Conditionals

GIS 5653 – Spatial Programming and GIS

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Boolean Expressions

An expression that is either *true* or *false*.

- `True` and `False` → data type `bool`

```
type(True)
```

- Examples:

```
print(5 == "5")

x = 5
print(x == 5)
```

Comparison Operators

```
x == y        # x is equal to y
x != y        # x is not equal to y
x > y         # x is greater than y
x < y         # x is less than y
x >= y        # x is greater than or equal to y
x <= y        # x is less than or equal to y
x is y        # x is the same as y
x is not y    # x is not the same as y
```

Example:

```
x = 5.0
print(x == 5)
print(x is 5)
```

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Logical Operators

Three logical operators:

1. and

```
x > 0 and x < 10
```

– `True` if x is greater than 0 AND less than 10

2. or

```
x < 0 or x > 100
```

– `True` if either of the conditions is true

3. not

```
not (x > y)
```

– `True` if `x` is less than or equal to `y`

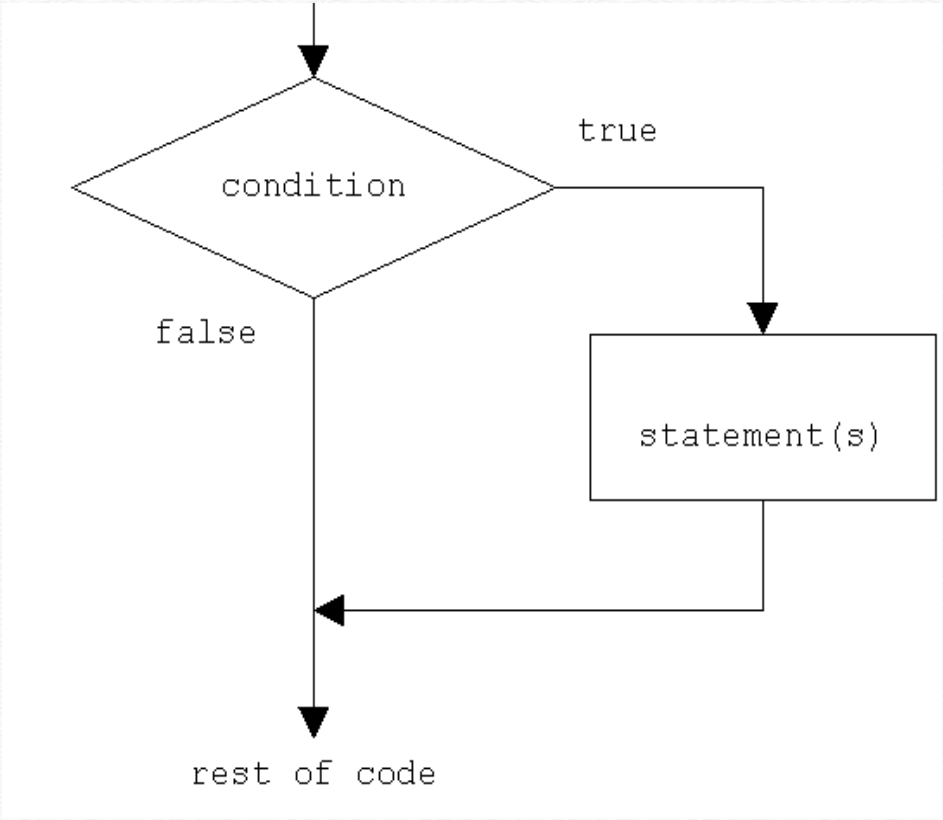
Conditional Execution

Conditional statement:

A statement that controls the flow of execution depending on some condition.

Example:

```
x = 5
if x >= 1:
   print(“positive value”)
print(“rest of code”)
```



Source: https://www.webucator.com

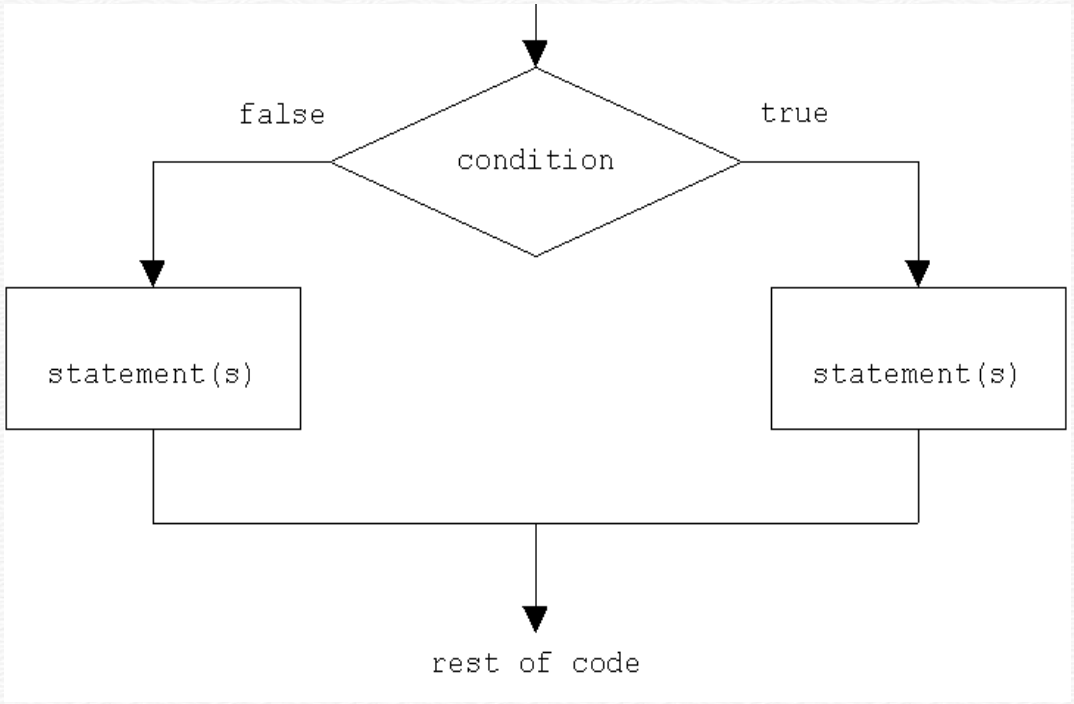
Alternative Execution

Alternative execution:

- Two possibilities
- Condition determines which one gets executed
- Alternatives are called **branches**

Example:

```
x = 5
if x >= 1:
    print("positive value")
else:
    print("negative value")
print("rest of code")
```



Source: https://www.webucator.com

Chained Conditionals

A conditional statement with a series of alternative branches.

Example:

```
if x < y:
   print("x is less than y")
elif x > y:
   print("x is greater than y")
else:
   print("x and y are equal")
```

Nested Conditionals

A conditional statement that appears in one of the branches of another conditional statement.

Example:

```
if x == y:
  print("x and y are equal")
else:
  if x < y:
    print("x is less than y")
  else:
    print("x is greater than y")
```

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