National University of Singapore
School of Computing
CS1010S: Programming Methodology
Semester II, 2024/2025

Optional:
Tutorial 2 Practices

Background

This document serves as an unofficial guide to reinforce students' understanding prepared by Zhu Ming. Participation in this practice is optional, and students are encouraged to work through the exercises at their own pace.

Recall

In Tutorial 2, we mainly focused on the following topics:

- Function
- Functional Abstraction

for more information, please refer to the tutorial slides.

Exercises: Function and Functional Abstraction. (Ideal time required 4-mins)

During the Chinese New Year (CNY) celebrations, you visited many relatives and friends. As someone well-loved, you received **angbaos** (red packets) in various currencies from relatives and friends across the globe, including the including the United States Dollar (USD), Malaysian Ringgit (MYR), and Singapore Dollar (SGD).

To calculate your total fortune, you decide to convert all the money into a single currency.

Let's write a function `convert_currency` that takes in three argument:

- `amount` (float): The amount of money to be converted.
- `from_currency` (str): The currency of the given amount.
- `to_currency` (str): The target currency to convert to.

The exchange rates are standardised with repsect to USD.

- 1 USD = 1 USD
- 1 USD = 4.0 MY
- 1 USD = 1.35 SGD

```python
def convert_currency(amount, from_currency, to_currency):
    # Write your code here
    # You may define helper functions if needed
```

```python
def total():
    from_captian_america = convert_currency(100, 'USD', 'SGD')
    from_piggy_ming = convert_currency(100, 'MY', 'SGD')
    from_adi = convert_currency(100, 'SGD', 'SGD')
    return from_captian_america + from_piggy_ming + from_adi

print(total()) # Expected output: 268.75 SGD
```

As a finanicial aware individual, you would like store your money in a bank account.

Write a function `calculate_interest` that takes in three arguments:

- `principal` (float): The initial amount of money.
- `interest_rate` (float): The yearly interest rate of the bank account. For example, 5% interest rate should be represented as 0.05.
- `years` (int): The number of years the money is stored in the bank account. `years` is always a positive integer.

The function should return the total amount of money in the bank account after the specified number of `years`.

```
def calculate_interest(principal, interest_rate, years):
    # Write your code here
    # You may define helper functions if needed
```

```
def bank_A_return():
    cny_angbao = total()
    return calculate_interest(cny_angbao, 0.05, 5)

print(bank_A_return()) # Expected output: 296.296875 SGD
```

My apology for sending this on CNY holiday, and I truly appreciate you taking the time to work on this exercise during the holiday season. Happy Chinese New Year!