

Repeat – until command / Extension to Fun Grammar

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The Fun grammar is extended with the *repeat-until* command as follows:

Lexicon additions:

```
REPEAT      :      'repeat' ;
UNTIL       :      'until' ;
```

Command additions:

```
com
:      ID ASSN expr
|      ID LPAR actual RPAR
|      IF expr COLON c1=seq_com
        ( DOT
        | ELSE COLON
          c2=seq_com DOT
        )
|      WHILE expr COLON
        seq_com DOT
|      FOR ID ASSN expr TO expr COLON
        seq_com DOT
|      REPEAT COLON seq_com UNTIL expr DOT
;
```

That is, the command is given by:

```
'repeat' ':' seq_com 'until' expr '.'
```

The repeat-until command must respect the following scope/type rules:

- The variables used in the *expr* have to be declared before the repeat-until command, that is, before the repeat-until body.
- The *expr* in the repeat-until command must be of type **bool**.

The repeat-until command has the following semantics:

1. Execute the body *seq_com*.
2. If the value of *expr* is false, terminate the repeat-until command.
3. Continue the repeat-until command at step 1.

The tree build operator is given by:

```
^(REPEAT seq_com expr)
```

That is, the repeat-until command tree has the repeat-until command in its top. Below, it has the sequence of commands and the expression to be evaluated.

The changes in the Fun grammar was highlighted by adding *//EXTENSION REPEAT UNTIL* comments in order to identify where the changes were made.

In order to achieve this first assignment objectives, tests were created as can be seen in the attached files. Below, each test is described:

simpleRepeatUntil.fun:

In this file a simple repeat-until loop was created, going from 0 to 4. No syntactic errors given.

intExpressionRepeatUntil:

In this file the expression to be evaluated is not boolean, but int. Although it is a context error, the statement is syntactically correct.

missingColonRepeatUntil.fun

In this file the colon was omitted in the repeat-until command declaration. The following errors were given:

Syntactic analysis ...

line 8:2 missing COLON at 'write'

1 syntactic errors

Compilation failed