

Complexity Economics: Problem Set Lab 2

1. Consider the following code listings. In each code listing there is a mistake. Correct the mistakes.

Script 0

```
1 """Sum integers from 1 to 10"""
2 result = 0
3 for i in range(10)
4     result += i
```

Script 1

```
1 """Sum integers from 1 to 10"""
2 result = 0
3 i = 1
4 while i <= 10
5     result += i
```

Script 2

```
1 """Function to compute relation of two arguments a and b"""
2 def rel(a, b):
3     return a / b
4
5 a = "2"
6 b = 20
7 result = rel(a, b)
```

Script 3

```
1 """Function to compute factorial of integer b"""
2 def factorial(result, a):
3     if a > 1:
4         result = factorial(result, a-1)
5     result *= a
6     return result
7
8 b = 20
9 result = factorial(b)
```

Script 4

```
1 """Function to compute factorial of integer b"""
2 def factorial(result, a):
3     if a > 1:
4         result = factorial(result, a-1)
5     result *= a
6
7 b = 20
8 result = factorial(1, b)
```

Script 5

```
1 """Function to compute factorial of integer b"""
2 def factorial(result , a):
3     while a > 1:
4         result = factorial(result , a-1)
5         result *= a
6     return result
7
8 b = 20
9 result = factorial(1, b)
```

2. Write a python script to compute the sum of all integer numbers between 0 and 100 that are not evenly (without remainder) divisible by either 4 or 5. That is, the numbers {1, 2, 3, 6, 7, 9, 11, 13, 14, 17, 18, ...}.
3. Consider the code in problem 2 again and rewrite the computation as a function such that the intervals (from 0 to 100 in problem 2) can be passed as arguments. Use this function to compute the sums of all integers not divisible by 4 or 5 in the following intervals [100, 300], [100, 300], [10000, 20000].
4. Consider the Fibonacci series, defined as
$$a_n = a_{n-1} + a_{n-2} \quad \text{for } n > 2 \quad \text{with } a_1 = 1, a_2 = 1,$$
thus {1, 1, 2, 3, 5, 8, 13, 21, 34, 55}. Write a python function to compute the n'th Fibonacci number. E.g, the function called with argument 9 should return 34; with argument 10, it should return 55 etc.
5. Use the function from problem 4 to compute the 40th Fibonacci number.

Please proceed as follows:

- Work together in groups of two students.
- Start each problem by discussing the task and a possible solution together.
- (Problems 2 to 5.) Write each python script together. Organize such that one person (the driver) types the script, the other (the navigator) specifies what to write. The navigator should be clear and specific; the driver may offer alternative solutions but should defer to the navigator where there is disagreement. Ensure that both students actively take part in the programming.