1. [6 points] Suppose you invested into a mutual fund account on January 1st, 2020. You earned 2% return in January and 5% return in February 2020. Then, the account balance at the end of February 2020 is $21,420. How much did you invest in the fund on January 1st, 2020?

*Not sure if correct?*

>starting\_saving <- 20000

>feb\_mysaving <- starting\_saving\*1.02\*1.05

>feb\_mysaving

[1] 21420

1. [4 points] Your portfolio contains 60% of stock A and 40% of stock B. Assume that stock A earned a 5% return and stock B earned - 4% return this month. What is your total portfolio return this month?

ret\_A <- 5

ret\_B <- 4

weight\_A <- 0.6

weight\_B <- 0.4

ret\_portfolio <- weight\_A\*ret\_A+weight\_B\*ret\_B

ret\_portfolio

[1] 4.6

*Not sure if correct?*

3. Consider the following formula to calculate the monthly payment amount.

M= 𝑃𝑖1− 1(1+𝑖)𝑛

a) [4 points] In this equation, P represents the principle, i the (monthly) interest rate, and n the number of payment terms for a mortgage with a principle balance of 200,000, monthly interest rate of 0.3%, and the number of payment terms of 360. Calculate the monthly payment amount M.

b) [6 points] Construct **a vector M** of length 3 with the results of this calculation for a series of principle balances: 150,000, 180,000, 220,000.

4. Use the “ **: operator** ” and **arithmetic operators** in Chapter 1 to create the following vectors. You have to use “ **: operator** ” on p. 7 in Chapter 1 course material for **both a) and b)**.

1. a) [8 points] [1] 5 10 15 20 25 30
2. b) [8 points] [1] 0 1 2 3 0 1 2 3 0 1 2 3 0 1 2 3 Hint: you may use Modulo %%

5. [6 points] Use the following R script to create a vector ‘**x**’.

set.seed(100)

x <- round(rnorm(18, mean = 2, sd = 0.1), 2)

Create a 3 x 6 matrix (matrix with 3 rows and 6 columns) using x, and assign the name ‘**x.mat**’ to the matrix.

6. [6 points] Use the following R script to create a vector ‘**x.vec**’.

x.vec <- c(2, 5, 6, 8, 3)

Assign the names (“Apple”, “Samsung”, “Amazon”, “CVS”, “Walmart”) to the vector.

7. [6 points] Use the following R script to create a matrix ‘**y.mat**’.

y.mat <- matrix(1:12, nrow = 4, ncol = 3)

Assign the names (“New York”, “Boston”, “Dallas”) to the three columns, and assign the names (“AAA”, “AA”, “A”, “BBB”) to the four rows.

8. [6 points] Create the following data frame with the name “myportfolio”. Then, select the stock price and volume of Company ZZZ.

> myportfolio

Company Stock\_Price Volume

1 XXX 56 1500

2 YYY 86 4100

3 ZZZ 62 2800