

COMPX307-21B

Functional Programming

Coursework Three

Parsing coursework

Using the techniques shown in the lectures and in chapter eight of Hutton's book (on the Moodle site), build a parser for the language TINY as given in chapter two of Gordon's book (also on the Moodle site).

You will need to stratify the grammar since there is some left recursion, and also introduce parentheses to disambiguate the grammar.

Show that your parser correctly parses, and builds a value for, the example program in section 2.3 of Gordon. Also, give two different example programs where the parser fails correctly (*i.e.* a parse fails due to incorrect syntax, and the parser reports this), and two different examples of the parser succeeding correctly. You can choose these four programs yourself, but make sure they each contain uses of four different commands, and use all five commands over the four examples.

The Haskell data type that your parser must produce values in is:

```
type Ide = String

data Exp = Zero | One | TT | FF | Read | I Ide |
           Not Exp | Equal Exp Exp | Plus Exp Exp |
           deriving Show

data Cmd = Assign Ide Exp | Output Exp |
           IfThenElse Exp Cmd Cmd |
           WhileDo Exp Cmd | Seq Cmd Cmd
           deriving Show
```

As ever, please hand-in your solution on the Moodle site, as a plain text .hs or .lhs file which has your name included on it at the top. The deadline for receipt of your solution is 1000 on Friday 24th September 2021.