01_Assignment_MayaGrapengießer (1)

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0.1 Task 01 – Hello World!

Write a simple program that asks the user to input a name and outputs a simple greeting, such as 'Hi Name! Nice to meet you!' and in the other line, 'Welcome to the Programing Course!'.

Hint: Check out the input () and print() function in Python.

```
[11]: x = input ("Hi wie heißt du?")
      print (x + ",schöner Name, Willkommen im Python Kurs!")
```

```
Hi wie heißt du? Maya

Maya,schöner Name, Willkommen im Python Kurs!
```

1 Assignment 01

Python Basics I This tutorial was written by Terry Ruas (University of Göttingen). The references for external contributors for which this material was anyhow adapted/inspired are in the Acknowledgments section (end of the document).

1.1 Task 02 – Reversed Words

Write a program that reads in a word provided by the user and prints the word in a reversed order. For example, if the input is hello, the output should be 'olleh'.

- Use a loop structure
- Use just array indexes

```
[33]: def reverse(word):
          reversed_word = ""
          for i in word:
              reversed_word = i+reversed_word
          print("Your reversed word is:",reversed_word)

      word = input("enter your word")
      print("entered word",word)
      reverse(word)
```

```
enter your word hello
```

```
entered word hello
Your reversed word is: olleh
```

1.2 Task 03 – Fibonacci Numbers

Write a program that reads in an upper bound (number) provided by the user and prints the sequence of Fibonacci numbers that are less or equal to the number given by the user. Use a while-loop for this task.

The Fibonacci sequence is defined as $ F_{n}=F_{n-1}+F_{n-2}$. Use $F_0 = 0$ and $F_1 = 1$ as seed values.

For example, if the user inputs 6, the output should be 0, 1, 1, 2, 3, 5.

```python
[32]: import math
def PerfectSquare (x):
 s = int(math.sqrt(x))
 return s*s==x

n = int(input("enter the number:"))
result1 = 5* (n*n)+4
result2 = 5* (n*n)-4

if PerfectSquare (result1) or PerfectSquar (result2):
    print(n,"is fibonacci number")
else:
    print(n,"is not fibonacci number")


i = int(input("Enter n:"))

 F0 = 0
 F1 = 1
 F2 = F0 + F1
print (F0)
print (F1)

while F2 = i:
    print(F2)
    F0 = F1
    F1 = F2
    F2 = F0 + F1
```

```
enter the number: 1

1 is fibonacci number
```

1.3 Task 04 – Selective Printing

Write a program that reads in an upper bound (number) provided by the user and prints all integer numbers that are less or equal to the upper bound except the integer numbers that are divisible by 3. Use the continue statement. For example, if the user enters 6 as the upper bound, the output should be 0, 1, 2, 4, 5.

```
[5]: x = int(input("sag mir eine beliebige Zahl"))
     for u in range(0,x+1):
             if u%3 == 0 and u !=0:
                 continue
             else:
                 print(u)
```

```
sag mir eine beliebige Zahl 9

0
1
2
4
5
7
8
```

1.4 Task 05 – Triangle Checking

Write a Python program that asks the user to input the lengths of the sides in a triangle and outputs whether the triangle is equilateral, isosceles, or scalene. The program should also check for the Triangle inequality $(z < x + y)$, and prompt the user for a valid input.

- An equilateral triangle is a triangle in which all three sides are of equal length.
- An isosceles triangle is a triangle with (at least) two sides of equal length.
- A scalene triangle is a triangle in which all three sides have different lengths.

For example, if the user inputs a=3, b=4, c=5, the triangle is scalene.

```
[ ]: while True:
       a = float(input("Maße der ersten Seite : "))
       b = float(input("Maße der zweiten Seite : "))
       c = float(input("Maße der dritten Seite : "))

       if a>b+c or b>a+c or c>a+b:
         print("Deine Maße sind ungültig, versuche neue Maße")

       else:
         break

       if a == b == c:
             print("The triangle is isosceles", end = "")
```

```
if a == b or b == c or a == c:
    print("and also equilateral")

else:
  print("The triangle is scalene")
```

1.5 Task 06 – Decimal to Octal Conversion

Write a program that reads a non-negative integer number in the decimal representation provided by the user and prints the octal representation of the number. For example, if the user enters 167, the output should be 247.

Write a more general program that reads in a non-negative number (potentially including decimal places) in the decimal representation provided by the user and prints the octal representation of the number. For example, if the user enters 25.11, the output should be 31.0702436560507534.

```
[ ]: def DecimalToOctal(n):
        if (n > 0):
            DecimalToOctal(int(n/7))
            print(n%7, end = "")

            n = float(input("decimal"))
            if n > 0:
                DecimalToOctal(n)
            else:
                print("Gib eine positive Zahl ein")
```

1.6 Acknowledgements

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