

Python Exception Handling

An exception occurs when an event during execution interrupts the flow of a program.

For example, we are not able to divide by zero in a program. The following code will work fine unless the user enters a zero (0), which will cause an exception:

```
numerator = int(input("Enter a number to divide: "))
denominator = int(input("Enter a number to divide by: "))
result = numerator / denominator
print(result)
```

This code works fine, until a zero appears on the denominator:

```
Enter a number to divide: 10
Enter a number to divide by: 0
Traceback (most recent call last):
  File "C:\Users\Shane.DWNS.000\PycharmProjects\helloWorld\main.py",
line 3, in <module>
    result = numerator / denominator
            ~~~~~^~~~~~
ZeroDivisionError: division by zero

Process finished with exit code 1
```

To handle these exceptions so they don't interrupt the flow of a program. The above code is considered dangerous because we don't know what the user is going to enter.

A simple method to catch the exception (**exception handling**) is to surround any dangerous code (that has the possibility of causing an exception) within a **try** block. This will **catch** the exception and do something else (other than break the flow of the code).

```
try:
    numerator = int(input("Enter a number to divide: "))
    denominator = int(input("Enter a number to divide by: "))
    result = numerator / denominator
    print(result)
except Exception:
    print("something went wrong")
```

If we know the specific exception that is most likely to occur, it is better practise to **handle** these before using the block that captures ALL exceptions.

```
try:
    numerator = int(input("Enter a number to divide: "))
    denominator = int(input("Enter a number to divide by: "))
    result = numerator / denominator
    print(result)
except ZeroDivisionError:
    print("You can't divide by ZERO")
#except Exception:
#    print("something went wrong")
```

If the user types in a word instead of a number, the code will also throw an exception.

```
try:
    numerator = int(input("Enter a number to divide: "))
    denominator = int(input("Enter a number to divide by: "))
    result = numerator / denominator

except ZeroDivisionError as e: # <-- defines the exception
    print(e)
    print("You can't divide by zero!")
except ValueError as e:
    print(e)
    print("Enter only numbers please")
except Exception as e:
    print(e)
    print("something went wrong :(")
else:
    print(result)
finally:
    print("This will always execute")
```