Exercise 4_Loops & Iterations

IIMT2602 Business Programming

HKU Business School

Contents

Exercise – square root

Write a program that prints out all numbers that meet the following requirements:

1. The numbers must be between 1 and 100000.
2. The square root of (number + 100) is an integer.
3. The square root of (number + 200) is an integer.

Exercise – repeated user inputs

Write a program which repeatedly reads numbers until the user enters "done". Once "done" is entered, print out the total, count, and average of the numbers. If the user enters anything other than a number, detect their mistake using try and except and print an error message and skip to the next number.

```
>>>Enter a number: 4
>>>Enter a number: 5
>>>Enter a number: HKU
Invalid input
>>>Enter a number: 7
>>>Enter a number: done
-------------
Total: 16
Count: 3
Average: 5.3333
```

Exercise – print a pattern

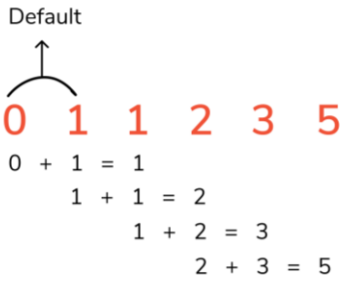
Write a program to construct the following pattern, using a nested for loop.

```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
```

Exercise – Fibonacci Sequence

Write a program to get the Fibonacci Sequence between 0 to 50 considering that the first two numbers, 0 & 1, are given as default.

Note: The Fibonacci Sequence is the series of numbers: 0, 1, 1, 2, 3, 5, 8, 13, 21, ... Every next number is the addition of two numbers before it.



Exercise – print hollow pyramid

Write a program to print the following pattern – a hollow pyramid. The number of rows is determined by user input. For simplicity, we assume the user will enter a positive integer number. On each row, the exact width of blanks between asterisks is decided by yourself, as long as the pattern looks like a pyramid. Only use one simple for loop; do NOT use nested for loop.

```
>>> Enter the number of rows: 8

        *
       * *
      *   *
     *     *
    *       *
   *         *
  *           *
 *             *
*               *
```

Exercise – guess a number

Write a program to guess a random number (the target) between 0 and 10.

```
>>> Take a guess: 5
Your guess is greater than the target.
>>> Take a guess: 3
Your guess is smaller than the target.
>>> Take a guess: 4
Bingo! You found it! It took you 3 guesses.
```

Exercise – sum of cubes

Write a program that searches all valid numbers (see rule below) between 100 and 1000. Print out all such numbers and separate them by a tab. A valid number can be presented as the sum of cubes of each digit, for example: $153 = 1^3 + 5^3 + 3^3$

```
The following numbers are valid:
153     370     371     407
```