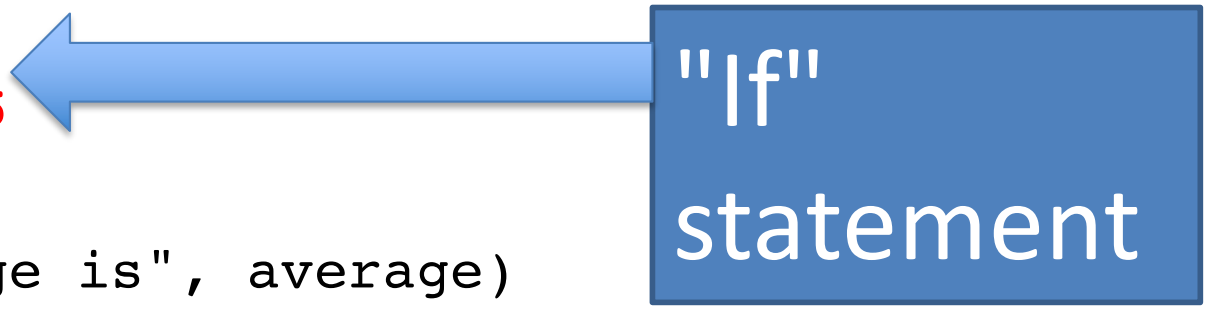
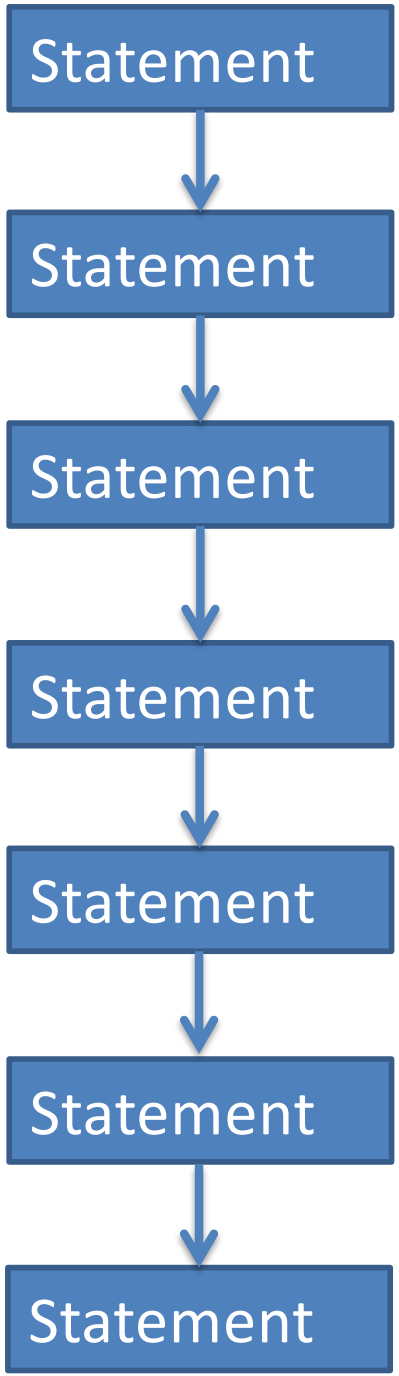
Conditionals/Branching

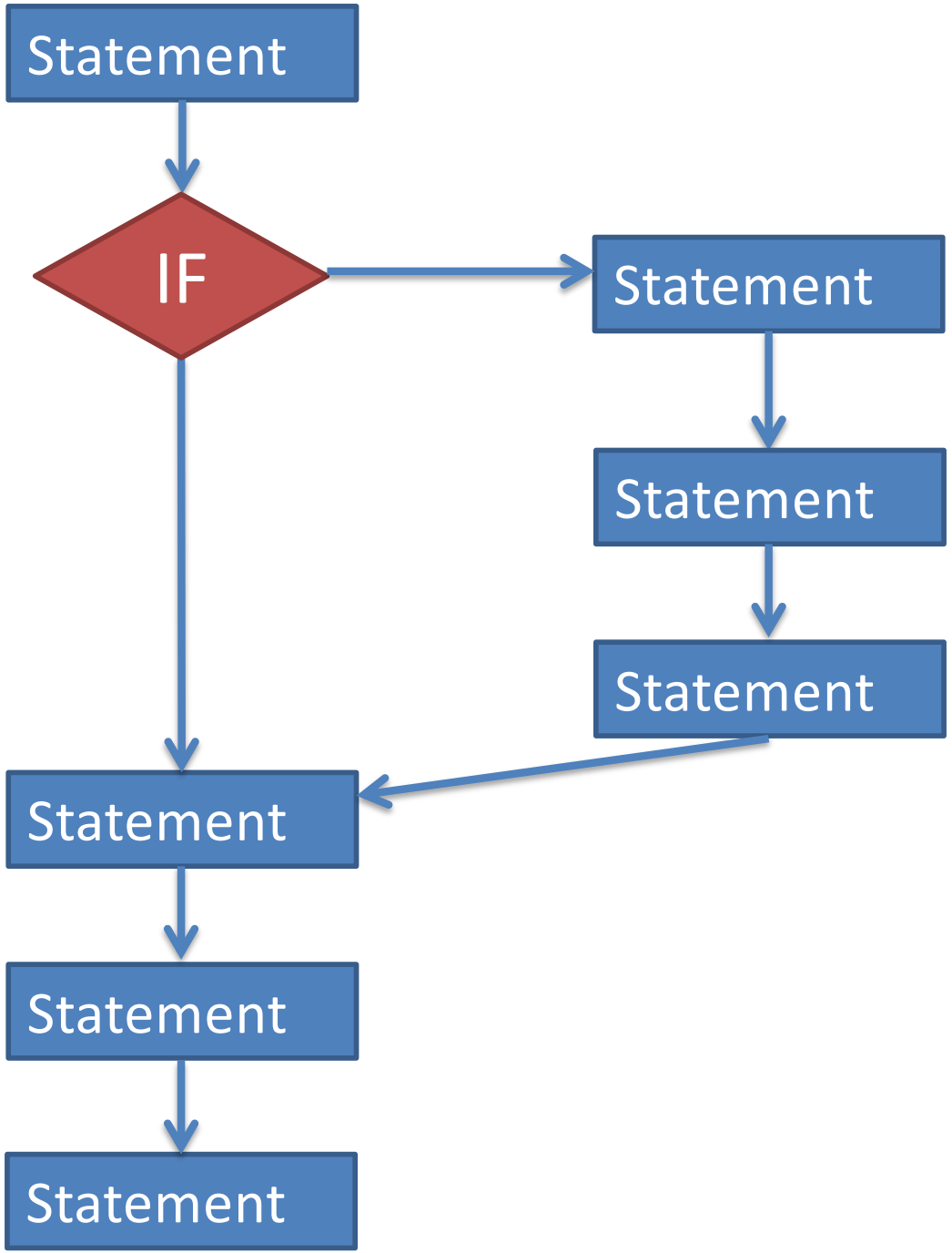
```
exam1 = int(input("What is your first exam score? "))
exam2 = int(input("What is your second exam score? "))
exam3 = int(input("What is your third exam score? "))
average = (exam1 + exam2 + exam3) / 3
print("Your exam average is", average)
```

```
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)
```




Statement
Statement
Statement
Statement
Statement
Statement
Statement


Statement
IF
Statement
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.

- Conditions are often built from the ***relational operators:***

`==` `!=` `<` `<=` `>` `>=`

- These operators compare two values, and give you back a true/false value.
- Can compare ints, floats, or strings.
  - ints and floats are comparable to each other.
  - strings are only comparable to other strings.

```
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
```

Suppose we want to write a program to figure out if someone should be paid overtime (if they work more than 40 hours per week).

```
hours_per_day = float(input("Hours per day? "))
days_per_week = int(input("Days per week? "))

if ___???___:
    print("You should get paid overtime!")
```

```
hours_per_day * days_per_week > 40
40 < hours_per_day * days_per_week
```

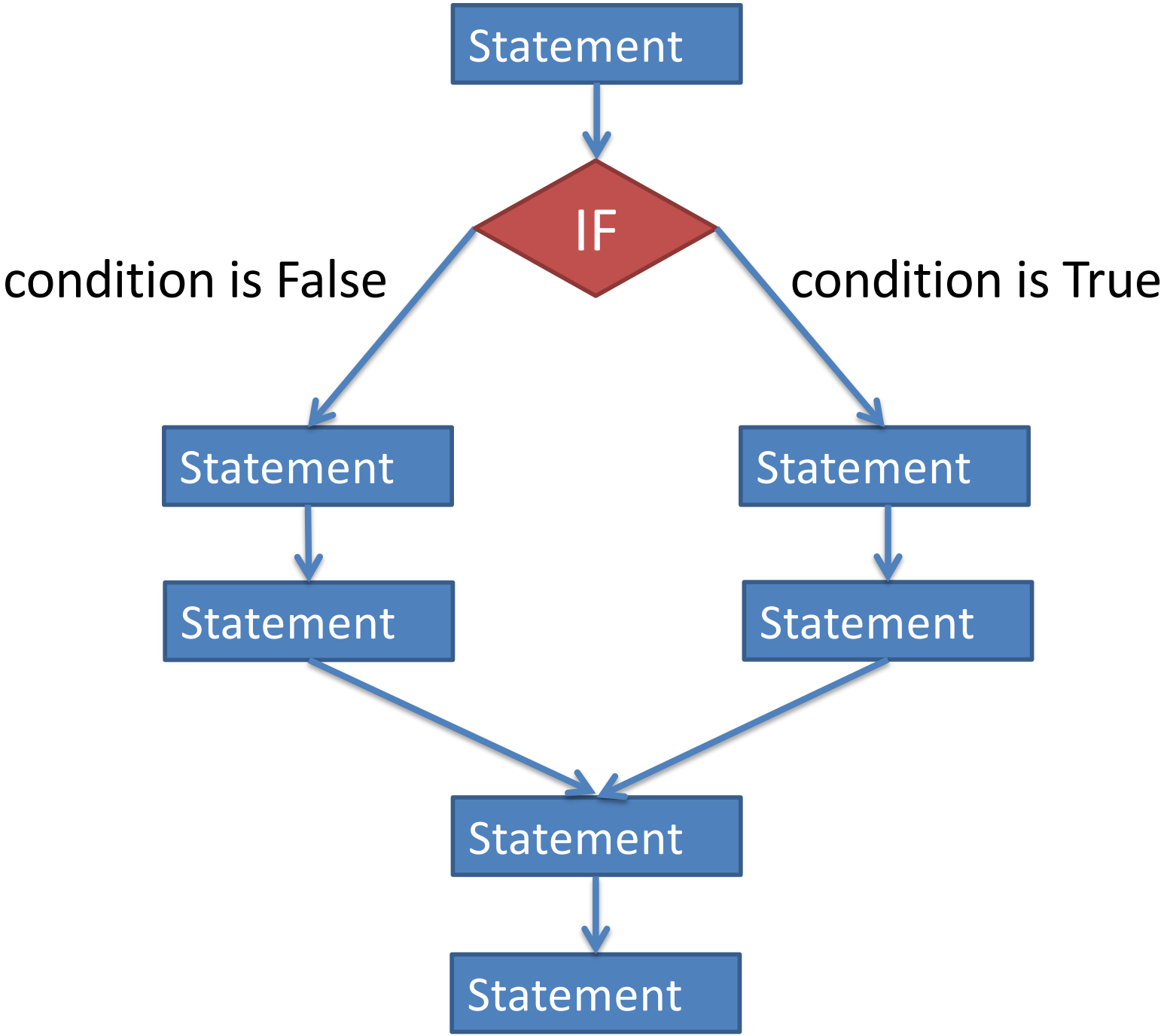
Suppose I'm buying doughnuts for my colleagues. The store has chocolate doughnuts and powdered sugar doughnuts. But my colleagues are only happy if I buy exactly one more chocolate doughnut than the number of powdered sugar doughnuts I buy.

```
num_choc = int(input("How many chocolate? "))
num_sugar = int(input("How many sugar? "))

if ___???___:
    print("Happy colleagues")
```

```
num_choc - 1 == num_sugar
num_choc == num_sugar + 1
num_choc - num_sugar == 1
```

- 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`?

```
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

```
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.

```
x = 1
y = 2
z = 3

if x < y:
  x = x + 1
  z = x - 1

if y < z:
  y = y – 1

if x < y:
  x = x + 1
else:
  z = z + x + 1

print(x, y, z)
```