Teach Yourself Haskell in 24 Hours
The Ultimate Personal Training Kit[1]

Roman Byzantine

June 2016

Dedicated to everyone who lives to fight another day

Contents

Introduction

Congratulations! By reding this sentence, you are already 15 second closer to learning Haskell, one of the most important functional programming language it the world.

After another 23 hours, 59 minutes, and 40 seconds, you will master Haskell functional programming language. This book consists of 24 well-structured and easy to follow 1-hour lessons accompanied with code examples to show you power and consiseness of the greates functional programming lanugage invented on Earth. We will start from basic concepts like functions, lambdas and pattern matching and continue our journey to such conepts as Monads, Functors, Arrows, etc.

Teach Yourself Haskell in 24 Hours will help you to become proficient with Haskell and teach you how to write next generation software!

Chapter 1

Hour 1 - Getting Started

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

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Code example which illustrates it:

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data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
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import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
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Chapter 2

Hour 2 - Hello World

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Chapter 3

Hour 3 - Haskell Syntax

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Chapter 4

Hour 4 - Thinking functionally

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Chapter 5

Hour 5 - Laziness

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Chapter 6

Hour 6 - Referential transparency

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24

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```haskell
import Control.Monad
import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours
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Teach Yourself Haskell in 24 Hours - ROLF

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```
import Data.Tuple
```

```
data Lol = Lol | Rolf deriving (Show)
```

```
main = print $ swap (Rolf, Lol)
```

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL.

Chapter 7

Hour 7 - Work with collections

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
```

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```haskell
import Control.Monad
import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

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Teach Yourself Haskell in 24 Hours - ROLF

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import Data.Tuple
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```
data Lol = Lol | Rolf deriving (Show)
```

```
main = print $ swap (Rolf, Lol)
```

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours
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Chapter 8

Hour 8 - Pattern matching

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
```

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```
import Control.Monad
import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

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Teach Yourself Haskell in 24 Hours - ROLF

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import Data.Tuple
```

```
data Lol = Lol | Rolf deriving (Show)
```

```
main = print $ swap (Rolf, Lol)
```

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24 Hours - LOL.

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours
- LOL.

Chapter 9

Hour 9 - Working with Strings

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24

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```haskell
import Control.Monad
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import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL.

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Teach Yourself Haskell in 24 Hours - ROLF

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```
import Data.Tuple
```

```
data Lol = Lol | Rolf deriving (Show)
```

```
main = print $ swap (Rolf, Lol)
```

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours
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Chapter 10

Hour 10 - Error handling

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
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    mappend = Rolf
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    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL.

Chapter 11

Hour 11 - Maybe, Either and others

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

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main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL.

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Teach Yourself Haskell in 24 Hours - ROLF

Teach Yourself Haskell in 24 Hours - LOOOOOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL.. Teach Yourself Haskell in 24 Hours - LOL.

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```
import Data.Tuple
```

```
data Lol = Lol | Rolf deriving (Show)
```

```
main = print $ swap (Rolf, Lol)
```

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL.

Chapter 12

Hour 12 - Modules and Imports

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24

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```
import Control.Monad
import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

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```
import Data.Tuple
```

```
data Lol = Lol | Rolf deriving (Show)
```

```
main = print $ swap (Rolf, Lol)
```

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL.

Chapter 13

Hour 13 - Type System

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
```

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```
import Control.Monad
import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours
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Teach Yourself Haskell in 24 Hours - ROLF

Teach Yourself Haskell in 24 Hours - LOOOOOL. Teach Yourself
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```
import Data.Tuple

data Lol = Lol | Rolf deriving (Show)

main = print $ swap (Rolf, Lol)
```

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL.

Chapter 14

Hour 14 - Polymorphism

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24

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```haskell
import Control.Monad
import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

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```
import Data.Tuple

data Lol = Lol | Rolf deriving (Show)

main = print $ swap (Rolf, Lol)
```

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL.

Chapter 15

Hour 15 - Typeclasses

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
```

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```
import Control.Monad
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import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
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    threadDelay 1000000
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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL.

Chapter 16

Hour 16 - Monadic computation

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

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Code example which illustrates it:

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```haskell
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import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
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    threadDelay 1000000
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main = print $ swap (Rolf, Lol)
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL.

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL.

Chapter 17

Hour 17 - Functors

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach

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Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24
Hours- LOL.

```haskell
import Control.Monad
import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours
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Teach Yourself Haskell in 24 Hours - ROLF

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Teach Yourself Haskell in 24 Hours - LOL.Teach Yourself Haskell
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```
import Data.Tuple

data Lol = Lol | Rolf deriving (Show)

main = print $ swap (Rolf, Lol)
```

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL.

Chapter 18

Hour 18 - Applicative functors

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
```

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```haskell
import Control.Monad
import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL.

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Teach Yourself Haskell in 24 Hours - ROLF

Teach Yourself Haskell in 24 Hours - LOOOOOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL.. Teach Yourself Haskell in 24 Hours - LOL.

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```
import Data.Tuple

data Lol = Lol | Rolf deriving (Show)

main = print $ swap (Rolf, Lol)
```

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL.

Chapter 19

Hour 19 - Monoids

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach

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Hours- LOL.

```haskell
import Control.Monad
import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours
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Teach Yourself Haskell in 24 Hours - ROLF

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```
import Data.Tuple

data Lol = Lol | Rolf deriving (Show)

main = print $ swap (Rolf, Lol)
```

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours
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Chapter 20

Hour 20 - Lenses

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach

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Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24
Hours- LOL.

```haskell
import Control.Monad
import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours
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Teach Yourself Haskell in 24 Hours - ROLF

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Teach Yourself Haskell in 24 Hours - LOL.Teach Yourself Haskell
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```
import Data.Tuple

data Lol = Lol | Rolf deriving (Show)

main = print $ swap (Rolf, Lol)
```

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL.

Chapter 21

Hour 21 - Combinators

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
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import Control.Monad
import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

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Teach Yourself Haskell in 24 Hours - ROLF

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main = print $ swap (Rolf, Lol)
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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL.

Chapter 22

Hour 21 - Arrows

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach

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Hours- LOL.

```haskell
import Control.Monad
import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

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Teach Yourself Haskell in 24 Hours - ROLF

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Teach Yourself Haskell in 24 Hours - LOL.Teach Yourself Haskell
in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL.

```
import Data.Tuple

data Lol = Lol | Rolf deriving (Show)

main = print $ swap (Rolf, Lol)
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL. Learn You Haskell in 24 Hours - LOL.

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL.

Chapter 23

Hour 21 - Zippers

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
```

Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours- LOL. Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Learn You Haskell in 24 Hours- LOL. Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL. Teach Yourself Haskell in 24 Hours- LOL. Teach

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Hours- LOL.

```haskell
import Control.Monad
import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

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Teach Yourself Haskell in 24 Hours - ROLF

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```
import Data.Tuple

data Lol = Lol | Rolf deriving (Show)

main = print $ swap (Rolf, Lol)
```

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Teach Yourself Haskell in 24 Hours - LOL. Haskell in 24 Hours - LOL.

Chapter 24

Hour 21 - Concurrency

Teach Yourself Haskell in 24 Hours - LOL

Did you really think that you can learn Haskell in 24 hours?! LOOOOL

Teach Yourself Haskell in 24 Hours - LOL.

LolLol LolLol Lol LolLolLolLolLol Lol Lol (*LOL*, *ROLF*, *LMAO*, *LMFAO*). Teach Yourself Haskell in 24 Hours- LOL

LOL LOL LOL LOL LOL LOL LOL LOL *ROLF LOL* LOL LOL LOL LOL LOL LOL LOL.

Code example which illustrates it:

```
--  Haskell in 24 Hours- LOL
data Lol = Lmao | Rolf Lol Lol

instance Monoid Lol where
    mempty = Lmao
    mappend = Rolf
```

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```haskell
import Control.Monad
import Control.Concurrent
import Control.Concurrent.STM

main = do
    lols <- atomically $ newTVar 0
    forM_ [0..49] $ \_ -> do
        forkIO . forever $ do
            atomically $ modifyTVar lols (+1)
            threadDelay 100

    threadDelay 1000000
    lolsFinal <- atomically $ readTVar lols
    putStrLn $ "lols: " ++ show lolsFinal
```

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Teach Yourself Haskell in 24 Hours - ROLF

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```
import Data.Tuple

data Lol = Lol | Rolf deriving (Show)

main = print $ swap (Rolf, Lol)
```

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