

Topic 03 - Tutorial Sheet

Types and Classes

Exercise 1:

What are the types of the following values?

```
['a', 'b', 'c']  
( 'a', 'b', 'c' )  
[(False, '0'), (True, '1')]  
(['1', '0'], ['0', '1'])  
[tail, init, reverse]
```

Use GHCi (:t) to check your solutions.

Exercise 2:

Write down definitions that have the following types:

```
bools :: [Bool]  
nums  :: [[Int]]  
add   :: Int -> Int -> Int -> Int  
copy  :: a -> (a, a)  
apply :: (a -> b) -> a -> b
```

Check your solutions using GHCi.

Exercise 3:

What are the types of the following functions?

```
copy x = (x, x)  
second xs = head (tail xs)  
swap (x,y) = (y,x)  
pair x y = (x,y)  
double x = x * 2  
palindrome xs = reverse xs == xs  
twice f x = f (f x)
```

Use GHCi (:t) to check their types.

Exercise 4:

When writing the following functions, what type class should be used in the class constraint?

```
(i) multiply :: ___ => a -> a -> a
(ii) areEqual :: ___ => a -> a -> Bool
(iii) sort :: ___ => [a] -> [a]
(iv) maxList :: ___ => [a] -> a
```
