

# Sample Lab Quiz 3

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

```
class SKU(val price: Double, var quantity: Int) {}

object Q1 {

  def q1(): Unit = {
    var inventory = List(
      new SKU(1.0, 2),
      new SKU(4.3, 1),
      new SKU(1, 1),
      new SKU(4, 0),
      new SKU(3, 2),
      new SKU(8, 5)
    )

    val comparator: (SKU, SKU) => Boolean =
      (a: SKU, b: SKU) => a.price * a.quantity > b.price * b.quantity

    inventory = inventory.sortWith(comparator)

    println(inventory)
  }
}
```

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

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

```
object Q2 {  
  
  def f(n: Int): Int = {  
    if (n < 1) {  
      -1  
    } else {  
      n + this.f(n - 2)  
    }  
  }  
}
```

What is returned by the method call `f(5)`?

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

```
object Q3 {  
  
  def f(n: Int): Int = {  
    if (n < 1) {  
      -1  
    } else {  
      n + this.f(n - 2) + f(n - 1)  
    }  
  }  
}
```

What is returned by the method call `f(4)`?

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

```
class SKU(val price: Double, var quantity: Int) {}

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

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

  def foreach(f: A => Unit): Unit = {
    f(this.value)
    if (this.next != null) {
      this.next.foreach(f)
    }
  }

  def foreachInt(f: A => Int): Int = {
    if (this.next == null) {
      f(this.value)
    } else {
      f(this.value) + this.next.foreachInt(f)
    }
  }
}
```

```
object Q4 {

  def q4(): Int = {
    var myList: LinkedListNode[SKU] = new LinkedListNode[SKU](
      new SKU(1.0, 2), null
    )

    myList = myList.prepend(new SKU(4.3, 1))
    myList = myList.prepend(new SKU(1, 12))
    myList = myList.prepend(new SKU(4, 0))
    myList = myList.prepend(new SKU(3, 2))
    myList = myList.prepend(new SKU(8, 5))

    val f: SKU => Unit = (x: SKU) => x.quantity += 1

    myList.foreach(f)

    val g: SKU => Int = (sku: SKU) => {
      if (sku.quantity < 10) {
        10 - sku.quantity
      } else {
        0
      }
    }

    myList.foreachInt(g)
  }
}
```

What is returned by the method call `q4()`?