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CSIS 618
Ch. 9 Homework

9.1
a) [5, 2, 4]
b) [4, 5, 5]
c) [4, 5, 5]

9.3
I'll answer these questions using the following non-tail recursive fibonnaci function in OCaml:

```
# let rec fib n =
  if n < 3 then 1
  else fib(n-1) + fib(n-2);;
```

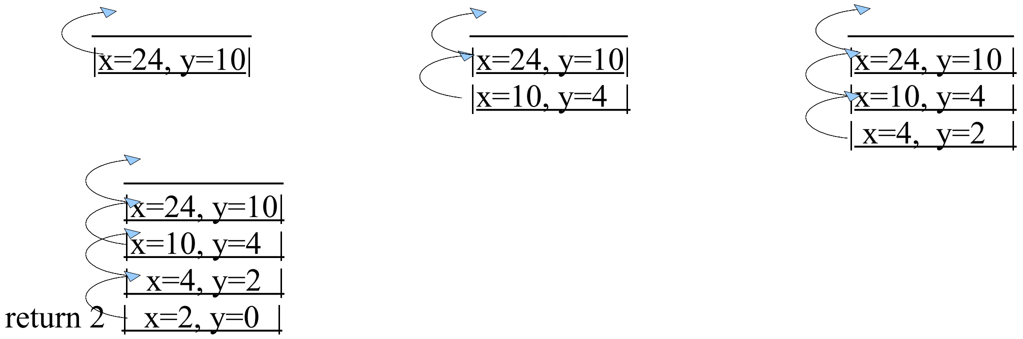
a) In the topmost activation record at the time of the function call, the parameter n is the value of n in the first call to the function. So if the call is fib(9), the parameter n in the topmost activation record is 9. Lower activation records will have values of n upon which the first function call depends.

b) The function to calculate the number of activation records required to determine fib(n) is the fibonnaci function! There are 213 activation records required to calculate fib(13).

c) The OCaml translation of this function is:

```
# let rec gcd (x, y) =
  if (y=0) then x
  else gcd(y, x mod y);;
```

The activation records would look like:



```
|x=24, y=10|

|x=24, y=10|
|x=10, y=4  |

|x=24, y=10 |
|x=10, y=4   |
| x=4,  y=2   |

         |x=24, y=10|
         |x=10, y=4  |
         | x=4, y=2  |
return 2 |  x=2, y=0  |
```