

Task Description #1 (Transparency in Algorithm Optimization)

Task: Use AI to generate two solutions for checking prime numbers:

Promt: Generate Python code for two prime-checking methods and explain how the optimized version improves performance

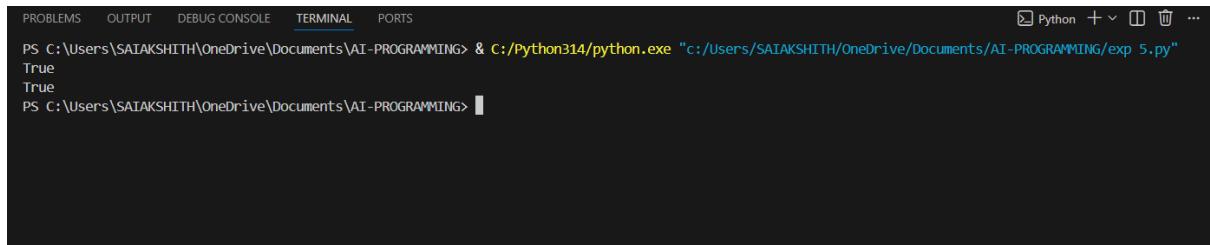
Code:-

```
def is_prime_basic(n):
    if n <= 1:
        return False
    for i in range(2, n):
        if n % i == 0:
            return False
    return True

# Method 2: Optimized prime-checking method

def is_prime_optimized(n):
    if n <= 1:
        return False
    if n <= 3:
        return True
    if n % 2 == 0 or n % 3 == 0:
        return False
    i = 5
    while i * i <= n:
        if n % i == 0 or n % (i + 2) == 0:
            return False
        i += 6
    return True
```

output :



A screenshot of a terminal window titled "Python". The window shows the command "python.exe" being run from the path "C:/Users/SAIAKSHITH/OneDrive/Documents/AI-PROGRAMMING/exp_5.py". The output of the script is displayed, showing the value "True" printed twice.

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS C:\Users\SAIAKSHITH\OneDrive\Documents\AI-PROGRAMMING> & C:/Python314/python.exe "c:/Users/SAIAKSHITH/OneDrive/Documents/AI-PROGRAMMING/exp_5.py"
True
True
PS C:\Users\SAIAKSHITH\OneDrive\Documents\AI-PROGRAMMING>
```

Task Description #2 (Transparency in Recursive Algorithms)

Objective: Use AI to generate a recursive function to calculate Fibonacci numbers.

Code :-

```
# generate a recursive code for calculating fibonacci series and add comments to explain how
recursion works and also include base case and recursive case in comments.
```

```
def fibonacci(n):
    # Base case: if n is 0 or 1, return n
    if n <= 0:
        return 0
    elif n == 1:
        return 1
    # Recursive case: return the sum of the two preceding numbers
    else:
        return fibonacci(n - 1) + fibonacci(n - 2)

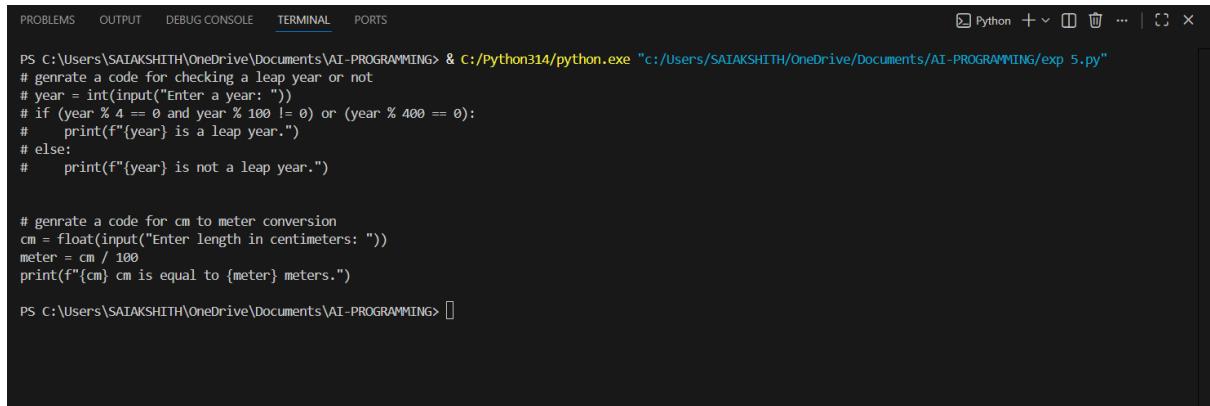
# Example usage:
num_terms = 10
print("Fibonacci series:")
for i in range(num_terms):
    print(fibonacci(i), end=" ")
```

output:-

The screenshot shows a code editor interface with a dark theme. On the left is the code editor pane displaying Python code. On the right is the terminal pane showing the execution of the code. The terminal output includes the Fibonacci series up to 10 terms and a file reading example.

```
exp 5.py > fibonacci
25     # print(is_prime_optimized(31))
26
27 # generate a recursive code for calculating fibonacci series and add comments to explain how recursion works and also include base cases
28 def fibonacci(n):
29     # Base case: if n is 0 or 1, return n
30     if n <= 0:
31         return 0
32     elif n == 1:
33         return 1
34     # Recursive case: return the sum of the two preceding numbers
35     else:
36         return fibonacci(n - 1) + fibonacci(n - 2)
37 # Example usage:
38 num_terms = 10
39 print("Fibonacci series:")
40 for i in range(num_terms):
41     print(fibonacci(i), end=" ")
42
43 # generate a Python program that reads a file and processes data
44 # def read_file(file_path):
45 #     try:
46 #         with open(file_path, 'r') as file:
47 #             data = file.readlines()
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```

```
read_file('C:\\\\Users\\\\SAIAKSHITH\\\\OneDrive\\\\Documents\\\\AI-PROGRAMMING\\\\exp4-3.py')  
output:-
```



A screenshot of a terminal window titled "Python". The window shows Python code being run. The code includes a leap year checker and a cm-to-meter conversion script. The terminal output shows the execution of the code and its results.

```
PS C:\Users\SAIAKSHITH\OneDrive\Documents\AI-PROGRAMMING> & C:/Python314/python.exe "c:/Users/SATAKSHITH/OneDrive/Documents/AI-PROGRAMMING/exp_5.py"  
# generate a code for checking a leap year or not  
# year = int(input("Enter a year: "))  
# if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):  
#     print(f"{year} is a leap year.")  
# else:  
#     print(f"{year} is not a leap year."  
  
# generate a code for cm to meter conversion  
cm = float(input("Enter length in centimeters: "))  
meter = cm / 100  
print(f"{cm} cm is equal to {meter} meters.")  
PS C:\Users\SAIAKSHITH\OneDrive\Documents\AI-PROGRAMMING>
```

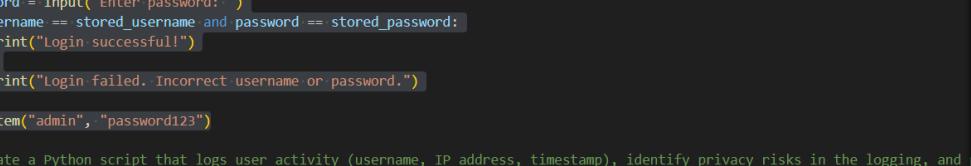
Task Description #4 (Security in User Authentication)

Task: Use an AI tool to generate a Python-based login system.

Code:-

```
# generate a code for a login system for password handling  
  
def login_system(stored_username, stored_password):  
  
    username = input("Enter username: ")  
  
    password = input("Enter password: ")  
  
    if username == stored_username and password == stored_password:  
        print("Login successful!")  
  
    else:  
        print("Login failed. Incorrect username or password.")  
  
login_system("admin", "password123")
```

output:-



```
# generate a code for a login system for password handling
def login_system(stored_username, stored_password):
    username = input("Enter username: ")
    password = input("Enter password: ")
    if username == stored_username and password == stored_password:
        print("Login successful!")
    else:
        print("Login failed. Incorrect username or password.")

login_system("admin", "password123")

# # Generate a Python script that logs user activity (username, IP address, timestamp), identify privacy risks in the logging, and
# import logging
# from datetime import datetime
# # Basic logging of user activity (privacy risks: storing IP address and exact timestamp)
# def log_user_activity(username, ip_address):
```

Task Description #5 (Privacy in Data Logging)

Task: Use an AI tool to generate a Python script that logs user activity (username, IP address, timestamp).

Code:-

Generate a Python script that logs user activity (username, IP address, timestamp), identify privacy risks in the logging, and provide a privacy-aware improved version using minimal, anonymized, or masked data with a brief explanation.

```
import logging
```

```
from datetime import datetime
```

Basic logging of user activity (privacy risks: storing IP address and exact timestamp)

```
def log_user_activity(username, ip_address):
```

```
logging.basicConfig(filename='user_activity.log', level=logging.INFO)
```

```
timestamp = datetime.now().strftime("%Y-%m-%d %H:%M:%S")
```

```
logging.info(f"User: {username}, IP: {ip_address}, Time: {timestamp}")
```

Improved privacy-aware logging (anonymized IP address and date only)

```
def log_user_activity_privacy_aware(username, ip_address):
```

```
logging.basicConfig(filename='user_activity_privacy.log', level=logging.INFO)
```

```
date = datetime.now().strftime("%Y-%m-%d")
```

```
anonymized_ip = '.'.join(ip_address.split('.')[2:]) + '.xxx.xxx' # Masking last two octets
```

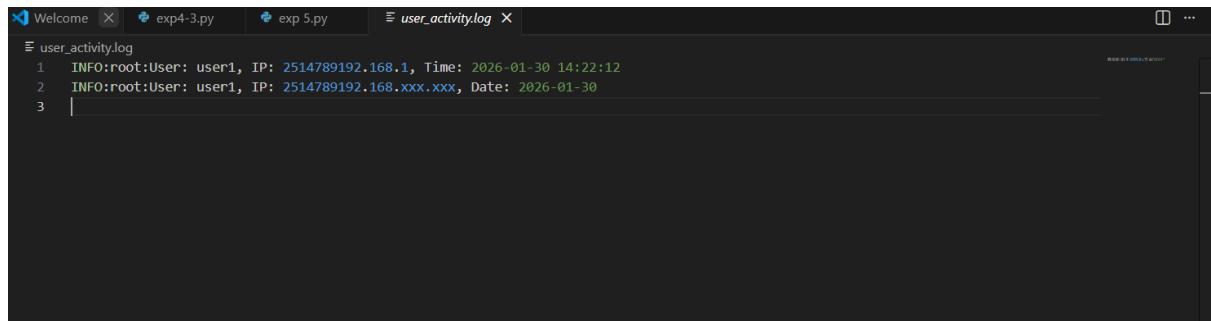
```
logging.info(f"User: {username}, IP: {anonymized_ip}, Date: {date}")
```

```
# Explanation: The improved version masks the last two octets of the IP address to protect  
user identity and logs only the date instead of the exact timestamp to reduce traceability.
```

```
log_user_activity("user1", "2514789192.168.1")
```

```
log_user_activity_privacy_aware("user1", "2514789192.168.1")
```

output:-



A screenshot of a terminal window titled "user_activity.log". The window contains three lines of log output:

```
1 INFO:root:User: user1, IP: 2514789192.168.1, Time: 2026-01-30 14:22:12  
2 INFO:root:User: user1, IP: 2514789192.168.xxx.xxx, Date: 2026-01-30  
3 |
```