Parul® University

Python Programming (203105467)

Computer Science and Engineering, PIET

Parul®
University

DIGITAL LEARNING CONTENT

CHAPTER-6

Errors and Exception Handling

Errors

- Error are the problems in a program due to which the program will stop the execution.
- Two types of Error occurs in python
  - Syntax errors
  - Logical errors (Exceptions)

Syntax Errors

- **When the proper syntax of the language is not followed then syntax error happens**

Example:

```
rupees=1000
if(rupees>3000)
        print("You have more money")
```

Output: File "/home/hitakshi/test.py" , line 2

```
  if(rupees>3000)
                  ^
SyntaxError: invalid syntax
```

It returns a syntax error because after the if statement a colon : is missing.

Exception

- Error happens during the execution of a program
- Exception handling avoids program to crash

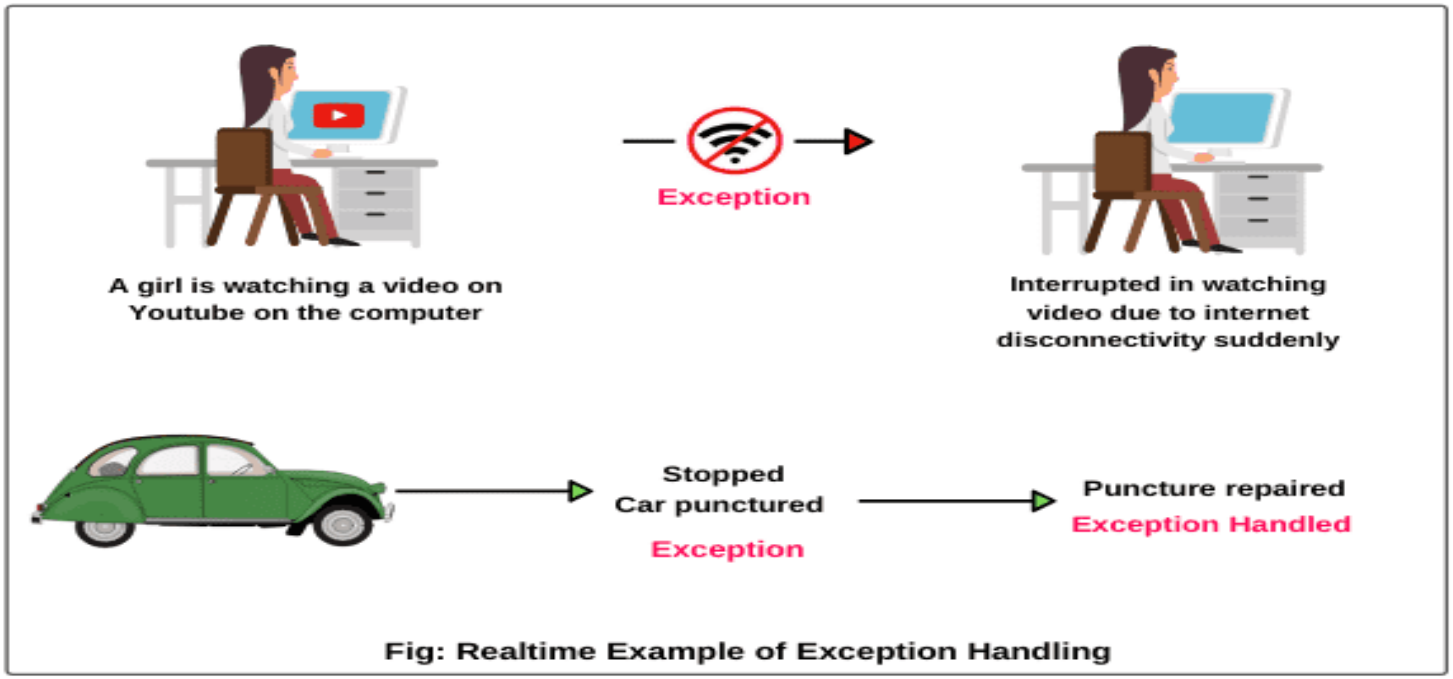
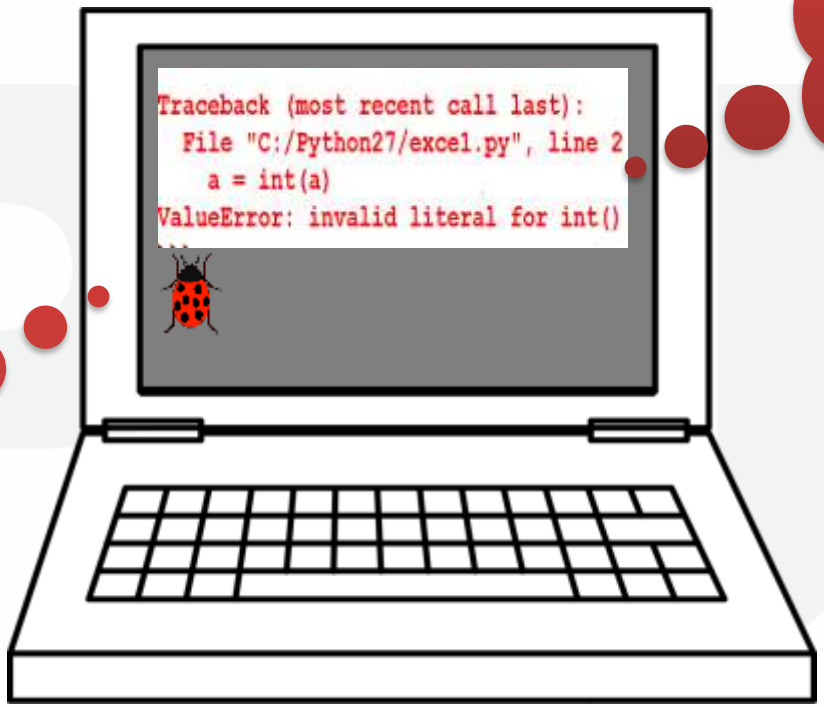


Fig: Realtime Example of Exception Handling



I don't know what to do with this error, so I am gonna raise an exception

Ohh Yuck! It looks like there is a bug!!

Image source : Google

Handling Exception

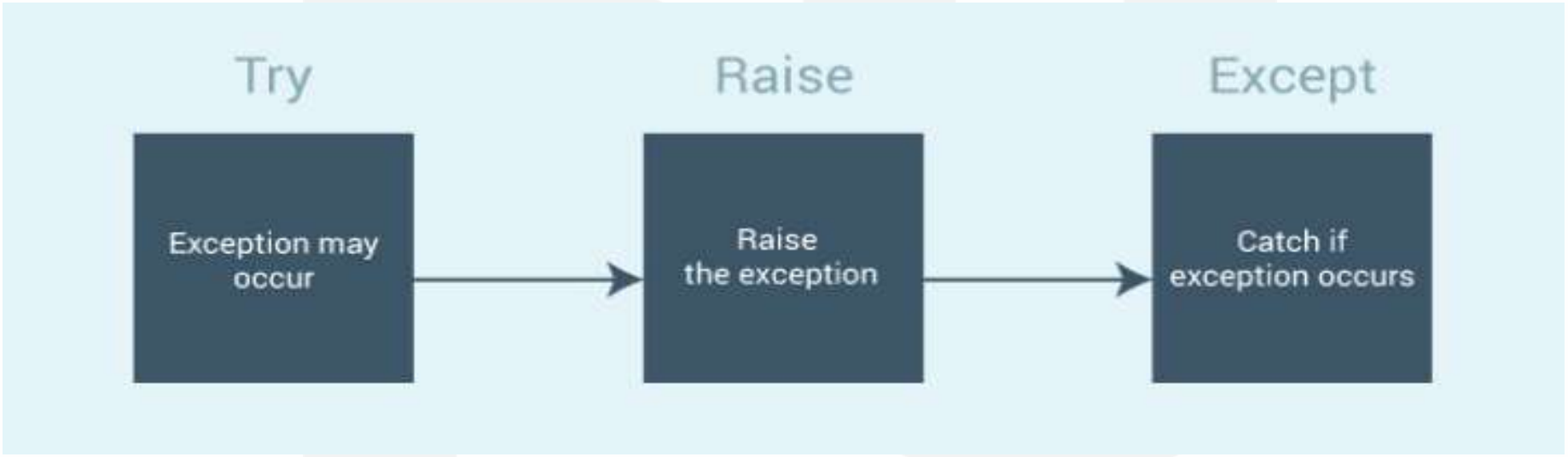


Image source : Google

What is happening

```
value = input('Enter Data')
num = int(value)
print(num)
```

No Error

```
Enter Data123
123
```

Runtime Error

```
  File "D:/PARUL_UNI/Even-sem/8th-sem/python-progs/ppt1.py", line 9, in <module>
    num = int(value)

ValueError: invalid literal for int() with base 10: 'hello'
```

Handle like a pro

```
value = input('Enter Data')

try:
    num = int(value)
except:
    print('Wrong Data!!Enter Valid Data')
    num = -1

print(num)
```

No Exception

```
Enter Data123
123
```

Exception handled

```
Enter Datahello
Wrong Data!!Enter Valid Data
-1
```

Built in Exceptions

- **Common Exception types are already defined in python**

EXCEPTION NAME	**DESCRIPTION**
Exception	Base class for all exceptions
ArithmeticError	Base class for all errors that occur for numeric calculation.
ZeroDivisionError	When division or modulo by zero operation is performed
NameError	When an identifier name is not defined in local or global namespace
IOError	When an input/ output operations are not successful
ValueError	When parameters of function have valid data type and invalid value is given as arguments.

Example- Simple Exception Handling

```
# The try block will generate an exception, because variable g is not defined
try:
  print(g)
except:
  print("An exception occurred")
```

Multiple Exceptions

One can define as many exception blocks as per requirement.
e.g. if you want to execute a special block of code for a special kind of error

```
#Print a message if the try block raises a NameError and another exception messages for other errors:
try:
  print(g)
except NameError:
  print("Variable g is not defined")
except:
  print("Something other exception")
```

Catching Specific Exception

```
try:
    fhand = open('my_file.txt','r')
    data = fhand.read()
    num = int(data)

except IOError:
    print('No such file or directory')
except ValueError:
    print('Not a valid number')
except:
    print('Error is unexpected!!')
```

Finally

The finally block, if specified, will be executed regardless if the try block raises an error or not.

```
try:
  print(x)
except:
  print("Something went wrong")
finally:
  print("The 'try except' is finished")
```

With else clause

```
try:
      fhand = open('my_file.txt','r')
      data = fhand.read()
      num = int(data)

except IOError:
      print('No such file or directory')
except ValueError:
      print('Not a valid number')
except:
      print('Error is unexpected!!')

else:
      print(num)
```

If try block does not raise an exception, then else block is executed

No Exception

```
123
```

Exception handled

```
Not a valid number
```

Raising Exception : Without Arguments

```
z = 0
def div(x,y):
    try:
        if y == 0:
            raise ZeroDivisionError
        z = x/y
        print('value of z', z)

    except ZeroDivisionError:
        print('zero')

x = int(input('enter the value of x:'))
y = int(input('enter the value of y:'))
div(x,y)
```

If condition is true, then exception will occur

```
enter the value of x:10
enter the value of y:5
value of z 2.0
```

```
enter the value of x:3
enter the value of y:0
zero
```

Raising Exception : With Arguments

```
z = 0
def div(x,y):
    try:
        if y == 0:
            raise ZeroDivisionError('Divisor should not be zero')
        z = x/y
        print('value of z', z)

    except ZeroDivisionError as Z:
        print('error',Z)

x = int(input('enter the value of x:'))
y = int(input('enter the value of y:'))
div(x,y)
```

Argument for exception

Use another name for exception

```
enter the value of x:3
enter the value of y:0
error Divisor should not be zero
```

Python Debugging Module

- Debugging is the process of finding and resolving of defects that prevent correct operation of computer software or a system
- Python debugger is available as '**pdb**' module

Trace your Program

```
import pdb

a = 12
pdb.set_trace()#calling the python debugger
b = 13
c = 14
add = a+b+c
print(add)
```

Parul®
University

DIGITAL LEARNING CONTENT

Python Debugging Module

```
In [1]: runfile('D:/PARUL_UNI/Even-sem/8th-sem/python-progs/ppt1.py', wdir='D:/PARUL_UNI/
Even-sem/8th-sem/python-progs')
> d:\parul_uni\even-sem\8th-sem\python-progs\ppt1.py(11)<module>()
      9 a=12
     10 pdb.set_trace()
---> 11 b=13
     12 c=14
     13 add = a+b+c


ipdb>
ipdb> n
> d:\parul_uni\even-sem\8th-sem\python-progs\ppt1.py(12)<module>()
     10 pdb.set_trace()
     11 b=13
---> 12 c=14
     13 add = a+b+c
     14 print(add)


ipdb> n
> d:\parul_uni\even-sem\8th-sem\python-progs\ppt1.py(13)<module>()
     10 pdb.set_trace()
     11 b=13
     12 c=14
---> 13 add = a+b+c
     14 print(add)


ipdb> n
> d:\parul_uni\even-sem\8th-sem\python-progs\ppt1.py(14)<module>()
     10 pdb.set_trace()
     11 b=13
     12 c=14
     13 add = a+b+c
---> 14 print(add)


ipdb> n
39
--Return--
```

Permissions: RW | End-of-lines: CRLF | Encoding: UTF-8 | Line: 14 | Column: 1 | Memory: 86 %

DIGITAL LEARNING CONTENT

Parul® University

www.paruluniversity.ac.in