

# S01 - Algebra Matricial

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## Pop Songs and Political Science

*Sheena Easton and Game Theory*

Sheena Easton describes the following scenario for her baby:

1. Takes the morning train
2. Works from nine 'til five
3. Takes another train home again
4. Finds Sheena Easton waiting for him

Sheena Easton and her baby are playing a **zero-sum (total conflict) game**.

- Akin to Holmes-Moriarty game (see: von Neumann and Morgenstern)
- Solution: **mixed strategy**

*Rick Astley's Re-election Platform*

Rick Astley's campaign promises:

- Never gonna give you up.
- Never gonna let you down.
- Never gonna run around and desert you.
- Never gonna make you cry.
- Never gonna say goodbye.
- Never gonna tell a lie and hurt you.

Whereas these pledges conform to the preferences of the **median voter**, we expect Congressman Astley to secure re-election.

*Caribbean Queen and Operation Urgent Fury*

Billy Ocean released "Caribbean Queen" in 1984.

- Emphasized sharing the same dream
- Hearts beating as one

"Caribbean Queen" is about the poor execution of Operation Urgent Fury.

- Coordination problems plagued its execution from the start.
- Echoed JCS chairman David Jones' frustrations with military establishment.

Billy Ocean is advocating for what became the Goldwater-Nichols Act.

- Wanted to take advantage of **economies of scale**, resolve **coordination problems** in U.S. military.

## *The Good Day Hypothesis*

We know the following about Ice Cube's day.

1. The Lakers beat the Supersonics.
2. No helicopter looked for a murder.
3. Consumed Fatburger at 2 a.m.
4. Goodyear blimp: "Ice Cube's a pimp."

This leads to two different hypotheses:

- $H_0$ : Ice Cube's day is statistically indistinguishable from a typical day.
- $H_1$ : Ice Cube is having a good (i.e. greater than average) day.

These hypotheses are tested using archival data of Ice Cube's life.

## **Example R code**

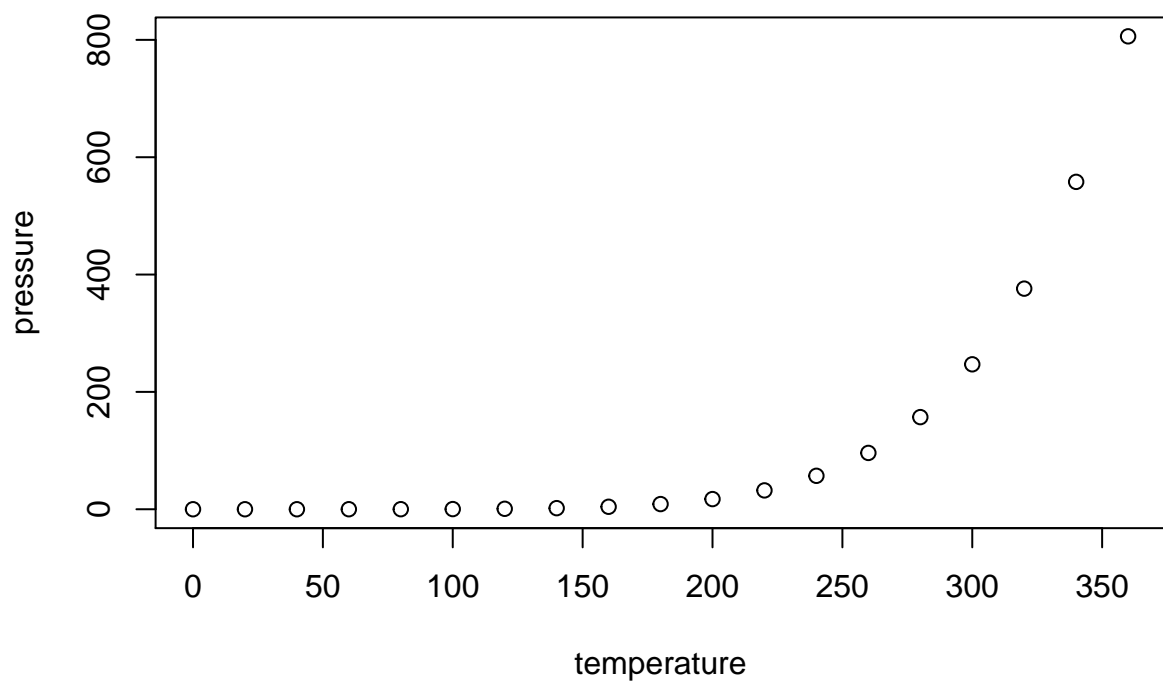
*Example R stuff*

```
summary(cars)
```

```
##      speed      dist
## Min.   : 4.0    Min.   : 2.00
## 1st Qu.:12.0    1st Qu.: 26.00
## Median :15.0    Median : 36.00
## Mean   :15.4    Mean    : 42.98
## 3rd Qu.:19.0    3rd Qu.: 56.00
## Max.   :25.0    Max.    :120.00
```

*Slide with Plot*

```
plot(pressure)
```



*ggplot code*

```
df <- data.frame(x = rnorm(1000))
x <- df$x
base <- ggplot(df, aes(x)) + geom_density() + scale_x_continuous(limits = c(-5, 5))
base + stat_function(fun = dnorm, colour = "red")
```

*Another Plot*

