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LAB#03 – ALL TASKS COMBINED

SERVER.PY

```
import socket as sock
import threading

grading_schema = [
    (90, "A+", 4.00),
    (86, "A", 4.00),
    (82, "A-", 3.67),
    (78, "B+", 3.33),
    (74, "B", 3.00),
    (70, "B-", 2.67),
    (66, "C+", 2.33),
    (62, "C", 2.00),
    (58, "C-", 1.67),
    (54, "D+", 1.33),
    (50, "D", 1.00),
    (0, "F", 0.00),
]

def calculate_grade(marks):
    for threshold, grade, gpa in grading_schema:
        if marks >= threshold:
            return grade, gpa
    return "F", 0.0

def handle_client(conn, addr):
    conn.sendall(b"Welcome to FAST-NUCES Karachi Campus CGPA Calculator!\n")
    student_id = conn.recv(1024).decode().strip()
    conn.sendall(b"Enter number of subjects: ")
    num_subjects = int(conn.recv(1024).decode().strip())

    total_points, total_credits = 0, 0
    results = []

    for i in range(num_subjects):
        conn.sendall(f"Subject {i+1} - Enter credit hours: ".encode())
        ch = int(conn.recv(1024).decode().strip())
        conn.sendall(f"Subject {i+1} - Enter marks (out of 100): ".encode())
        marks = int(conn.recv(1024).decode().strip())
        grade, gpa = calculate_grade(marks)
        total_points += gpa * ch
        total_credits += ch
        results.append((ch, marks, grade, gpa))

    cgpa = total_points / total_credits if total_credits > 0 else 0.0
```

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```
    response = f"\nStudent ID: {student_id}\n"
    for idx, (ch, marks, grade, gpa) in enumerate(results, 1):
        response += f"Subject {idx}: Credit Hours={ch}, Marks={marks},
Grade={grade}, GPA={gpa}\n"
    response += f"Overall CGPA: {cgpa:.2f}\n"
    conn.sendall(response.encode())

    with open("cgpa_log.txt", "a") as f:
        f.write(response + "\n")

    conn.close()

def start_server():
    server = sock.socket(sock.AF_INET, sock.SOCK_STREAM)
    server.bind(("127.0.0.1", 5555))
    server.listen(5)
    print("Server running on 127.0.0.1:5555")

    while True:
        conn, addr = server.accept()
        threading.Thread(target=handle_client, args=(conn, addr)).start()

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

CLIENT.PY

```
import socket as sock

def run_client():
    client = sock.socket(sock.AF_INET, sock.SOCK_STREAM)
    client.connect(("127.0.0.1", 5555))

    print(client.recv(1024).decode(), end="")

    student_id = input("Enter your Student ID: ")
    client.sendall(student_id.encode())

    print(client.recv(1024).decode(), end="")
    num_subjects = input()
    client.sendall(num_subjects.encode())

    for _ in range(int(num_subjects)):
        print(client.recv(1024).decode(), end="")
        ch = input()
        client.sendall(ch.encode())

        print(client.recv(1024).decode(), end="")
```

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```
        marks = input()
        client.sendall(marks.encode())

    print("\n--- Reslt ---")
    print(client.recv(4096).decode())

    client.close()

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

OUTPUT

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS        powershell

PS C:\Users\Bira\Documents\CN Lab> py client.py
Welcome to FAST-NUCES Karachi Campus CGPA Calculator!
Enter your Student ID: 23K-0914
Enter number of subjects: 4
Subject 1 - Enter credit hours: 3
Subject 1 - Enter marks (out of 100): 90
Subject 2 - Enter credit hours: 2
Subject 2 - Enter marks (out of 100): 84
Subject 3 - Enter credit hours: 1
Subject 3 - Enter marks (out of 100): 86
Subject 4 - Enter credit hours: 3
Subject 4 - Enter marks (out of 100): 79

--- Reslt ---

Student ID: 23K-0914
Subject 1: Credit Hours=3, Marks=90, Grade=A+, GPA=4.0
Subject 2: Credit Hours=2, Marks=84, Grade=A-, GPA=3.7
Subject 3: Credit Hours=1, Marks=86, Grade=A, GPA=4.0
Subject 4: Credit Hours=3, Marks=79, Grade=B+, GPA=3.3
Overall CGPA: 3.70

PS C:\Users\Bira\Documents\CN Lab>
```