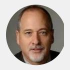
3.7: CATCHING EXCEPTIONS USING TRY AND EXCEPT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Earlier we saw a code segment where we used the `input` and `int` functions to read and parse an integer number entered by the user. We also saw how treacherous doing this could be:

```
>>> prompt = "What...is the airspeed velocity of an unladen swallow?\n"
>>> speed = input(prompt)
What...is the airspeed velocity of an unladen swallow?
What do you mean, an African or a European swallow?
>>> int(speed)
ValueError: invalid literal for int() with base 10:
>>>
```

When we are executing these statements in the Python interpreter, we get a new prompt from the interpreter, think "oops", and move on to our next statement.

However if you place this code in a Python script and this error occurs, your script immediately stops in its tracks with a traceback. It does not execute the following statement.

Here is a sample program to convert a Fahrenheit temperature to a Celsius temperature:

CODE 3.7.1 (PYTHON):

```
inp = input('Enter Fahrenheit Temperature: ')
fahr = float(inp)
cel = (fahr - 32.0) * 5.0 / 9.0
print(cel)

# Code: http://www.py4e.com/code3/fahren.py
```

run restart

If we execute this code and give it invalid input, it simply fails with an unfriendly error message:

```
python fahren.py
Enter Fahrenheit Temperature:72
22.22222222222222
```

```
python fahren.py
Enter Fahrenheit Temperature:fred
Traceback (most recent call last):
  File "fahren.py", line 2, in <module>
    fahr = float(inp)
ValueError: could not convert string to float: 'fred'
```

There is a conditional execution structure built into Python to handle these types of expected and unexpected errors called "try / except". The idea of `try` and `except` is that you know that some sequence of instruction(s) may have a problem and you want to add some statements to be executed if an error occurs. These extra statements (the except block) are ignored if there is no error.

You can think of the `try` and `except` feature in Python as an "insurance policy" on a sequence of statements.

We can rewrite our temperature converter as follows:

CODE 3.7.2 (PYTHON):

```python
inp = input('Enter Fahrenheit Temperature:')
try:
    fahr = float(inp)
    cel = (fahr - 32.0) * 5.0 / 9.0
    print(cel)
except:
    print('Please enter a number')

# Code: http://www.py4e.com/code3/fahren2.py
```

run restart

Python starts by executing the sequence of statements in the `try` block. If all goes well, it skips the `except` block and proceeds. If an exception occurs in the `try` block, Python jumps out of the `try` block and executes the sequence of statements in the `except` block.

```
python fahren2.py
Enter Fahrenheit Temperature:72
22.22222222222222
```

```
python fahren2.py
Enter Fahrenheit Temperature:fred
Please enter a number
```

Handling an exception with a `try` statement is called *catching* an exception. In this example, the `except` clause prints an error message. In general, catching an exception gives you a chance to fix the problem, or try again, or at least end the program gracefully.