



DOKUZ EYLÜL  
ÜNİVERSİTESİ  
**İSTATİSTİK**  
**BÖLÜMÜ**

# Computer Programming – 2

Alper VAHAPLAR

2019 – 2020

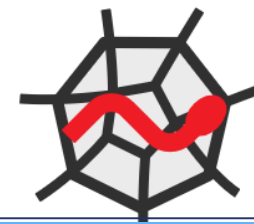
# Python Programming Language



## ➤ 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



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

```
1 # -*- coding: utf-8 -*-
2 """
3 Created on Tue Oct 1 16:41:00 2019
4
5 @author: Alper
6 """
7
8
```

Name	Type	Size	Value
Variable / File explorer			

Variable explorer | File explorer | Help

IPython console

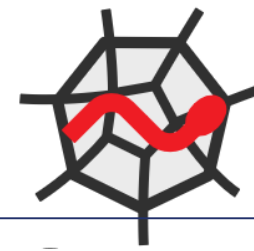
```
Python 3.6.4 |Anaconda, Inc.| (default, Jan 16 2018, 10:22:32) [MSC v.1900 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.

IPython 6.2.1 -- An enhanced Interactive Python.
>>>

In [1]:
```

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

# Spyder – Python Editor



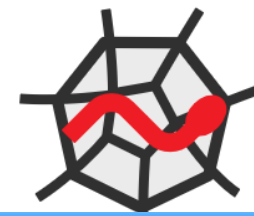
- Spyder Console (Ipython)
  - ✓ Command Line

```
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



## ➤ 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

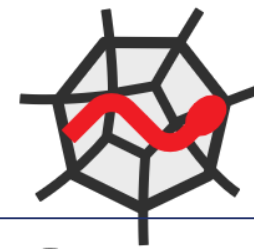
```
default.
Opti
file
current
sep:
end:
newline.
flush

In [111]
01234567

In [112]
History log
```

Permissions: RW End-of-lines: CRLF Enc

# Spyder – Python Editor

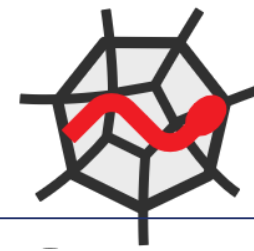


## ➤ Python Programming

- ✓ 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



## ➤ Python Programming

- ✓ Comments:
- ✓ # Comment in line
- ✓ """

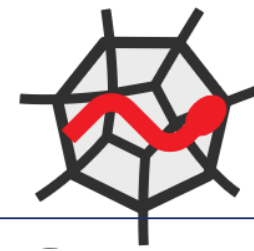
Comment in blocks,  
or paragraphs,  
or multi-line commenting...

"""

- ✓ ( ''' ) can also be used for multiline commenting.

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

# Spyder – Python Editor



- Python Programming
- `print` command.

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

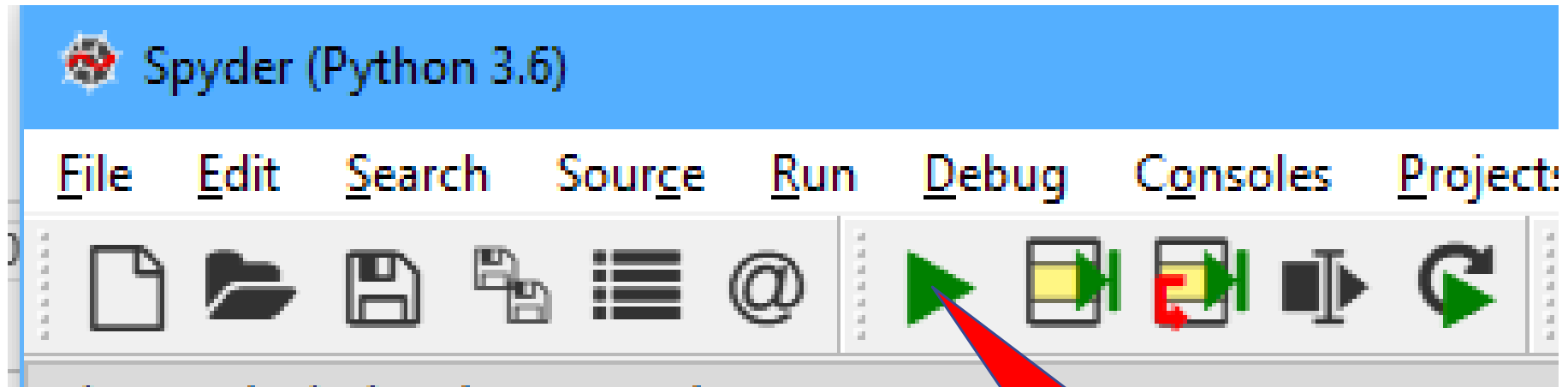


# Spyder – Python Editor



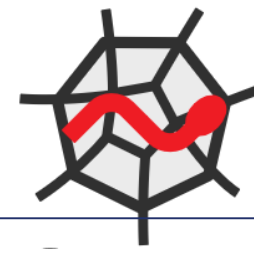
- Python Programming
- `print` command.

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



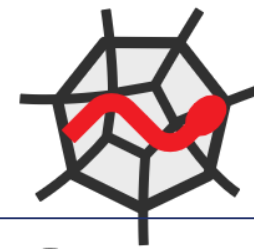
Run  
File  
(F5)

# Spyder – Python Editor



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

# Spyder – Python Editor



- Python Programming
- Assignment Operator ( = )

```
yaş = 35  
print (yaş)
```

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

# Operators in Python



## ➤ Arithmetic Operators

Operator	Operation	Example
<b>+</b>	Addition	48 + 23
<b>-</b>	Subtraction	48 - 23
<b>*</b>	Multiplication	48 * 23
<b>/</b>	Division	48 / 23
<b>%</b>	Modulus	48 % 23
<b>**</b>	Exponent	48 ** 23
<b>//</b>	Floor Division	48 // 23

# Operators in Python



## ➤ Comparison Operators

Operator	Operation	Example
<code>==</code>	Equal	<code>48 == 23</code>
<code>!=</code>	Not Equal	<code>48 != 23</code>
<code>&lt;&gt;</code>		<code>48 &lt;&gt; 23</code>
<code>&gt;</code>	Greater than	<code>48 &gt; 23</code>
<code>&lt;</code>	Smaller than	<code>48 &lt; 23</code>
<code>&gt;=</code>	Greater than or equal to	<code>48 &gt;= 23</code>
<code>&lt;=</code>	Less than or equal to	<code>48 &lt;= 23</code>

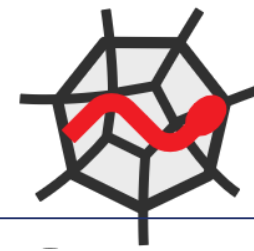
# Operators in Python



## ➤ Compound Operators

Operator	Example	Equivalent to
<b>+=</b>	<code>x += 3</code>	<code>x = x + 3</code>
<b>-=</b>	<code>x -= 3</code>	<code>x = x - 3</code>
<b>*=</b>	<code>x *= 3</code>	<code>x = x * 3</code>
<b>/=</b>	<code>x /= 3</code>	<code>x = x / 3</code>
<b>%=</b>	<code>x %= 3</code>	<code>x = x % 3</code>

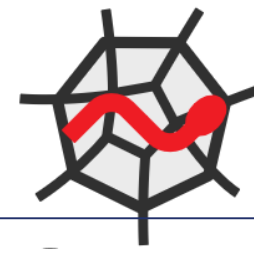
# Spyder – Python Editor



- Python Programming
- Assignment Operator ( = )

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

# Spyder – Python Editor



- Python Programming
- Assignment Operator ( = )

```
isim = "Alper"  
doğumyılı = 1985  
yaş = 2019 - doğumyılı  
print ("Dear", isim, "You're"  
       , yaş, "years old")
```



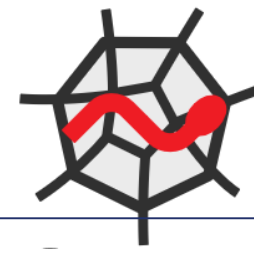
# Spyder – Python Editor



- 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



- 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



- 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



- Condition Control

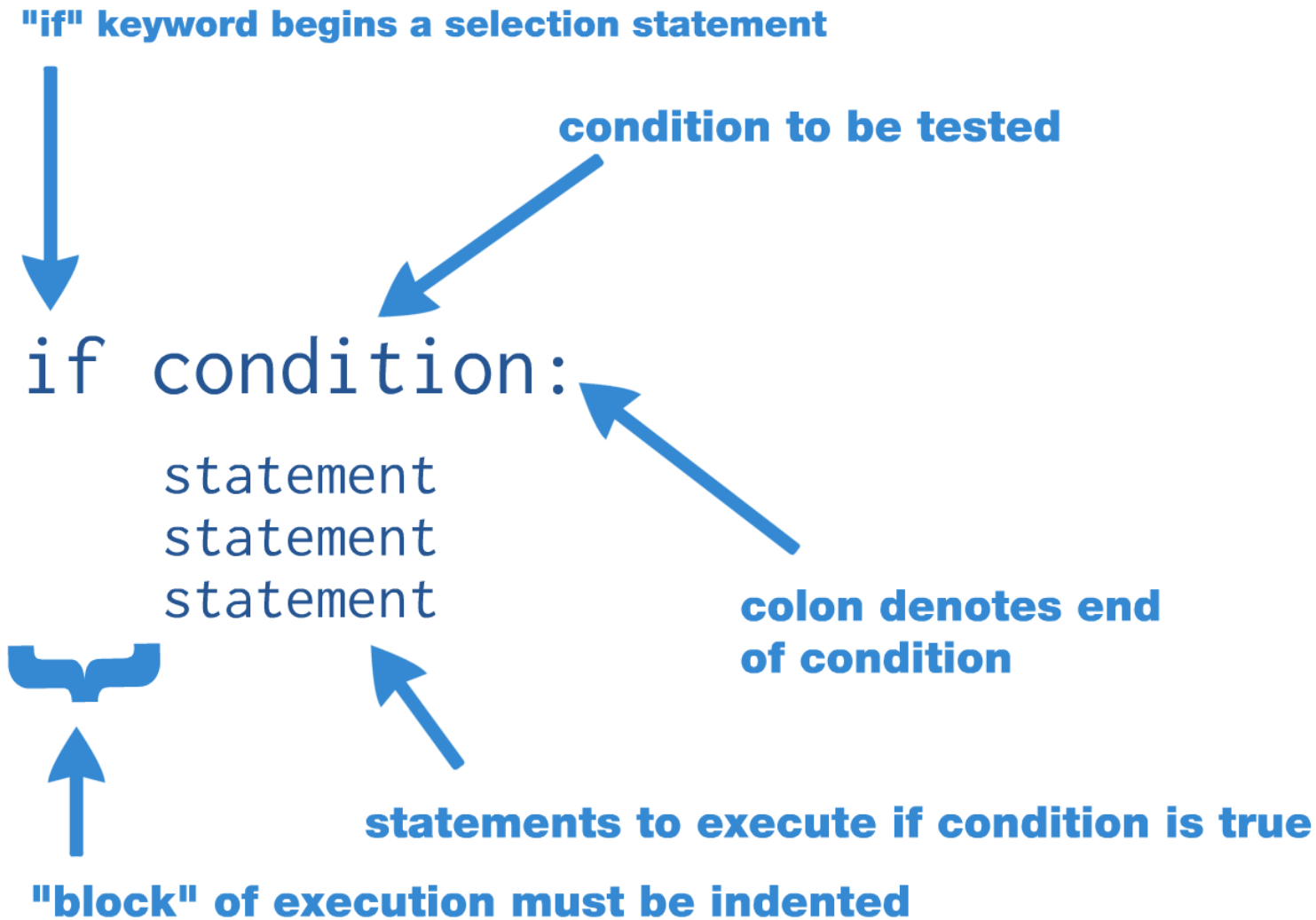
- **if** condition:

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



# Python – Control Structures



➤ **if** condition:

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

```
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")
print ("Program ended...")
```

# Python – Control Structures



- Condition Control

- **if** condition:

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

- else:**

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

# Python – Control Structures



➤ **if** condition:

things to do if condition is **true**

**else:**

things to do if condition is **false**

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



# Python – Control Structures



```
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



```
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



## ➤ 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



## ➤ 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



- User input in Python
- "input"

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

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

# Python – Control Structures



➤ User input in Python

➤ "input"

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

# Python – Control Structures



- 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



- Convert data type (str to int)
- `int( )` function

Name	Type	Size	
yaş	int	1	12

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

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



# Python – Guess the number



- 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



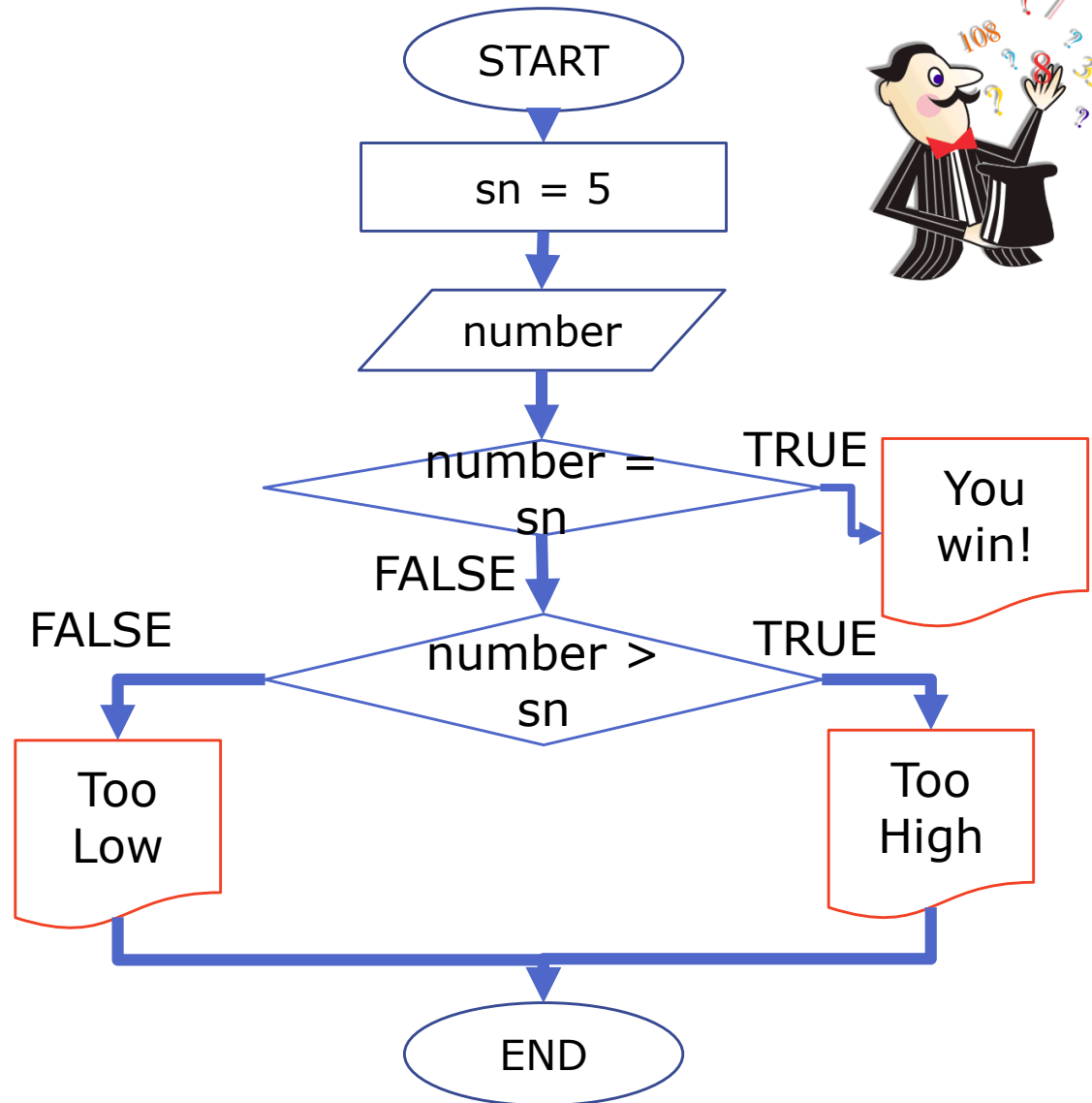
1. START
2. secretnumber = 5
3. READ number
4. IF (number = secretnumber) PRINT "You Win..."  
ELSE  
    IF (number > secretnumber) PRINT "Too High"  
    ELSE PRINT "Too Low"
5. END



# Python – Guess the number



```
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



```
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



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



# Spyder – Python Editor



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