

For this project, I decided to use Python 3 (version 3.7.0 was used) as it is quite popular and its code is very easy readable.

Firstly, we have to define a function that will take three arguments:

```
def triangleType(a, b, c):
```

Then, the function should check the input data for correctness (i.e., the values must be numbers) and in case any of them is not a number, the message will be shown and the function will be terminated:

```
    if (not isinstance(a, int)) and (not isinstance(a, float)):

        print('a is NaN!')

        return None

    if (not isinstance(b, int)) and (not isinstance(b, float)):

        print('b is NaN!')

        return None

    if (not isinstance(c, int)) and (not isinstance(c, float)):

        print('c is NaN!')

        return None
```

If all the values are correct, the function should find out the type of the triangle. We'll use `if...then...else` statement for that. In order to show the right type, the order of the conditions are important here. That's why the **equilateral** type check goes first, and **isosceles** goes second:

```
    if a==b==c:

        triangle_type = 'equilateral'

    elif (a==b) or (b==c) or (c==a):

        triangle_type = 'isosceles'

    else:
```

```
triangle_type = 'scalene'
```

If the **isosceles** type check were on the first place, any **equilateral** triangle was showed as a **isosceles** one.

After defining the type, the message is printed and the type is returned:

```
print('The triangle (a = ', a, ', b = ', b, ', c = ', c, ') is ', triangle_type, '!', sep='')

return triangle_type
```

The entire code looks like this:

```
def triangleType(a, b, c):

    if (not isinstance(a, int)) and (not isinstance(a, float)):

        print('a is NaN!')

        return None

    if (not isinstance(b, int)) and (not isinstance(b, float)):

        print('b is NaN!')

        return None

    if (not isinstance(c, int)) and (not isinstance(c, float)):

        print('c is NaN!')

        return None

    if a==b==c:

        triangle_type = 'equilateral'

    elif (a==b) or (b==c) or (c==a):

        triangle_type = 'isosceles'

    else:
```

```
triangle_type = 'scalene'

print('The triangle (a = ', a, ', b = ', b, ', c = ', c, ') is ', triangle_type, '!', sep='')

return triangle_type
```

Now, we can test our code:

```
# test cases

triangleType(1, 2, 3)

triangleType(1, 2, 2)

triangleType(2, 2, 2)

triangleType(1, 2.0, 3)

triangleType(1, 2.0, 2)

triangleType(2, 2.0, 2)

triangleType(None, 2, 2)

triangleType('e', 2, 2)

triangleType(2, None, 2)

triangleType(2, 'e', 2)

triangleType(2, 2, None)

triangleType(2, 2, 'e')
```

The output are:

```
The triangle (a = 1, b = 2, c = 3) is scalene.

The triangle (a = 1, b = 2, c = 2) is isosceles.

The triangle (a = 2, b = 2, c = 2) is equilateral.
```

The triangle ( $a = 1$ ,  $b = 2.0$ ,  $c = 3$ ) is scalene.

The triangle ( $a = 1$ ,  $b = 2.0$ ,  $c = 2$ ) is isosceles.

The triangle ( $a = 2$ ,  $b = 2.0$ ,  $c = 2$ ) is equilateral.

$a$  is NaN!

$a$  is NaN!

$b$  is NaN!

$b$  is NaN!

$c$  is NaN!

$c$  is NaN!