

CS261: Exam 2 – Group 1

Problem 1: Remove All Bag – 40 points

Complete the C functions for removing all elements with a given value from Bag, where Bag is implemented as a doubly linked list. Input arguments of the function include the pointer to Bag, and a value to be removed. In the skeleton code, the function `removeAllBag()` calls two other functions `containsBag()` and `_removeDLink()` that are not implemented; therefore, your task is to complete `containsBag()` and `_removeDLink()`.

Problem 2: Count Distinct Bag – 60 points

Complete the C function for computing the total number of distinct values of elements in Bag, where Bag is implemented as a doubly linked list. Many elements in Bag may have the same value, but you are supposed to count only once that value. For example, the total number of distinct values in $\text{Bag}=\{2, 2, 3, 4, 4, 4\}$ is 3. An input argument of the function is the pointer to Bag, and the function returns the total number of distinct values in Bag. An important condition is that after returning from the function no new memory is occupied (i.e., if your solution allocates memory for a new data structure, then the old one must be removed from memory).