Conditionals/Branching

```python
exam1 = int(input("What is your first exam score? "))
exam2 = int(input("What is your second exam score? "))
exam3 = int(input("What is your third exam score? "))
average = (exam1 + exam2 + exam3) / 3
print("Your exam average is", average)
```

```python
exam1 = int(input("What is your first exam score? "))
exam2 = int(input("What is your second exam score? "))
exam3 = int(input("What is your third exam score? "))
average = (exam1 + exam2 + exam3) / 3

extra_pts = int(input("How many extra credit points
                                    did you earn? "))
average = average + extra_pts

print("Your exam average is", average)
```
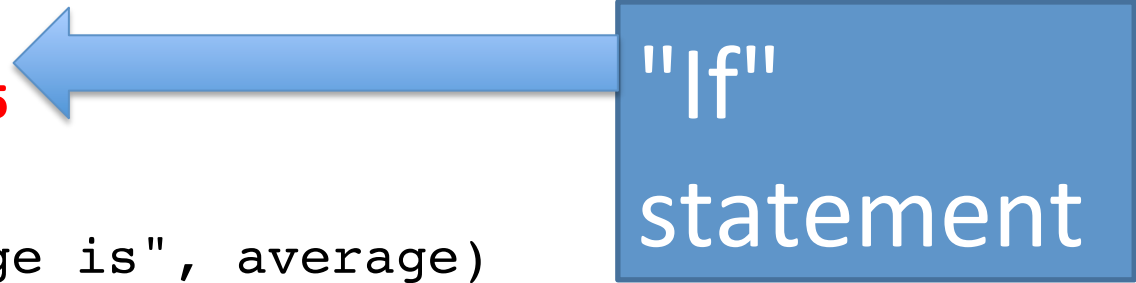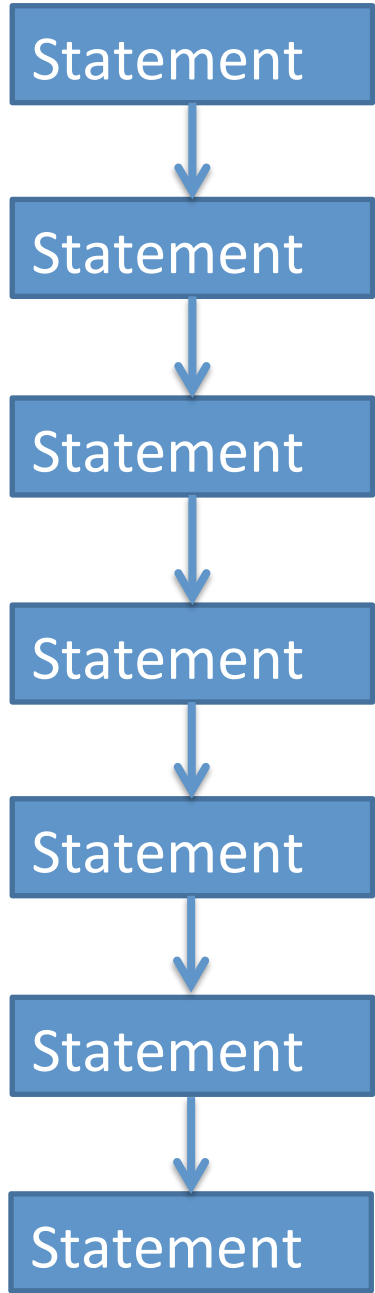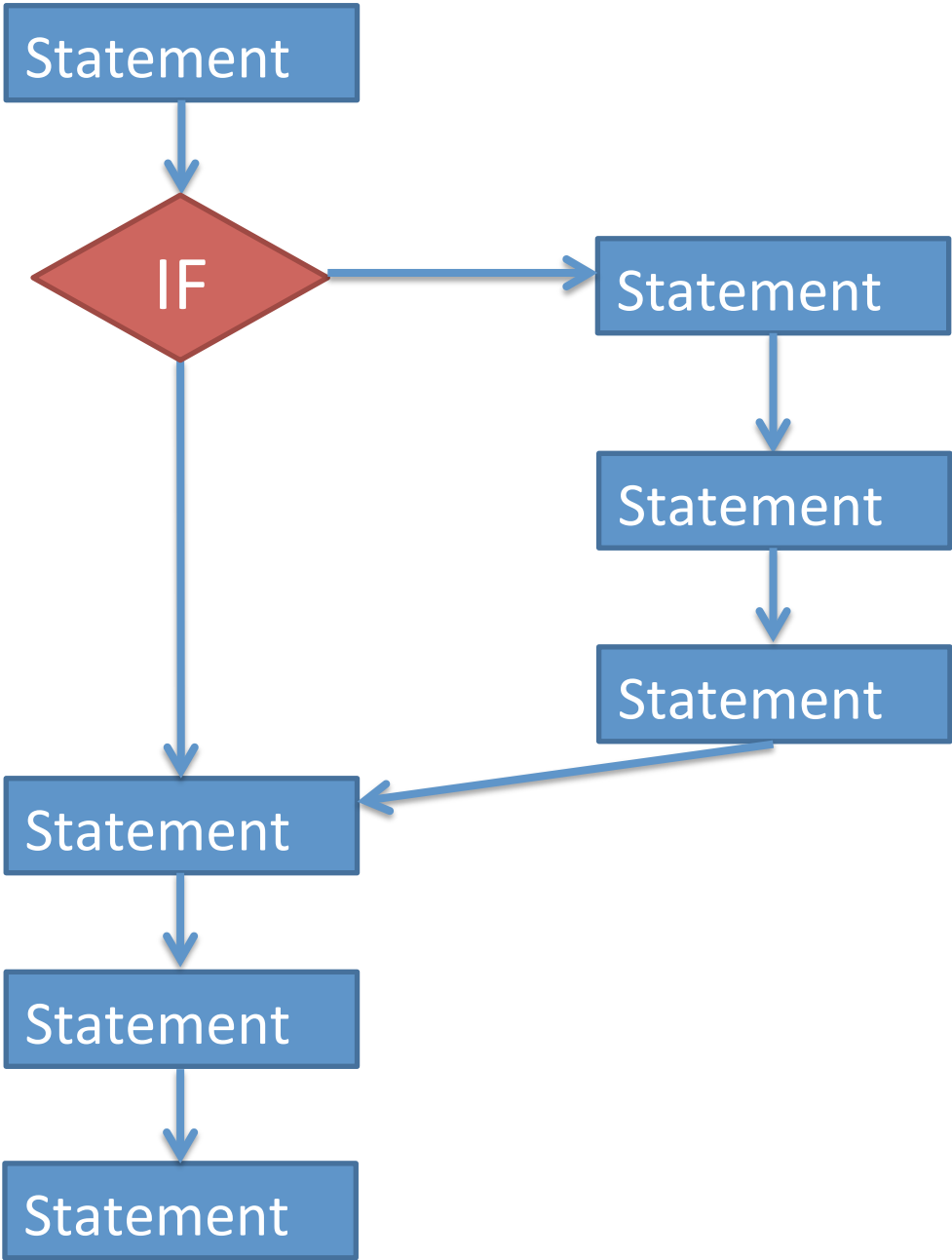
```
exam1 = int(input("What is your first exam score? "))
exam2 = int(input("What is your second exam score? "))
exam3 = int(input("What is your third exam score? "))
average = (exam1 + exam2 + exam3) / 3

choice = input("Did you do the extra assignment? "))
if choice == "yes":
    average = average + 5


print("Your exam average is", average)
```

"If" statement

```
┌─────────────┐
│  Statement  │
└─────────────┘
       │
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│  Statement  │
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┌─────────────┐
│  Statement  │
└─────────────┘
```

```
Statement
   │
   ▼
  IF ──────────────────► Statement
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   │                        ▼
   │                     Statement
   │                        │
   │                        ▼
   │                     Statement
   │                        │
   ▼                        │
Statement ◄─────────────────┘
   │
   ▼
Statement
   │
   ▼
Statement
```

```
if    condition    :
    statement
    statement
    more statements…
statement
statement
more statements…
```
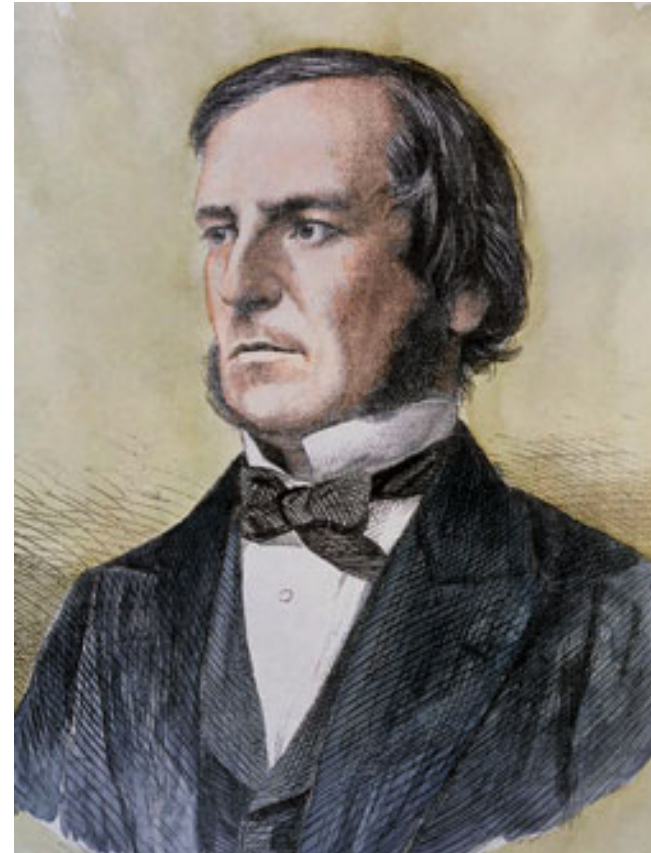
The *condition* must be something that is True or False.

Boolean data type

- What is an example of an integer literal?
- A floating-point literal?
- A string literal?

- New data type: boolean

```
a = 1
b = 2
c = 3

a < b

a + 1 < b

a + 1 <= b

c == 3

a + b != 3
```

```
x = "hello"
y = "computer"
z = 141

x == "hello"

x == "Hello"

x < y

x < "Hello"

x < z
```
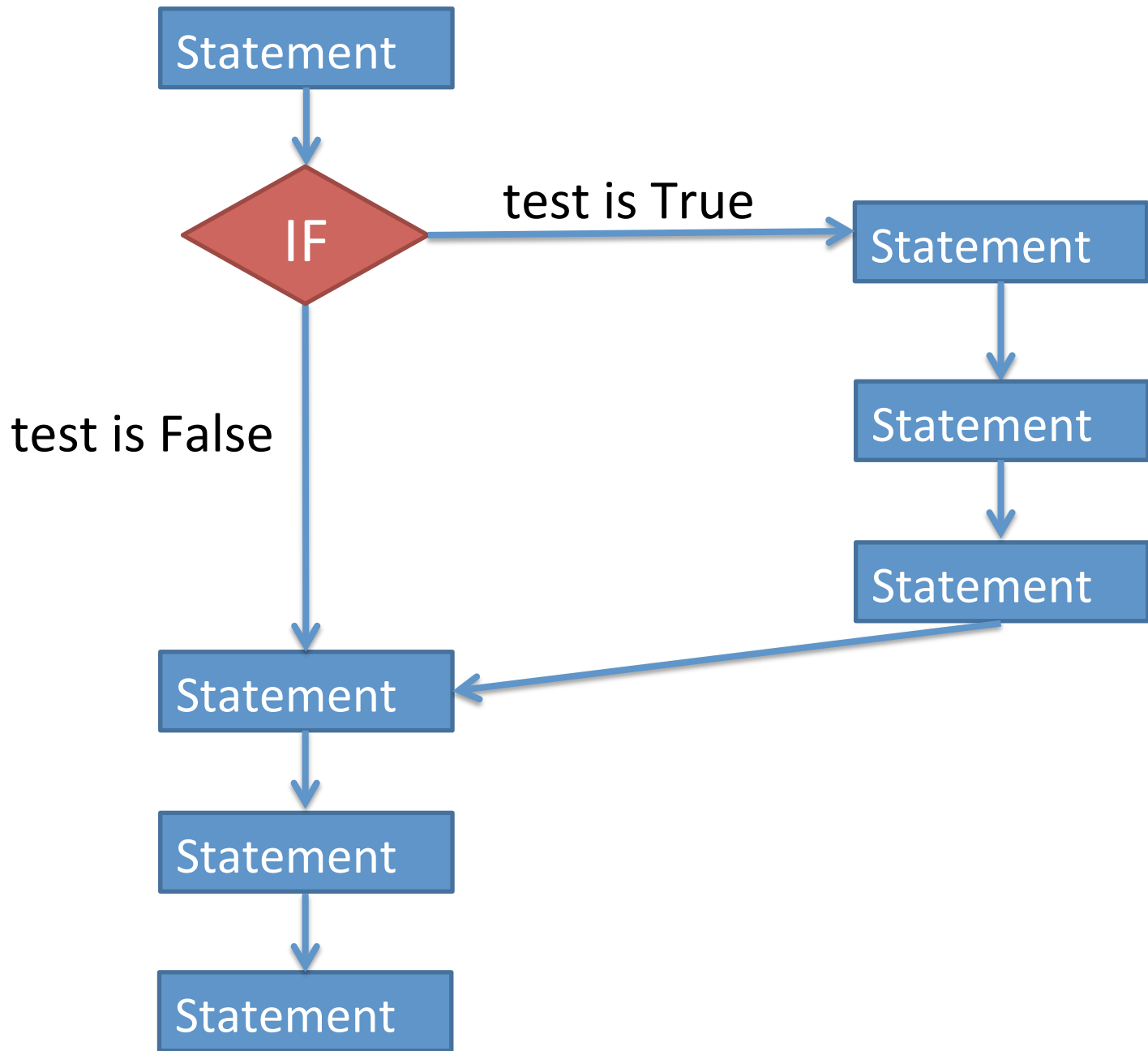
- Relational operators:

  ==   !=   <   <=   >   >=

- These operators compare two values, and give you back a Boolean value.

- Can compare ints, floats, or strings.
  - ints and floats are comparable to each other.
  - strings are only comparable to other strings.

Statement

IF — test is True → Statement → Statement → Statement

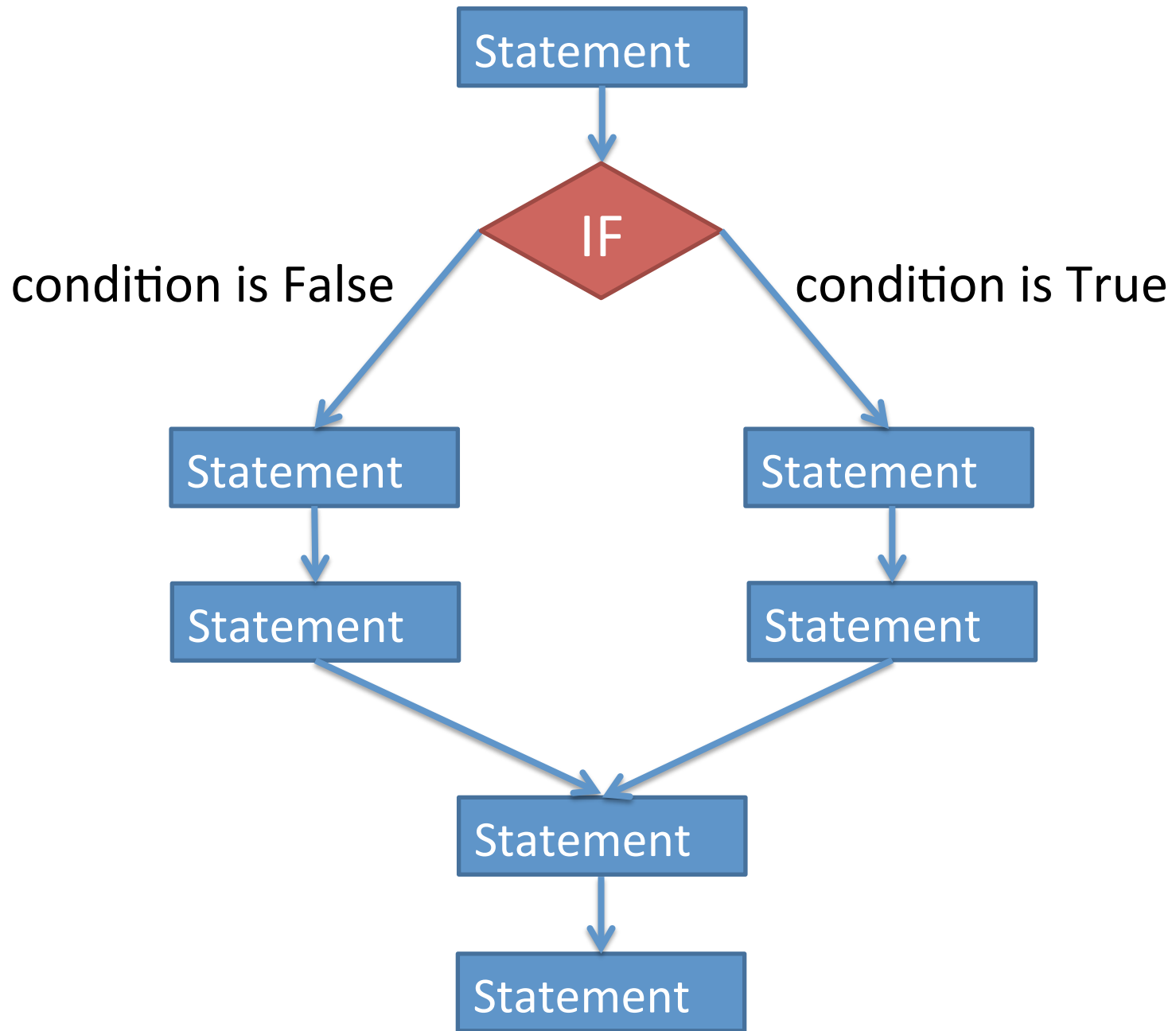test is False → Statement → Statement → Statement

- If statement:
  - Run some extra statements if a condition is true.
- But what if you want run one set of statements if a condition is `True`, and a different set of statements if the condition is `False`?

```python
if        condition     :
    statement
    more statements…
else:
    statement
    more statements…
more statements…
```

Statement

IF

condition is False

condition is True

Statement

Statement

Statement

Statement

Statement

Statement

```python
exam1 = int(input("What is your first exam score? "))
exam2 = int(input("What is your second exam score? "))
exam3 = int(input("What is your third exam score? "))
average = (exam1 + exam2 + exam3) / 3

choice = input("Did you do the extra assignment? ")
if choice == "yes":
  print("Your exam average is", average + 5)
else:
  print("Your exam average is", average)
```

- Write a program that asks the user to type in his or her age, and prints whether or not they are (legally) able to drink. *[use if-else]*
- Write a program that asks the user if they want to calculate the area of a square or a triangle. (The user will type in `square` or `triangle`.)
  - If they enter `square`, then ask the user for the length of a side and print the area.
  - If they enter `triangle`, then ask the user for the base and height and print the area.