**🧪 Python Testing ZGuide: Manual Test vs Test Case vs Exception Handling**

## **1️⃣ WHY TEST YOUR CODE?**

To avoid:

* Bugs in production
* App crashes
* Wrong output
* Poor user experience

## **2️⃣ ⚔️ Manual Testing vs Automated Test Cases**

| **Feature** | **Manual Testing** | **Test Case (Automated Testing)** |
| --- | --- | --- |
| How it works | Run code manually and check output | Write assert statements to auto-check |
| Fast for small code | ✅ Yes | ⚠️ Overhead at first, but pays off later |
| Repeatable | ❌ You must test again manually | ✅ Run all tests with pytest/unittest |
| Catch regressions | ❌ Hard to track | ✅ Alerts when old bug comes back |
| Example | print(divide(10, 2)) | assert divide(10, 2) == 5 |

## **3️⃣ 🛡 Exception Handling vs Test Case**

| **Feature** | **Exception Handling** | **Test Case (unittest / pytest)** |
| --- | --- | --- |
| Purpose | Avoid crashes | Validate that logic is correct |
| When used | In production app | During development |
| Handles invalid input? | ✅ Yes | ✅ Yes (you can test invalid input too) |
| Detects wrong logic? | ❌ No | ✅ Yes |
| Example | try: a/b except: | assert divide(6, 2) == 3 |

## **4️⃣ ✅ Sample Code + Manual Testing**

def divide(a, b):

return a / b

print(divide(10, 2)) # ✅ OK

print(divide(10, 0)) # ❌ ZeroDivisionError (crash)

## **5️⃣ ✅ Improved Code With Exception Handling**

def divide(a, b):

try:

return a / b

except ZeroDivisionError:

return "Cannot divide by zero ❌"

Manual test:

print(divide(10, 0)) # ✅ "Cannot divide by zero ❌"

## **6️⃣ ✅ Add Test Cases with unittest**

import unittest

def divide(a, b):

try:

return a / b

except ZeroDivisionError:

return "Cannot divide by zero ❌"

class TestDivideFunction(unittest.TestCase):

def test\_divide\_normal(self):

self.assertEqual(divide(10, 2), 5.0)

def test\_divide\_zero(self):

self.assertEqual(divide(10, 0), "Cannot divide by zero ❌")

if \_\_name\_\_ == '\_\_main\_\_':

unittest.main()

Run with:

python test\_divide.py

## **7️⃣ ✅ Same with pytest (Simpler)**

# test\_divide.py

from your\_module import divide

def test\_divide\_normal():

assert divide(10, 2) == 5.0

def test\_divide\_zero():

assert divide(10, 0) == "Cannot divide by zero ❌"

Run with:

pytest test\_divide.py

## **8️⃣ 🔥 What Happens if You Introduce a Bug?**

If you change this:

return a \* b # ❌ by mistake

You will still get:

FAILED test\_divide\_normal - assert 20 == 5.0

🎯 So your test case **instantly catches bugs**.

## **🔚 Final Summary**

| **Concept** | **What It Helps With** |
| --- | --- |
| Manual Testing | Quick checks during development |
| Exception Handling | Graceful crash protection in real time |
| Unit Test / Pytest | Automated correctness check, regression safety |

### **About the Author**

**Gowtham SB** is a **Data Engineering expert, educator,** **and content creator** with a passion for **big data technologies, as well as cloud and Gen AI** . With years of experience in the field, he has worked extensively with **cloud platforms, distributed systems, and data pipelines**, helping professionals and aspiring engineers master the art of data engineering.

Beyond his technical expertise, Gowtham is a **renowned mentor and speaker**, sharing his insights through engaging content on **YouTube and LinkedIn**. He has built one of the **largest Tamil Data Engineering communities**, guiding thousands of learners to excel in their careers.

Through his deep industry knowledge and hands-on approach, Gowtham continues to **bridge the gap between learning and real-world implementation**, empowering individuals to build **scalable, high-performance data solutions**.

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