UNIVERSITY OF KARACHI, DEPARTMENT OF COMPUTER SCIENCE

Artificial Intelligence in Software Engineering (CSSE-509)

ASSIGNMENT FILE

Name	Kamran Iqbal
Seat no	B22110106033
Course Title	Artificial Intelligence in S.E
Course Code	CSSE-509
Course In-charge	Dr. Humera Bashir

```python
# # EXERCISE 1:

# (I) Cabinets and Boxes are objects that are mostly in cubic shape. Make a program that takes
# inputs like height, width and depth from user and then calculate volume of the cube:
# volume = height * width * depth

def categorize_volume(volume):
    if 1 <= volume <= 10:
        return "Extra Small"
    elif 11 <= volume <= 25:
        return "Small"
    elif 26 <= volume <= 75:
        return "Medium"
    elif 76 <= volume <= 100:
        return "Large"
    elif 101 <= volume <= 250:
        return "Extra Large"
    else:
        return "Extra-Extra Large"

def main():
    try:
        height = float(input("Enter height (cm): "))
        width = float(input("Enter width (cm): "))
        depth = float(input("Enter depth (cm): "))

        volume = height * width * depth
        label = categorize_volume(volume)

        print(f"Volume: {volume} cm³")
        print(f"Category: {label}")
    except ValueError:
        print("Invalid input. Please enter numeric values.")

if __name__ == "__main__":
    main()



# (II) In a company ,worker efficiency is determined on the basis of the time required for a worker
# to complete a particular job.If the time taken by the worker is between 2-3 hours then the worker
# is said to be highly efficient. If the time required by the worker is between 3-4hours,then the worker
# is ordered to improve speed. If the time taken is between 4-5 hours ,the worker is given training to
# improve his speed ,and if the time taken by the worker is more than 5 hours ,then the worker haas
# to leave the company, If the time taken by the worker is input through the keyboard,find the
# efficiency of the worker.

def evaluate_efficiency(time_taken):
    if 2 <= time_taken < 3:
        return "Highly Efficient"
    elif 3 <= time_taken < 4:
        return "Improve Speed"
    elif 4 <= time_taken < 5:
        return "Training Required"
    else:
        return "Worker must leave the company"

if __name__ == "__main__":
    time_taken = float(input("Enter time taken (hours): "))
    efficiency = evaluate_efficiency(time_taken)
    print(f"Efficiency: {efficiency}")



# (iii) The program must prompt the user for a username and password. The program should
# compare the password given by the user to a known password. If the password matches, the
# program should display “Welcome!” If it doesn’t match, the program should display “I don’t
# know you.
```

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def authenticate_user():

    username = input("Enter your username: ")
    password = input("Enter your password: ").strip()

    if password.lower() == "abc$123".lower() :
        print("Welcome!")
    else:
        print("I don't know you.")

if __name__ == "__main__":
    authenticate_user()
```

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## EXERCISE 2:

# (i) What Would Python Print?
n = 3
while n >= 0:
    n -= 1
    print(n)

# Output:
# 2
# 1
# 0
# -1

# (ii) What Would Python Print? (Infinite Loop Example)
n = 4
while n > 0:
    n += 1  # This causes an infinite loop as n keeps increasing
    print(n)


# (I) Try the scenrio below:

# Make a program that lists the countries in the set

clist = ['Canada', 'USA', 'Mexico', 'Australia']
for country in clist:
    print(country)

# 1. Create a loop that counts from 0 to 100
for i in range(101):
    print(i)

# 2. Make a multiplication table using a loop
num = int(input("Enter a number for multiplication table: "))
for i in range(1, 11):
    print(f"{num} x {i} = {num * i}")

# 3. Output the numbers 1 to 10 backwards using a loop
for i in range(10, 0, -1):
    print(i)

# 4. Create a loop that counts all even numbers to 10
for i in range(0, 11, 2):
    print(i)

# 5. Create a loop that sums the numbers from 100 to 200
total = sum(range(100, 201))
print("Sum of numbers from 100 to 200:", total)


# (II) Try the exercise below:

# (1) Make a program that lists the countries in the set below using a while loop.

clist = ["Canada", "USA", "Mexico"]
i = 0
while i < len(clist):
    print(clist[i])
    i += 1

# (2) Difference between while loop and for loop
# - A while loop runs as long as a condition is true, useful when the number of iterations is unknown.
# - A for loop iterates over a sequence (e.g., list, range), useful when the number of iterations is known.

# (3) Can you sum numbers in a while loop?
sum_total = 0
n = 1
while n <= 10:
    sum_total += n
    n += 1
```

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print("Sum of numbers from 1 to 10:", sum_total)

# (4) Can a for loop be used inside a while loop?
count = 0
while count < 2:
    for i in range(1, 4):
        print(f"Iteration {i} inside while loop cycle {count+1}")
    count += 1
```