

## EXERCISE SOLUTIONS

1. In a program, the number of days in a calendar year is already initialized as 365 in the variable `days_in_year`. Write a simple `if` statement that modifies that number appropriately if the boolean variable `leap_year` is true.

```
if leap_year:
    days_in_year = 366
```

2. Write an `if-else` statement to print out the square root of `a_number`, or print out a message that the square root is imaginary if the value of `a_number` is negative.

```
if a_number >= 0:
    print("Square root of " + a_number + " is " + math.sqrt(a_number))
else:
    print("The square root of a negative number is imaginary.")
```

3. Write an `if-else` statement that takes the variables `a` and `b` and prints out the answer to `a / b`, but only if `b` is not 0. Otherwise, the statement should print an error message.

(Note that the following code is legal and works as it should—this strategy only works for single-line statements, though.)

```
if b != 0: print(a/b)
else: print("Division by 0 is undefined.")
```

4. Write a series of appropriate `if-elif-else` statements (a “switch-style” statement) to **print** an appropriate comment on the weather based on the temperature as given by the variable `degrees_Fahrenheit`. Include at least 4 comments in your solution.

```
if (degrees_Fahrenheit >= 100):
    print("It's a heatwave!")
elif (degrees_Fahrenheit >= 80):
    print("It's a little warm, eh?")
elif (degrees_Fahrenheit >= 60):
    print("Nice day for a picnic!")
elif (degrees_Fahrenheit >= 40):
    print("It's a little chilly, don't you think?")
else:
    print("It's COLD out! Better bundle up!")
```

5. A program stores the lengths of the three sides of a triangle in the variables `a`, `b`, and `c`. Write `if-else` statements to print the type of the triangle: *equilateral*, *isosceles*, or *scalene*.

```
if (a == b and b == c):
    print "equilateral"
elif (a == b or b == c or a == c):
    print "isosceles"
else:
    print "scalene"
```

6. You're trying to decide what to do this weekend. If you're **alone** and you **have\_money** (both boolean variables), you'll go to the movies, but if you're broke, you'll stay home and read. If you're *not* alone though, and you have money, you'll take your friends out to dinner, but if you don't have money, you'll all hang out and play video games. Write a set of **if-else** statements to print out your weekend options based on the boolean variables **alone** and **have\_money**.

```
if alone:
    if (have_money):
        print("Going to movies alone")
    else:
        # ie. we don't have money
        print("Staying home to read")
else: # this is the not alone part...
    if (have_money):
        print("Taking friends out to dinner")
    else:
        print("Playing videogames with friends")
```

Nesting statements as shown above is far preferable to trying to code everything with a series of complex, repetitive, and time-wasting **if-else** statements. *Don't do it like this:*

```
if (alone and have_money):
    print("Going to movies alone")
if (alone and not have_money):
    print("Staying home to read")
if (not alone and have_money):
    print("Taking friends out to dinner")
if (not alone and not have_money):
    print("Playing videogames with friends")
```