COMPUTER PROGRAMMING 2
Introduction To Python

BIL3120

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Python Programming Language

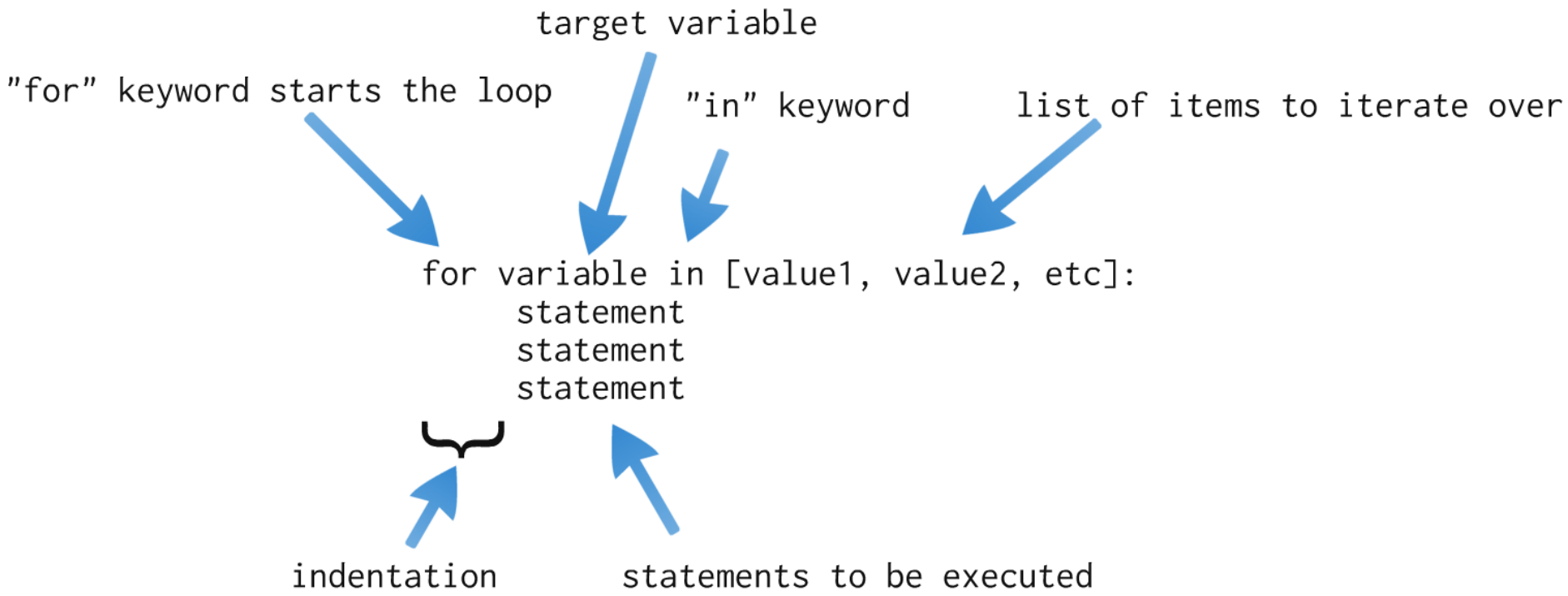
- Loops
- Counter Controlled Loops
  - Counter Controlled Loop is a repetition structure that iterates a specific number of times.
  - The **for** loop can be used to iterate over the contents of any **container**

```
for variable in [a list]:
        things to do for each item in the list.
```

Python Programming Language

- `for variable in [a list]:`

things to do while condition is True.



Python Programming Language

- for item in [a list]:

  things to do for each item in the list.

- Ex:

```
for sayi in [1,2,3,4,5]:
    print (sayi)
for sayi in [1,2,3,4,5]:
    print ("Hello Python")
for isim in ["Ali", "Ayşe","Veli"]:
    print (isim)
```

Python Programming Language

- for item in [a list]:

  things to do for each item in the list.

- Ex:

```
for sayi in [1,2,3,4,5]:
    print ("Hello Python")
```

while equivalent:

```
sayi = 1
while sayi<=5:
    print ("Hello Python")
    sayi = sayi + 1
```

Python Programming Language

- for item in [a list]:

  things to do for each item in the list.

- Ex:

```
for sayi in [10,20,30,40,50]:
    print (sayi)

for sayi in [10,20,30,40,50]:
    print ("Hello Python")
```

for – Exercises

- for item in [a list]:

  things to do for each item in the list.

- range(a) function
  - used for generating a sequence of integers.
  - range(5) = [0, 1, 2, 3, 4]

```
for sayi in range(5):
    print (sayi)
```

for – Exercises

- for item in [a list]:

  things to do for each item in the list.

- range(a, b) function
  - used for generating a sequence of integers.
  - range(1, 5) = [1, 2, 3, 4]

```
for sayi in range(1,5):
    print (sayi)
```

for – Exercises

- for item in [a list]:

  things to do for each item in the list.

- range(a, b, step) function
  - used for generating a sequence of integers.
  - range(1, 15, 3) = [1, 4, 7, 10, 13]

```
for sayi in range(1,15,3):
    print (sayi)
```

for – Exercises

- Find the sum of numbers from 1 to 10 using a "for" loop.

```
toplam = 0
for i in range(11):
    toplam = toplam + i
print (toplam)
```

for – Exercises

- Find the sum of numbers from 100 to 478 using a "for" loop.

```
toplam = 0
for i in range(100,479):
    toplam = toplam + i
print (toplam)
```

for – Exercises

- Find the aveage of 5 numbers entered by the user.

```
toplam = 0
for i in range(5):
    print (i,"nci sayıyı giriniz :")
    sayi = int(input())
    toplam = toplam + sayi
print (toplam/5)
```

for – Exercises

- Find the minimum of 5 numbers entered by the user.
- Find the maximum of 5 numbers entered by the user.
- Generate 10 random integers between 1 and 100
  - Find the minimum of these random numbers
  - Find the maximum of these random numbers
  - Find the average of these random numbers

for – Exercises

- Print the multiplication table for "5"

```
1 x 5 = 5
2 x 5 = 10
3 x 5 = 15
4 x 5 = 20
5 x 5 = 25
6 x 5 = 30
7 x 5 = 35
8 x 5 = 40
9 x 5 = 45
10 x 5 = 50
```

```
for i in range(1,11):
    print (i,"x",5,"=",i*5)
```

for – Exercises

- Nested Loops
  - "loops" in "loops"

```
persons = ["John", "Jack", "Susan"]
restaurants = ["Japanese", "Mexican", "Turkish", "FastFood"]
for person in persons:
    for restaurant in restaurants:
        print (person, "eats", restaurant)
```

```
John eats Japanese
John eats Mexican
John eats Turkish
John eats Fast Food
Jack eats Japanese
Jack eats Mexican
Jack eats Turkish
Jack eats Fast Food
Susan eats Japanese
Susan eats Mexican
Susan eats Turkish
Susan eats Fast Food
```

for – Exercises

- Nested Loops
- Print the multiplication table for 1 – 5

```
for i in range(1,6 ):
    for j in range(1,11):
        print (i,"x",j,"=",i*j)
```

for – Exercises

- Nested Loops
- Print the whole multiplication table

```
    |   1   2   3   4   5   6   7   8   9  10
----+----------------------------------------
  1 |   1   2   3   4   5   6   7   8   9  10
  2 |   2   4   6   8  10  12  14  16  18  20
  3 |   3   6   9  12  15  18  21  24  27  30
  4 |   4   8  12  16  20  24  28  32  36  40
  5 |   5  10  15  20  25  30  35  40  45  50
  6 |   6  12  18  24  30  36  42  48  54  60
  7 |   7  14  21  28  35  42  49  56  63  70
  8 |   8  16  24  32  40  48  56  64  72  80
  9 |   9  18  27  36  45  54  63  72  81  90
 10 |  10  20  30  40  50  60  70  80  90 100
```

for – Exercises

- Nested Loops
- Print the following shapes

```
*****      *      *****      1
*****      **     ****       1 2
*****      ***    ***        1 2 3
*****      ****   **         1 2 3 4
*****      *****  *          1 2 3 4 5
```

for – Exercises

- Print the following matrices

1	1	1	1	1
1	1	1	1	1
1	1	1	1	1
1	1	1	1	1
1	1	1	1	1

0	1	1	1	1
1	0	1	1	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

0	0	0	0	0
1	0	0	0	0
1	1	0	0	0
1	1	1	0	0
1	1	1	1	0

for – Exercises

- Print the following matrix

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

for – Exercises

- Print the proper divisors of a given number. (Verilen bir sayının tam bölenlerini yazdırınız.)
- Check if a given number is prime or not. (Verilen sayının asal olup olmadığını bulunuz.
- Check if a given number is "perfect number" or not. (Verilen sayının mükemmel sayı olup olmadığını bulunuz.)

Perfect number is a positive integer that is equal to the sum of its proper divisors.

Eg: 6 = 1 + 2 + 3,

Eg: 28 = 1 + 2 + 4 + 7 + 14

for – Exercises

- List the common divisors of two given numbers (Verilen iki sayının ortak bölenlerini yazdırınız.)
- Calculate the factorial of a given number.
- Calculate x^y for the given x and y values.
- List the prime numbers between 1 and 100
- List the perfect numbers between 1 and 10.000