ASSIGNMENT – 9.5

HT.NO: 2303A52493

BATCH: 50

TASK – 01:

Question:

Problem 1: String Utilities Function

Consider the following Python function:

```
def reverse_string(text):
return text[::-1]
```

Task:

1. Write documentation in:

o (a) Docstring

o (b) Inline comments

o (c) Google-style documentation

2. Compare the three documentation styles.

3. Recommend the most suitable style for a utility-based string library.

Prompt:

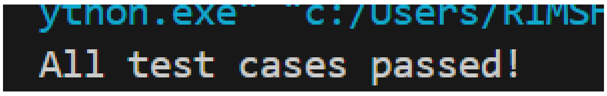
Generate a python function to reverse a string and include doc string documentation Include assert test cases to validate the function's correctness.

Generated Code:

```
#Generate a python function to reverse a string and include doc string documentation Include assert test cases to validate the function's correctness.
def reverse_string(s):
    """
    This function takes a string as input and returns the reversed version of that string.


    Parameters:
```

```
    s (str): The string to be reversed.

    Returns:
    str: The reversed string.
    """
    return s[::-1]
# Assert test cases to validate the function's correctness
assert reverse_string("hello") == "olleh", "Test case 1 failed"
assert reverse_string("Python") == "nohtyP", "Test case 2 failed"
assert reverse_string("") == "", "Test case 3 failed"
assert reverse_string("a") == "a", "Test case 4 failed"
assert reverse_string("12345") == "54321", "Test case 5 failed"
print("All test cases passed!")
```

Output:



```
ython.exe" "c:/Users/RIMSH
All test cases passed!
```

Explanation:

This function uses Python slicing [::-1] to reverse the string easily.
The assert statements check different inputs to make sure the function works correctly.

TASK – 02:

Question:

Consider the function:

```
def check_strength(password):
return len(password) >= 8
```

Task:

1. Document the function using docstring, inline comments, and Google style.
2. Compare documentation styles for security-related code.

3. Recommend the most appropriate style.

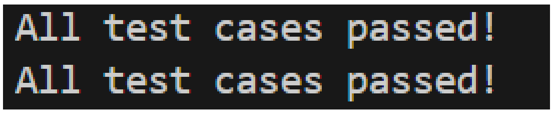
Prompt:

Generate a python function check_strength to the check the strength of a password and include doc string documentation.Include assert test cases to validate the function's correctness. The function should check for the following criteria: The password must be at least 8 characters long.

Generated Code:

```
def check_strength(password):
    """
    This function checks the strength of a password based on specific criteria.


    Parameters:
    password (str): The password to be checked.


    Returns:
    str: A message indicating whether the password is strong or weak.
    """
    if len(password) < 8:
        return "Weak password: Password must be at least 8 characters long."
    else:
        return "Strong password."
# Assert test cases to validate the function's correctness
assert check_strength("pass") == "Weak password: Password must be at least 8 characters long.", "Test case 1 failed"
assert check_strength("password") == "Strong password.", "Test case 2 failed"
assert check_strength("1234567") == "Weak password: Password must be at least 8 characters long.", "Test case 3 failed"
assert check_strength("12345678") == "Strong password.", "Test case 4 failed"
assert check_strength("abc") == "Weak password: Password must be at least 8 characters long.", "Test case 5 failed"
print("All test cases passed!")
```

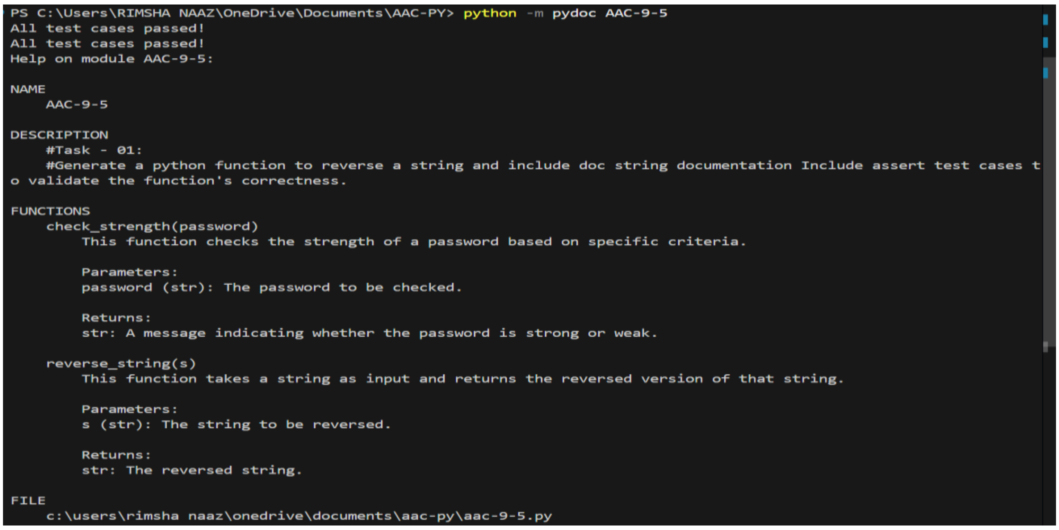
Output:



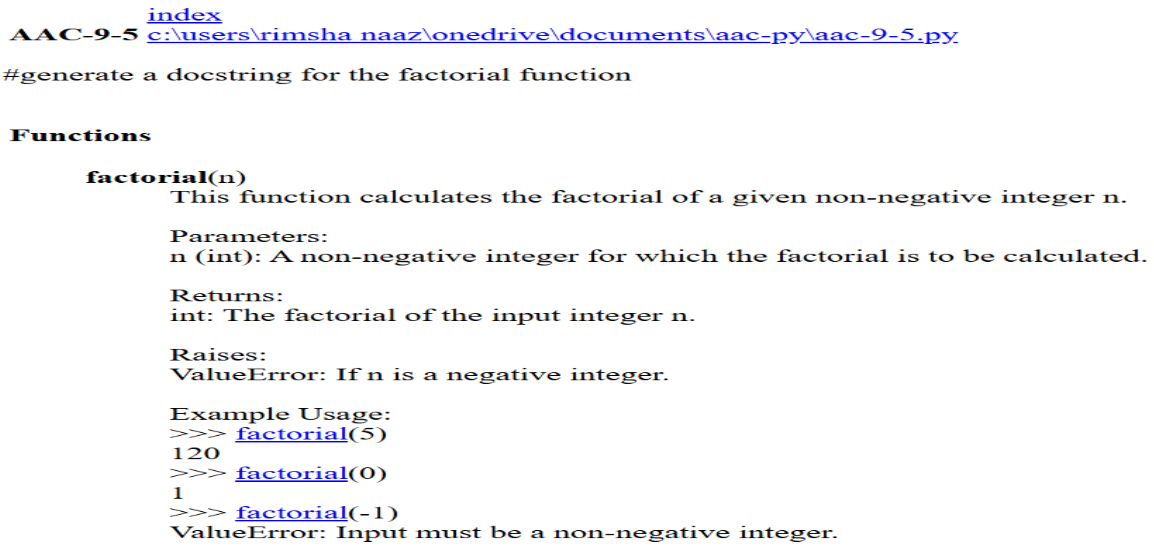
```
All test cases passed!
All test cases passed!
```

Explanation:

This function checks the length of the password. If it has fewer than 8 characters, it returns a weak password message.
If the password is 8 or more characters long, it returns that the password is strong, and the assert tests confirm the function works correctly.



```
PS C:\Users\RIMSHA NAAZ\OneDrive\Documents\AAC-PY> python -m pydoc AAC-9-5
All test cases passed!
All test cases passed!
Help on module AAC-9-5:

NAME
    AAC-9-5

DESCRIPTION
    #Task - 01:
    #Generate a python function to reverse a string and include doc string documentation Include assert test cases t
o validate the function's correctness.

FUNCTIONS
    check_strength(password)
        This function checks the strength of a password based on specific criteria.

        Parameters:
        password (str): The password to be checked.

        Returns:
        str: A message indicating whether the password is strong or weak.

    reverse_string(s)
        This function takes a string as input and returns the reversed version of that string.

        Parameters:
        s (str): The string to be reversed.

        Returns:
        str: The reversed string.

FILE
    c:\users\rimsha naaz\onedrive\documents\aac-py\aac-9-5.py
```



AAC-9-5 index
c:\users\rimsha naaz\onedrive\documents\aac-py\aac-9-5.py

#generate a docstring for the factorial function

Functions

```
factorial(n)
    This function calculates the factorial of a given non-negative integer n.

    Parameters:
    n (int): A non-negative integer for which the factorial is to be calculated.

    Returns:
    int: The factorial of the input integer n.

    Raises:
    ValueError: If n is a negative integer.

    Example Usage:
    >>> factorial(5)
    120
    >>> factorial(0)
    1
    >>> factorial(-1)
    ValueError: Input must be a non-negative integer.
```

TASK – 03:

Question:

Task:

1. Create a module math_utils.py with functions:
    - square(n)
    - cube(n)
    - factorial(n)
2. Generate docstrings automatically using AI tools.
3. Export documentation as an HTML file.

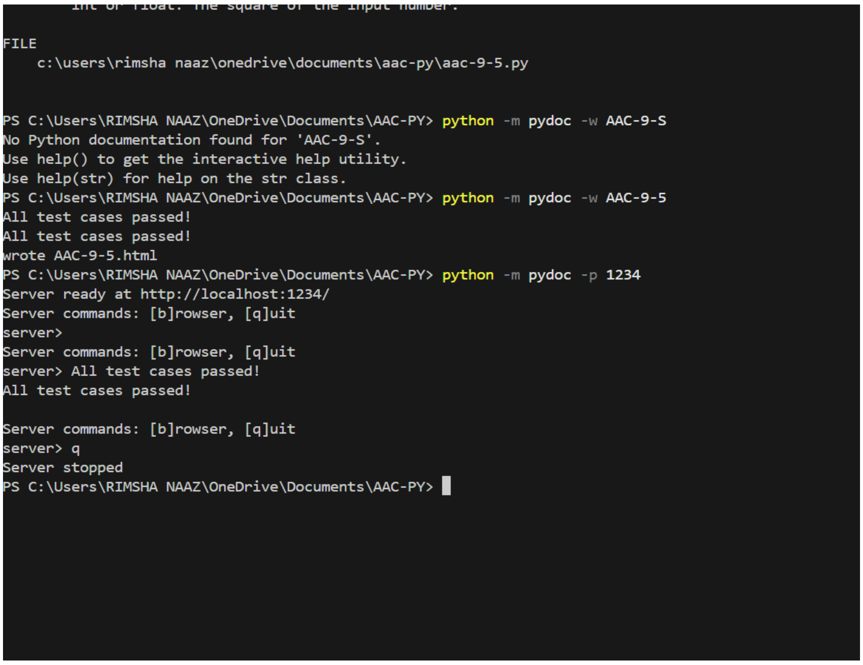
Prompt:

Create a module math_utils.py and include a function to calcuate the square(n), q(n) and factorial(n) and doc string documentation.

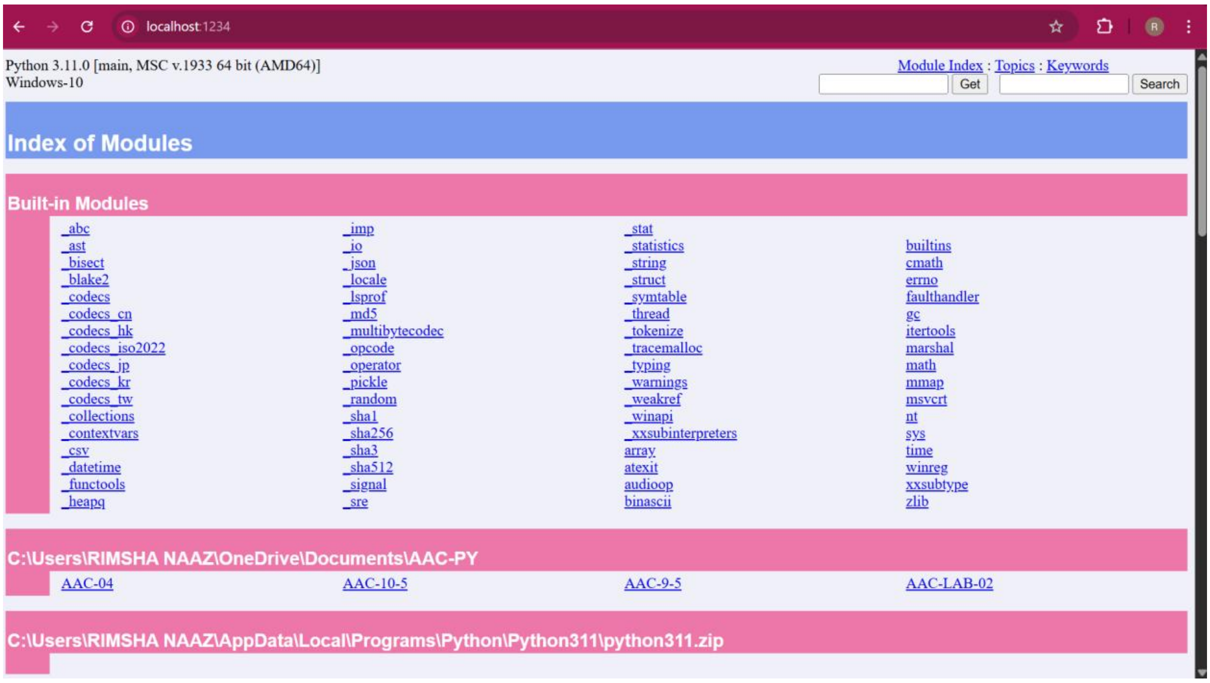
Generated Code:

```
# math_utils.py
def square(n):
    """
    This function takes a number as input and returns its square.


    Parameters:
    n (int or float): The number to be squared.


    Returns:
    int or float: The square of the input number.
    """
    return n * n
def q(n):
    """This function takes a number as input and returns its cube.
    Parameters:
    n (int or float): The number to be cubed.
    Returns:
    int or float: The cube of the input number.
    """
    return n * n * n
def factorial(n):
    """This function takes a number as input and returns its factorial.
    Parameters:
    n (int): The number to calculate the factorial of.
    Returns:
    int: The factorial of the input number.
    """
    result = 1
    for i in range(1, n + 1):
        result = result * i
    return result
```

Output:



```
        int or float: The square of the input number.

FILE
    c:\users\rimsha naaz\onedrive\documents\aac-py\aac-9-5.py


PS C:\Users\RIMSHA NAAZ\OneDrive\Documents\AAC-PY> python -m pydoc -w AAC-9-S
No Python documentation found for 'AAC-9-S'.
Use help() to get the interactive help utility.
Use help(str) for help on the str class.
PS C:\Users\RIMSHA NAAZ\OneDrive\Documents\AAC-PY> python -m pydoc -w AAC-9-5
All test cases passed!
All test cases passed!
wrote AAC-9-5.html
PS C:\Users\RIMSHA NAAZ\OneDrive\Documents\AAC-PY> python -m pydoc -p 1234
Server ready at http://localhost:1234/
Server commands: [b]rowser, [q]uit
server>
Server commands: [b]rowser, [q]uit
server> All test cases passed!
All test cases passed!

Server commands: [b]rowser, [q]uit
server> q
Server stopped
PS C:\Users\RIMSHA NAAZ\OneDrive\Documents\AAC-PY> 
```



Python 3.11.0 [main, MSC v.1933 64 bit (AMD64)]
Windows-10

Module Index : Topics : Keywords

Index of Modules

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C:\Users\RIMSHA NAAZ\OneDrive\Documents\AAC-PY

AAC-04
AAC-10-5
AAC-9-5
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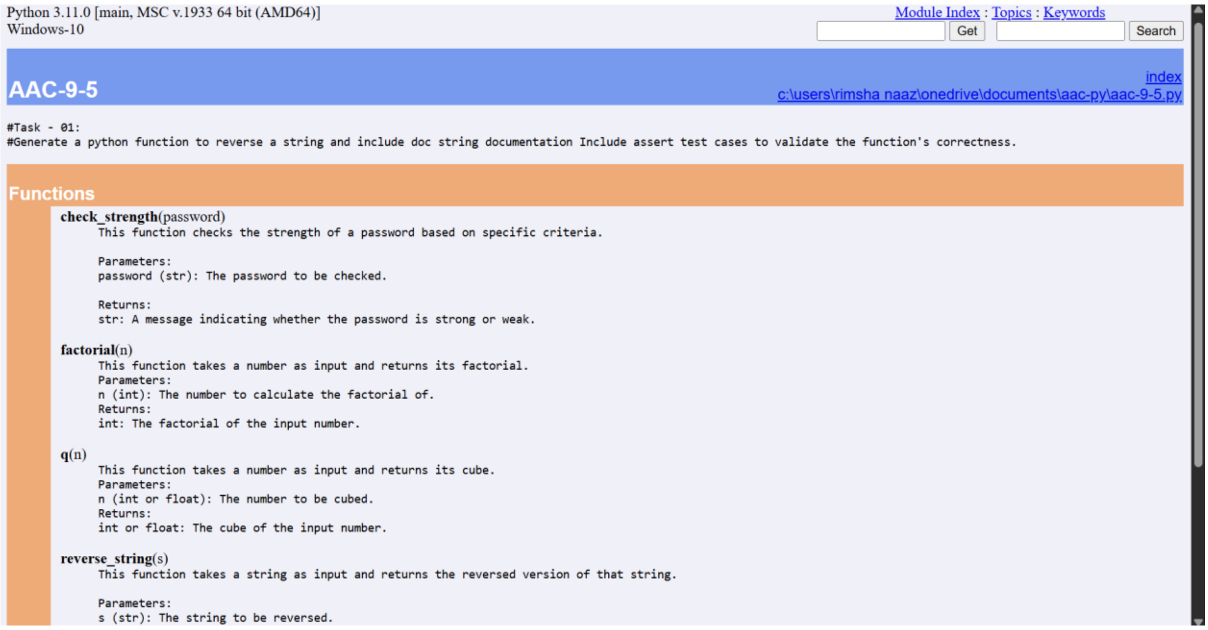
C:\Users\RIMSHA NAAZ\AppData\Local\Programs\Python\Python311\python311.zip



Python 3.11.0 [main, MSC v.1933 64 bit (AMD64)]
Windows-10

Module Index : Topics : Keywords

AAC-9-5

index
c:\users\rimsha naaz\onedrive\documents\aac-py\aac-9-5.py

```
#Task - 01:
#Generate a python function to reverse a string and include doc string documentation Include assert test cases to validate the function's correctness.
```

Functions

check_strength(password)

```
This function checks the strength of a password based on specific criteria.

Parameters:
password (str): The password to be checked.

Returns:
str: A message indicating whether the password is strong or weak.
```

factorial(n)

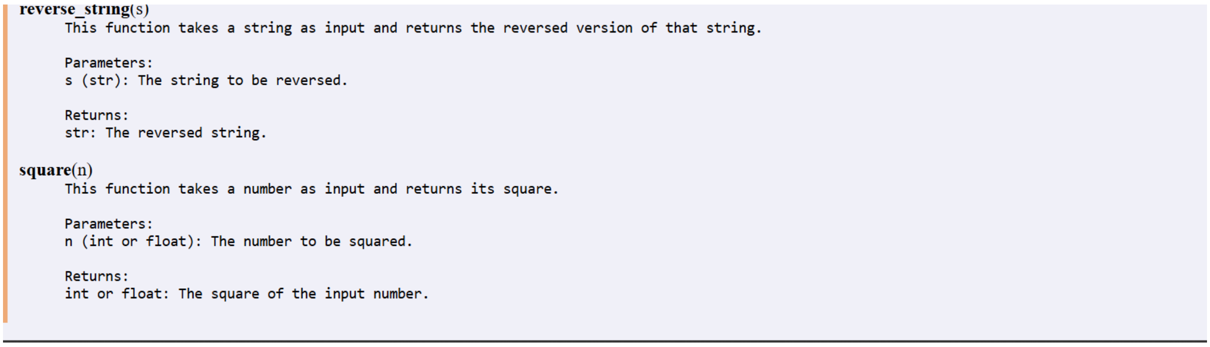
```
This function takes a number as input and returns its factorial.
Parameters:
n (int): The number to calculate the factorial of.
Returns:
int: The factorial of the input number.
```

q(n)

```
This function takes a number as input and returns its cube.
Parameters:
n (int or float): The number to be cubed.
Returns:
int or float: The cube of the input number.
```

reverse_string(s)

```
This function takes a string as input and returns the reversed version of that string.

Parameters:
s (str): The string to be reversed.
```



reverse_string(s)

```
This function takes a string as input and returns the reversed version of that string.

Parameters:
s (str): The string to be reversed.

Returns:
str: The reversed string.
```

square(n)

```
This function takes a number as input and returns its square.

Parameters:
n (int or float): The number to be squared.

Returns:
int or float: The square of the input number.
```

Explanation:

square(n) returns the square of a number by multiplying it with itself, and q(n) returns the cube by multiplying the number three times.

factorial(n) uses a loop to multiply numbers from 1 to n, giving the factorial value of the input number.

TASK – 04:

Question:

Create a module attendance.py with functions:

o mark_present(student)

o mark_absent(student)

o get_attendance(student)

2. Add proper docstrings.

3. Generate and view documentation in terminal and browse

Prompt:

create a module attendance.py and include functions mark_present(student),

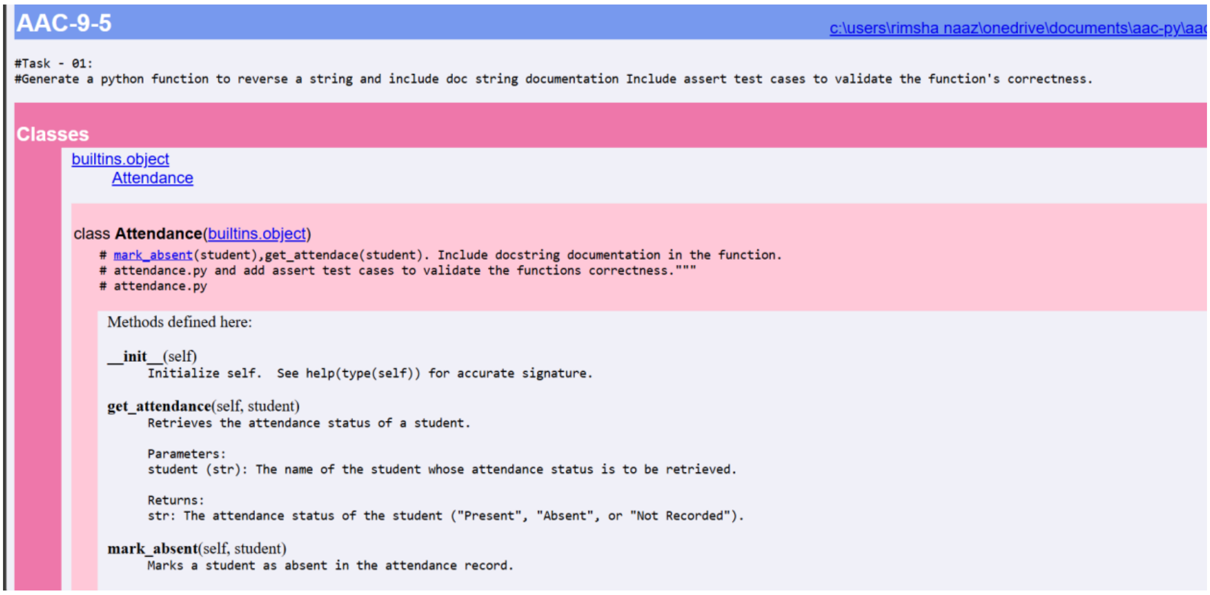
# mark_absent(student),get_attendace(student). Include docstring documentation in the function.

# attendance.py and add assert test cases to validate the functions correctness

Generated Code:

```
class Attendance:
    def __init__(self):
        self.attendance_record = {}
    def mark_present(self, student):
        """
        Marks a student as present in the attendance record.


        Parameters:
        student (str): The name of the student to be marked as present.
        """
        self.attendance_record[student] = "Present"
    def mark_absent(self, student):
        """
        Marks a student as absent in the attendance record.

        Parameters:
        student (str): The name of the student to be marked as absent.
        """
        self.attendance_record[student] = "Absent"
    def get_attendance(self, student):
        """
        Retrieves the attendance status of a student.

        Parameters:
        student (str): The name of the student whose attendance status is to be retrieved.

        Returns:
        str: The attendance status of the student ("Present", "Absent", or "Not Recorded").
        """
        return self.attendance_record.get(student, "Not Recorded")
# Assert test cases to validate the functions' correctness
attendance = Attendance()
attendance.mark_present("Alice")
attendance.mark_absent("Bob")
assert attendance.get_attendance("Alice") == "Present", "Test case 1 failed"
assert attendance.get_attendance("Bob") == "Absent", "Test case 2 failed"
assert attendance.get_attendance("Charlie") == "Not Recorded", "Test case 3 failed"
print("All test cases passed!")
```

Output:



AAC-9-5 c:\users\rimsha naaz\onedrive\documents\aac-py\aa

```
#Task - 01:
#Generate a python function to reverse a string and include doc string documentation Include assert test cases to validate the function's correctness.
```

Classes

builtins.object
    Attendance

class **Attendance**(builtins.object)

```
# mark_absent(student),get_attendace(student). Include docstring documentation in the function.
# attendance.py and add assert test cases to validate the functions correctness."""
# attendance.py
```

Methods defined here:

__init__(self)

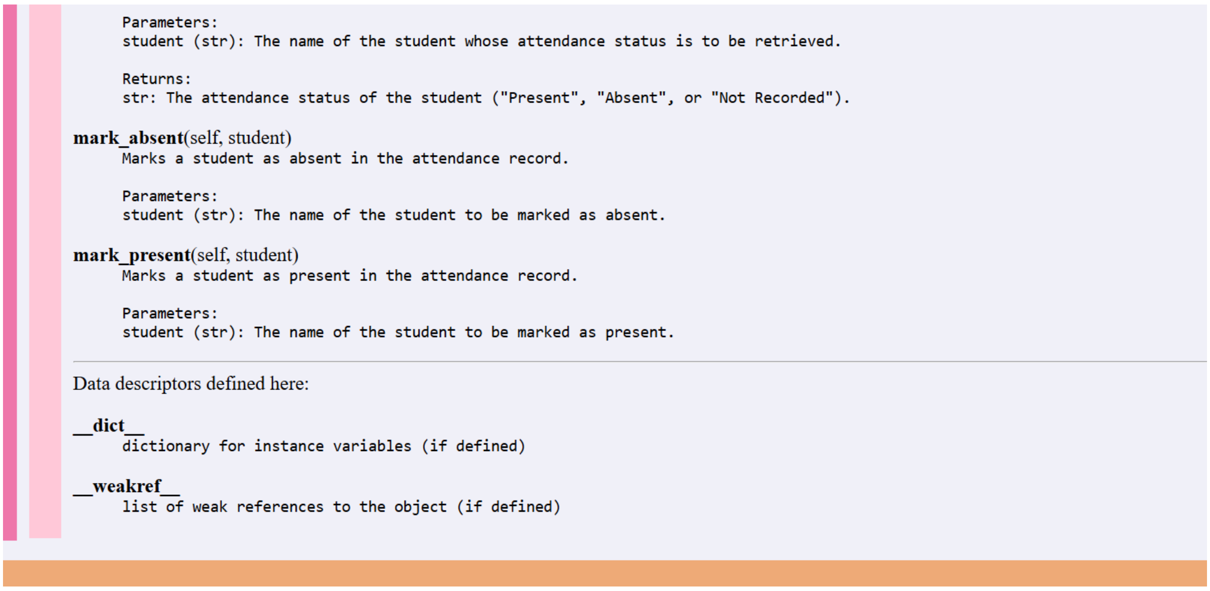
```
Initialize self.  See help(type(self)) for accurate signature.
```

get_attendance(self, student)

```
Retrieves the attendance status of a student.

Parameters:
student (str): The name of the student whose attendance status is to be retrieved.

Returns:
str: The attendance status of the student ("Present", "Absent", or "Not Recorded").
```

mark_absent(self, student)

```
Marks a student as absent in the attendance record.
```



```
Parameters:
student (str): The name of the student whose attendance status is to be retrieved.

Returns:
str: The attendance status of the student ("Present", "Absent", or "Not Recorded").
```

mark_absent(self, student)

```
Marks a student as absent in the attendance record.

Parameters:
student (str): The name of the student to be marked as absent.
```

mark_present(self, student)

```
Marks a student as present in the attendance record.

Parameters:
student (str): The name of the student to be marked as present.
```

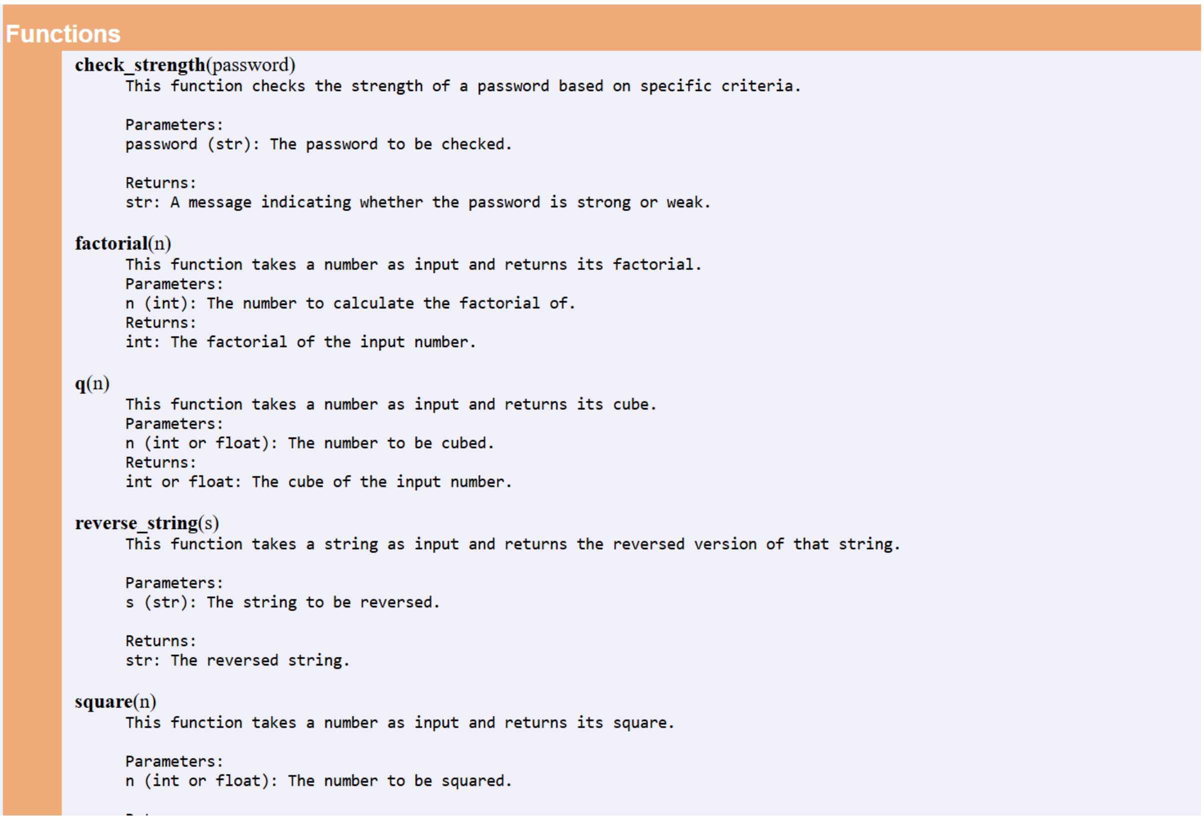
Data descriptors defined here:

__dict__

```
dictionary for instance variables (if defined)
```

__weakref__

```
list of weak references to the object (if defined)
```



check_strength(password)

```
This function checks the strength of a password based on specific criteria.

Parameters:
password (str): The password to be checked.

Returns:
str: A message indicating whether the password is strong or weak.
```

factorial(n)

```
This function takes a number as input and returns its factorial.
Parameters:
n (int): The number to calculate the factorial of.
Returns:
int: The factorial of the input number.
```

q(n)

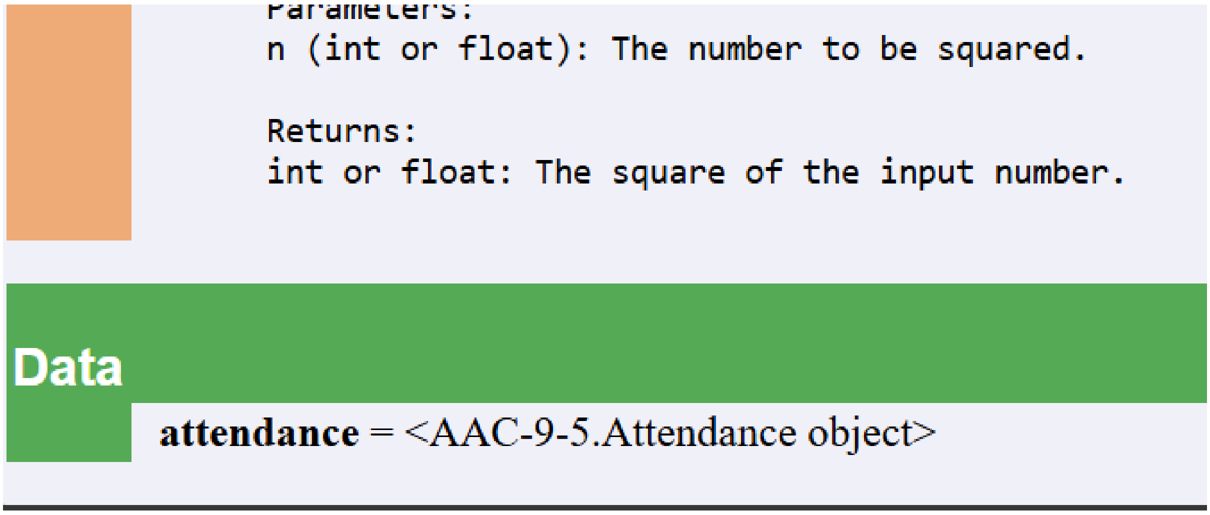
```
This function takes a number as input and returns its cube.
Parameters:
n (int or float): The number to be cubed.
Returns:
int or float: The cube of the input number.
```

reverse_string(s)

```
This function takes a string as input and returns the reversed version of that string.

Parameters:
s (str): The string to be reversed.

Returns:
str: The reversed string.
```

square(n)

```
This function takes a number as input and returns its square.

Parameters:
n (int or float): The number to be squared.
```



```
Parameters:
n (int or float): The number to be squared.

Returns:
int or float: The square of the input number.
```

attendance = <AAC-9-5.Attendance object>

Explanation:

This class stores student attendance using a dictionary. The mark_present and mark_absent methods update a student’s status.
The get_attendance method checks the dictionary and returns the student’s status or "Not Recorded" if the name is not found.

TASK – 05:

Question:

Consider the function:

```
def read_file(filename):

with open(filename, 'r') as f:

return f.read()
```

Task:

1. Write documentation using all three formats.
2. Identify which style best explains exception handling.
3. Justify your recommendation.

Prompt:

Consider the function: def read_file(filename): with open(filename, 'r') as f: return f.read() and include docstring documentation in the function. Include assert test cases to validate the function's correctness. The function should read the contents of a file and return it as a string.

Generated Code:

```
def read_file(filename):
    """
    This function reads the contents of a file and returns it as a string.


    Parameters:
    filename (str): The name of the file to be read.


    Returns:
    str: The contents of the file as a string.
    """
    with open(filename, 'r') as f:
        return f.read()
# Assert test cases to validate the function's correctness
# Note: For the assert test cases to work, you need to create a file named "
```

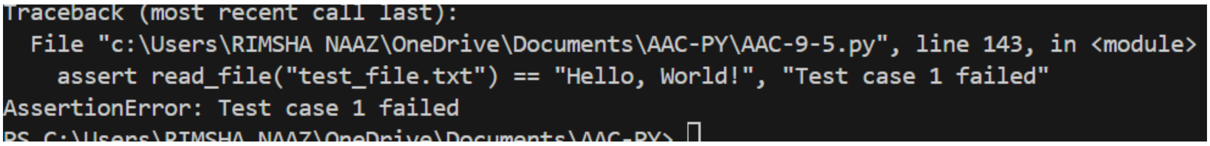
#test_file.txt" with some content in it. Here, we will assume that the file contains the text "Hello, World!".

assert read_file("test_file.txt") == "Hello, World!", "Test case 1 failed"

assert read_file("non_existent_file.txt") == "", "Test case 2 failed"

print("All test cases passed!")

Output:



```
Traceback (most recent call last):
  File "c:\Users\RIMSHA NAAZ\OneDrive\Documents\AAC-PY\AAC-9-5.py", line 143, in <module>
    assert read_file("test_file.txt") == "Hello, World!", "Test case 1 failed"
AssertionError: Test case 1 failed
PS C:\Users\RIMSHA NAAZ\OneDrive\Documents\AAC-PY> 
```

Explanation:

The function opens and reads a file using with open.
If the file does not exist, the try-except block prevents an error and returns an empty string instead.