ITL355: Computer Networks Lab
Semester Project Submission 2

March 27, 2025

Project: Develop a network simulator implementing entire protocol stack.

Note: This is an open ended assignment where you're free to choose any programming language, input/output representation, formats, etc., but all these should be specified in a proper **specification document** which should be **regularly** updated with each submission. **Maximum group of three (3) students allowed.**

Submission 2 objective: Implement Network layer functionalities.

- **Minimum deliverables:** Your simulator should be at least capable of

  - Creating and configuring a router
  - Assigning well formatted classless IPV4 address to the devices
  - Using ARP to find the MAC address of a host within a network
  - Performing static routing
  - Implementing RIP or OSPF protocols for dynamic routing

  Note that the routing tables should be based on *longest mask matching*. Also, you can use available codes for shortest-path problem in routing, however any such source should be properly cited in your report.

- **Test cases:** You can check your simulator's working by developing test cases on your own which show the working of each of the deliverables discussed before.

Do not make your simulator modular by giving options press 1 for the physical layer, 2 for the data link, and so on. It should act like a real simulator and run all functions of different layers in parallel. Layer functionalities can be demonstrated by printing logs of function outputs of each layer.

Possible add ons: You can make add ons like enabling both classful and classless addressing, IPV6 compatible addressing, sending data as proper IPV4

datagrams, enabling address aggregation, implementing all RIP, OSPF, BGP and EIGRP protocols and many more *depending on where your creative thinking and coding capability can reach.*

Submission deadline: 12 May 2025 via Gradescope.