	King Saud University			College of Computer and Information Sciences		
				Department of Computer Science		
	Data Structui	res CSC 212		Midterm Exam - Spri	ng 2019	
	Date: ——			Duration: 90 minutes		
Guidelin	es					
•No calc	ulators or any	other electron	nic devices are a	allowed in this exam.		
Student	ID:			Name:		
Section:				Instructor:		
1	2	3.1	3.2	Total		
Show	the content o	f the data stru	ucture(s) after	parsing each operation +	-	
>		-	+	#	&&	

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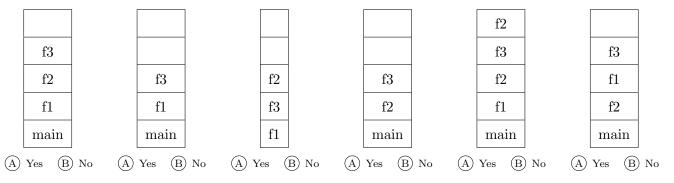
2. Trace the execution of the following expression: ((4+2)/(7%4)) + 2 - (5*2+(6/3)) + 2. Draw the content of the data structure(s) after parsing each operation.

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3. Consider the following code:

```
public static void f1(int n) {
 n++;
 f3(n);
 f2(n);
 f3(n); }
public static void f2(int n) {
 f3(n);
 n++;
 f3(n); }
public static void f3(int n) {
 System.out.println(n); }
public static void main(String[] args) {
 int n = 3;
 f2(n);
 n++;
 f1(n); }
```

For each snapshot of the call stack below, indicate if it is valid for this code.



We want to write an algorithm that takes as input a text, finds all the words that appear in it and prints them in random order without repetition.

Example 2. If the input text is "dogs hate cats and cats also hate dogs", a possible output is: hate, cats, dogs, and, also. Notice that there are no repetitions.

To achieve this, we will use a data structure that supports the following interface:

1. Write the class ArrayRandomSet which implements the interface RandomSet using array storage.

Remark 1. To get a random number in Java use the following:

import java.util.Random;
Random rnd = new Random();
int $n = 5;$
int $k = rnd.nextInt(n)$; // returns a random number between 0 and $n-1$

2. Write the method public static <t> boolean find(RandomSet<t> s, T e), which returns true if e exists in</t></t>
s, false otherwise.