

# Structuring if Statements

## if-elif vs. if-if

An if statement with an elif clause is a single statement. The expressions are evaluated from top to bottom until one produces True or until there are no expressions left to evaluate. When an expression produces True, the body associated with it is executed and then the if statement exits. Any subsequent expressions are ignored. For example:

```
grade1 = 70
grade2 = 80

if grade1 >= 50:
    print('You passed a course with grade: ', grade1)
elif grade2 >= 50:
    print('You passed a course with grade: ', grade2)
```

The if statement condition (grade1 >= 50) evaluates to True, so the body associated with the if is executed and then the if exits. The elif condition is not even evaluated in this case.

It is possible for if statements to appear one after another in a program. Although they are adjacent to each other, they are completely independent of each other and it is possible for the body of each if to be executed. For example:

```
grade1 = 70
grade2 = 80

if grade1 >= 50:
    print('You passed a course with grade: ', grade1)
if grade2 >= 50:
    print('You passed a course with grade: ', grade2)
```

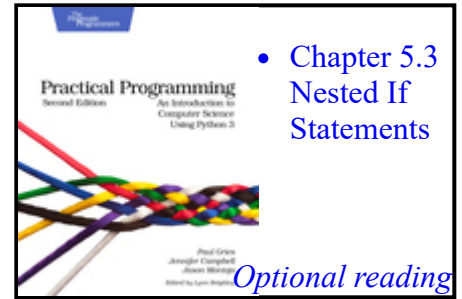
In the program above, the condition associated with the first if statement (grade1 >= 50) produces True, so the body associated with it is executed. The condition associated with the second if statement (grade2 >= 50) also produces True, so the body associated with it is also executed.

## Nested ifs

It is possible to place an if statement within the body of another if statement. For example:

```
if precipitation:
    if temperature > 0:
        print('Bring your umbrella!')
    else:
        print('Wear your snow boots and winter coat!')
```

The statement above can be simplified by removing some of the nesting. The message 'Bring your umbrella!' is printed only when both of the if statement conditions are True. The message 'Wear your snow boots and winter coat!' is printed only when the outer if condition is True, but the inner if condition is False. The following is equivalent to the code above:



```
if precipitation and temperature > 0:  
    print('Bring your umbrella')  
elif precipitation:  
    print('Wear your snow boots and winter coat!')
```

---

Jennifer Campbell • Paul Gries  
University of Toronto

---