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

Optional:
Tutorial 1 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 1, we have learned the following concepts:

- Data Types
- Operation on Data Types
- Precedence of Operators
- Control flow (if-elif-else, if-if-if)

for more information, please refer to the tutorial slides.

Exercises: Simple Arithmetic Operations (Ideal time required 4-mins)

Do the following question without using computer / calculator.

1. 5 % 2 =
2. 5 // 2 =
3. -5 % 2 =
4. -5 // 2 =
5. 5 % -2 =
6. 5 // -2 =
7. 2 ** 3 ** 0 =

Exercises: String Operations (Ideal time required 1-mins)

Which of the following expressions are valid in Python? If it is valid, what is the output?

1. "Hello" + "World"
2. "This is a string" - "string"
3. "Hello" * 3
4. "Hello" / 3
5. "Hello" % 3
6. "Hello" // 3
7. "Hello" ** 3
8. "Hello" + 3

Exercises: Data types conversion (Ideal time required 1-mins)

Which of the following expressions are valid in Python? If it is valid, what is the output?

1. int("3.14")
2. float("3.14")
3. str(3.14)
4. int("3.14")
5. int(3.14)
6. float("3.14")

Note: In Python, we can check the type of a variable by using the type() function.

```
a = 3.14
print(type(a)) # Output: <class 'float'>
```

Exercises: Control Flow (Ideal time required 5-mins)

Which of the following control flow are **logical equivalent**?

1.
```
price = 500000  # Example price

if price < 100000:
    print("Affordable Property")
elif 100000 <= price < 500000:
    print("Mid-range Property")
else:
    print("Luxury Property")
```

2.
```
price = 500000  # Example price

if price < 100000:
    print("Affordable Property")
if 100000 <= price < 500000:
    print("Mid-range Property")
if price >= 500000:
    print("Luxury Property")
```

3.
```
price = 500000  # Example price

if price < 100000:
    print("Affordable Property")
elif price < 500000:
    print("Mid-range Property")
else:
    print("Luxury Property")
```

Exercises: Logical Operators (Ideal time required 2-mins)

Fill in the blanks with `True (T)` or `False (F)`.

1. True and _ = True
2. True and False = _
3. False and True = _
4. False and False = _
5. True or _ = _
6. _ or _ = False
7. Not True = _
8. Not False = _
9. Not Not True = _
10. Not True and False = _

Exercises: Everything in one (Ideal time required 5-mins)

Write the output of the following code:

```
a = '10'
b = '20'
d = 2

if a + b == 1020:
    print('a + b is 1020')
elif a + b == '1020':
    a = int(a)
    b = float(b)
else:
    print('what is a + b?')

if type(b // a) == float:
    print('b // a is float')
else:
    print(b // a)

if (a + b) % 2 == 0 and a > 0 or not b < 0:
    print('a + b is even')
    print(str(b) + '=' + str(d) + '*' + str(a))
else:
    print('a + b is odd')

a = -9
b = 4

print(a // b ** 0.5)
print(a % b ** 0.5)
```