Lab Quiz 3

Q1

Q1 (25 points): Study the following code to answer the question below

```
class Date(var month: Int, var day: Int) {}


def q1(): Unit = {
 var dateList = List(
   new Date(3, 10),
   new Date(5, 30),
   new Date(8, 14),
   new Date(5, 9),
   new Date(2, 1)
 )

 val comparator: (Date, Date) => Boolean = (a: Date, b: Date) => a.day < b.day

 dateList = dateList.sortWith(comparator)

 println(dateList)
}
```

In what order are the elements of the inventory list printed at the end of the q1() method call?

Q2

Q2 (25 points): Study the following code to answer the question below

```
def f(n: Int): Int = {
 if (n > 20) {
   1
 } else {
   n * f(n+5)
 }
}
```

What is returned by the method call `f(3)`?

Q3

Q3 (25 points): Study the following code to answer the question below

```
def fibonacci(n: Int): Int = {
 if (n == 0) {
   0
 } else if (n == 1) {
   1
 } else {
   fibonacci(n-1) + fibonacci(n-2)
 }
}
```

What is returned by the method call ***fibonacci(7)***?

Q4

Q4 (25 points): Study the following code to answer the question below

```
class Date(var month: Int, var date: Int) {}

def q4(): Int = {
 var myList: LinkedListNode[Date] = new LinkedListNode[Date](
   new Date(1, 1), null
 )
 myList = myList.prepend(new Date(4, 1))
 myList = myList.prepend(new Date(5, 2))
 myList = myList.prepend(new Date(6, 14))
 myList = myList.prepend(new Date(7, 16))
 myList = myList.prepend(new Date(8, 20))

 val doubleMonth: Date => Date = (x: Date) => new Date(x.month*2, x.date)
 myList = myList.map(doubleMonth)

 val validMonth: Date => Int = (x: Date) => {
   if (x.month <= 12 && x.month > 0) {
     1
   } else {
     0
   }
 }

 myList.sumValidDates(validMonth)
}


class LinkedListNode[Date](var value: Date, var next: LinkedListNode[Date]) {

 def sumValidDates(f: Date => Int): Int = {
   if (this.next == null) {
     f(this.value)
   }else{
     f(this.value) + this.next.sumValidDates(f)
   }
 }

 def prepend(a: A): LinkedListNode[A] = {
   new LinkedListNode[A](a, this)
 }

 def map[B](f: A => B): LinkedListNode[B] = {
   val newValue = f(this.value)
   if (this.next == null) {
     new LinkedListNode[B](newValue, null)
```

```
    } else {
      new LinkedListNode[B](newValue, this.next.map(f))
    }
  }

}
```

What does a call to q4() return?