CEng 240 – Spring 2021 Week 6

Sinan Kalkan

Conditional and Repetitive Execution
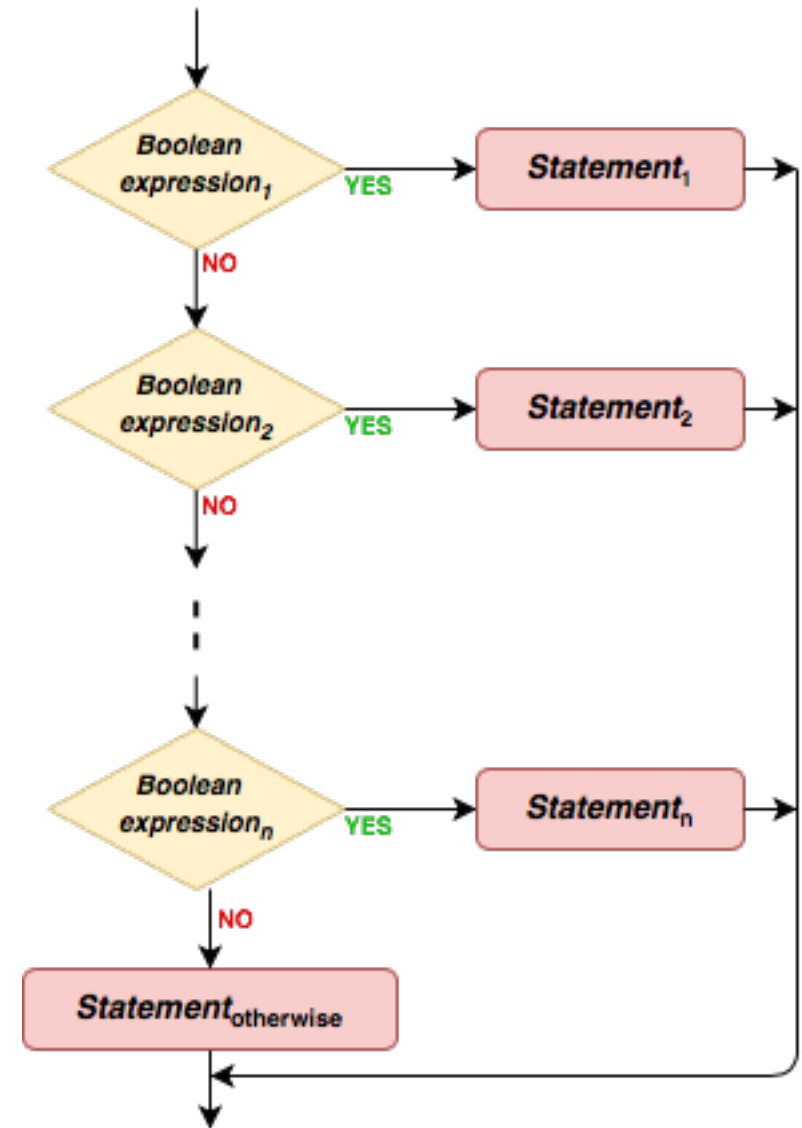
Multiple If Statements in Python

```
if   Boolean expression_1  :  Statement_1

elif  Boolean expression_2  :  Statement_2

 ⋮

elif  Boolean expression_n  :  Statement_n

else :  Statement_otherwise
```

Conditional <u>Expression</u> in Python

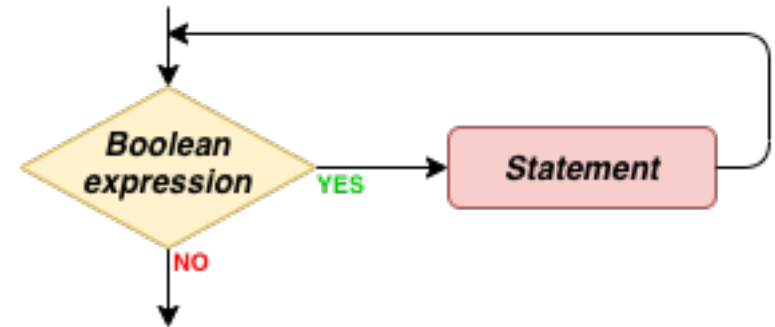<exp-1> if <cond-exp> else <exp-2>

Note that this is an expression not a statement!!

while statement

METU Computer Engineering

while $\boxed{\textit{Boolean expression}}$: $\boxed{\textit{Statement}}$
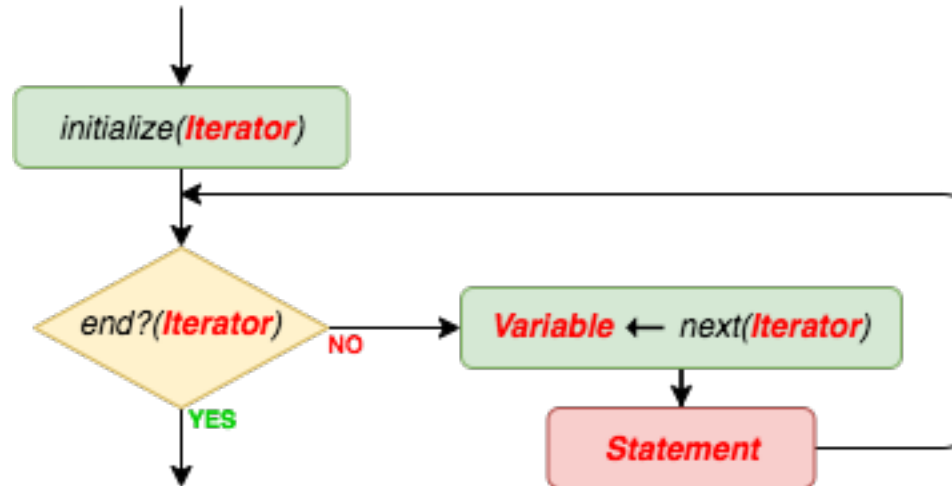


```
while <condition-1>:
    statement-1
    statement-2
    ...
    while <condition-2>:
        statement-inner-1
        statement-inner-2
        ...
        statement-inner-M
    ... # statements after the second while
    statement-N
```

for statement

for $Variable$ in $Iterator$: $Statement$

Break statements

Previously on CENG240!

```
while <cond-1> :
        <statements-before-break>
        if <cond-2> :
Execution ........ break
Jumps
        <statements-after-break>
        <statements-after-while>
```

```
for <var> in <list> :
        <statements-before-break>
        if <cond> :
Execution ........ break
Jumps
        <statements-after-break>
        <statements-after-for>
```

Continue statements

METU Computer Engineering

```
while <cond-1> :
    <statements-before-continue>
    if <cond-2> :
        continue
    <statements-after-continue>

<statements-after-while>
```

Execution Jumps

```
for <var> in <list> :
    <statements-before-continue>
    if <cond> :
        continue
    <statements-after-continue>

<statements-after-for>
```
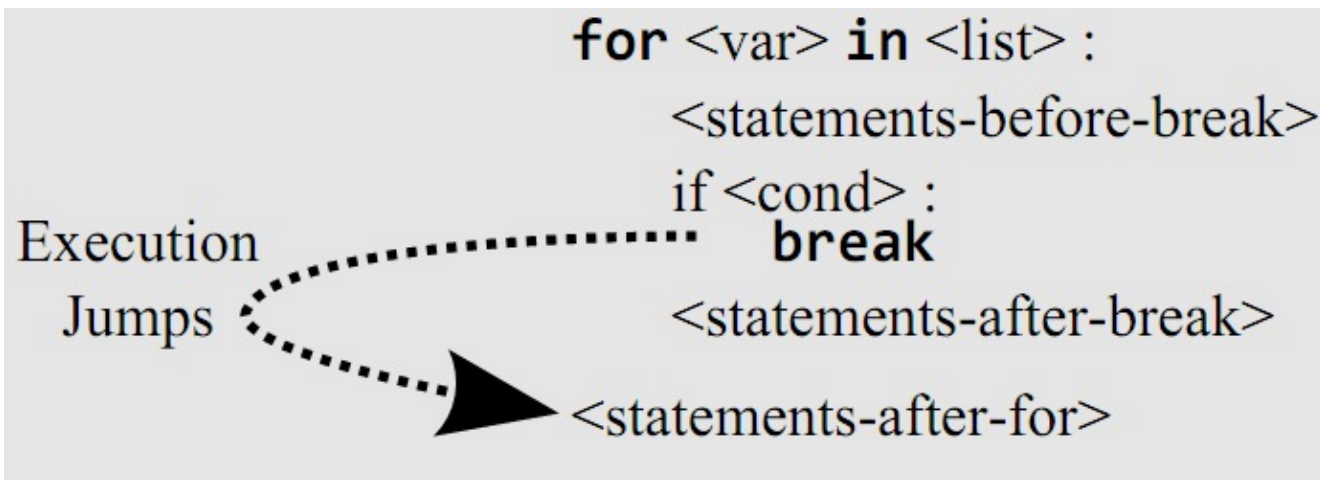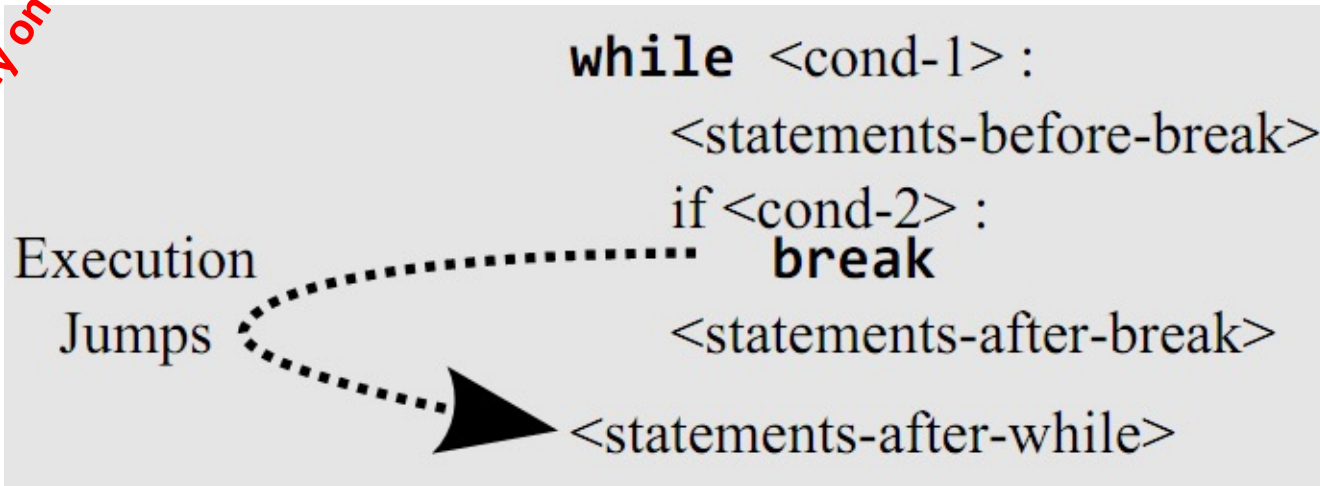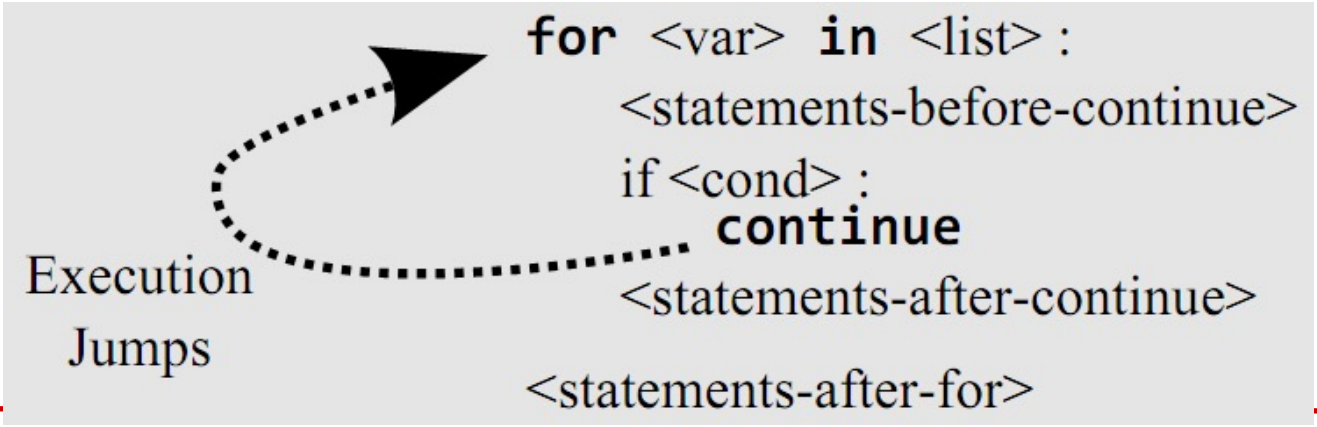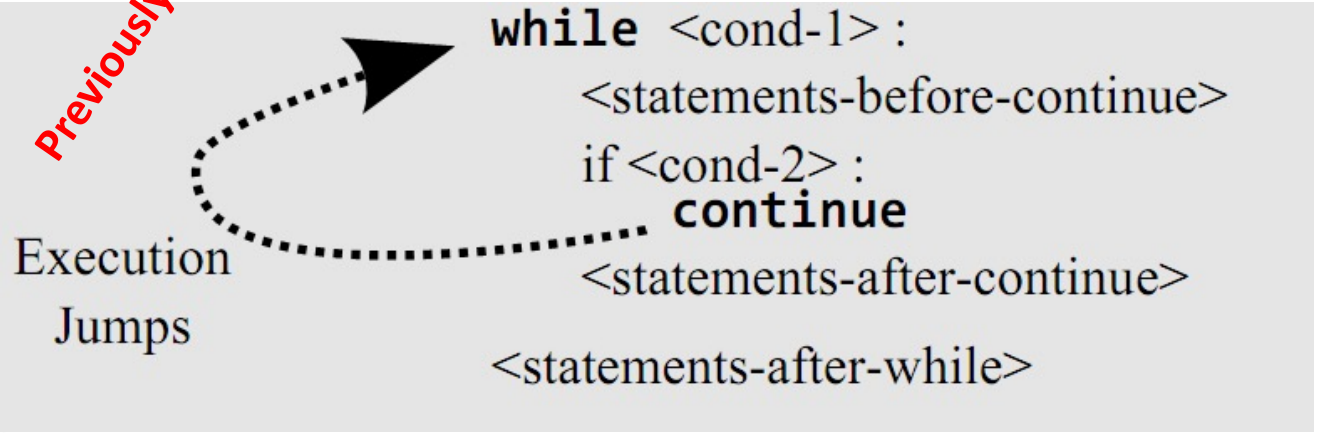
Execution Jumps

■ <var> will point to the next item in the list.

Set and list comprehension

- [x**3 **for** x **in** range(8)]

- {x**3 **for** x **in** range(8)}

S. Kalkan - CEng 240

This Week

■ More examples with conditional and iterative execution

Administrative Notes

■ No quiz this week!

■ Lab 3 and Lab 2 makeup

■ Midterm: 1 June, Tuesday, 17:40

Problems

- Sequential search: Find whether a number is in a list of numbers or not.

- Example input/output:
  - 5 is in [100, 4, 48, 5] => True
  - 5 is in [38, 45, 20, 3] => False

Problems

■ Decimal number to binary conversion

■ Example input/output:
- 5=> "101".
- 9 => "1001"

	Dividend		Divisor		Quotient	Remainder
Step 1	19	÷	2	=	9	1
Step 2	9	÷	2	=	4	1
Step 3	4	÷	2	=	2	0
Step 4	2	÷	2	=	1	0
Step 5	1	÷	2	=	0	1

Continue until quotient is zero

The result:

1	0	0	1	1

Problems

■ Calculate AND operation on two binary strings.

■ Example input/output:

  ■ "1011" AND "1001" => "1001".

  ■ "1010" AND "0101" => "0000".

Problems

- Binary string to decimal conversion
- Example input/output:
  - "101" => 5.
  - "1001" => 9.

Problems

- In a list, if you encounter another list of numbers, replace that nested list of numbers with the average of the numbers.

- Example input/output:
  - [[1, 3], [4, 5, 6], 7, [10, 20]] => [2, 5, 7, 15].
  - [20, 30, [4, 8]] => [20, 30, 6]

Problems

- Bubble sort: Sort numbers in increasing order

- Example input/output:

  - [5, 1, 3, 6] => [1, 3, 5, 6]

  - [10, -4, 8, 20] => [-4, 8, 10, 20]

Final Words:
Important Concepts

■ The same as last week.

METU Computer Engineering

THAT'S ALL FOLKS!
STAY HEALTHY