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Questions

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subsequences

2/2 points (graded)

```
/* 1 */ public static String subsequences(String word) {
/* 2 */     if (word.isEmpty()) {
/* 3 */         return ""; // base case
/* 4 */     } else {
/* 5 */         char firstLetter = word.charAt(0);
/* 6 */         String restOfWord = word.substring(1);
/* 7 */
/* 8 */         String subsequencesOfRest = subsequences(restOfWord);
/* 9 */
/* 10 */        String result = "";
/* 11 */        for (String subsequence : subsequencesOfRest.split(",", -1)) {
/* 12 */            result += "," + subsequence;
/* 13 */            result += "," + firstLetter + subsequence;
/* 14 */        }
/* 15 */        result = result.substring(1); // remove extra leading comma
/* 16 */        return result;
/* 17 */    }
/* 18 */ }
```

What does subsequences("c") return?

☐ "c"

☐ ""

☒ ",c"

☐ "c,"



Explanation

subsequences("c") first calls subsequences(""), which just returns "".

We then split this empty string on ",", which returns an array of one element, the empty string.

The for loop then iterates over this array and constructs the two ways that subsequences of "c" can be formed (with or without the letter c). It appends each new subsequence to result, starting it with a comma. This means we'll end up with an extra comma at the beginning of result, which we have to remove after the for loop.

- result = "" (after line 10)
- result = "," (after line 12)
- result = ",c" (after line 13)
- result = ",c" (after line 15)

Finally subsequences("c") returns ",c" representing the empty string and the string "c", the two possible subsequences of the one-character string "c".

What does subsequences("gc") return?

☐ "g,c"

☒ ",g,c,gc"

☐ "gc,g,c"

☐ "g,c,gc"



Explanation

subsequences("gc") first calls subsequences("c"), which returns ",c" as we saw in the previous question.

We then split this string on ",", which produces an array of two elements, "" and "c".

The for loop then iterates over this array, producing two new subsequences from each element:

- result = "" (after line 10)
- result = "" (line 12)
- result = ",g" (line 13)
- result = ",g,c" (line 12)
- result = ",g,c,gc" (line 13)
- result = ",g,c,gc" (line 15)

This final result is returned from subsequences("gc").

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