Introduction to Java

Discussion 1: August 31, 2020

1 Our First Java Program

Below is our first Java program of the semester. Next to each line, write out what you think the code will do when run. This exercise is adapted from Head First Java.

```
int size = 27;
    String name = "Fido";
   Dog myDog = new Dog(name, size); New object
    int x = size - 5; x > 2
    if (x < 15) {
        myDog.bark(8);
    }
                       22 ~3 play 19>2
    while (x > 3) {
        x -= 1;
        myDog.play();
10
    }
11
    int[] numList = {2, 4, 6, 8};
12
                                       Hells
    System.out.print("Hello ");
13
   System.out.println("Dog: " + name); Pog: Fido
14
    System.out.println(numList[1]);
    if (numList[3] == 8) {
16
        System.out.println("potato"); ✓ potato
17
   }
18
    For your convenience, here is the same code in Python:
    size = 27
    name = "Fido"
   myDog = Dog(name, size)
   x = size - 5;
    if x < 15:
        myDog.bark(8)
    while x > 3:
        x -= 1
        myDog.play()
    numList = [2, 4, 6, 8]
10
    print("Hello")
    print("Dog: " + name)
12
   print(numList[1])
    if numList[3] == 8:
14
        print("potato")
15
```

2 Mystery

This is a function (a.k.a. method). It takes an array of integers and an integer as arguments, and returns an integer.

```
public static int mystery(int[] inputArray, int k) {
       int x = inputArray[k]; \gamma = \psi
2
                             answer = 2
       int answer = k;
                             index =3
       int index = k + 1;
4
       while (index < inputArray.length) {</pre>
           if (inputArray[index] < x) {</pre>
              x = inputArray[index];
               answer = index;
           }
           index = index + 1;
10
       }
11
       return answer;
12
   (a) What mystery returns if inputArray = [3, 0, 4, 6, 3] and k = 2. ***

(b) Constant
   }
13
   Extra: This is another function. It takes an array of integers and returns nothing.
   public static void mystery2(int[] inputArray) {
       int index = 0;
2
       while (index < inputArray.length) {</pre>
3
           int targetIndex = mystery(inputArray, index);
         Cint temp = inputArray[targetIndex];
                                                         2
           inputArray[targetIndex] = inputArray[index];
         LinputArray[index] = temp;
           index = index + 1;
```

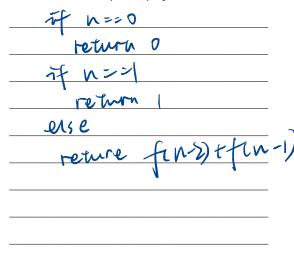
Describe what mystery2 does if inputArray = [3, 0, 4, 6, 3].

3 Writing Your First Program

Implement fib which takes in an integer n and returns the nth Fibonacci number. You may not need to use all the lines.

The Fibonacci sequence is $0, 1, 1, 2, 3, 5, 8, 13, 21, \ldots$

public static int fib(int n) {



Extra: Implement fib in 5 lines or fewer. Your answer must be efficient. You don't have to make use of the parameter k in your solution.

public static int fib2(int n, int k, int f0, int f1) {

return fo:

Selse f

return fibx(n,kt),fi,fotfi);

int n=n
int k=0 // 1/30 + 1/20,
fo=0
fi=1

white (n!=k) {
 temp=fo
 fo=fi
 f. = fi+ temp
k+++;

temp=fo 《ffin·次,》 fo=fi f.=fi+ temp C+f;

3 Faturn fo;

}

}