

Assignment

I. Exploratory Data Work on the bank dataset. Find 10 findings from data. Use R Markdown.

```
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title: "FE8828 Assignment for Exploratory Data Analysis"
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date: "Nov 15, 2017"
output: html_document
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```{r setup, include=FALSE}
library(tidyverse)
library(lubridate)
library(bizdays)
knitr::opts_chunk$set(echo = FALSE, fig.align="center", collapse = TRUE, cache = T)
bank <- read.csv("https://goo.gl/PBQnBt", sep = ";")
```

# Finding #1
This data contains `r nrow(data)` rows.

# Finding #2
```{r, echo = F}
Find the big age group
bank %>%
 group_by(age_group = (age %/% 10) * 10) %>%
 summarise(count = n()) %>%
 arrange(age_group) -> res
```

```
res

plot(resage_group, rescount)
``

Discover insights of data
- Employment
- Social attributes.
- Count for sub-total / total, plot graph
```

# Assignment

## 2. Book option trades

I.1 Store the options from [https://finance.google.com/finance/option\\_chain?q=NASDAQ%3AAMZN&ei=iloAWvDmF8GqugSsj5mlCw](https://finance.google.com/finance/option_chain?q=NASDAQ%3AAMZN&ei=iloAWvDmF8GqugSsj5mlCw)

| Date | Strike | Quantity | Underlying | Long/Short | Call/Put |
|------|--------|----------|------------|------------|----------|
|------|--------|----------|------------|------------|----------|

I.2 Count the total valuation of call alone, put alone, call and put.

I.3 Find those in the money.

I.4. Plot the volatility curve, strike v.s. vol

```
GBSVolatility(price, TypeFlag, S, X, Time, r, b, tol, maxiter)
Use Price to back-out implied volatility
GBSVolatility(867.30, "c", 1135.67, 240,
 as.numeric((as.Date("2018-01-19") - as.Date("2017-11-15"))
[1] 8.101273e-18
GBSVolatility(256.50, "c", 1135.67, 880.00,
 as.numeric((as.Date("2018-01-19") - as.Date("2017-11-15"))
[1] 0.3107899
GBSVolatility(53.62, "c", 1135.67, 1120.00,
```

```
as.numeric((as.Date("2018-01-19") - as.Date("2017-11-15"))/365)
[1] 0.2394823
```

# Assignment

## 3. Bank (Group - choose a coordinator to send me the report)

This is the 1st installment of the assignment. There will be more installment. Due on 6th week. Please pace your group.

```
Data frame 1: Account
```

```
| AccountNo | Name |
```

```
Data frame 2: Transaction
```

```
| TransactionNo | Date | AccountNo | TransactionType | Amount | Currency |
```

```
Data frame 3: Currency to SGD
```

```
| Currency | Conversion | Date |
```

TransactionType can be: Withdraw/Deposit/Spend Write follow functions and use them to initialize the data.

1. Create 10 accounts with initial random deposit and credit in SGD.
2. Create 3 currencies: CNY, USD, SGD. Download their conversion rate between 2017-07-01 and 2017-09-30.
3. Generate random transaction data for 10 accounts during 2017-07-01

and 2017-09-30. Make it more realistic, deposit is 1-2 times per month, a random number of 3000-5000. Spend/Withdraw can be any times and any amount. Deposit is positive, Withdraw/Spend is negative. You can't withdraw more than the deposit, can't spend more than credit + deposit.

4. Generate report for transaction as month-end statement in SGD.

```
{ Client Name }
{ Month }

Transaction History

Date | TransactionType | Amount | Currency | Deposit Balance | Credit Balance |
| | | | | | |
| | | | | | |
| | | | | | |

Month-End Balance | Deposit | Credit |

Summary

TransactionType | Amount |
...
```

Submission:

1. A report describing interesting learning points on design and coding  
(1-2 pages, just be concise)
2. Code with decent amount of comments
3. Example running result.