

## Quiz Submissions - Quiz Recursion and Functional Programming



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Attempt 1

Written: Sep 26, 2020 5:20 PM - Sep 26, 2020 5:30 PM

Submission View

Your quiz has been submitted successfully.

### Question 1

Consider the following Scala function definition.

```
def f [X] (xs:List[X]) : List[X] = {  
  xs match {  
    case Nil    => Nil  
    case y::ys => y::(f (ys))  
  }  
}
```

If this function is executed on a list of length  $N$ , what is the length of the resulting list?

- ☐ N-1
- ✓ ☒ 2N
- ☐ 2N-1
- ☐ N
- ☐ 2(N-1)

### Question 2

Consider the following Scala function definition.

```
def f [X] (xs:List[X], ys:List[X]) : List[X] = {  
  xs match {  
    case Nil    => ys  
    case z::zs => z::(f (zs, ys))  
  }  
}
```

If this function is executed on two lists of length  $M$  and  $N$  respectively, what is the length of the resulting list?

- ☐ M+N-2
- ✓ ☒ M+N

- ☐ M+N-1
- ☐ 2M+2N-1
- ☐ 2M+2N

### Question 3

Consider the following Scala function definition.

```
def f [X] (xs:List[X]) : List[X] = {  
  xs match {  
    case Nil    => Nil  
    case y::ys => f (ys) ::: List (y)  
  }  
}
```

What is the result of evaluating the following Scala code?

```
val myList:List[(Int,Int)] = List( (1,2), (3,4), (5,6) )  
f (myList)
```

- ✓ ☒ List((5,6), (3,4), (1,2))
- ☐ List((6,5), (4,3), (2,1))
- ☐ List(1,2,3,4,5,6)
- ☐ List((1,2),(3,4),(5,6))
- ☐ List((2,1),(4,3),(6,5))
- ☐ List(6,5,4,3,2,1)

### Question 4

What is the result of evaluating the following Scala code?

```
List (1,2,3,4,5,6,7,8,9,10).filter ((x:Int) => (x%2) == 0).map ((x:Int) => x*2)
```

- ☐ List(1,2,3,4,5,6,7,8,9,10)
- ✓ ☒ List(4,8,12,16,20)
- ☐ List(2,4,6,8,10,12,14,16,18,20)
- ☐ List(2,4,6,8,10)

### Question 5

What is the result of evaluating the following Scala code?

```
List (1,2,3,4,5,6,7,8,9,10).map ((x:Int) => x*2).filter ((x:Int) => (x%2) == 0)
```

- ☐ List(1,2,3,4,5,6,7,8,9,10)
- ✓ ☒ List(2,4,6,8,10,12,14,16,18,20)
- ☐ List(4,8,12,16,20)
- ☐ List(2,4,6,8,10)

### Question 6

Which types should replace ?1 and ?2 in the following Scala function definition?

```
def f [X] (xss:?1) : ?2 = for (xs <- xss; x <- xs) yield x
```

- ☐ ?1 = List[X]  
?2 = List[List[X]]
- ☐ ?1 = List[List[X]]  
?2 = List[List[X]]
- ☐ ?1 = List[X]  
?2 = X
- ☐ ?1 = X  
?2 = List[X]
- ☐ ?1 = List[X]  
?2 = List[X]
- ✓ ☒ ?1 = List[List[X]]  
?2 = List[X]

### Question 7

Which types should replace ?1, ?2, ?3 in the following Scala function definition?

```
def g [X,Y] (xs:?1, f:?2) : ?3 = {
  xs match {
    case Nil => Nil
    case y::ys => f(y) :: g(ys, f)
  }
}
```

- ☐ ?1 = List[X]  
?2 = List[X]=>List[Y]  
?3 = List[Y]
- ✗ ☒ ?1 = List[X]  
?2 = List[X]=>Y  
?3 = List[Y]

☐ ?1 = List[X]  
?2 = X=>List[Y]  
?3 = List[Y]

☐ ?1 = List[X]  
?2 = List[X=>Y]  
?3 = List[Y]

☒ ?1 = List[X]  
?2 = X=>Y  
?3 = List[Y]

☐ ?1 = List[X]  
?2 = List[Y]  
?3 = List[Y]

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**Attempt Score:** 6 / 7 - 85.71 %

**Overall Grade (highest attempt):** 6 / 7 - 85.71 %

Done