

CISC-235 Data Structures

Assignment 1.1

January 10, 2019

1 Problem Context: ADT Bag

In class, we defined an Abstract Data Type called “Bag”. A bag is a container for a group of data items. It has two main features:

- 1) The positions of the data items don’t matter.
- 2) The items do not need to be unique (unlike a set).

The Bag ADT also defines six operations applied on the data stored in the bag:

- 1) `add(item)`: add item to the Bag
- 2) `remove(item)`: remove one occurrence of item (if any) from the Bag.
- 3) `contains(item)`: check if item is in the Bag.
- 4) `numItems()`: get the number of items in the Bag
- 5) `grab()`: get an item at random, without removing it.
- 6) `__str__()`: get a string representing the current contents of the bag.

2 Assignment Requirements

Your assignment is to create a class in Python/Java/C++ to implement the details of the six operations defined in Section 1 and write a test to demonstrate the correctness of your function. For instance, to demonstrate that your `add(item)` is correct, you need to print the data items in the bag before and after running this function. You are **only allowed** to use the build-in libraries and modules provided by Python/Java/C++. Your test code should be put in a main function.

If you are writing Python code, you must put your test code inside a main function:

```
def main():  
    [your test code]  
  
if __name__ == '__main__':  
    main()
```

Deadline: By the end of next Wednesday (Jan-16,2019)

Where to submit: OnQ

What to submit: You should upload your runnable source code (one file containing Bag ADT implementation and test code). I don't need extra document as we are not doing any algorithm analysis for this task.