

## Tutorial 1

1. General idea of this problem: You have just graduated from NUS and just started your first job. You plan to buy a flat on your own which has **price** = \$1,200,000 (1.2 million dollars). You need to save money for several years before you can afford to make the down payment which is 25% of the flat's price.

- Call the amount that you have saved thus far: **saved**. You start the very first month with a savings of \$10,000 that your parents gave you.
- Call your monthly salary as **salary** which is paid at the end of every month.
- Each month, you are going to dedicate 40% of your salary to save for the down payment.
- Assume that you invest your savings wisely, with a monthly average return of 2%. That means: at the end of each month, you receive an additional of  $\text{saved} \times 0.02$  funds where **saved** is the amount you have from end of previous month to put into your savings.
- At the end of each month, your savings will be increased by the return on your investment, plus 40% of your monthly salary.

**Note:** In your code for the questions below, you MUST use the names as given in bold above.

- (a) Write the code to calculate how many months it will take you to save up enough money for the down payment for two persons of different salary: (i) **salary** = \$7,000; and (ii) **salary** = \$10,000.  
(b) In question above, we unrealistically assumed that the salary doesn't change over the years. However, now we consider that the salary will be raised every 4 months by a rate named **rate**, this variable should be in decimal form (i.e. 0.03 for 3%). The new salary will be applied for the month after every batch of 4 months.  
With this further assumption, write the code to calculate how many months it will take a person to save up enough money for the down payment if that person has (i) (**salary** = \$7,000 and **rate** = 0.02); (ii) (**salary** = \$10,000 and **rate** = 0.01).
2. For Question 1(a) above, use the code to define a function, called F1, where the argument of F1 is **salary**; the output of function F1 is the number of months. Run function F1 for the two cases mentioned to obtain the results.
3. For Question 1(b) above, use the code to define a function, called F2, where F2 has two arguments: **salary** and **rate** where the default value for **rate** is 0.02; the output of function F2 is the number of months. Run function F2 for the two cases mentioned to obtain the results.