Solution Plan Assignment Hat

* Deadline : 26 February 2016
* Topics involved: implementing a generic data structure;
* analyzing the theoretical complexity of algorithms;
* validating the complexity of your algorithms in running time experiments.

StackOverflow: allowed reference

gitHub: allowed reference

email the teacher about question you cannot find on stack overflow:

book: specific code reference should be given

## Hat

A hat is a data structure that can be used to retrieve random elements. For instance, it can be used to draw names. It supports the following API:

Public class Hat<Item>

Hat() *create a new empty hat*

boolean isEmpty() *is the hat empty?*

int size() *number of items in the hat*

void add(Item item) *add an item to the hat*

Item draw() *delete a random item from the hat and return it*

#### Example usage:

## To an initially empty hat you add a number of to strings, representing the names of the people in the room. You draw the names of the people who have to do the chores today.

## Hat<String> people = new Hat<String>(); people.add(“Joe”); people.add(“Kate”); people.add(“Mo”); people.add(“Katya”);

## StdOut.println(“Washing dishes: “+people.draw()); StdOut.println(“Vacuuming: “+people.draw());

## Task

## Code written in Java

## implements several methods look in in Cornell Java book.

1. Implement the class Hat(How to implement a class). Create reasonably efficient implementations of the required methods(Reasonably efficient method list of implementing elements).
2. Create a simple test client to test your implementations(How to create a test client in order to implement a class).
3. Determine the average case time complexity of each of the methods(How to determine average case time complexity of each of the methods?). If this is too hard use the worst-case complexity as an upper-bound(Use worst case complexity example ).
4. Use doubling ratio experiments to verify the time complexity of your implementation.

Describe your work in a report and add your code as an appendix. The report should be no longer than 5 pages including appendices. Make sure the report contains all elements of a good report and is readable for people who do not know the assignment.