

COMPUTER PROGRAMMING 2

Introduction To Python

BIL3120

Dokuz Eylul University, Faculty of Science,
Department of Statistics



Python Programming Language

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□ Logical Operators

□ AND

□ OR

□ NOT

| A | B | A and B |
|---|---|---------|
| 0 | 0 | 0 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

AND

| A | B | A or B |
|---|---|--------|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 1 |

OR

| A | not A |
|---|-------|
| 0 | 1 |
| 1 | 0 |

NOT



Python Programming Language

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□ Logical Operators

▣ NOT

```
ders = input("Bu dersin kodu?: ")
if not (ders == "BİL2205"):
    print ("Bilemedin...")
else:
    print ("Evet doğru...")
```



Python Programming Language

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□ Logical Operators

▣ AND

True **and** True => True

True **and** False => False

False **and** True => False

False **and** False => False

```
if saat > 9 and saat < 17:  
    print ("Mesaideyiz...")  
else:  
    print ("Dükkan kapalı...")
```



Python Programming Language

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□ Logical Operators

▣ OR

True or True => True

True or False => True

False or True => True

False or False => False

```
if gün == "Cumartesi" or gün == "Pazar":  
    print ("Yaşasın Tatil...")  
else:  
    print ("Bugün iş günü...")
```



□ Logical Operators

```
a = 5
```

```
b = 10
```

```
print (a > b and a > 1) → False
```

```
print (a > 1 and b > a) → True
```

```
print (a == 5 and b < 100) → True
```

```
print (a > 1 and b < 1 and b > a)  
→ False
```

```
print (a > 1 and b > 1 and b > a)  
→ True
```



Python Programming Language

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□ Logical Operators

```
a = 5
```

```
b = 10
```

```
print (a > b or a > 1) → True
```

```
print (a > 1 or b > a) → True
```

```
print (a == 5 or b < 100) → True
```

```
print (a > 1 or b < 1 or b > a)  
→ True
```

```
print (a > 1 or b > 1 or b > a)  
→ True
```



Python Programming Language

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- "random" Module
- contains functions for generating random values.
 - ▣ `random.random()`
 - ▣ `random.randint(a, b)`
 - ▣ `random.choice([a list of options])`



Python Programming Language

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□ `random.random()`

▣ generates a float number in the interval $[0, 1)$.

▣ `print (random.random())`

□ `random.randint(a, b)`

▣ returns random integer in range $[a, b]$, including both end points.

▣ `print (random.randint(1, 6))`

□ `random.choice([a list of options])`

▣ choose a random element from a non-empty sequence.

▣ `print (random.choice([3,1,6,7,8,2]))`



Python Programming Language

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□ `random.seed(a)`

□ Determine the right seed value to generate the deterministic random data you want.

□ `random.seed(12)`

□ `print (random.randint(1, 6))`



Exercise

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- Write a program to guess the number randomly chosen by the computer.
- Roll 2 dice for 2 players. Display the winner in the following rules:
 - Greater dice wins
 - Less dice wins
 - Odd dice wins
 - Even dice wins
 - "1", "2" or "6" wins

Programming Challenge



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- Write a program to ask the user to select one of three options - Taş (t), Kağıt (k) or Makas (m).
- Use the `random.choice()` function to select an option for the computer.
- Determine the winner and print the result:
 - Taş Makası yener
 - Makas Kağıdı yener
 - Kağıt Taşı yener



Python Programming Language

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- Loops

- Condition Controlled Loops

- ▣ A condition controlled loop is programming structure that causes a statement or set of statements to repeat as long as a condition evaluates to **True**.

- `while` condition:

- things to do while condition is **True**.



Python Programming Language

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- Condition Controlled Loops

- We refer to the process of going through a loop as an “iteration”

`while` condition:

things to do while condition is **True**.



Python Programming Language

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□ Condition Controlled Loops

standard Boolean condition that evaluates to True or False

```
while condition:  
    statement  
    statement  
    statement  
    statement
```

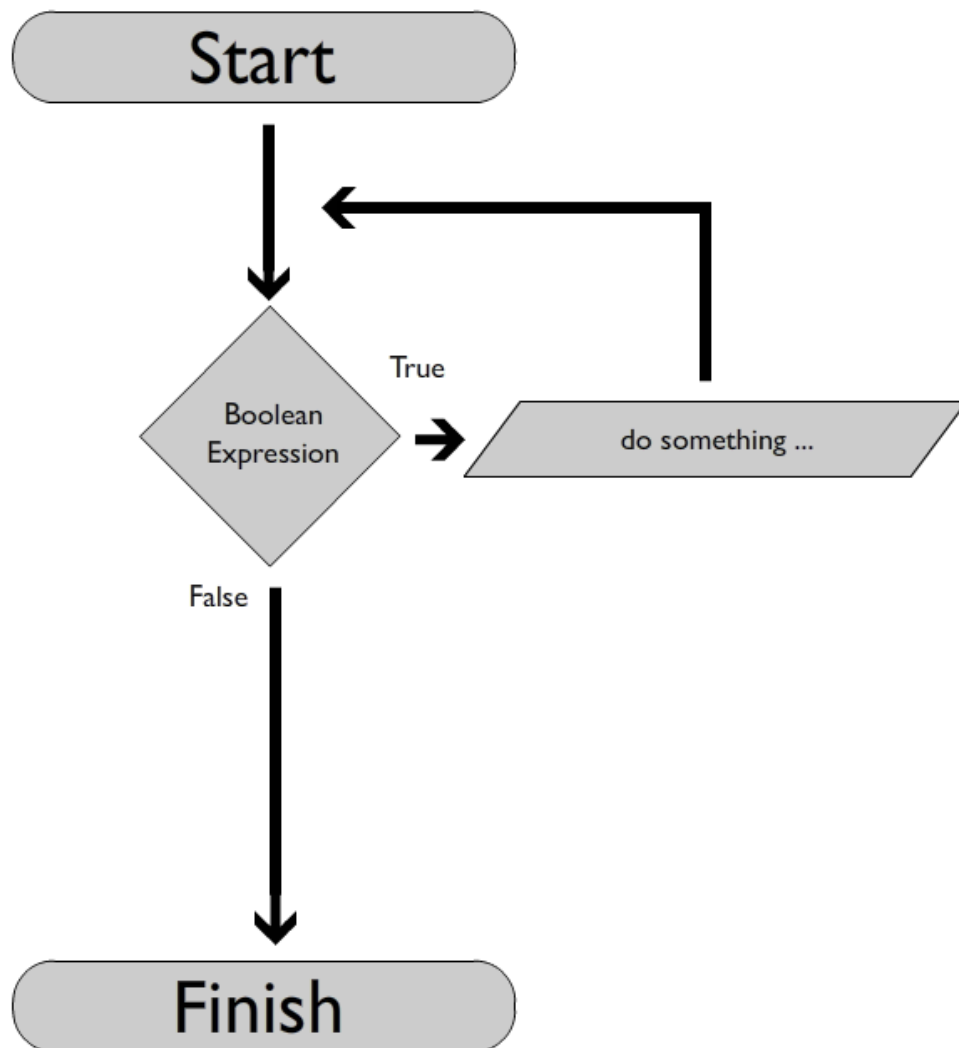
the statements that will be repeated

indentation indicates that the statements under the while loop should be repeated



Python Programming Language

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while

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□ Print the numbers from 1 to 10.

```
sayi = 1
while sayi <= 10:
    print (sayi)
    sayi = sayi + 1
```



while

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□ Print the sum of numbers from 1 to 10.

```
sayi = 1
toplam = 0
while sayi <= 10:
    toplam = toplam + sayi
    sayi = sayi + 1
print (toplam)
```



while

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- Calculate the sum of digits of a number entered by the user.

```
sayi = int(input("Enter a number: "))
toplam = 0
while (sayi > 0):
    toplam = toplam + (sayi % 10)
    sayi = sayi // 10
print (toplam)
```



while

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- A bank offers an interest of %5 of the balance for each year. In how many years does 100TL becomes 200TL or more?

```
para = 100
yil = 0
while (para < 200):
    para = para + para*0.05
    yil += 1
print (yil,"yıl sonra",para,"TL olur")
```



while

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- Find the average of 10 numbers randomly generated between 55 and 65.

```
import random
toplam = 0
adet = 0
while adet < 10:
    sayi = random.randint(55,65)
    toplam = toplam + sayi
    adet = adet + 1
avg = toplam / adet
print ("Ortalama =",avg)
```

while



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- Flip a coin for 100 times. Count the number of heads and tails. (100 kere para at, yazı – tura sayısını bul)

```
import random
yazi = 0
tura = 0
atis = 0
while atis<100:
    para = random.choice(["Yazı", "Tura"])
    if (para=="Yazı"): yazi += 1
    else: tura += 1
    atis += 1
print("Yazı sayısı:", yazi)
print("Tura sayısı:", tura)
```



while – sentinel values

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□ Calculate the average of numbers entered by the user.

Sentinel
value



```
toplam = 0
adet = 0
sayi=int(input("Enter a number (0) to exit: "))
while (sayi>0):
    toplam = toplam + sayi
    adet = adet + 1
    sayi=int(input("Enter a number (0) to exit: "))
print ("Average = ",toplam/adet)
```



while – sentinel values

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- Find the minimum of the numbers entered by the user.
- Find the maximum of the numbers entered by the user.
- Find the range of the numbers entered by the user.



While – Exercises

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- 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.

$$\text{Eg: } 6 = 1 + 2 + 3,$$

$$\text{Eg: } 28 = 1 + 2 + 4 + 7 + 14$$



While – Exercises

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- 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
- Factorize a given number (Verilen bir sayıyı çarpanlarına ayırın. Ör: $420 = 2 \times 2 \times 3 \times 5 \times 7$)