

## **School of Computer Science and Artificial Intelligence**

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### **Lab Assignment # 8.2**

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**Program : B. Tech (CSE)**  
**Specialization : AIML**  
**Course Title : AI Assisted Coding**  
**Course Code : 23CS002PC304**  
**Semester : VI**  
**Academic Session : 2025-2026**  
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**Enrollment No. : 2303A52207**  
**Batch No. : 33**  
**Date : 10/02/26**

**Task 1 – Even/Odd Number Validator**

## Step 1: Test Cases (written first)

```
Commands + Code + Text ▶ Run all ▼

Task 1 – Even/Odd Number Validator

Step 1: Test Cases (written first)

import unittest

# Define the function directly since 'task1.py' does not exist
def is_even(n):
    if not isinstance(n, int):
        raise TypeError("Input must be an integer")
    return n % 2 == 0

class TestIsEven(unittest.TestCase):

    def test_even_positive(self):
        self.assertTrue(is_even(2))

    def test_odd_number(self):
        self.assertFalse(is_even(7))

    def test_zero(self):
        self.assertTrue(is_even(0))

    def test_negative_even(self):
        self.assertTrue(is_even(-4))

    def test_large_number(self):
        self.assertTrue(is_even(1000000))

    def test_invalid_input(self):
        with self.assertRaises(TypeError):
            is_even("10")

if __name__ == "__main__":
    # Use argv=['first-arg-is-ignored'], exit=False to run in a notebook
    unittest.main(argv=['first-arg-is-ignored'], exit=False)

.....
Ran 6 tests in 0.005s

OK
```

### Step 2: Implementation (task1.py)

```
def is_even(n):
    if not isinstance(n, int):
        raise TypeError("Input must be an integer")
    return n % 2 == 0
```

## Task 2 – String Case Converter

### Step 1: Test Cases

```
Task 2 – String Case Converter

Step 1: Test Cases

import unittest

# Defining the functions directly since 'task2.py' does not exist
def to_uppercase(s):
    if not isinstance(s, str):
        raise TypeError("Input must be a string")
    return s.upper()

def to_lowercase(s):
    if s is None:
        raise ValueError("Input cannot be None")
    if not isinstance(s, str):
        raise TypeError("Input must be a string")
    return s.lower()

class TestStringCase(unittest.TestCase):

    def test_uppercase_normal(self):
        self.assertEqual(to_uppercase("ai coding"), "AI CODING")

    def test_lowercase_normal(self):
        self.assertEqual(to_lowercase("TEST"), "test")

    def test_empty_string(self):
        self.assertEqual(to_uppercase(""), "")

    def test_mixed_case(self):
        self.assertEqual(to_lowercase("PyThOn"), "python")

    def test_none_input(self):
        with self.assertRaises(ValueError):
            to_lowercase(None)

    def test_invalid_type(self):
        with self.assertRaises(TypeError):
            to_uppercase(123)

if __name__ == "__main__":
    # Use argv=['first-arg-is-ignored'], exit=False for notebook compatibility
    unittest.main(argv=['first-arg-is-ignored'], exit=False)

.....
Ran 12 tests in 0.012s
```

## Step 2: Implementation (task2.py)

```
def to_uppercase(text):
    if text is None:
        raise ValueError("Input cannot be None")
    if not isinstance(text, str):
        raise TypeError("Input must be a string")
    return text.upper()

def to_lowercase(text):
    if text is None:
        raise ValueError("Input cannot be None")
    if not isinstance(text, str):
        raise TypeError("Input must be a string")
    return text.lower()
```

## Task 3 – List Sum Calculator

### Step 1: Test Cases

```
Task 3 – List Sum Calculator
Step 1: Test Cases

import unittest

# Defining the function directly since 'task3.py' does not exist
def sum_list(items):
    if not isinstance(items, list):
        raise TypeError("Input must be a list")
    total = 0
    for item in items:
        if isinstance(item, (int, float)):
            total += item
    return total

class TestSumList(unittest.TestCase):

    def test_normal_list(self):
        self.assertEqual(sum_list([1, 2, 3]), 6)

    def test_empty_list(self):
        self.assertEqual(sum_list([]), 0)

    def test_negative_numbers(self):
        self.assertEqual(sum_list([-1, 5, -4]), 0)

    def test_with_non_numeric(self):
        self.assertEqual(sum_list([2, "a", 3]), 5)

    def test_invalid_input(self):
        with self.assertRaises(TypeError):
            sum_list("123")

if __name__ == "__main__":
    # Use argv[1] if first-arg-is-ignored, exit=False for notebook compatibility
    unittest.main(argv=[first-arg-is-ignored], exit=False)

.....
Ran 17 tests in 0.018s
OK
```

## Step 2: Implementation (task3.py)

```
def sum_list(numbers):
    if not isinstance(numbers, list):
        raise TypeError("Input must be a list")

    total = 0
    for num in numbers:
        if isinstance(num, (int, float)):
            total += num
    return total
```

## Task 4 – Student Result Class

## Step 1: Test Cases

```
Task 4 – StudentResult Class

Step 1: Test Cases

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## Step 1: Test Cases

Task 5 – Username Validator

Step 1: Test Cases

```
[14] 0s import unittest

# Defining the function directly since 'task5.py' does not exist
def is_valid_username(username):
    if not isinstance(username, str):
        return False
    if len(username) < 3:
        return False
    if not username.isalnum():
        return False
    return True

class TestUsername(unittest.TestCase):

    def test_valid_username(self):
        self.assertTrue(is_valid_username("user01"))

    def test_short_username(self):
        self.assertFalse(is_valid_username("ai"))

    def test_space_in_username(self):
        self.assertFalse(is_valid_username("user name"))

    def test_special_characters(self):
        self.assertFalse(is_valid_username("user@123"))

    def test_non_string(self):
        self.assertFalse(is_valid_username(12345))

if __name__ == "__main__":
    # Use argv=['first-arg-is-ignored'], exit=False for notebook compatibility
    unittest.main(argv=['first-arg-is-ignored'], exit=False)

***
-----
Ran 26 tests in 0.027s

OK
```

Step 2: Implementation (task5.py)

```
[15] 0s def is_valid_username(username):
    if not isinstance(username, str):
        return False
    if len(username) < 3:
        return False
    if " " in username:
        return False
    if not username.isalnum():
        return False
    return True
```

## Lab Outcomes Covered

- Test cases written first (TDD style)
- Input validation & error handling
- Edge cases: empty, None, negative, large values
- unittest usage
- Clean and reliable implementations

