

AI-ASSISTED CODING

Assignment: 9.1

Lab Experiment: Documentation Generation - Automatic documentation and code comments

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Problem 1

Given Function

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

(a) Docstring Style

```
def find_max(numbers):  
    """
```

Returns the maximum value from a list of numbers.

Parameters:

numbers (list): A list containing numeric values.

Returns:

int/float: The largest number in the list.

"""

```
    return max(numbers)
```

(b) Inline Comments

```
def find_max(numbers):
    # This function returns the largest number
    # from the given list of numbers
    return max(numbers)
```

(c) Google-Style Documentation

```
def find_max(numbers):
    """
    Finds the maximum number in a list.
```

Args:

numbers (list): List of numeric values.

Returns:

int or float: Maximum value in the list.

"""

```
return max(numbers)
```

Critical Comparison

Style	Advantages	Disadvantages	Use Case
Docstring	Standard Python documentation	Slightly lengthy	General Python projects
Inline Comments	Easy to understand quickly	Not included in documentation tools	Small scripts
Google Style	Structured & professional	Requires formatting knowledge	Large team projects

Recommended Style (Mathematical Utility Library)

Google-Style Documentation

Easy to read

Compatible with documentation tools

Standard in professional development

Problem 2

Given Function

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

(a) Docstring Style

```
def login(user, password, credentials):  
    """  
    Validates user login credentials.  
    """
```

Validates user login credentials.

Parameters:

user (str): Username
password (str): Password entered by user
credentials (dict): Stored username-password pairs

Returns:

bool: True if login successful, otherwise False

.....

```
return credentials.get(user) == password
```

(b) Inline Comments

```
def login(user, password, credentials):  
    # Check whether entered password  
    # matches stored password  
    return credentials.get(user) == password
```

(c) Google Style Documentation

```
def login(user, password, credentials):
```

::::

Authenticates a user.

Args:

user (str): Username

password (str): User password

credentials (dict): Dictionary of stored credentials

Returns:

bool: Authentication result

::::

return credentials.get(user) == password

Comparison

Style Strength

Inline Quick understanding

Docstring Standard & simple

Google Style Best readability & structure

Recommended Style (For New Developers)

Google Style

Very clear structure

Easy onboarding

Professional readability

Problem 3 – Calculator Module

calculator.py

Calculator Module

Provides basic arithmetic operations.

```
def add(a, b):
    Returns sum of two numbers.
    return a + b

def subtract(a, b):
    Returns difference of two numbers.
    return a - b

def multiply(a, b):
    Returns product of two numbers.
    return a * b

def divide(a, b):
    Returns quotient of two numbers.
    if b == 0:
        raise ValueError("Cannot divide by zero")
    return a / b
```

Display Documentation in Terminal

python -m pydoc calculator

Generate HTML Documentation

python -m pydoc -w calculator

This creates:

calculator.html

Problem 4 – Conversion Utilities Module

conversion.py

Conversion Utility Module

Provides number conversion functions.

```
def decimal_to_binary(n):
```

Converts decimal number to binary.

```
return bin(n)[2:]
```

```
def binary_to_decimal(b):
```

Converts binary number to decimal.

```
return int(b, 2)
```

```
def decimal_to_hexadecimal(n):
```

Converts decimal number to hexadecimal.

```
return hex(n)[2:]
```

Terminal Documentation

```
python -m pydoc conversion
```

Generate HTML

```
python -m pydoc -w conversion
```

Problem 5 – Course Management Module

```
course.py
```

```
"
```

Course Management Module

Handles course operations.

```
"
```

```
courses = {}
```

```
def add_course(course_id, name, credits):
```

Adds a course to the course list.

```
courses[course_id] = {"name": name, "credits": credits}
```

```
def remove_course(course_id):
```

Removes a course from the list.

```
courses.pop(course_id, None)
def get_course(course_id):
    Returns course details.
    return courses.get(course_id)
```

Terminal Documentation

python -m pydoc course

Generate HTML

python -m pydoc -w course