

Introduction to Computer Programming

Week 3.1: Loops - Demos



For Loops

Example: Print the numbers 1 to 5

In [3]:

```
for i in [1,2,3,4,5]:  
    print(i)
```

```
1  
2  
3  
4  
5
```

Example: Print the numbers 1 to 10 with the help of the `range` function.

In [6]:

```
for i in range(1, 11):  
    print(i)
```

```
1  
2  
3  
4  
5  
6  
7  
8  
9  
10
```

This exercise will explore the `range` function more

Example: Print the **even** numbers between 0 and 10, in **decreasing** order.

Decreasing: Starts at value other than 0, start (10) and stop (-1) argument needed

Even: Step size other than 1, step size (-2) argument needed

In []:

```
for i in range(10, -1, -2):  
    print(i)
```

Example: Loop over a sequence of strings

In [9]:

```
for s in ['my', 'name', 'is', 'hemma']:  
    print(s)
```

```
my  
name  
is  
hemma
```

Example: Looping multiple iterables with zip

In [1]:

```
a = [1, 2, 3]  
b = [2, 4, 6]  
  
print(zip(a,b))  
  
print(list(zip(a, b)))
```

```
<zip object at 0x000002700639FF80>  
[(1, 2), (2, 4), (3, 6)]
```

In [2]:

```
for i,j in zip(a, b):  
    print(i, j)
```

```
1 2  
2 4  
3 6
```

Example: Sum the first five positive integers and print the final value

In [13]:

```
val = 0

for i in range(1,6):
    val += i

print(val)
```

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Example: print only the even values in the first ten positive integers

In [14]:

```
for i in range(1, 11):

    if i%2 == 0:
        print(i)
```

2
4
6
8
10

In [15]:

```
for i in range(1, 11):

    if not i%2:
        print(i)
```

2
4
6
8
10

In [16]:

```
for i in range(1, 11):

    if i%2:
        pass

    else:
        print(i)
```

2
4
6
8
10

While loops

Example: A square number is an integer of the form n^2 .

Print the square numbers, starting from 1, that are smaller than 200.

In [3]:

```
n = 1

while(n**2 < 200):
    print(n**2, end=' ')
    n += 1
```

1 4 9 16 25 36 49 64 81 100 121 144 169 196

Example: Continue requesting numbers from the user until the total input exceeds 100.

In [21]:

```
total = 0

while(total < 100):

    n = input(f'total is {total}, input another number ')

    n = int(n)

    total += n

print('total >= 100 reached')
```

total is 0, input another number 20
total is 20, input another number 100
total >= 100 reached
