**Experiment 8**

**Aim:** To implement exception handling in python.

**Theory** :

What is Exception?

An exception is an event, which occurs during the execution of a program that disrupts the normal flow of the program's instructions. In general, when a Python script encounters a situation that it cannot cope with, it raises an exception. An exception is a Python object that represents an error. When a Python script raises an exception, it must either handle the exception immediately otherwise it terminates and quits.

Handling an exception

If you have some suspicious code that may raise an exception, you can defend your program by placing the suspicious code in a try: block. After the try: block, include an except: statement, followed by a block of code which handles the problem as elegantly as possible.

Syntax :

Syntax of try....except...else blocks –

**try:**

**You do your operations here;**

**......................**

**except ExceptionI:**

**If there is ExceptionI, then execute this block.**

**except ExceptionII:**

**If there is ExceptionII, then execute this block. ......................**

**else:**

**If there is no exception then execute this block.**

Here are few important points about the above-mentioned syntax –

· A single try statement can have multiple except statements. This is useful when the try block contains statements that may throw different types of exceptions.

· You can also provide a generic except clause, which handles any exception.

· After the except clauses, you can include an else-clause. The code in the else-block executes if the code in the try: block does not raise an exception.

· The else-block is a good place for code that does not need the try: block's protection.

Python provides two very important features to handle any unexpected error in your Python programs and to add debugging capabilities in them

· Exception Handling: This would be covered in this tutorial. Here is a list standard Exceptions available in Python: Standard Exceptions.

· Assertions: This would be covered in Assertions in Python tutorial.

List of Standard Exceptions :

|  |  |
| --- | --- |
| **Sr.No.** | **Exception Name & Description** |
| 1 | **Exception**  Base class for all exceptions |
| 2 | **StopIteration**  Raised when the next() method of an iterator does not point to any object. |
| 3 | **SystemExit**  Raised by the sys.exit() function. |
| 4 | **StandardError**  Base class for all built-in exceptions except StopIteration and SystemExit. |
| 5 | **ArithmeticError**  Base class for all errors that occur for numeric calculation. |
| 6 | **OverflowError**  Raised when a calculation exceeds maximum limit for a numeric type. |
| 7 | **FloatingPointError**  Raised when a floating point calculation fails. |
| 8 | **ZeroDivisionError**  Raised when division or modulo by zero takes place for all numeric types. |
| 9 | **AssertionError**  Raised in case of failure of the Assert statement. |
| 10 | **AttributeError**  Raised in case of failure of attribute reference or assignment. |

**Assertions in Python :**

An assertion is a sanity-check that you can turn on or turn off when you are done with your testing of the program.

**Conclusion:** Thus studied how to handle exception in python.

**Question:**

1.What is difference between exception and error?

Ans.

| sERROR | EXCEPTION |
| --- | --- |
| It can be caused due to lack of system resources. | It can be caused due to bad code. |
| It represents an irrecoverable event. | It represents a recoverable event. |
| Errors cannot be handled by program code. | Errors cannot be handled by program code (using try, catch, and throw keywords). |
| In case of error program will terminate abnormally. | In case of exception, we can handle it by using try, catch or throws keyword and hence can control the abnormal termination of program. |
| Errors are of unchecked type. | Exceptions can be of checked or unchecked type. |
| Errors defined in java.lang.Error package. | Exceptions defined in java.lang.Exception. |
| **Examples:**  OutOfMemory, StackOverFlow. | **Examples:**  Checked Exceptions : NoSuchMethod, ClassNotFound. Unchecked Exceptions : NullPointer, IndexOutOfBounds. |