': 4082 obs. of 13 variables:
 $ Year      : int  2019 2019 2019 2019 2019 2019 2019 2019 2019 ...
 $ Incident.Date : chr  "2019-11-02T00:00:00.000" "2019-11-02T00:00:00.000" "2019-11-01T00:00:00.000" "2019-10-30T00:00:00.000" ...
 $ Incident.Type : chr  "DRIVER/JOCKEY INJURED" "EQUINE DEATH" "RACING INCIDENT" "RACING INCIDENT" ...
 $ Track       : chr  "Aqueduct Racetrack (NYRA)" "Belmont Park (NYRA)" "Aqueduct Racetrack (NYRA)" "Batavia Downs" ...
 $ Inv.Location : chr  " " "Belmont TT" " " "Batavia Downs - approaching start" ...
 $ Racing.Type.Description: chr  "Racing" "Training" "Racing" "Racing" ...
 $ Division    : chr  "Thoroughbred" "Thoroughbred" "Thoroughbred" "Harness" ...
 $ Weather.Conditions : chr  "Cloudy; cool" " " "cool and overcast" "Cloudy 55 deg" ...
 $ Horse       : chr  "Crimson Frost" "Kid Robin hood" "FELONY MELANIE (KY)" "Our Els Dream N" ...
 $ Trainer     : chr  "MICHELLE C. NEVIN" " " "CARLOS F. MARTIN" "DAVID S. RUSSO" ...
 $ Jockey.Driver : chr  "HARRY HERNANDEZ" " " "MICHAEL J. LUZZI" "JOHN P. CUMMINGS JR" ...
 $ Incident.Description : chr  "CRIMSON FROST (KY)(Tr: Michelle Nevin Jockey: Harry Hernandez) fell after the start and unseated rider. Inves" | __truncated__
 "Kid Red Robin Hood sustained an injury to LF Cannon Bone while galloping on the Belmont Training Track. Horse w" | __truncated__ "FELONY MELANIE (Tr: C. F. Mart
in; Jockey: Michael Luzzi) was pulled up inside the sixteenth pole and was vanned" | __truncated__ "H: Our Els Dream N (Driver John Cummings Jr) - Horse ran appro
aching gate line broke while driver tried to ga" | __truncated__ ...
 $ Death.or.Injury : chr  "Accident" "Euthanasia" " " " " ...
```

*\*Note: for this exercise, minimal data cleanup was done.*

The calculation of the dataset is as:

- Number of columns (variables) = 13
- Number of rows (observations) = 4,082
- $(13 \times 4) \times (4,082/100) = 52 \times 40.82 = 2,122.64 \geq 100$

### Descriptive Plots

The following descriptive plots are provided on the following pages:

#### Single Dimensional Plots

- Number of Incidents (Frequency) by Type
- Frequency of Incidents by Track
- Racetrack Incidents by Year

#### Multi-Dimensional Plots

- Incident Type by Racetrack Division (Harness or Thoroughbred)
- Incident Type by Track