Variables begin with a lowercase letter.
Type names begin with an uppercase letter.

`--` comment out the rest of the line.

```
{- multiline comment -}
```

(nesting is allowed)

`True` and `False` are of type `Bool`.

The type is strict, only admitting those two literals.

`&&`, `||`, `not`

'==` and `/=`

... strict, since there's no coercion. They have integer and floating point versions.

truncate

```
ord :: Char -> Int
chr :: Int -> Char
```

A list of `Chars`, that is, `[Char]`.

show whatever

Surrounding an identifier with back ticks makes it infix.

Surrounding an operator with parens makes it prefix.

```
ghci> ['a', 'b', 'c'] !! 0
'a'
```

`elem`, `notElem`

nub

concat

```
fst, snd
```

`[a..b]` is a list of all the values from `a` to `b`, inclusive.

`[a..]` is an infinite list from `a` up.

```
[expr | generatorOrGuard1, ... ,generatorOrGuardN]
```

Guards are just expressions that result in `Bool`. No `if` is used.

```
\params -> result
```

```
expression where declarations

let declarations in expressions
```

The expression can have multiple new variables in it.

```
case expr1 of
  expr2 -> ...
  expr3 -> ...
```

```
func params =
   | boolean1 -> ...
   | boolean2 -> ...
```

`fst` and `snd`

The first nonblank character following `where`, `let`, or `of` determines the starting column.

Curlies can be used instead, but indentation alone is generally preferred.

... exactly the same signature. There is no overloading.

Allows you to create variables with an offset from what is matched:

```
subtractFive (n + 5) = n
```

```
(>>=) :: (Monad m) => m a -> (a -> m b) -> m b
```

It passes the "state of the world" resulting from one function to the next function.

```
(>>) :: (Monad m) => m a -> m b -> m b
```

It is convenient to have another function that doesn't demand a function as its second argument.

```
return :: (Monad m) => a -> m a
```

It creates a monad container for arbitrary values.

One `>>=`/`>>` after another. It also allows the `let` form.

```
import Control.Monad
forever :: (Monad m) => m a -> m b
forever a = a >> forever a
```

- A type constructor `M`.
- A bind operation

```
(>>=) :: (Monad m) => m a -> (a -> m b) -> m b
```

- A return operation

```
return :: (Monad m) => a -> m a
```

```
return x >>= f   =   f x

m >>= return     =   m
```

`>>=` is associative

It's often encessary to check a condition in an I/O function and in one case `return IO`.

```
when :: (Monad m) => Bool -> m () -> m ()
```

It does the `return ()` for you in the event the condition fails.

... `sequence`.

```
sequence :: (Monad m) => [m a] -> m [a]
```

This will work only if all statements in the `do` return the same type.

```
import System.IO
handle <- openFile "myFile.txt" ReadMode
contents <- hGetContents handle
hClose handle
```

```
ghci> :t openFile
openFile :: FilePath -> IOMode -> IO Handle
ghci> :t withFile
withFile :: FilePath -> IOMode -> (Handle -> IO r) -> IO r
```

```
readFile :: FilePath -> IO String
writeFile :: FilePath -> String -> IO ()
appendFile :: FilePath -> String -> IO ()
```