# Homework13a

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This file was created on 2020-07-24 and last modified on 2021-04-10.

Note: this solution uses R and SQLite. An alternate solution using SAS and Oracle is also available.

Note: Some of the names used in this code are arbitrary and you can choose whatever names you want. To emphasize which names can be modified at your discretion, I am using names of famous statisticians.

The statistician being honored in this code is Hirotugu Akaike.

1. Do an inner join of acupuncture_baseline_results and acupuncture_one_year_results. Display the first ten rows of data only.

```
library(sqldf)
```

```
## Loading required package: gsubfn
```

```
## Loading required package: proto
```

```
## Loading required package: RSQLite
```

```
akaike <- dbConnect(SQLite(),
  dbname="../data/melange.sqlite")
hirotugu1 <- dbGetQuery(conn=akaike,  "
    select b.id, b.pk1, o.pk5
      from acupuncture_baseline_results as b
      join acupuncture_one_year_results as o
      on b.id=o.id
    limit 10
")

hirotugu1
```

```
##     id   pk1      pk5
## 1  104 16.00 15.33333
## 2  108 16.50 23.25000
## 3  112  9.25  6.25000
## 4  113 42.50 51.25000
## 5  114 24.25 25.25000
## 6  126 21.00 15.25000
## 7  130 21.75  1.00000
## 8  131 14.50  2.50000
## 9  135 40.50 28.75000
## 10 137 11.75 13.50000
```

```
dbDisconnect(conn=akaike)
```

2. Do a left join of acupuncture_baseline_results and acupuncture_one_year_results and display the fields id, pk1, and pk5. Display the first ten rows of data only. Explain why these results are different from the results of the previous question.

```
library(sqldf)
akaike <- dbConnect(SQLite(),
  dbname="../data/melange.sqlite")
hirotugu2 <- dbGetQuery(conn=akaike,  "
    select b.id, b.pk1, o.pk5
      from acupuncture_baseline_results as b
      left join acupuncture_one_year_results as o
      on b.id=o.id
    limit 10
")

hirotugu2
```

```
##     id   pk1      pk5
## 1  100 10.75       NA
## 2  101  9.50       NA
## 3  104 16.00 15.33333
## 4  105 32.50       NA
## 5  108 16.50 23.25000
## 6  112  9.25  6.25000
## 7  113 42.50 51.25000
## 8  114 24.25 25.25000
## 9  126 21.00 15.25000
## 10 130 21.75  1.00000
```

```
dbDisconnect(conn=akaike)
```

There are several patients in the baseline table that are not in the one year table. These patients are excluded from the inner join, but not the left join.

3. Count the number of records after an inner join of acupuncture_baseline_results and acupuncture_one_year_results. Count the number of records after a left join of acupuncture_baseline_results and acupuncture_one_year_results.

```
library(sqldf)
akaike <- dbConnect(SQLite(),
  dbname="../data/melange.sqlite")
hirotugu3a <- dbGetQuery(conn=akaike,  "
    select count(*) as n
      from acupuncture_baseline_results as b
      join acupuncture_one_year_results as o
      on b.id=o.id
")
hirotugu3a
```

```
##     n
## 1 301
```

```
hirotugu3b <- dbGetQuery(conn=akaike,  "
    select count(*) as n
      from acupuncture_baseline_results as b
      left join acupuncture_one_year_results as o
      on b.id=o.id
")
hirotugu3b
```

```
##     n
## 1 401
```

```
dbDisconnect(conn=akaike)
```

4. Compute the average pk score at baseline, the average score at one year, and the average change score.

```
library(sqldf)
akaike <- dbConnect(SQLite(),
  dbname="../data/melange.sqlite")
hirotugu4 <- dbGetQuery(conn=akaike,  "
    select
      avg(b.pk1) as pk1_avg,
      avg(o.pk5) as pk5_avg,
      avg(b.pk1)-avg(o.pk5) as change_score
      from acupuncture_baseline_results as b
      join acupuncture_one_year_results as o
      on b.id=o.id
")

hirotugu4
```

```
##    pk1_avg  pk5_avg change_score
## 1 25.56894 19.08245     6.486489
```

```
dbDisconnect(conn=akaike)
```

5. Display all the pk1 values for patients 64 and older.

```
library(sqldf)
akaike <- dbConnect(SQLite(),
  dbname="../data/melange.sqlite")
hirotugu5 <- dbGetQuery(conn=akaike,  "
    select
      d.id, d.age, b.pk1
      from acupuncture_demographics as d
      inner join acupuncture_baseline_results as b
      on d.id=b.id
      where d.age >= 64
")

hirotugu5
```

```
##     id age   pk1
## 1  131  64 14.50
## 2  172  64 74.25
## 3  217  65 22.50
## 4  252  64 29.75
## 5  380  65 41.25
## 6  578  64 13.00
## 7  590  65 20.50
## 8  634  64 70.00
## 9  734  64 18.00
## 10 884  65 17.50
```

```
dbDisconnect(conn=akaike)
```

6. There are 100 patients with baseline values but no values at one year. Print the ids of the first ten of these patients.

```
library(sqldf)
akaike <- dbConnect(SQLite(),
  dbname="../data/melange.sqlite")
hirotugu6 <- dbGetQuery(conn=akaike,  "
    select
      b.id as unmatched_ids
      from acupuncture_baseline_results as b
      left join acupuncture_one_year_results as o
      on b.id=o.id
    where o.id is null
    limit 10
")

hirotugu6
```

```
##    unmatched_ids
## 1            100
## 2            101
## 3            105
## 4            138
## 5            139
## 6            151
## 7            154
## 8            159
## 9            164
## 10           166
```

```
dbDisconnect(conn=akaike)
```