

IN-CLASS WORK: PYTHON — DECISIONS & REPETITIONS

11. Packages

(The following is a slight variation on §2.2.5.)

Try using

```
exp(2.0)
```

If you have not imported a package which contains the function `exp`, then you will get an error message. In Newman's book he uses the package `math`, we will use `numpy`. So ensure to include in your program for example the line

```
import numpy as np
```

In that case you can determine `exp(2.0)` with

```
print(np.exp(2.0))
```

Test your program with the `import` command and without. Note, you can comment out a line with `#` (see Newman §2.2.7). Test a few other functions like `sin` and others, by quickly scanning Newman's §2.2.5.

12. Decisions

Read §2.3.1 and as you read try the commands on page 39

```
x=int(input("Enter a whole number no greater than ten: "))
if x > 10:
    print("You entered a number greater than ten.")
    print("Let me fix that for you.")
    x=10
print("Your number is",x)
```

and the commands at the bottom of page 41

```
x=int(input("Enter a whole number no greater than ten: "))
if x>10:
    print("your number is great than ten.")
elif x>9:
    print("Your number is OK, but you're cutting it close.")
else:
    print("Your number is fine. Move along.")
```

Continue reading §2.3.2 and try the commands

```
x=int(input("Enter a whole number no greater than ten: "))
while x>10:
    print("This is greater than ten. Please try again.")
    x=int(input("Enter a whole number no greater than ten: "))
print("Your number is",x)
```

but stop reading on page 45 before you get to the commands `f1=1` and following lines. Put the book aside and try yourself to write a program which determines the Fibonacci numbers. When you succeeded, continue reading on page 45.

Try the commands on top of the page 46

```
f1,f2=1,1
while f1<=1000:
    print(f1)
    f1,f2=f2,f1+f2
```

and try to understand how exactly this program works. If you google “Fibonacci Nature” you get some beautiful examples and explanations for the occurrence of fibonacci sequence in nature. Also google “Fibonacci Vi Hart”, then you get some cool you tube videos from Vi Hart.

12. Repetitions Sample Program

To practice how repetition commands work, copy into your working directory the sample program

```
~kvollmay/share.dir/pythonsamples.dir/sample_repetitions.py
```

Look at this program and before running this program, lookup online the used commands. Still before running this program, predict what exactly the program will print on the screen when you run the program. After your prediction, run the program and compare with your prediction.

13. Write a program that print Sign-Up times for Mo, Wed, Fr and on each day 10:0, 10:10, 10:20,... 10:50, 11:0,11:10,... 11:50. So the first few and last few lines of out put should be

```
Mo 10 : 0
Mo 10 : 10
...
Fr 11 : 40
Fr 11 : 50
```

14. Write a program that reads in an integer N and a float $r < 1$, and determines and prints out $\sum_{k=0}^N r^k$ and also for comparison $\frac{(1-r^{N+1})}{(1-r)}$. Test your program for several values of N and r .

15. If time is left: In the next class we will learn about lists and arrays. Start reading about them.