

Computer Science 145

Exam 2—Fall 2011

Name: _____

Problem	Score	Possible
1		12
2		8
3		12
4		8
Total		40

This is a closed-book, no-calculator, no-electronic-devices, individual-effort exam. You may reference one page of handwritten notes. All answers should be clearly written. Questions that require code should be written using correct Java syntax. Please do all your work on these pages. Partial credit will be given if work is shown and is partially correct. You may write `SOP` to represent `System.out.println`.

Class	Method/Constructor	Description
Scanner	<code>Scanner(System.in)</code>	create <code>Scanner</code> for parsing <code>System.in</code>
	<code>Scanner(String text)</code>	create <code>Scanner</code> for parsing <code>text</code>
	<code>String next()</code>	get next delimited word
	<code>double nextDouble()</code>	get next delimited double
	<code>boolean nextBoolean()</code>	get next delimited boolean
	<code>int nextInt()</code>	get next delimited integer
String	<code>int length()</code>	get number of characters
	<code>char charAt(int i)</code>	get the character at index <code>i</code>
	<code>boolean endsWith(String other)</code>	return true if this <code>String</code> ends with <code>other</code>
	<code>boolean startsWith(String other)</code>	return true if this <code>String</code> starts with <code>other</code>
Random	<code>Random()</code>	create a random number generator.
	<code>nextInt(int i)</code>	get a random number between 0 and <code>i - 1</code> , inclusive.
	<code>nextDouble()</code>	get a random number between 0.0 and 1.0.

1. *Tabulae Vero*

Suppose a , b , and c are boolean variables. For each row in the tables below, suppose these variables had the values listed in the row and evaluate the expression in the rightmost column accordingly. Write T if the expression evaluates to **true**; write F otherwise. You may optionally use the other columns to evaluate subexpressions.

(a)

a	b		$a \ \ !b$
true	true		
false	true		
true	false		
false	false		

(b)

a	b	c			$!a \ \&\& \ (b \ \ c)$
true	true	true			
false	true	true			
true	false	true			
false	false	true			
true	true	false			
false	true	false			
true	false	false			
false	false	false			

2. In Your Element

For the following problems, show the contents of an array after the code is executed. Each box corresponds to one element of the array, with the leftmost box having index 0.

(a)

```
int[] multiples = new int[10];
for (int i = 0; i < multiples.length; i++) {
    multiples[i] = 10 * i;
}
```

What are the contents of `multiples`?

0	1	2	3	4	5	6	7	8	9

(b)

```
String cardnumber = "2343111198763434";
char[] bleeped = new char[cardnumber.length()];
for (int i = 0; i < bleeped.length / 2; i++) {
    bleeped[i] = '*';
}
for (int i = bleeped.length / 2; i < bleeped.length; ++i) {
    bleeped[i] = cardnumber.charAt(i);
}
}
```

What are the contents of `bleeped`?

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

(c)

```
String[] snowball = new String[4];
snowball[0] = ":)";
for (int i = 1; i < snowball.length; i++) {
    snowball[i] = snowball[i - 1] + snowball[i - 1];
}
}
```

What are the contents of `snowball`?

0	1	2	3

3. *Out of Your Element*

Suppose you have an `int` array named `nums`, which has already been declared and allocated so that it has a size corresponding to the number of cells you see in the following questions. For each question, write a loop that fills `nums` with the values seen in the cells. Use may assign at most one element outside of your loop. Do not wrap your code up in methods.

(a)

0	1	0	1	0	1	0
---	---	---	---	---	---	---

(b)

6	5	4	3	2	1	0
---	---	---	---	---	---	---

(c)

2	4	16	256	65536
---	---	----	-----	-------

Hint: for $i > 0$, element i is the square of the previous element.

4. *My Friend, The End*

Write a method named `countSuffixMatches` that takes as an argument an array of `Strings` and a `String` suffix. It returns as an `int` the number of elements in the array that end with the specified suffix. Assume the array is not `null`. It may, however, contain 0 elements.