**Practical No.:-** 4

**Name:** Sattyam Sagar Chavan, AI&DS-B4 batch, Roll no: 73

**Input :-**

print("Name : Sattyam Sagar Chavan , Class : SE - AI&DS , Batch : B2 , Roll no : 73\n

OUTPUT :\n")

def binary\_search\_recursive(phonebook, name, left, right):

if left > right:

return None

mid = (left + right) // 2

if phonebook[mid][0] == name:

return phonebook[mid]

elif phonebook[mid][0] < name:

return binary\_search\_recursive(phonebook, name, mid + 1, right)

else:

return binary\_search\_recursive(phonebook, name, left, mid - 1)

def binary\_search\_nonrecursive(phonebook, name):

left, right = 0, len(phonebook) - 1

while left <= right:

mid = (left + right) // 2

if phonebook[mid][0] == name:

return phonebook[mid]

elif phonebook[mid][0] < name:

left = mid + 1

else:

right = mid - 1

return None

def insert\_friend(phonebook, name, number):

for i, entry in enumerate(phonebook):

if entry[0] == name:

print(f"{name} is already in the phonebook.")

return

elif entry[0] > name:

phonebook.insert(i, (name, number))

print(f"{name} has been added to the phonebook.")

return

phonebook.append((name, number))

print(f"{name} has been added to the phonebook.")

def main():

phonebook = [] # List of tuples (name, number)

while True:

print("Phonebook Options:")

print("1. Search for a friend (binary search - recursive)")

print("2. Search for a friend (binary search - non-recursive)")

print("3. Insert a friend")

print("4. Exit")

choice = int(input("Enter your choice: "))

if choice == 1:

name = input("Enter the name to search: ")

result = binary\_search\_recursive(phonebook, name, 0, len(phonebook) - 1)

if result:

print(f"Name: {result[0]}, Number: {result[1]}")

else:

print(f"{name} not found in the phonebook.")

elif choice == 2:

name = input("Enter the name to search: ")

result = binary\_search\_nonrecursive(phonebook, name)

if result:

print(f"Name: {result[0]}, Number: {result[1]}")

else:

print(f"{name} not found in the phonebook.")

elif choice == 3:

name = input("Enter the name to insert: ")

number = input("Enter the number: ")

insert\_friend(phonebook, name, number)

elif choice == 4:

break

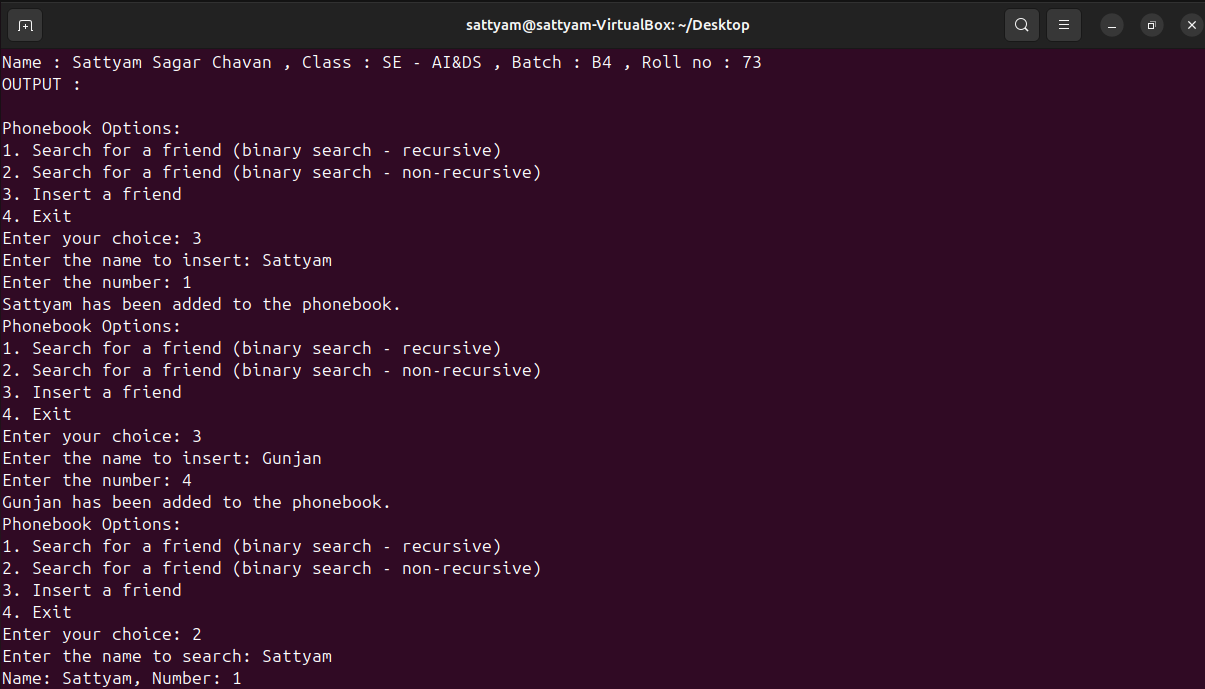
else:

print("Invalid choice. Please enter a valid option.")

if \_\_name\_\_ == "\_\_main\_\_":

main()

**Output :**

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