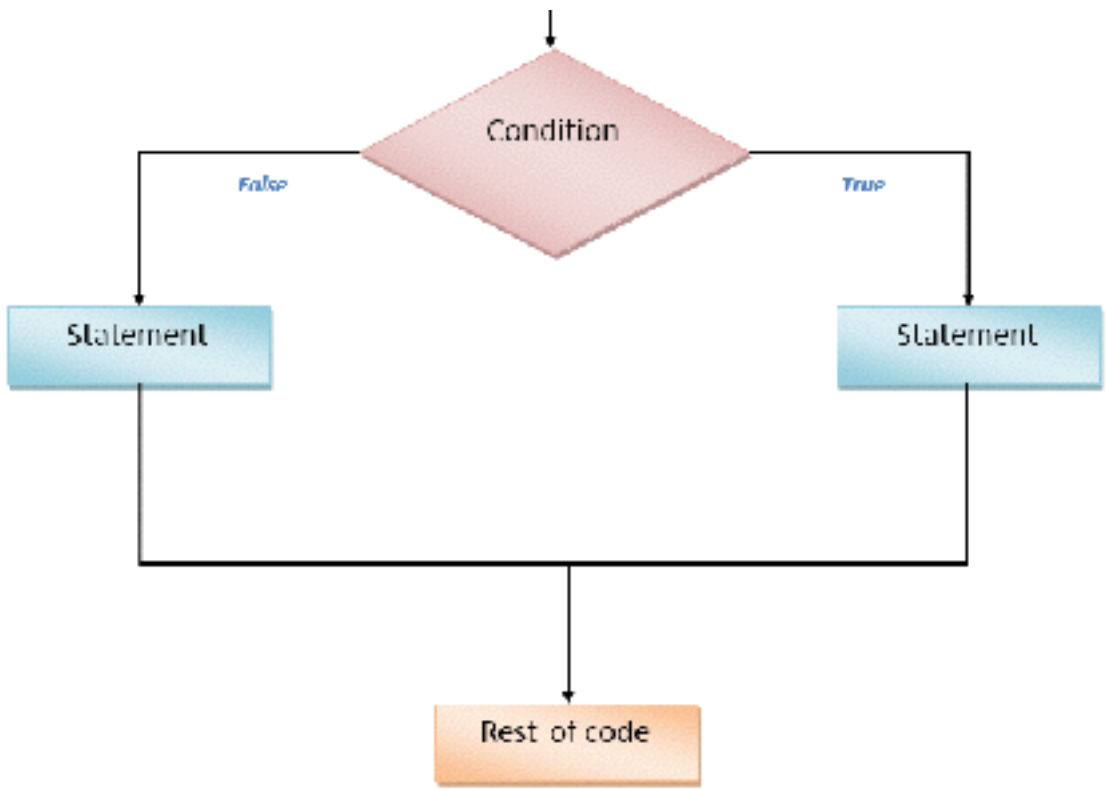
15-112
Fundamentals of Programming

Lecture 2:
Conditional Statements



Conditional Statements

Conditional Statements

3 Types:

if statement

if-else statement

if-elif-...-elif-else statement

if Statement

```
instruction1
instruction2

if (expression):
    instruction3
    instruction4

instruction5
```

Ideally, should evaluate to **True** or **False**.

If the expression evaluates to **True**:

```
instruction1
instruction2
instruction3
instruction4
instruction5
```

if Statement

```
instruction1
instruction2

if (expression):
    instruction3
    instruction4

instruction5
```

Ideally, should evaluate to **True** or **False**.

If the expression evaluates to **False**:

```
instruction1
instruction2
instruction5
```

if Statement

```
1.  def abs(n):
2.      if(n < 0):
3.          n = -n
4.      return n
```

```
1.  def abs(n):
2.      if(n < 0): n = -n
3.      return n
```

```
1.  def abs(n):
2.      if(n < 0):
3.          return -n
4.      return n
```

if Statement

```
instruction1
instruction2

if(expression1):
    instruction3
    instruction4

if(expression2):
    instruction5
    instruction6

instruction7
```

If both expressions evaluate to **true**:

```
instruction1
instruction2
instruction3
instruction4
instruction5
instruction6
instruction7
```

If the first expression is true, we don't skip checking the second one.

if Statement

```
def message(age)
    if (age < 16):
        print("You can't drive.")
    if (age < 18):
        print("You can't vote.")
    if (age < 21):
        print("You can't drink alcohol.")
    if (age >= 21):
        print("You can do anything that's legal.")
    print("Bye!")
```

if - else

```
instruction1
instruction2

if(expression):
    instruction3
    instruction4
else:
    instruction5
    instruction6

instruction7
```

If the expression evaluates to **True**.

```
instruction1
instruction2
instruction3
instruction4
instruction7
```

Exactly one of the two blocks will get executed!

if - else

```
instruction1
instruction2

if(expression):
    instruction3
    instruction4
else:
    instruction5
    instruction6

instruction7
```

If the expression evaluates to **False**.

```
instruction1
instruction2
instruction5
instruction6
instruction7
```

Exactly one of the two blocks will get executed!

if - else

```
def f(x, y, z):
    if((x <= y and y <= z) or (x >= y and y >= z)):
        return True
    else:
        return False
```

if - else

```
def inOrder(x, y, z):
    if((x <= y and y <= z) or (x >= y and y >= z)):
        return True
    else:
        return False
```

if - else

```
def inOrder(x, y, z):
    if((x <= y and y <= z) or (x >= y and y >= z)):
        return True
    return False
```

if - else

What if you want to check 2 or more conditions ?

```
if(expression1):
    instruction1
else:
    if(expression2):
        instruction2
    else:
        instruction3
```

Only one of `instruction1`, `instruction2`, `instruction3` will be executed.

if - elif - else

```
if(expression1):
    instruction1
else:
    if(expression2):
        instruction2
    else:
        instruction3
```

```
if(expression1):
    instruction1
elif(expression2):
    instruction2
else:
    instruction3
```

if - elif - else

```
def numberOfQuadraticRoots(a, b, c):
    # Returns number of roots (zeros) of y = a*x**2 + b*x + c
    d = b**2 - 4*a*c
    if (d > 0):
        return 2
    elif (d == 0):
        return 1
    else:
        return 0
```

if - elif - ... - elif - else

```
def getGrade(score):
    if (score >= 90):
        grade = "A"
    elif (score >= 80):
        grade = "B"
    elif (score >= 70):
        grade = "C"
    elif (score >= 60):
        grade = "D"
    else:
        grade = "R"
    return grade
```

Some guidelines on correct usage of conditional statements

see notes