**Dates and Times, Data Compression, Performance Measurement, and Quality Control**

**Datetime Module:**

The datetime module provides classes for manipulating dates and times.

It supports date and time arithmetic, with a focus on efficient member extraction for formatting and manipulation.

The module includes support for timezone-aware objects.

**Data Compression**:

Python supports common data archiving and compression formats through modules like zlib, gzip, bz2, lzma, zipfile, and tarfile.

Example

import zlib

>>> s = b'witch which has which witches wrist watch'

>>> len(s)

41

**Performance Measurement:**

Python provides a measurement tool, timeit, to compare the performance of different approaches to the same problem.

Example compares the performance of traditional argument swapping and tuple packing/unpacking.

**Quality Control:**

The doctest module validates tests embedded in a program's docstrings, improving documentation, and ensuring code accuracy.

Example includes a function and its test embedded in a docstring, validated using doctest.testmod().

The unittest module allows more comprehensive tests to be maintained in a separate file, providing a structured approach to testing.

Example includes a test class with test cases for the average function, including cases for empty input and incorrect types.

Running unittest.main() from the command line invokes all tests.

example

import doctest

doctest.testmod() # automatically validate the embedded tests

The unittest module is not as effortless as the doctest module, but it allows a more comprehensive set of tests to be maintained in a separate file:

import unittest

class TestStatisticalFunctions(unittest.TestCase):

def test\_average(self):

self.assertEqual(average([20, 30, 70]), 40.0)

self.assertEqual(round(average([1, 5, 7]), 1), 4.3)

with self.assertRaises(ZeroDivisionError):

average([])

with self.assertRaises(TypeError):

average(20, 30, 70)

unittest.main() # Calling from the command line invokes all tests.

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