

Assignment-9.1

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Batch -23

Problem 1:

Consider the following Python function:

```
def find_max(numbers):  
    return max(numbers)
```

Task:

- Write documentation for the function in all three formats:

(a) Docstring

(b) Inline comments

(c) Google-style documentation

- Critically compare the three approaches. Discuss the advantages, disadvantages, and suitable use cases of each style.
- Recommend which documentation style is most effective for a mathematical utilities library and justify your answer.

```

#doc string
def find_maximum(a, b):
    """Returns the maximum of two numbers.

    Parameters:
    a (int): The first number.
    b (int): The second number.

    Returns:
    int: The maximum of a and b.
    """
    return max(a, b)
print(find_maximum.__doc__)
#inline comment
def find_maximum(a, b):
    # Use the built-in max function to find the maximum of a and b
    return max(a, b)
print(find_maximum.__doc__)
#google style documentation
def find_maximum(a, b):
    """Returns the maximum of two numbers.

    Args:
        a (int): The first number.
        b (int): The second number.

    Returns:
        int: The maximum of a and b.
    """
    return max(a, b)
print(find_maximum.__doc__)

```

```
a (int): The first number.  
b (int): The second number.  
  
Returns:  
int: The maximum of a and b.  
  
None  
Returns the maximum of two numbers.  
None  
Returns the maximum of two numbers.  
Returns the maximum of two numbers.  
  
Args:  
    a (int): The first number.  
    b (int): The second number.  
  
Returns:  
    int: The maximum of a and b.
```

Problem 2: Consider the following Python function:

```
def login(user, password, credentials):  
    return credentials.get(user) == password
```

Task:

1. Write documentation in all three formats.
2. Critically compare the approaches.
3. Recommend which style would be most helpful for new developers onboarding a project, and justify your choice.

```

#doc string
def login(username,password,credentials):
    """Checks if the provided username and password match the credentials.

    Parameters:
    username (str): The username to check.
    password (str): The password to check.
    credentials (dict): A dictionary containing valid username-password pairs.

    Returns:
    bool: True if the credentials are valid, False otherwise.
    """
    return credentials.get(username) == password
print(login.__doc__)
#inline comment
def login(username,password,credentials):
    # Check if the provided username and password match the credentials
    return credentials.get(username) == password
print(login.__doc__)
#google style documentation
def login(username,password,credentials):
    """Checks if the provided username and password match the credentials.

    Args:
    | username (str): The username to check.
    | password (str): The password to check.
    | credentials (dict): A dictionary containing valid username-password pairs.
    Returns:
    | bool: True if the credentials are valid, False otherwise.
    """
    return credentials.get(username) == password
print(login.__doc__)

```

```
Checks if the provided username and password match the credentials.

Parameters:
username (str): The username to check.
password (str): The password to check.
credentials (dict): A dictionary containing valid username-password pairs.

Returns:
bool: True if the credentials are valid, False otherwise.

None
Checks if the provided username and password match the credentials.

Args:
    username (str): The username to check.
    password (str): The password to check.
    credentials (dict): A dictionary containing valid username-password pairs.
Returns:
    bool: True if the credentials are valid, False otherwise.
```

Problem 3: Calculator (Automatic Documentation Generation)

Task: Design a Python module named `calculator.py` and demonstrate automatic documentation generation.

Instructions:

1. Create a Python module `calculator.py` that includes the following functions, each written with appropriate docstrings:
 - o `add(a, b)` – returns the sum of two numbers
 - o `subtract(a, b)` – returns the difference of two numbers
 - o `multiply(a, b)` – returns the product of two numbers
 - o `divide(a, b)` – returns the quotient of two numbers
2. Display the module documentation in the terminal using Python's documentation tools.
3. Generate and export the module documentation in HTML format using the `pydoc` utility, and open the generated HTML file in a web browser to verify the output.

ulations.py > subtract

```
def add(a, b):  
  
    Parameters:  
    a (int): The first number.  
    b (int): The second number.  
  
    Returns:  
    int: The sum of a and b.  
    """  
    return a + b  
print(add.__doc__)  
def subtract(a, b):  
    """Returns the difference of a and b.  
  
    Parameters:  
    a (int): The first number.  
    b (int): The second number.  
  
    Returns:  
    int: The difference of a and b.  
    """  
    return a - b  
print(subtract.__doc__)  
def multiply(a, b):  
    """Returns the product of a and b.  
  
    Parameters:  
    a (int): The first number.  
    b (int): The second number.  
  
    Returns:  
    int: The product of a and b.  
    """  
    return a * b  
print(multiply.__doc__)  
def divide(a, b):  
    """Returns the quotient of a and b.  
  
    Parameters:  
    a (int): The first number.  
    b (int): The second number.  
  
    Returns:  
    int: The quotient of a and b.  
  
    Raises:  
    ValueError: If b is zero.  
    """  
    if b == 0:  
        raise ValueError("Cannot divide by zero.")  
    return a / b  
print(divide.__doc__)
```

```
PS C:\Users\Aishwarya\OneDrive\Desktop\AI LAB> python -m pydoc -w calculations
```

Parameters:

a (int): The first number.
b (int): The second number.

Returns:

int: The difference of a and b.

Returns the product of a and b.

Parameters:

a (int): The first number.
b (int): The second number.

Returns:

int: The product of a and b.

Returns the quotient of a and b.

Parameters:

Parameters:

a (int): The first number.
b (int): The second number.

Returns:

int: The product of a and b.

Returns the quotient of a and b.

❖ Parameters:

Returns the quotient of a and b.

Parameters:

Parameters:

a (int): The first number.
b (int): The second number.

Returns:

int: The quotient of a and b.

Raises:

ValueError: If b is zero.

wrote calculations.html

#doc string

Functions

add(a, b)

Returns the sum of a and b.

Parameters:

a (int): The first number.

b (int): The second number.

Returns:

int: The sum of a and b.

divide(a, b)

Returns the quotient of a and b.

Parameters:

a (int): The first number.

b (int): The second number.

Returns:

int: The quotient of a and b.

Raises:

ValueError: If b is zero.

multiply(a, b)

Returns the product of a and b.

Parameters:

a (int): The first number.

b (int): The second number.

Returns:

int: The product of a and b.

subtract(a, b)

Returns the difference of a and b.

Parameters:

a (int): The first number.

b (int): The second number.

Returns:

int: The difference of a and b.

Conversion Utilities Module

Task:

1. Write a module named conversion.py with functions:

o decimal_to_binary(n)

o binary_to_decimal(b)

o decimal_to_hexadecimal(n)

2. Use Copilot for auto-generating docstrings.

3. Generate documentation in the terminal.

4. Export the documentation in HTML format and open it in a browser.

```
def decimal_to_binary(n):
    """
    n (int): The decimal number to convert.

    Returns:
    str: The binary representation of the decimal number.
    """
    if n == 0:
        return "0"

    binary = ""
    while n > 0:
        binary = str(n % 2) + binary
        n //= 2

    return binary
print(decimal_to_binary.__doc__)

def binary_to_decimal(b):
    """Converts a binary number to decimal.

    Args:
    b (str): The binary number to convert.

    Returns:
    int: The decimal representation of the binary number.
    """
    decimal = 0
    for index, digit in enumerate(reversed(b)):
        decimal += int(digit) * (2 ** index)

    return decimal
print(binary_to_decimal.__doc__)

def decimal_to_hexadecimal(n):
    """Converts a decimal number to hexadecimal.

    Args:
    n (int): The decimal number to convert.

    Returns:
    str: The hexadecimal representation of the decimal number.
    """
    if n == 0:
        return "0"

    hexadecimal = ""
    hex_digits = "0123456789ABCDEF"

    while n > 0:
        hexadecimal = hex_digits[n % 16] + hexadecimal
        n //= 16

    return hexadecimal
print(decimal_to_hexadecimal.__doc__)
```

```
wrote calculations.html
PS C:\Users\Aishwarya\OneDrive\Desktop\AI LAB> python -m pydoc -p 8080
Server ready at http://localhost:8080/
Server commands: [b]rowser, [q]uit
server> b
server> 
```

conversion

#doc_string

Functions

binary_to_decimal(b)

Converts a binary number to decimal.

Args:

b (str): The binary number to convert.

Returns:

int: The decimal representation of the binary number.

decimal_to_binary(n)

Converts a decimal number to binary.

Args:

n (int): The decimal number to convert.

Returns:

str: The binary representation of the decimal number.

decimal_to_hexadecimal(n)

Converts a decimal number to hexadecimal.

Args:

n (int): The decimal number to convert.

Returns:

str: The hexadecimal representation of the decimal number.

Problem 5 – Course Management Module

Task:

1. Create a module course.py with functions:

o add_course(course_id, name, credits)

o remove_course(course_id)

o get_course(course_id)

2. Add docstrings with Copilot.
3. Generate documentation in the terminal.
4. Export the documentation in HTML format and open it in a

Browser

```
#doc string
def add_course(course_id,name,credits):
    """Adds a course to the system.
    Parameters:
    course_id (str): The unique identifier for the course.
    name (str): The name of the course.
    credits (int): The number of credits for the course.
    Returns:
    str: A message indicating the success or failure of the operation.
    """
    # Code to add course to database
    return f"Course {name} with ID {course_id} and {credits} credits added successfully."
print(add_course.__doc__)
def remove_course(course_id):
    """Removes a course from the system.
    Parameters:
    course_id (str): The unique identifier for the course to remove.
    Returns:
    str: A message indicating the success or failure of the operation.
    """
    # Code to remove course from database
    return f"Course with ID {course_id} removed successfully."
print(remove_course.__doc__)
def get_course_info(course_id):
    """Retrieves information about a course.
    Parameters:
    course_id (str): The unique identifier for the course.
    Returns:
    str: A message indicating the success or failure of the operation.
    """
    # Code to get course information from database
    return f"Information for course with ID {course_id} retrieved successfully."
```

Server stopped

PS C:\Users\Aishwarya\OneDrive\Desktop\AI LAB> python -m pydoc -w course

Adds a course to the system.

Parameters:

course_id (str): The unique identifier for the course.

name (str): The name of the course.

credits (int): The number of credits for the course.

Returns:

str: A message indicating the success or failure of the operation.

Removes a course from the system.

Parameters:

course_id (str): The unique identifier for the course to remove.

Removes a course from the system.

Parameters:

course_id (str): The unique identifier for the course to remove.

course_id (str): The unique identifier for the course to remove.

Returns:

str: A message indicating the success or failure of the operation.

wrote course.html

PS C:\Users\Aishwarya\OneDrive\Desktop\AI LAB> python -m pydoc -p 8080

Server ready at http://localhost:8080/

Server commands: [b]rowser, [q]uit

server> b

server>

[index](#)

course [c:\users\aiswarya\onedrive\desktop\ai lab\course.py](#)

#doc string

Functions

add_course(course_id, name, credits)

Adds a course to the system.

Parameters:

course_id (str): The unique identifier for the course.

name (str): The name of the course.

credits (int): The number of credits for the course.

Returns:

str: A message indicating the success or failure of the operation.

get_course_info(course_id)

Retrieves information about a course.

Parameters:

course_id (str): The unique identifier for the course.

Returns:

str: A message indicating the success or failure of the operation.

remove_course(course_id)

Removes a course from the system.

Parameters:

course_id (str): The unique identifier for the course to remove.

Returns:

str: A message indicating the success or failure of the operation.

Python 3.13.5 [tags/v3.13.5:6cb20a2, MSC v.1943 64 bit (AMD64)]
Windows-11

course

#doc string

Functions

add_course(course_id, name, credits)

Adds a course to the system.

Parameters:

course_id (str): The unique identifier for the course.

name (str): The name of the course.

credits (int): The number of credits for the course.

Returns:

str: A message indicating the success or failure of the operation.

get_course_info(course_id)

Retrieves information about a course.

Parameters:

course_id (str): The unique identifier for the course.

Returns:

str: A message indicating the success or failure of the operation.

remove_course(course_id)

Removes a course from the system.

Parameters:

course_id (str): The unique identifier for the course to remove.

Returns:

str: A message indicating the success or failure of the operation.