# CENG 113 – Programming Basics

Lab 4

# if/else

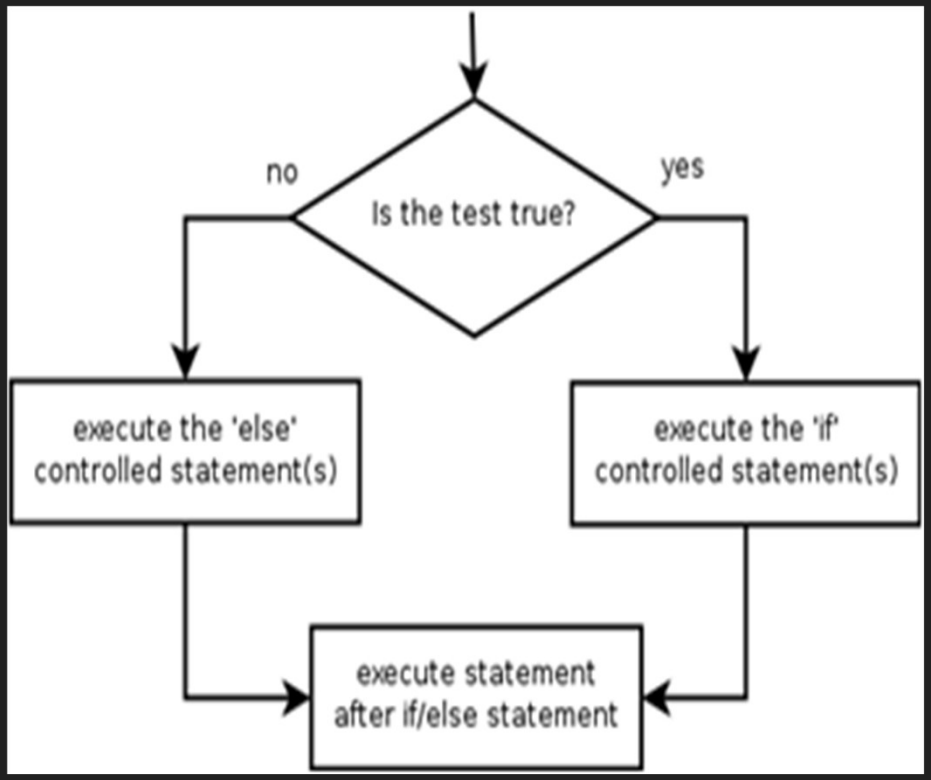
**`if/else` statement**:

- Syntax:

```
if condition:
        statements
else:
        statements
```

- Example:

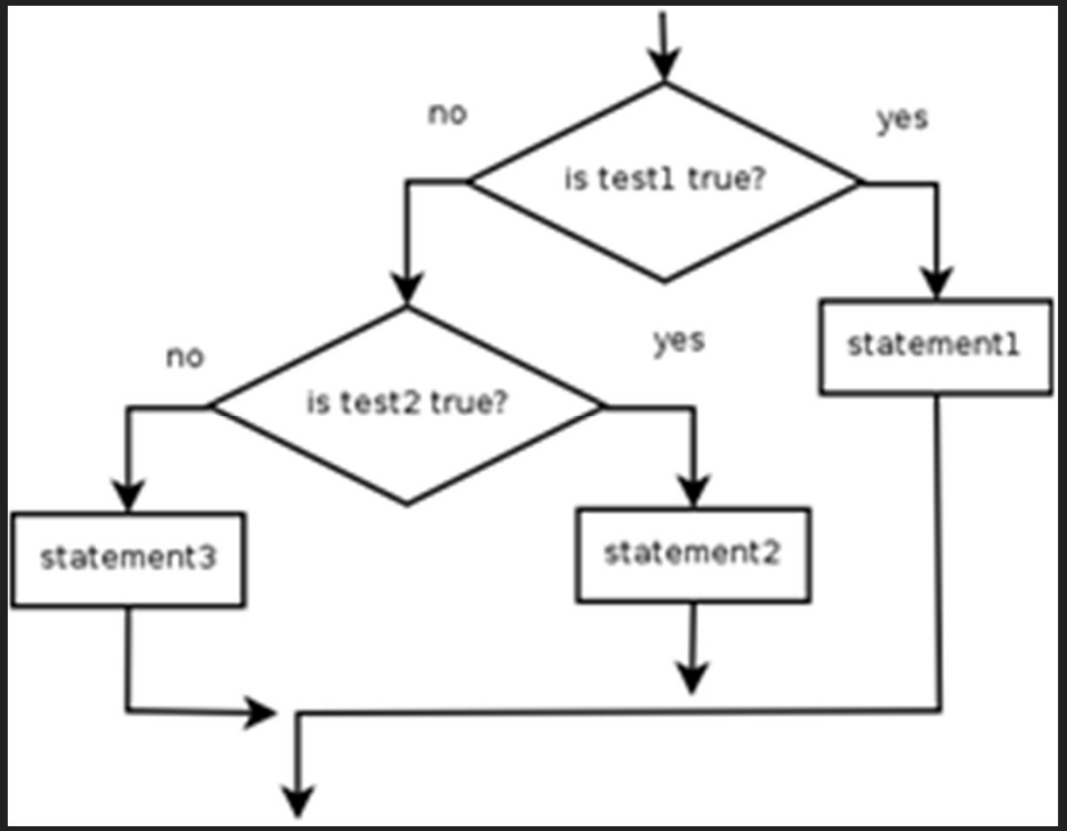
```
gpa = 1.4
if gpa > 2.0:
        print "Welcome to Mars University!"
else:
        print "Your application is denied."
```



# if/elif/else

- Multiple conditions can be chained with `elif` ("else if"):

```
if condition:
        statements
elif condition:
        statements
else:
        statements
```



# Comparison Operators and Logical Operators

- Comparison Operators: **==, !=, <, >, <=, >=**
- e.g. 3 >= 0 → True

"abc" == "Abc" → False

3 != 3.0 → False

8 + 4 > 12 - 3 → True

- Logical Operators: **and, or, not**
- e.g. True and True → True

3 + 5 <= 9 or 8 == 600 → True

not True → False

not ("abc" == "Abc") → True

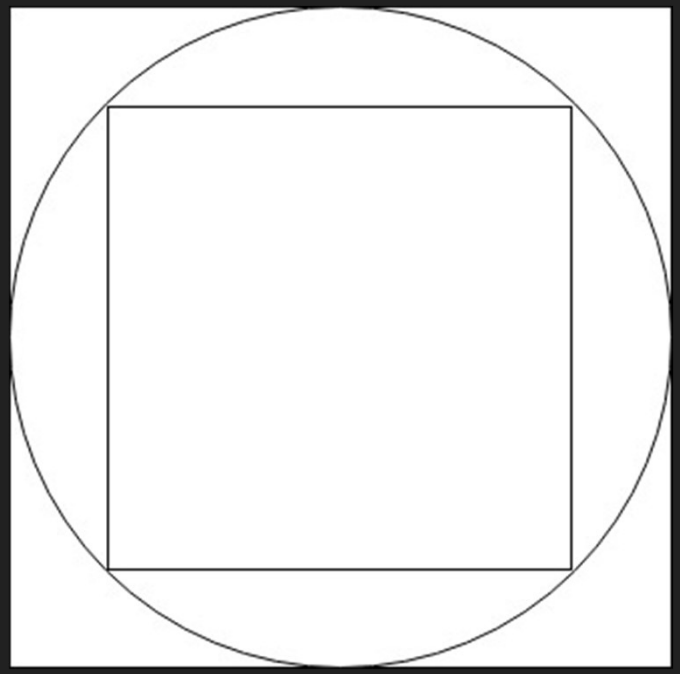
# Examples

# Minimum Value

. Write a Python code that asks the user for three numbers, calculate the minimum of them and print it.

# Area of Squares

- Write a Python program that asks the user for radius of a circle, then calculate the area of two squares:
  - the biggest inner square and
  - the smallest outer square.



# Ticket Discount

. Write a Python program that asks user for age and calculates ticket price accordingly:
  - Normal bus ticket price is 3 TL.
  - Bus ticket price for people younger than 6 and older than 60 years old is free.
  - People whose age are between 7 and 18 take 50% discount.

# Graduation Condition

. Write a Python code to ask user to enter two values: one for GPA and the other for Number of Lectures. According to the below table, decide whether user will be graduated or not. If not, give an appropriate message as given table.

| Number of Lectures\GPA | GPA < 2.0 | GPA >= 2.0 |
|---|---|---|
| Number of Lectures < 47 | “Not enough number of lectures and GPA!” | “Not enough number of lectures!” |
| Number of Lectures >= 47 | “Not enough GPA!” | “GRADUATED!!!” |

# Roots of Quadratic Equation

. Write a Python code that asks the user for parameters(a, b, c) of a quadratic equation represented as:
. Discriminant:
  - When $\Delta>0$, there are two real roots
  - When $\Delta=0$, there is one real root
  - When $\Delta<0$, there are two complex roots

Hint: $\Delta = b^2 - 4ac$

# Letter Grade

. Write a python code that asks the user for a number as a score then convert it to grade as letter and print score and grade.
. 100 - 90 AA
. 89 - 85 BA
. 84 - 80 BB
. 79 - 75 CB
. 74 - 70 CC
. 69 - 65 DC
. 64 - 60 DD
. 59 – 50 FD
. 49 – 0 FF