International Software Engineering Program
School of Engineering
King Mongkut's Institute of Technology Ladkrabang

13006101 **Introduction to Computers and Programming**
Midterm Examination
20th October 2021, 16:00 – 19:00 Hrs

Instruction

There are **5** questions, please **answer all** of them.

Questions:

1. (2 marks) What is the value returned by the Python interpreter after evaluating each of the following expression?

   a) `6 - 2 ** 3 * 3 ** 2 // 5 - 4`

   b) `3 * (4 if 3 > 1 and 6 > 7 else 2)`

2. (3 marks) Write a currency exchange program using Python, the program does the following:
   1. Read the name of the first currency together with its amount and the name of the second currency from the user.
   2. The program asks the user to give the exchange (conversion) rate between the two currencies.
   3. The program converts the amount of the first currency to the amount of the second currency and prints the amount of the second currency out with 2 digit precision, e.g. XX.XX Bahts.

   For example, Please enter the first currency: **US Dollar**

   What amount of *US Dollar* do you want to exchange: **2**

   What currency do you want to convert to? : **Bahts**

   Please tell me the exchange rate, 1 *US Dollar* how much you will get in *Bahts*: **30**

   So, your 2 *US Dollars* will be exchanged to 60.00 *Bahts*.

3. (3 marks) Write a **for** loop to print out the following series of integers:

   `0, 3, 6, 9, 12, 18, 21, 24, 27, 30, 36.`

4. (3 marks) Write a Python program to **repeat** reading one character from the keyboard, and the program then prints out the character and its type. If the character is a letter, when given a small case letter the program will print its capital letter also and vice versa. **The program will terminate only when the user enters the Tab character.**

   Note. See this table for ASCII codes for each type of characters. Use function **ord(char)** to get the ASCII code of a character, and use **chr(ASCII code)** to create a character of the ASCII code.

ASCII Code	Character Type
0x30 – 0x39	Numeric Character
0x41 – 0x5A	Capital Letter
0x61 – 0x7A	Small-case Letter
other ASCII value	Special Character

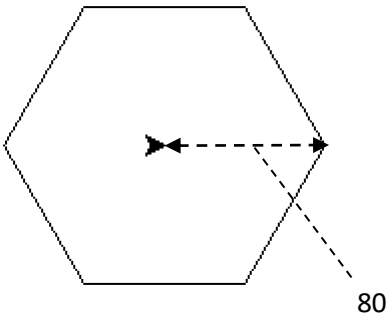
This is an example of the interaction with the program:

```
Please enter a character: w
>>w is a small-case letter and its capital letter is W.
Please enter a character: A
>>A is a capital letter and its small-case letter is a.
Please enter a character: 4
>>4 is a numeric character.
Please enter a character: \
>>\ is a special character.
Please enter a character: <tab>
Bye, see you tomorrow.
```

5. (4 marks) Please define two functions to draw the spiral hexagons of size 80 as shown below. One of the two function is **draw_hex(n)** which is a function to draw a hexagon of any size **n**, and this function will be called by the other function, named **spiral_hex(s)**, which draws a spiral hexagon of any size **s**.

   From the second picture below, the hexagon of the inner is 75% of the size of the outer and the inner hexagon rotates 30 degrees anti-clockwise from the outer hexagon. The program stops drawing when the size of the inner hexagon is smaller than 10. The function call **spiral_hex(80)** draws the second picture below.

draw_hex(80)



spiral_hex(80)