**Discussion 8: Recursion II**

**Mystery Blocks**
What do each of the blocks below do?

1. ____________________________________________________________
2. ____________________________________________________________
3. ____________________________________________________________

**More Practice**
(a) Write a block that reports the index of the first occurrence of a letter in a word. You may assume the letter appears at least once.

```
position of letter (letter) in word (word):
if ________________:
    report ________________
else:
    report ________________
```

(b) Write a block that counts the instances of an item in a list

```
count (item) in (lst):
```
(c) Write a block that finds the max item in a list. You may find the following block useful:

```
maximum item of list: [-1, 5, 0] is 5
```

maximum item in lst:

(d) Write a block that removes items in the first list from the second list. You may find the append block, pictured below, useful.

```
append list: 1 2 3 to list: I say hello (recursive)
```

don’t keep these (lst1) from (lst2):

Fibonacci
The Fibonacci sequence is defined as follows: 1, 1, 2, 3, 5, etc., where each number is the sum of the two previous numbers in the sequence.

(a) Fill in the code below to find the nth Fibonacci number:

```
Fibonacci(n)
if n == 0 or n == 1:
    report 1
if n > 1:
    report nth number in sequence:
else:
    report ...
```
(b) Fill in the recursive tree below representing the call: Fib(4)

```
Fib(4)
  /   \
Fib(_)
  /  \
Fib(_)
  /  \
Fib(____)  Fib(_)
      /  \
returns
```

(c) What is the runtime of Fibonacci? _____________________________