

Lecture 1 Examples

UCLA, Econ 10P: Introduction to Python for Economists
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I. Data Types

1. Create 5 variables with names that are NOT allowed

```
# For example, the one below is allowed  
x = 1  
# but x@ = 1, is not
```

2. Identify the type of each variable

```
t = 1 + 2j  
u = letter  
w = "True"  
x = 3.14  
y = 4  
z = "Hello"  
result1 = 10/3  
result2 = 10.0//3  
result3 = 5%2
```

3. Identify the order of operations and rewrite each expression using parenthesis to make them more legible.

```
# 1  
5-3*2
```

```
# 2  
20%5*3-7
```

```
#3  
40/10*2+1
```

```
#4  
25//4-21%3-4+5*2
```

4. For the string, $x = \text{'Department of Economics'}$, extract

- a. the first 5 characters.
- b. the last 5 characters.
- c. the word 'Economics'.

5. For the string below,

$x = \text{'Department of Economics'}$

- a. find its length.
- b. find the location of the letter 'E'.
- c. convert all letters upper case.
- d. convert all letters to lower case.

6. Compute the future value of a deposit. Prompt the user to enter the monthly interest rate (in decimal form), the initial deposit amount, and the duration of the deposit (in months). You can use the formula

$$FV = PV(1 + r)^n,$$

where PV = present value of the initial deposit, r = monthly rate, and n = number of months. After computing the future value, output it to the screen formatted with 2 decimal places.

7. Repeat Exercise 6 but instead compute the PV assuming you know the FV.

8. Repeat Exercise 6 but instead compute the number of months needed for an initial deposit (PV) to grow to a future value (FV). Note: You will need to include the command `import math` and to compute a `log` value, use the command `math.log()`.

II. Flow Control & Loops

1. Write a `control flow` script that (i) asks a user to input a number, and (ii) prints the sign of the number (e.g., positive or negative). If the number is zero, print "The number is zero".

2. What is the output of the code below for $X = 8, 9, 10$?

```
x = 8
if x > 9:
    x -= 2
```

```
In [6]: x = 9
if x > 9:
    x -= 2
elif x < 9:
    x += 2
else:
    x = x%9
print(x)
```

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3. What is the output of the code below?

```
x = 1; y = 2; z = 3
if z < x or y < x:
    print("True")
else:
    print("False")
```

4. Write a nested `for` loop (where i and j range from 1 to 10) that prints only the odd (i, j) pairs (i.e., both numbers are odd). Hint: use the `range()` function.

5. Using a `while` control flow, write a script that adds the numbers from 1 to 100.

6. What is the output of the code below? What is the last value of x ?

```
x = 100
tot = 0
while x > 0:
    if tot > 200:
        break
    tot += x
    x = x // 2
```