

Homework Programming 1 - Session 1

Contents

1 Exercises	1
1.1 Exercise on samples	1
1.2 Solved example on samples	2

1 Exercises

1.1 Exercise on samples

Peter Lynch is a legendary investor and stock picker. Assume you have gotten some advice from him and you try to replicate his portfolio with some limitations:

- (1) Generate a vector with the stocks Peter recommended: ‘AMZN’, ‘TSLA’, ‘PLTR’, ‘ABNB’, ‘BAYN’, ‘TSM’, ‘GLD’, and ‘BABA’
- (2) Assume you only have money to invest in three of them (Peter’s advice was limited to the names, not the quantities to invest), so pick them randomly without repeating the same stock twice (set the seed equal to 1 beforehand). Assume also that all shares are worth the same so you do not have any reason to favor one over the others (I know this is a lame assumption, we will do more advances simulations on future sessions).
- (3) A few days later you receive some pocket money from your aunt, and you decide to double down and also to put some money into TSLA, which you did not have so far: generate a vector that contains the same three stock names, but repeated ten times each (use the *rep()* command). Then add fifty TSLA shares.
- (4) Unfortunately, a few months later the market suffers a severe downturn and you need to sell forty of your shares randomly. Generate a vector with forty stocks randomly sampled from your portfolio (without replacement!) - you will sell those.
- (5) How many TSLA shares did you sell?

```
# Solutions Exercise on samples
(lynch <- c('amzn', 'tsla', 'pltr', 'abnb', 'bayn', 'tsm', 'gld', 'baba'))
set.seed(1)
(portfolio <- sample(lynch, 3, replace=FALSE))
(portfolio_dd <- c(rep(portfolio, 10), rep('TSLA', 50)))
(sell <- sample(portfolio_dd, 40, replace=FALSE))
(sum(sell=='TSLA'))
```

1.2 Solved example on samples

Create a vector with the names of the the 11 US presidents from Eisenhower to Obama by accessing the *presidential* dataframe:

```
(presidents <- presidential$name)
```

```
[1] "Eisenhower" "Kennedy"      "Johnson"     "Nixon"        "Ford"
[6] "Carter"      "Reagan"       "Bush"         "Clinton"      "Bush"
[11] "Obama"
```

Set the seed to 2.

```
set.seed(2)
```

Pick 5 names randomly without replacement.

```
(sample_presidents <- sample(presidents, 5, replace=FALSE))
```

```
[1] "Ford"          "Carter"        "Bush"          "Bush"          "Eisenhower"
```

Your favorite president is Obama, so you want to add it to your vector five times.

```
(fav_presidents <- c(sample_presidents, rep('Obama', 5)))
```

```
[1] "Ford"          "Carter"        "Bush"          "Bush"          "Eisenhower"
[6] "Obama"         "Obama"         "Obama"         "Obama"         "Obama"
```

Now take a random sample of this new vector, with three elements without replacement.

```
(chosen_presidents <- sample(fav_presidents, 3, replace=FALSE))
```

```
[1] "Ford"    "Obama"    "Carter"
```

How many times did you get 'Obama'?

```
(sum(chosen_presidents=='Obama'))
```

```
[1] 1
```