MTH 307: Programming and Data Structures

Homework VI

(Due 20/04)

Write `C` programs for the following:

1. Declaring a structure tag named `complex` with two arguments `real` and `imaginary` of type `double`.

    (a) Then passing a variable of `complex` type into functions for calculating and returning the inverse, modulus, and conjugate of a complex number.

    (b) Then passing two variables of `complex` type into functions for adding, subtracting, multiplying, and dividing two complex numbers, and then returning resulting complex number of `complex` type.

2. Declaring a structure tag named `fraction` with two arguments `numerator` and `denominator` of type `long`.

    (a) Then passing a variable of `fraction` type into a function for calculating and returning the resulting fraction in reduced form.

    (b) Then passing two variables of `fraction` type into functions for adding, subtracting, multiplying, and dividing two fractions, and then return resulting fraction of `fraction` type in the reduced form.

3. Implementing the following abstract data structures:

    (a) `stack`,

    (b) `queue`,

    (c) `priority-queue`, and

    (d) `dequeue`.

    Note that the programs should feature separate functions for insertion, deletion, and printing.

4. Implementing the binary and Fibonacci search algorithms.