

## ASSIGNMENT-8

NAME:S.Nagarjuna Reddy

HT.NO: 2403A52064

BATCH: AIB03

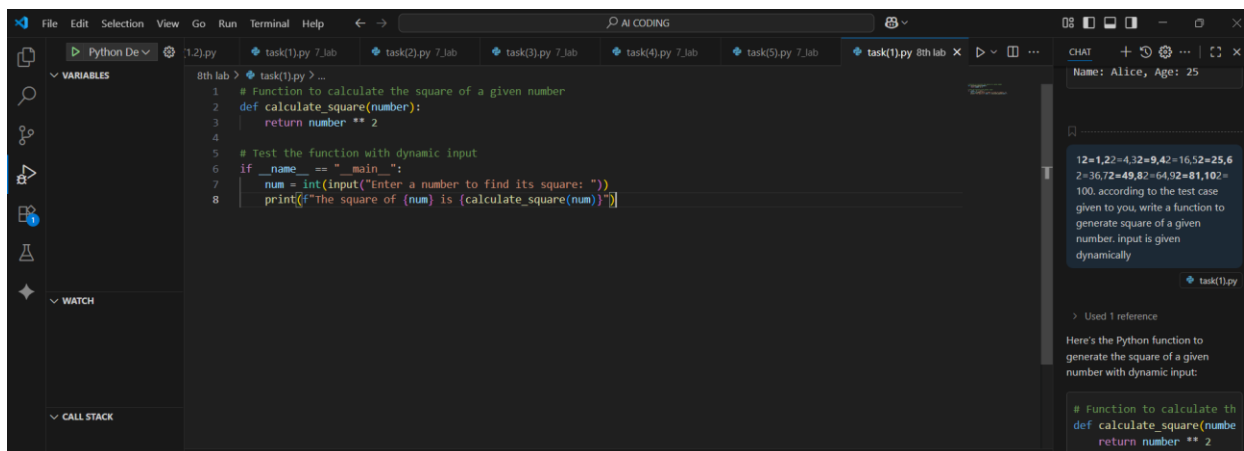
### Task-1

Write a test case to check if a function returns the square of a number. Then write the function with help from GitHub Copilot or Cursor AI.

Prompt:

1\*\*2=1,2\*\*2=4,3\*\*2=9,4\*\*2=16,5\*\*2=25,6\*\*2=36,7\*\*2=49,8\*\*2=64,9\*\*2=81,10\*\*2=100. according to the test case given to you, write a function to generate square of a given number. input is given dynamically

Code:



```
8th lab > task(1).py 7...
1 # Function to calculate the square of a given number
2 def calculate_square(number):
3     return number ** 2
4
5 # Test the function with dynamic input
6 if __name__ == "__main__":
7     num = int(input("Enter a number to find its square: "))
8     print(f"The square of {num} is {calculate_square(num)}")
```

CHAT

Name: Alice, Age: 25

12=1,22=4,32=9,42=16,52=25,62=36,72=49,82=64,92=81,102=100. according to the test case given to you, write a function to generate square of a given number. input is given dynamically

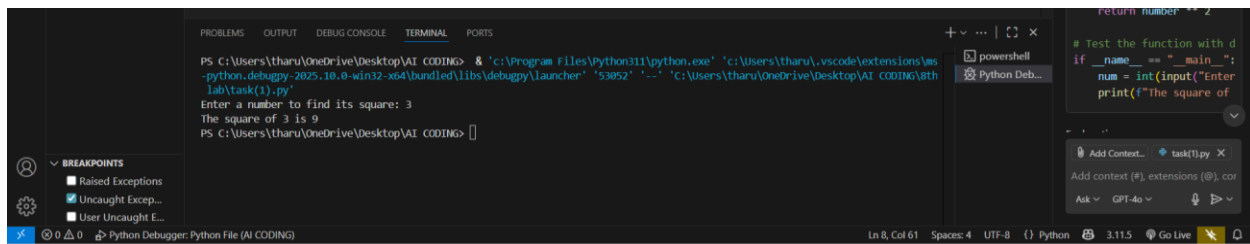
task(1).py

Used 1 reference

Here's the Python function to generate the square of a given number with dynamic input:

```
# Function to calculate the
def calculate_square(numbe
    return number ** 2
```

OP:



## Observation:

The `calculate_square` function takes a number as input and returns its square using the `**` operator. I have prompted to input a number dynamically. The program calculates the square of the input number and prints the result.

## Task-2:

Create test cases to validate an email address (e.g., contains `@` and `.com`). Use AI assistance to implement the `validate_email()` function

## Prompt:

write a function which validates a email id. examples of a mail id is `containt@gmail.com`, `madam@gmail.com`, `anyone@gmail.com`. according to the test case/examples given generate code.

## Code:

```
8th lab > task(2).py > ...
1 import re
2
3 # Function to validate an email ID
4 def validate_email(email):
5     """
6     Validate an email ID using a regular expression.
7
8     Args:
9         email (str): The email ID to validate.
10
11     Returns:
12         bool: True if the email is valid, False otherwise.
13     """
14     # Regular expression for validating an email
15     pattern = r'^[a-zA-Z0-9_%.]+@[a-zA-Z0-9-]+\.[a-zA-Z]{2,}$'
16     return re.match(pattern, email) is not None
17
18 # Test the function with dynamic input
19 if __name__ == "__main__":
20     email = input("Enter an email ID to validate: ")
21     if validate_email(email):
22         print(f'{email} is a valid email ID.')
23     else:
24         print(f'{email} is not a valid email ID.')

PS C:\Users\tharu\OneDrive\Desktop\AI CODING> c:\cd 'c:\Users\tharu\OneDrive\Desktop\AI CODING'; & 'c:\Program Files\Python311\python.exe' 'c:\Users\tharu\.vscode\extensions\ms-python.debugpy-2025.10.0-win32-x64\bundle\libs\debugpy\launcher' '59688'
Enter an email ID to validate: varshigmail.com
'varshigmail.com' is a valid email ID.
PS C:\Users\tharu\OneDrive\Desktop\AI CODING>
```

OP:

```
8th lab > task(2).py > ...
1 import re
2
3 # Function to validate an email ID
4 def validate_email(email):
5     """
6     Validate an email ID using a regular expression.
7
8     Args:
9         email (str): The email ID to validate.
10
11     Returns:
12         bool: True if the email is valid, False otherwise.
13     """
14     # Regular expression for validating an email
15     pattern = r'^[a-zA-Z0-9_%.]+@[a-zA-Z0-9-]+\.[a-zA-Z]{2,}$'
16     return re.match(pattern, email) is not None
17
18 # Test the function with dynamic input
19 if __name__ == "__main__":
20     email = input("Enter an email ID to validate: ")
21     if validate_email(email):
22         print(f'{email} is a valid email ID.')
23     else:
24         print(f'{email} is not a valid email ID.')

PS C:\Users\tharu\OneDrive\Desktop\AI CODING> c:\cd 'c:\Users\tharu\OneDrive\Desktop\AI CODING'; & 'c:\Program Files\Python311\python.exe' 'c:\Users\tharu\.vscode\extensions\ms-python.debugpy-2025.10.0-win32-x64\bundle\libs\debugpy\launcher' '59688'
Enter an email ID to validate: varshigmail.com
'varshigmail.com' is a valid email ID.
PS C:\Users\tharu\OneDrive\Desktop\AI CODING>
```

Observation:

Examples like containt@gmail.com, madam@gmail.com, and anyone@gmail.com are valid because, They contain alphanumeric characters before the @. They have a domain name after the @ (e.g., gmail.com). The domain name ends with a valid top-level domain (e.g., .com). Emails without an @ symbol or domain name are invalid. Emails with special characters in invalid positions (e.g., @example.com or name@.com) are invalid.

Task-3:

Write test cases for a function that returns the maximum of three numbers. Prompt Copilot/Cursor to write the logic based on tests

Prompt:

in 13,54,98 98 is the maximum of three numbers. 1,2,3 3 is the maximum of three numbers. now generate a function that returns the maximum of three numbers, according to the test case given. take input dynamically

Code:

The screenshot shows the VS Code editor with a file named `task(3).py` open. The code defines a function `find_maximum(a, b, c)` that returns the maximum of three numbers. It also includes a `main` function that takes user input for three numbers and prints the result. The terminal shows the execution of the script, where the user enters 87, 90, and 99, and the output is "The maximum of 87, 90, and 99 is 99." The right sidebar shows a chat window with a prompt and a response.

```
1 # Function to find the maximum of three numbers
2 def find_maximum(a, b, c):
3     """
4     Find the maximum of three numbers.
5
6     Args:
7         a (int): The first number.
8         b (int): The second number.
9         c (int): The third number.
10
11     Returns:
12         int: The maximum of the three numbers.
13     """
14     return max(a, b, c)
15
16 # Test the function with dynamic input
17 if __name__ == "__main__":
18     print("Enter three numbers:")
19     num1 = int(input("Enter the first number: "))
20     num2 = int(input("Enter the second number: "))
21     num3 = int(input("Enter the third number: "))
22
23     maximum = find_maximum(num1, num2, num3)
24     print(f"The maximum of {num1}, {num2}, and {num3} is {maximum}.")
```

Terminal Output:

```
PS C:\Users\tharu\OneDrive\Desktop\AI CODING> ^C
PS C:\Users\tharu\OneDrive\Desktop\AI CODING> cd 'c:\Users\tharu\OneDrive\Desktop\AI CODING' & 'c:\Program Files\Python311\python.exe' 'c:\Users\tharu\OneDrive\Desktop\AI CODING\ath lab\task(3).py'
Enter three numbers:
Enter the first number: 87
Enter the second number: 90
Enter the third number: 99
The maximum of 87, 90, and 99 is 99.
PS C:\Users\tharu\OneDrive\Desktop\AI CODING>
```

OP:

This screenshot is identical to the one above, showing the same VS Code editor window with the `task(3).py` file and the same terminal output.

Observation:

The `find_maximum` function takes three numbers as arguments and returns the maximum using Python's built-in `max()` function. I have prompted to input three numbers dynamically. The program calculates the maximum of the three numbers and prints the result.

Task-4:

Use TDD to write a shopping cart class with methods to add, remove, and get total price. First write tests for each method, then generate code using AI.

Prompt: Now generate a Python class `ShoppingCart` that can add items, remove items, and calculate the total price according to the given test cases. Take input dynamically from the user. Input: Add Apple with quantity 2 and price 3.0 → Output: `{"Apple": {"quantity": 2, "price": 3.0}}`. Input: Remove Apple from the cart → Output: `{}`. Input: Add Apple (quantity 2, price 3.0) and Banana (quantity 1, price 1.5) → Output: Total price is 7.5.

Code:

The screenshot shows the VS Code editor with the `task(4).py` file open. The code defines a `ShoppingCart` class with methods for adding, removing items, and calculating the total price. The `__main__` block contains a menu-driven loop for user interaction.

```
1 class ShoppingCart:
2     def __init__(self):
3         self.items = {}
4     def add_item(self, name, quantity, price):
5         if name in self.items:
6             self.items[name]["quantity"] += quantity
7         else:
8             self.items[name] = {"quantity": quantity, "price": price}
9     def remove_item(self, name):
10        if name in self.items:
11            del self.items[name]
12        else:
13            print(f"Item '{name}' not found in the cart.")
14    def get_total_price(self):
15        total = 0
16        for item in self.items.values():
17            total += item["quantity"] * item["price"]
18        return total
19
20 if __name__ == "__main__":
21     cart = ShoppingCart()
22     while True:
23         print("\nShopping Cart Menu:")
24         print("1. Add Item")
25         print("2. Remove Item")
26         print("3. View Total Price")
27         print("4. View Cart")
28         print("5. Exit")
29         choice = input("Enter your choice: ")
30         if choice == "1":
31             name = input("Enter the item name: ")
32             quantity = int(input("Enter the quantity: "))
33             price = float(input("Enter the price per unit: "))
34             cart.add_item(name, quantity, price)
35         elif choice == "2":
36             name = input("Enter the item name to remove: ")
37             cart.remove_item(name)
38         elif choice == "3":
39             total_price = cart.get_total_price()
40             print(f"The total price of items in the cart is: {total_price}")
41         elif choice == "4":
42             print("Current items in the cart:")
43             for name, details in cart.items.items():
44                 print(f"({name}): Quantity = {details['quantity']}, Price = {details['price']}")
45         elif choice == "5":
46             print("Exiting the shopping cart. Thank you!")
47             break
48         else:
49             print("Invalid choice. Please try again.")
```

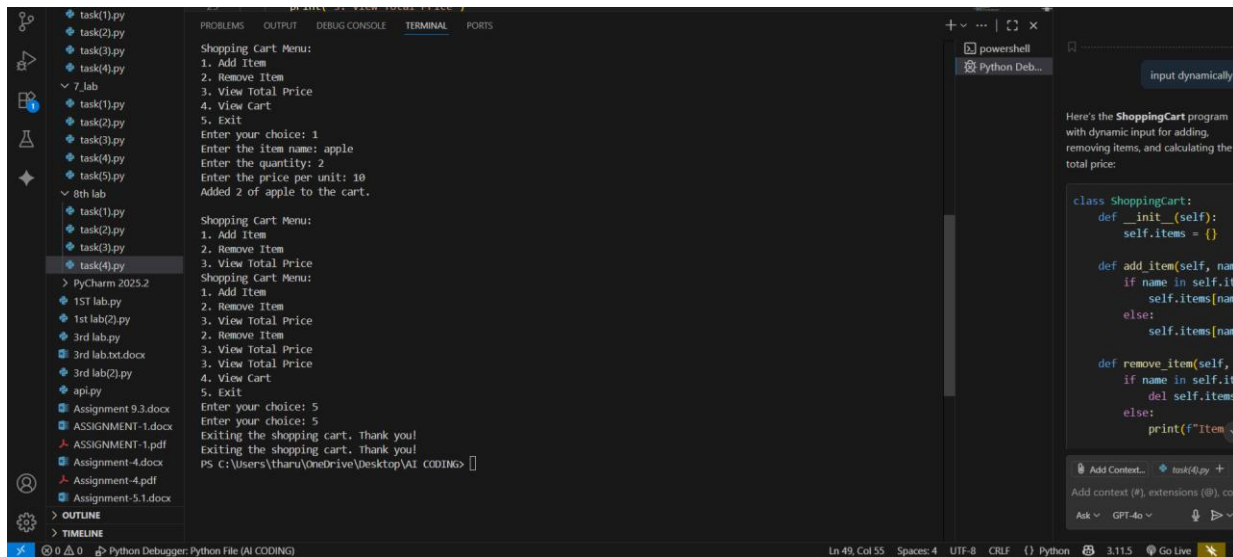
The right sidebar shows the CHAT panel with a prompt: "Let me know if you'd like to see the dynamic input version!" and a button labeled "input dynamically".

The screenshot shows the VS Code editor with the `task(4).py` file open. The code is the same as the previous screenshot, but it includes a `break` statement in the `elif choice == "5":` block, which was missing in the previous version.

```
1 class ShoppingCart:
2     def __init__(self):
3         self.items = {}
4     def add_item(self, name, quantity, price):
5         if name in self.items:
6             self.items[name]["quantity"] += quantity
7         else:
8             self.items[name] = {"quantity": quantity, "price": price}
9     def remove_item(self, name):
10        if name in self.items:
11            del self.items[name]
12        else:
13            print(f"Item '{name}' not found in the cart.")
14    def get_total_price(self):
15        total = 0
16        for item in self.items.values():
17            total += item["quantity"] * item["price"]
18        return total
19
20 if __name__ == "__main__":
21     cart = ShoppingCart()
22     while True:
23         print("\nShopping Cart Menu:")
24         print("1. Add Item")
25         print("2. Remove Item")
26         print("3. View Total Price")
27         print("4. View Cart")
28         print("5. Exit")
29         choice = input("Enter your choice: ")
30         if choice == "1":
31             name = input("Enter the item name: ")
32             quantity = int(input("Enter the quantity: "))
33             price = float(input("Enter the price per unit: "))
34             cart.add_item(name, quantity, price)
35             print(f"Added {quantity} of {name} to the cart.")
36         elif choice == "2":
37             name = input("Enter the item name to remove: ")
38             cart.remove_item(name)
39         elif choice == "3":
40             total_price = cart.get_total_price()
41             print(f"The total price of items in the cart is: {total_price}")
42         elif choice == "4":
43             print("Current items in the cart:")
44             for name, details in cart.items.items():
45                 print(f"({name}): Quantity = {details['quantity']}, Price = {details['price']}")
46         elif choice == "5":
47             print("Exiting the shopping cart. Thank you!")
48             break
49         else:
50             print("Invalid choice. Please try again.")
```

The right sidebar shows the CHAT panel with a prompt: "Let me know if you'd like to see the dynamic input version!" and a button labeled "input dynamically".

OP:



Observation: The program uses `input()` to allow the user to interact with the shopping cart dynamically. Users can add items, remove items, view the total price, and see the cart's contents.

- **Option 1:** Add an item to the cart.
- **Option 2:** Remove an item from the cart.
- **Option 3:** Calculate and display the total price of items in the cart.
- **Option 4:** Display all items in the cart.
- **Option 5:** Exit the program.

If the user tries to remove an item that doesn't exist, the program displays an appropriate message

Task-5:

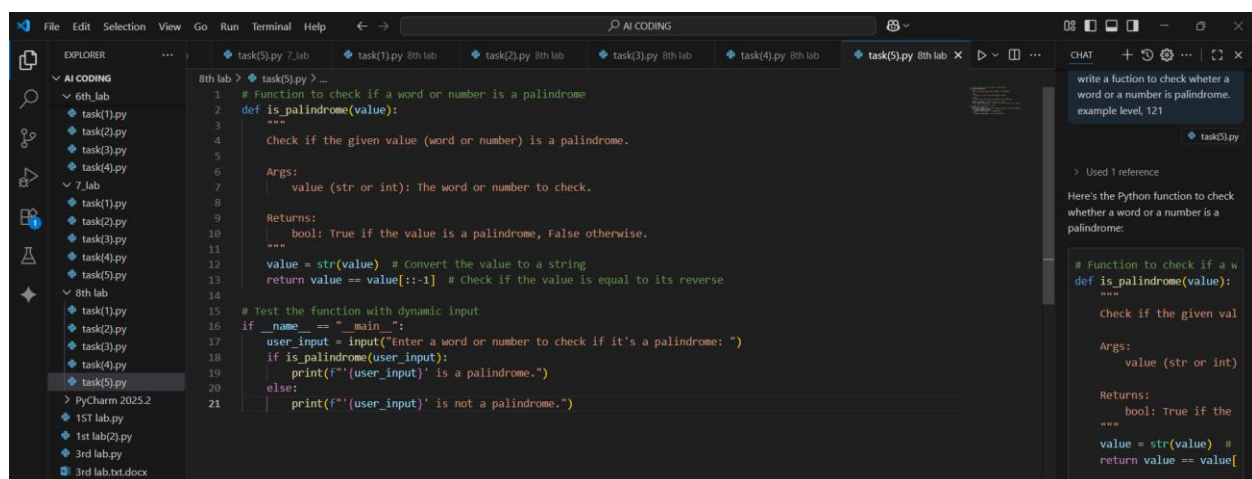


Write tests for a palindrome checker (e.g., `is_palindrome("level")` → True). Let Copilot suggest the function based on test case expectations.

Prompt:

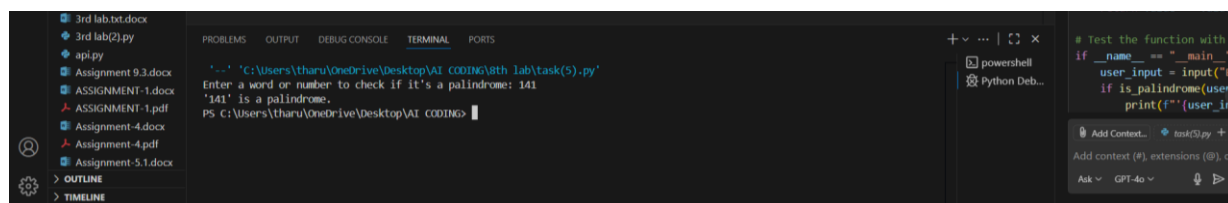
write a function to check whether a word or a number is palindrome or not. Example: level, 121

Code:



```
1 # Function to check if a word or number is a palindrome
2 def is_palindrome(value):
3     """
4     Check if the given value (word or number) is a palindrome.
5
6     Args:
7         value (str or int): The word or number to check.
8
9     Returns:
10         bool: True if the value is a palindrome, False otherwise.
11     """
12     value = str(value) # Convert the value to a string
13     return value == value[::-1] # Check if the value is equal to its reverse
14
15 # Test the function with dynamic input
16 if __name__ == "__main__":
17     user_input = input("Enter a word or number to check if it's a palindrome: ")
18     if is_palindrome(user_input):
19         print(f"{user_input} is a palindrome.")
20     else:
21         print(f"{user_input} is not a palindrome.")
```

OP:



```
PS C:\Users\tharu\OneDrive\Desktop\AI CODING\8th lab\task(5).py>
Enter a word or number to check if it's a palindrome: 141
'141' is a palindrome.
```

Observation:

The input value is converted to a string using `str(value)` to handle both words and numbers. The function checks if the string is equal to its reverse using slicing (`value[::-1]`). I have prompted to enter a word or number dynamically. The program prints whether the input is a palindrome



