

# Python for Data Science - Modul Exam FS2023

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## Task 1: Slicing

For each of the following code snippets: What will be printed?

### Task 1.1

```
s = "Mojo is the successor programming language to Python!"
print(s[12:19])
```

Output:

```
success
```

**Prove**

```
s = "Mojo is the successor programming language to Python!"
print(s[12:19])
```

```
success
```

### Task 1.2

```
s = "Mojo is the successor programming language to Python!"  
print(s[12::4])
```

Output:

```
seromngnot!
```

**Prove**

```
s = "Mojo is the successor programming language to Python!"  
print(s[12::4])
```

```
seromngnot!
```

### Task 1.3

```
s = "Mojo is a language"  
print(s[::-1])
```

Output:

```
egaugnal a si oJoM
```

**Prove**

```
s = "Mojo is a language"  
print(s[::-1])
```

```
egaugnal a si oJoM
```

### Task 1.4

```
L = ["Mojo", "is", "a", "language"]  
print(L[3][:4])
```

Output:

```
lang
```

**Prove**

```
L = ["Mojo", "is", "a", "language"]  
print(L[3][:4])
```

```
lang
```

## Task 2: Pack/Unpacking, Lambda

The following list and the two functions are given:

```
letter_list = ["h", "s", "l", "u", " ", "m", "e", "p", "!"]  
  
def upper_with_for_loop(letter_list):  
    squares = []  
    for x in letter_list:  
        squares.append(x.upper())  
    return squares  
  
def upper_with_lambda(letter_list):  
    return list(map(lambda x: x.upper(), letter_list))
```

For each of the following code snippets: What will be printed?

## Task 2.1

```
print("1) for_loop_a:", upper_with_for_loop(letter_list))
print("2) for_loop_b:", *upper_with_for_loop(letter_list), sep="")
```

Output:

```
1) for_loop_a: ['H', 'S', 'L', 'U', ' ', 'M', 'E', 'P', '!']
2) for_loop_b:HSLU MEP!
```

### Prove

```
print("1) for_loop_a:", upper_with_for_loop(letter_list))
print("2) for_loop_b:", *upper_with_for_loop(letter_list), sep="")
```

```
1) for_loop_a: ['H', 'S', 'L', 'U', ' ', 'M', 'E', 'P', '!']
2) for_loop_b:HSLU MEP!
```

## Task 2.2

```
print("3) lambda_a:", upper_with_lambda(letter_list))
print("4) lambda_b:", *upper_with_lambda(letter_list))
```

Output:

```
3) lambda_a: ['H', 'S', 'L', 'U', ' ', 'M', 'E', 'P', '!']
4) lambda_b: H S L U   M E P !
```

### Prove

```
print("3) lambda_a:", upper_with_lambda(letter_list))
print("4) lambda_b:", *upper_with_lambda(letter_list))
```

```
3) lambda_a: ['H', 'S', 'L', 'U', ' ', 'M', 'E', 'P', '!']
4) lambda_b: H S L U   M E P !
```

## Task 3: OO Inheritance

For each of the following code snippets: What will be printed?

### Task 3.1

```
class AAA:
    def m(self):
        print("AAA")

class BB(AAA):
    def m(self):
        print("BB")

class CC(AAA):
    def m(self):
        print("CC")

class D(BB, CC):
    def m(self):
        print("D")
```

```
d = D()
d.m()
```

Output:

D

### Prove

```
d = D()
d.m()
```

D

### Task 3.2

```
class AAA:
    def m(self):
        print("AAA")

class BB(AAA):
    def m(self):
        print("BB")

class CC(AAA):
    def m(self):
        print("CC")

class D(BB, CC):
    pass
```

```
d = D()
d.m()
```

Output:

```
BB
```

#### Prove

```
d = D()
d.m()
```

```
BB
```

### Task 3.3

```
class AAA:
    def m(self):
        print("AAA")
```

```
class BB(AAA):  
    pass  
  
class CC(AAA):  
    def m(self):  
        print("CC")  
  
class D(BB, CC):  
    pass
```

```
d = D()  
d.m()
```

Output:

```
CC
```

### Prove

```
d = D()  
d.m()
```

```
CC
```

### Task 3.4

```
class AAA:  
    def m(self):  
        print("AAA")  
  
class BB(AAA):  
    pass  
  
class CC(AAA):  
    pass  
  
class D(BB, CC):  
    pass
```



```
d = D()
d.m()
```

Output:

```
AAA
```


**Prove:**

```
d = D()
d.m()
```

```
AAA
```

## Task 4 String: C-style / format()

For two following code snippets (Task 4.1 and Task 4.2): What will be printed?

 Caution

Your inputs are given in the comments!

### Task 4.1

```
name = input("Enter your name: ") # your input: Anna
age = int(input("Enter your age: ")) # your input: 23

print("My name is %s and I am %d years old." % (name, age))
```

Output:

```
My name is Anna and I am 23 years old.
```

**Prove**

```
name = "Anna"
age = 23

print("My name is %s and I am %d years old." % (name, age))
```

My name is Anna and I am 23 years old.

## Task 4.2

```
first_name = input("Enter your first name: ") # your input: Anna
last_name = input("Enter your last name: ") # your input: Meier
birth_year = input("Enter your birth year: ") # your input: 1998
username = "%s%s%s" % (first_name[0].lower(), last_name[:3].lower(), birth_year[-2:])

print("Generated username: %s" % username)
```

Output:

```
Generated username: amei98
```

## Prove

```
first_name = "Anna"
last_name = "Meier"
birth_year = "1998"
username = "%s%s%s" % (first_name[0].lower(), last_name[:3].lower(), birth_year[-2:])

print("Generated username: %s" % username)
```

```
Generated username: amei98
```

## Task 4.3

For the following code snippet: Change the C-style string format below to the “pythonic way” with the `format()`-function. Write the “pythonic way” with the `format()`-function as result.

### Caution

Your inputs are given in the comments!

```
name = input("Enter your name: ") # your input: Anna
age = int(input("Enter your age: ")) # your input: 23

# replace the next line with a 'format(...)' function:
print("Hello, my name is %s and I am %d years old." % (name, age))
```

Solution:

```
print("Hello, my name is {} and I am {} years old.".format(name, age))
```

Output:

```
My name is Anna and I am 23 years old.
```

### Prove

```
name = "Anna"
age = 23

print("Hello, my name is {} and I am {} years old.".format(name, age))
```

```
Hello, my name is Anna and I am 23 years old.
```

### Task 4.4

For the following code snippet: Change the C-style string format below to the “pythonic way” with the `format()`-function. Write the “pythonic way” with the `format()`-function as result.

### Caution

Your inputs are given in the comments!

```

first_name = input("Enter your first name: ") # your input: Anna
last_name = input("Enter your last name: ") # your input: Meier
birth_year = input("Enter your birth year: ") # your input: 1998

# replace the next two code lines with 'format(...)' functions:
username = "%s%s%s" % (first_name[0].lower(), last_name[:3].lower(), birth_year[-2:])
print("Generated username: %s" % username)

```

Solution:

```

print("Generated username: {}".format(username))

```

Output:

```

Generated username: amei98

```

### Prove

```

first_name = "Anna"
last_name = "Meier"
birth_year = "1998"
username = "%s%s%s" % (first_name[0].lower(), last_name[:3].lower(), birth_year[-2:])

print("Generated username: {}".format(username))

```

```

Generated username: amei98

```

## Task 5: True/False Statements

Which of the following statements are true? Select only the correct statements!

### Caution

Each false selection of a statement gives a 1/2 point deduction.

- ☐ Examples of non-Iterable are Integer, Float.
- ☐ Generator, Files and Range are all iterables.
- ☐ Integer and floats are non-sequence types.

- [ ] An iterator is always an iterable.
- [ ] Iterators always must have a `__iter__()` and `__next__()` method.
- [o] A generator expression is never an iterable.
- [o] A generator function is an iterable.
- [o] Byte and Range are not iterable.