NED University of Engineering and Technology
Department of Computer Science and Information Technology
Fall 2025 – Second Year Computer Science

CT159 – Data Structures Algorithms & Application

Assignment # 2
Due Date: Thursday, Nov 13 2025 by 16:00 Hours

Instructions (Read carefully)

- **Handwritten solution** on a A4 size paper to be submitted before due date
- Answer questions in the SAME sequence as the questions are given, no need to copy questions
- In case of more than one sheet of paper, each to be numbered and all should be stapled before submission
- First sheet should have your name, roll number, and assignment number clearly mentioned on top
- Late submission would be penalized

Question 1: What is a red-black tree, and what are its key properties? Explain how these properties ensure that the tree remains balanced, and describe the basic operations of insertion and deletion in a red-black tree.

Answer must include:

- Brief answer explaining the concept of red-black tree.

Question 2: Explain the concept of a Priority Queue and describe how it differs from a regular queue. Also describe how a Binary Heap is used to implement a Priority Queue.

Answer must include:

- Brief answer explaining the concept of Priority Queue.