

COMPUTER PROGRAMMING I

Introduction To Python

BIL2205

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□ Python

- is a **general purpose, interpreted** programming language.
- is a language that supports multiple approaches to software design, principally **structured** and **object-oriented** programming.
- provides automatic **memory management** and **garbage collection**.
- is **extensible**.

Spyder – Python Editor



File Edit Search Source Run Debug Consoles Projects Tools View Help

Editor - C:\Users\Alper Vahaplar\untitled0.py

untitled0.py

Variable explorer

Variable / File explorer

Variable explorer File explorer Help

IPython console

Console 1/A

Console

History log IPython console

Permissions: RW End-of-lines: CRLF Encoding: UTF-8 Line: 8 Column: 1 Memory: 52%

Spyder – Python Editor



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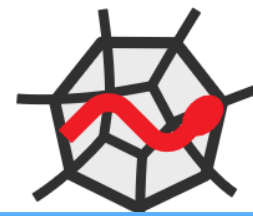
- Spyder Console (Ipython)
- Command Line

```
Console 1/A [X]
Python 3.6.4 |Anaconda, Inc.| (default, Jan 16 2018, 10:22:32) [MSC v.1900 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.

IPython 6.2.1 -- An enhanced Interactive Python.

In [1]:
```

Spyder – Python Editor



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□ Editor

Spyder (Python 3.6)

File Edit Search Source Run Debug Consoles Projects Tools View Help

Editor - G:\Belgelerim\2019-2020\2019-2020 Güz\BIL2001 - Algoritmalar ve Veri Yapıları\uygulama\untitled1.py

temp.py untitled1.py*

```
1# -*- coding: utf-8 -*-
2"""
3Created on Fri Oct 4 11:21:24 2019
4
5@author: Alper
6"""
7
8|
```

Name	Type
a	int
i	int
t	int
x	list

Variable explorer

IPython console

Console

```
default.
Opti
file
current
sep:
end:
newline.
flush

In [111]
01234567

In [112]
History log
```

Permissions: RW End-of-lines: CRLF Enc



□ Python Programming

- ▣ Comments: The part of a program that the interpreter (or compiler) will ignore, will not try to convert and execute.

```
1 # -*- coding: utf-8 -*-  
2 """  
3 Created on Fri Oct  4 11:21:24 2019  
4  
5 @author: Alper  
6 """  
7  
8 # This is a comment line...
```

Spyder – Python Editor



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□ Python Programming

□ Comments:

□ # Comment in line

□ """

Comment in blocks,
or paragraphs,
or multi-line commenting...

"""

□ (`'''`) can also be used for multiline commenting.

```
1 # -*- coding: utf-8 -*-
2 """
3 Created on Fri Oct  4 11:21
4
5 @author: Alper
6 """
7
8 # This is a comment line...
```

Spyder – Python Editor



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- Python Programming
- `print` command.

```
1 # This is a comment line... |
2 # Let's begin with our first
3 # program....
4
5 print ("Hello World")
```

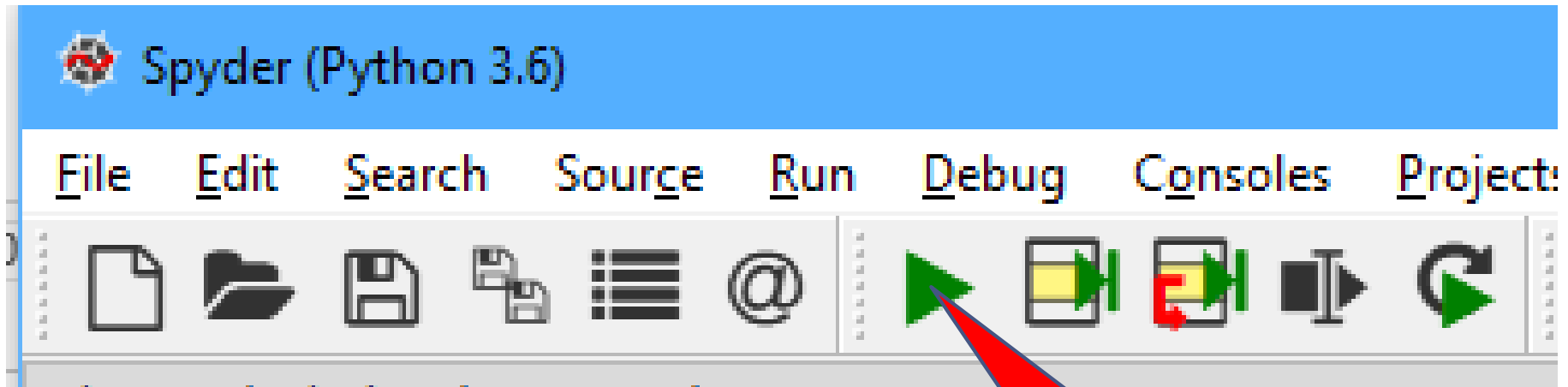

Spyder – Python Editor



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- Python Programming
- `print` command.

```
1 # This is a comment line...|
2 # Let's begin with our first
3 # program....
4
5 print ("Hello World")
```



Run File
(F5)

Spyder – Python Editor



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- Python Programming
- `print` command.
- `print ("Hello World")`
- `print ("Python is fun...")`
- `print ("Hello World", "Python is fun...")`

Spyder – Python Editor



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- Python Programming
- Assignment Operator (=)

```
yaş = 35  
print (yaş)
```

```
isim = 'Alper'  
print (isim)
```



- Python Programming
- Assignment Operator (=)

```
h = 12
r = 3
volume = 3.14 * r**2 * h
print ("Volume of the cylinder is :",volume)
```



Python Programming

Assignment Operator (=)

```
isim = "Alper"
```

```
dogumyılı = 1985
```

```
yaş = 2019 - dogumyılı
```

```
print ("Dear", isim, "You're"  
      , yaş, "years old")
```



- Calculate "geçme_notu" for given "vize, ödev, final" grades.

```
vize = 72
```

```
ödev = 80
```

```
final = 55
```

```
geçme_notu = vize * 0.4
```

```
geçme_notu = geçme_notu + ödev * 0.10
```

```
geçme_notu += final * 0.50
```

```
print (geçme_notu)
```

Exercises



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- Convert 42 mpg to liters/100km
 - 1 Gallon = 3.785411784 Liters
 - 1 Mile = 1.609344 Kilometers
- Calculate the day number of January 1st, 2020.
 - (0 => Sunday, 1=>Monday, ... 6 =>Saturday)



Python – Control Structures

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- Condition Control

- **if** condition:

 - things to do if **condition** is **true**

- Example:

```
if 23 > 45:
```

```
    print ("23 is greater than 45")
```

```
print ("Out of 'if'...")
```




Python – Control Structures

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- Condition Control

- **if** condition:

things to do if **condition** is **true**

- Example:

```
isim = "Alper"
```

```
dogumyılı = 1985
```

```
yaş = 2019 - dogumyılı
```

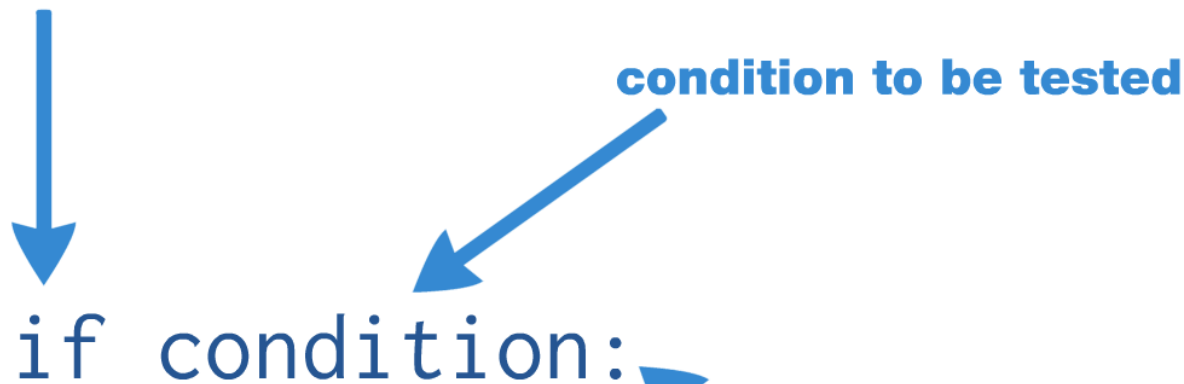
```
if yaş >= 40:
```

```
    print ("How OLD you are...")
```



Python – Control Structures

"if" keyword begins a selection statement



statement
statement
statement

colon denotes end of condition

statements to execute if condition is true

"block" of execution must be indented



Python – Control Structures

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□ if condition:

things to do if condition is true

```
isim = "Alper"  
dogumyılı = 1985  
yaş = 2019 - dogumyılı  
if yaş >= 40:  
    print ("Hi Grandfather", isim)  
    print ("How OLD you are...")  
    print ("Have you seen Atatürk?")  
    yeniyaş = yaş + 30  
    print ("You'll be", yeniyaş, "in 30 years")  
print ("Program ended...")
```



Python – Control Structures

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- Condition Control

- **if** condition:

 - things to do if **condition** is **true**

- else:**

 - things to do if **condition** is **false**



Python – Control Structures

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□ **if** condition:

things to do if **condition** is **true**

else:

things to do if **condition** is **false**

```
isim = "Alper"  
dogumyılı = 1985  
yaş = 2019 - dogumyılı  
if yaş >= 40:  
    print ("How OLD you are...")  
else:  
    print ("You are young yet...")
```



Python – Control Structures

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```
isim = "Alper"
doğumyılı = 1985
yaş = 2019 - doğumyılı
if yaş>=40:
    print ("Hi Grandfather", isim)
    print ("How OLD you are...")
    print ("Have you seen Atatürk?")
    yeniyaş = yaş + 30
    print ("You'll be",yeniyaş,"in 30 years")
else:
    print ("You are young yet...")
    print ("Do you go to school?")
    print ("We call you 'bebe' in Turkey")
print ("Program Ended...")
```



Python – Control Structures

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```
isim = "Alper"
doğumyılı = 1975
yaş = 2019 - doğumyılı
if yaş>=40:
    print ("Hi Grandfather", isim)
    print ("How OLD you are...")
else:
    if yaş>=20:
        print ("You are young yet...")
    else:
        print ("Do you go to school?")
        print ("We call you 'bebe' in Turkey")
print ("Program Ended...")
```



Python – Control Structures

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□ Nested "if"

```
if (g > 90):  
    print ('A')  
else:  
    if (g > 80):  
        print ('B')  
    else:  
        if (g > 70):  
            print ('C')  
        else:  
            if (g > 60):  
                print ('D')  
            else:  
                print ('F')
```




Python – Control Structures

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□ if – elif – else

```
if (g > 90):
    print ('A')
else:
    if (g > 80):
        print ('B')
    else:
        if (g > 70):
            print ('C')
        else:
            if (g > 60):
                print ('D')
            else:
                print ('F')
```

```
if g > 90:
    print ('A')
elif g > 80:
    print ('B')
elif g > 70:
    print ('C')
elif g > 60:
    print ('D')
else:
    print ('F')
```



Python – Control Structures

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User input in Python

"input"

```
isim = input("Enter your name: ")  
print ("Hello", isim)
```

```
Enter your name: Alper  
Hello Alper
```



Python – Control Structures

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User input in Python

"input"

```
yaş = input("How old are you? ")  
print(yaş)
```



Python – Control Structures

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- User input in Python
- "input"

Name	Type	Size	
yaş	str	1	12

```
yaş = input("How old are you? ")  
print(yaş + 10)
```

How old are you? 12

Traceback (most recent call last):

```
File "<ipython-input-22-1daa3b0719f1>", line 2, in  
<module>  
    print(yaş+10)
```

TypeError: must be str, not int



Python – Control Structures

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❑ Convert data type (str to int)

❑ `int()` function

```
yaş = input("How old are you? ")  
print(yaş + 10)
```

Name	Type	Size	
yaş	int	1	12

```
yaş = int(input("How old are you? "))  
print(yaş + 10)
```

Python – Guess the number



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- Ask the user to guess a number between 1 and 10. Assume they will enter an Integer.
- Pick a number between 1 and 10 that is your “secret” number (for example, 5)
- If the user types in your secret number, tell them that they win!
- If the user types in a number less than or greater than your secret number, tell them that they’re either above or below the number and to try again.

Python – Guess the number



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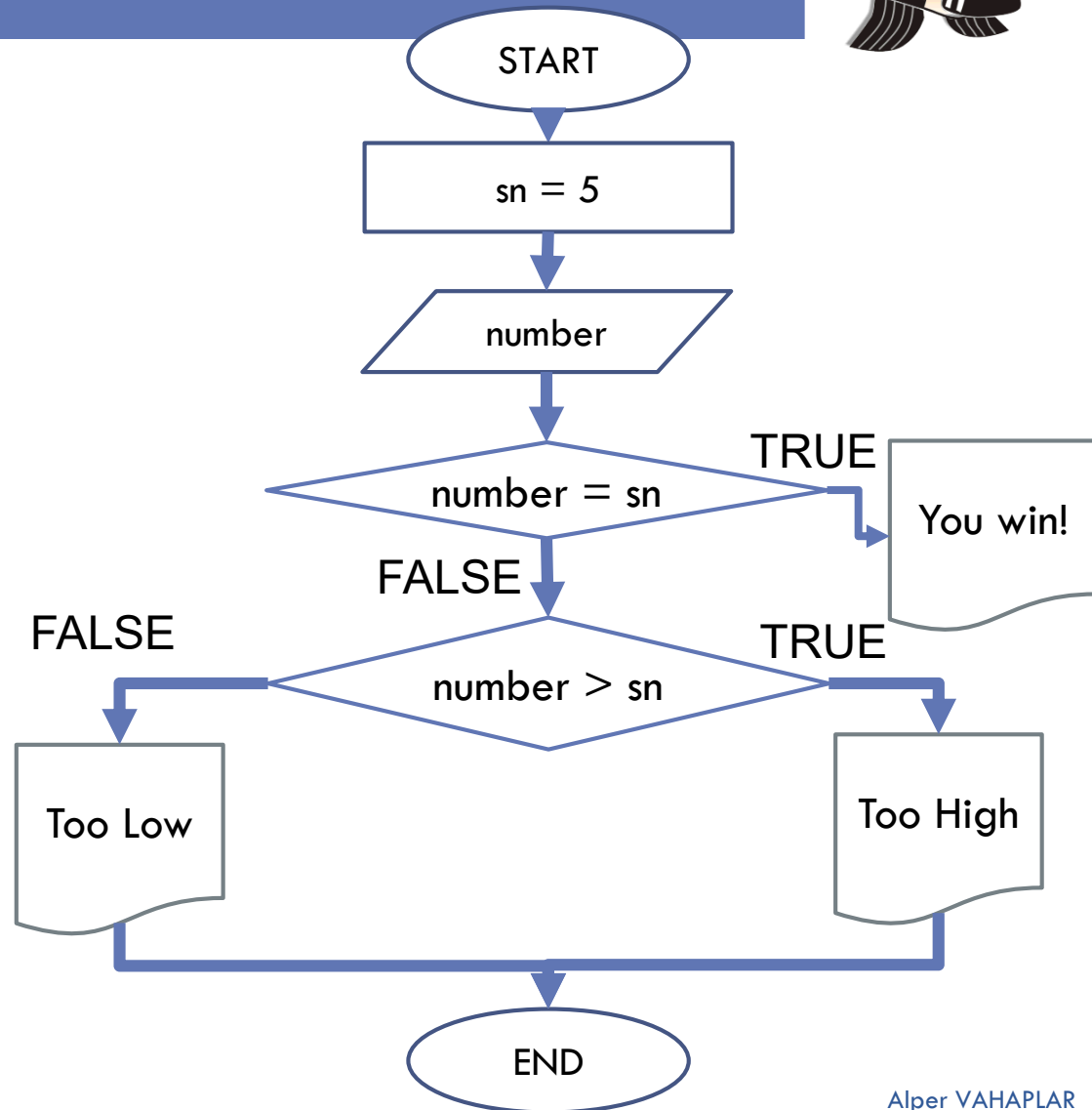
1. START
2. `secretnumber = 5`
3. READ number
4. IF (`number = secretnumber`) PRINT "You Win..."
ELSE
 IF (`number > secretnumber`) PRINT "Too High"
 ELSE PRINT "Too Low"
5. END

Python – Guess the number



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1. START
2. `secretnumber = 5`
3. READ number
4. IF (`number = secretnumber`)
 PRINT "You Win..."
ELSE IF (`number > secretnumber`)
 PRINT "Too High"
 ELSE PRINT "Too Low"
5. END



Python – Guess the number



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1. START
2. secretnumber = 5
3. READ number
4. IF (number = secretnumber)
 PRINT "You Win..."
ELSE IF (number > secretnumber)
 PRINT "Too High"
 ELSE PRINT "Too Low"
5. END

```
secretnumber = 5
number = int(input("Guess a number:"))
if number == secretnumber:
    print ("You Win!!!")
else:
    if number > secretnumber:
        print ("Too High")
    else:
        print ("Too Low")
```

Python – Guess the number



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```
secretnumber = 5
number = int(input("Guess a number:"))
if number == secretnumber:
    print ("You Win!!!")
elif number > secretnumber:
    print ("Too High")
else:
    print ("Too Low")
```



- Calculate "geçme_notu" for given "vize, ödev, final" grades.
- Define the corresponding letter for "geçme_notu"
- $\text{geçme_notu} = \text{vize} \times 40\% + \text{Final} \times 50\% + \text{ödev} \times 10\%$
 - $\text{geçme_notu} < 60 \quad \Rightarrow \quad " F "$
 - $60 < \text{geçme_notu} < 70 \quad \Rightarrow \quad " D "$
 - $70 < \text{geçme_notu} < 80 \quad \Rightarrow \quad " C "$
 - $80 < \text{geçme_notu} < 90 \quad \Rightarrow \quad " B "$
 - $\text{geçme_notu} > 90 \quad \Rightarrow \quad " A "$