Sultan Qaboos University
College of Science - Department of Computer Science
COMP3502: Computer Networks
Project: TCP Socket Programming
(Due on April 26, 2023)

1. Instructions:

- This is a group project of three students in each group.
- Name your folder with Project_xxxxxx_yyyyyy_zzzzzz.pdf, where xxxxxx, yyyyyy and zzzzzz are the SQU IDs of the group members.
- Submit your solution in the given link in Moodle on or before the due date.

2. Tasks:

1. A collision domain can be defined as a part of a network where packet collisions can occur. Hub device doesn't isolate collision domains whereas switch, bridge and router isolate collision domains. With the help of the Cisco Packet Tracer illustrate and explain the above concept for both hub and switch.

   Basically, you need to design and configure a small network using hub and demonstrate that hub doesn't isolate collision domains. Then, replace the hub with the switch and show that it isolates collision domain.

   In the report, you need to describe your design and IP configuration of your network in the design section. Support your description with screen shots of the design from packet tracer. In the testing section, explain the scenarios you used to demonstrate collision domains. Finally, in the conclusion, summarize what you learn from this task.

   You need also to submit a demo of not exceeding 10 minutes to explain your design as well as simulation for both hub and switch.

2. Develop a client server socket program using python to perform the following. The client sends a string to the server. Then, the server checks whether that string is palindrome or not and responds to the client with an appropriate message. The client displays the string and whether it is palindrome or not in the screen. In the same connection, the client can send multiple strings for checking. Once the client decides to quit, it sends an appropriate message to the server and upon which the connection is disconnected. The server should be able to accept multiple connections simultaneously.

You need to write a report for the solution. The report should include Introduction, Design and Implementation, Testing (testing multiple connections and with different number of strings sent) and

Conclusion. You need also to submit a demo of not exceeding 10 minutes to explain your idea and code as well as showing a sample run for the program with multiple connections.

Note: Each group member should participate in at least one demo.

Grading Scheme:

Criteria	Mark
Task 1	
1. Report (Provide screenshots wherever needed)	**5**
Introduction	0.5
Analysis & Design (Support your report with screenshots from Packet Tracer)	
1- Design and IP Configuration of network _ Hub case	1
2- Design and IP Configuration of same network _ Switch case	1
Testing (a scenario using hub + the same scenario but using switch, Provide screenshots of the result)	2
Conclusion	0.5
2. Packet Tracer	**4**
Design and IP Configuration of network _ Hub case	2
Design and IP Configuration of same network _ Switch case	2
3. Demo	**6**
Demonstrate collision domain _ Hub case	2
Demonstrate collision domain _ Switch case	2
Summarize the results	1.5
Demo not exceeding time limit	0.5
Task 2	
1. Report (Provide screenshots wherever needed)	**4**
Introduction	0.5
Design & Implementation (with screen shots)	2
Testing (sample run)	1
Conclusion	0.5
2. Python Code	**5**
Client	2
Server (must accept multiple connections)	3
3. Demo	**6**
Code Explanation	3
Sample run	2.5
Demo not exceeding time limit	0.5