

Programmer som Data - Assignment3

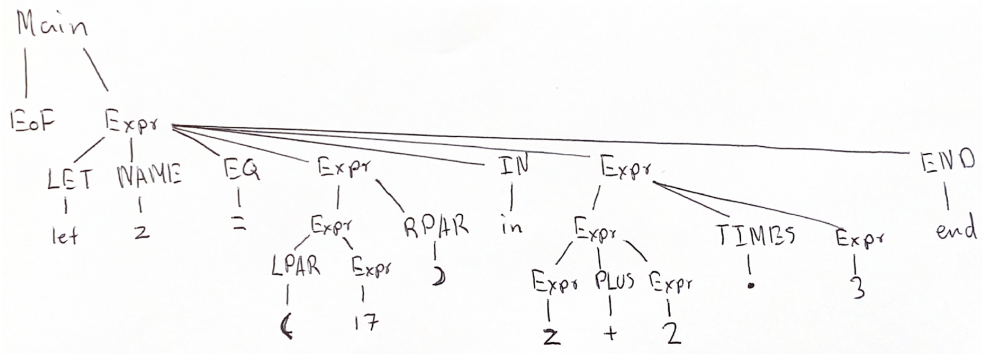
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3.3

```
GOAL:  let z = (17) in z + 2 * 3 end EoF
START: Main =>
01:    Expr EoF =>
02:    LET NAME EQ Expr IN Expr END EoF =>
03:    LET NAME EQ Expr IN Expr end EoF =>
04:    LET NAME EQ Expr IN Expr TIMES Expr end EoF =>
05:    LET NAME EQ Expr IN Expr TIMES 3 end EoF =>
06:    LET NAME EQ Expr IN Expr * 3 end EoF =>
07:    LET NAME EQ Expr IN Expr PLUS Expr * 3 end EoF =>
08:    LET NAME EQ Expr IN Expr PLUS 2 * 3 end EoF =>
09:    LET NAME EQ Expr IN Expr + 2 * 3 end EoF =>
10:    LET NAME EQ Expr IN z + 2 * 3 end EoF =>
11:    LET NAME EQ Expr in z + 2 * 3 end EoF =>
12:    LET NAME EQ Expr RPAR in z + 2 * 3 end EoF =>
13:    LET NAME EQ Expr ) in z + 2 * 3 end EoF =>
14:    LET NAME EQ LPAR Expr ) in z + 2 * 3 end EoF =>
15:    LET NAME EQ LPAR 17) in z + 2 * 3 end EoF =>
16:    LET NAME EQ (17) in z + 2 * 3 end EoF =>
17:    LET NAME = (17) in z + 2 * 3 end EoF =>
18:    LET z = (17) in z + 2 * 3 end EoF =>
END:   let z = (17) in z + 2 * 3 end EoF
```

3.4



NOTE: The EoF should be on the right side in order to give the correct outcome.

3.5

```
fssharp - fsLexYacc.Runtime.dll --fssharp - mono /Library/Frameworks/Mono.framework/Versions/6.12.0/lib/mono/fssharp/fsi.exe --exename:fssharp -r FsLexYacc.Runtime.dll ~/Documents/GitHub/Cat...

open Parse;;

q
A

/Users/bastjansejberg/fssharp/stdin(4,1): error FS0039: The value or constructor 'q' is not defined.

> open Parse;;
> fromString "1 * 3";
val it : Absyn.expr = Prim ("*", CstI 1, CstI 3)

> fromString "3 * 4 + 2";
val it : Absyn.expr = Prim ("*", CstI 3, Prim ("+", CstI 4, CstI 2))

> fromString "x +";
System.Exception: parse error near line 1, column 3
at Microsoft.FSharp.Core.PrintModule<PrintFormatTostringThenFail@1433[TResult].Invoke (System.String message) [0x00000] in <b56f33d2f53c2e7533e6754e4d8591b5>:0
at FSI_0002.Parse.fromString (System.String str) [0x0009a] in <0a65b6739bc244cbbd8835e0a5b954a5>:0
at <StartupCode$FSI_0009>.$FSI_0009.main@ () [0x00000] in <0a65b6739bc244cbbd8835e0a5b954a5>:0
at (wrapper managed-to-native) System.Reflection.RuntimeMethodInfo.InternalInvoke(System.Reflection.RuntimeMethodInfo,object,object[],System.Exception)
at System.Reflection.RuntimeMethodInfo.Invoke (System.Object obj, System.Reflection.BindingFlags invokeAttr, System.Reflection.Binder binder, System.Object[] parameters, System.Globalization.CultureIn
fo culture) [0x0006a] in <baaab171478d4061bd9316f48a642f06>:0
Stopped due to error
> fromString "1 + 2 * 3";
val it : Absyn.expr = Prim ("*", CstI 1, Prim ("*", CstI 2, CstI 3))

> fromString "1 - 2 - 3";
val it : Absyn.expr = Prim ("-", CstI 1, Prim ("-", CstI 2, CstI 3))

> fromString "1 + -2";
val it : Absyn.expr = Prim ("+", CstI 1, CstI -2)

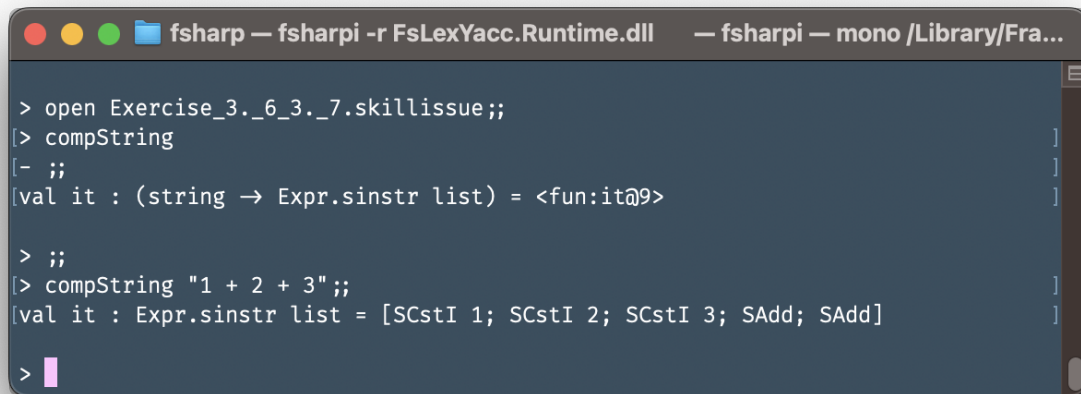
> fromString "x +";
System.Exception: parse error near line 1, column 3
at Microsoft.FSharp.Core.PrintModule<PrintFormatTostringThenFail@1433[TResult].Invoke (System.String message) [0x00000] in <b56f33d2f53c2e7533e6754e4d8591b5>:0
at FSI_0002.Parse.fromString (System.String str) [0x0009a] in <0a65b6739bc244cbbd8835e0a5b954a5>:0
at <StartupCode$FSI_0013>.$FSI_0013.main@ () [0x00000] in <0a65b6739bc244cbbd8835e0a5b954a5>:0
at (wrapper managed-to-native) System.Reflection.RuntimeMethodInfo.InternalInvoke(System.Reflection.RuntimeMethodInfo,object,object[],System.Exception)
at System.Reflection.RuntimeMethodInfo.Invoke (System.Object obj, System.Reflection.BindingFlags invokeAttr, System.Reflection.Binder binder, System.Object[] parameters, System.Globalization.CultureIn
fo culture) [0x0006a] in <baaab171478d4061bd9316f48a642f06>:0
Stopped due to error
> fromString "1 + 1.2";
System.Exception: Lexer error: illegal symbol near line 1, column 6
at Microsoft.FSharp.Core.PrintModule<PrintFormatTostringThenFail@1433[TResult].Invoke (System.String message) [0x00000] in <b56f33d2f53c2e7533e6754e4d8591b5>:0
at FSI_0002.Parse.fromString (System.String str) [0x0009a] in <0a65b6739bc244cbbd8835e0a5b954a5>:0
at <StartupCode$FSI_0014>.$FSI_0014.main@ () [0x00000] in <0a65b6739bc244cbbd8835e0a5b954a5>:0
at (wrapper managed-to-native) System.Reflection.RuntimeMethodInfo.InternalInvoke(System.Reflection.RuntimeMethodInfo,object,object[],System.Exception)
at System.Reflection.RuntimeMethodInfo.Invoke (System.Object obj, System.Reflection.BindingFlags invokeAttr, System.Reflection.Binder binder, System.Object[] parameters, System.Globalization.CultureIn
fo culture) [0x0006a] in <baaab171478d4061bd9316f48a642f06>:0
```

```
fssharp - fsLexYacc.Runtime.dll --fssharp - mono /Library/Frameworks/Mono.framework/Versions/6.12.0/lib/mono/fssharp/fsi.exe --exename:fssharp -r FsLexYacc.Runtime.dll ~/Documents/GitHub/Cat...

at <StartupCode$FSI_0014>.$FSI_0014.main@ () [0x00000] in <0a65b6739bc244cbbd8835e0a5b954a5>:0
at (wrapper managed-to-native) System.Reflection.RuntimeMethodInfo.InternalInvoke(System.Reflection.RuntimeMethodInfo,object,object[],System.Exception)
at System.Reflection.RuntimeMethodInfo.Invoke (System.Object obj, System.Reflection.BindingFlags invokeAttr, System.Reflection.Binder binder, System.Object[] parameters, System.Globalization.CultureIn
fo culture) [0x0006a] in <baaab171478d4061bd9316f48a642f06>:0
Stopped due to error
> fromString "1 + ";
System.Exception: parse error near line 1, column 4
at Microsoft.FSharp.Core.PrintModule<PrintFormatTostringThenFail@1433[TResult].Invoke (System.String message) [0x00000] in <b56f33d2f53c2e7533e6754e4d8591b5>:0
at FSI_0002.Parse.fromString (System.String str) [0x0009a] in <0a65b6739bc244cbbd8835e0a5b954a5>:0
at <StartupCode$FSI_0015>.$FSI_0015.main@ () [0x00000] in <0a65b6739bc244cbbd8835e0a5b954a5>:0
at (wrapper managed-to-native) System.Reflection.RuntimeMethodInfo.InternalInvoke(System.Reflection.RuntimeMethodInfo,object,object[],System.Exception)
at System.Reflection.RuntimeMethodInfo.Invoke (System.Object obj, System.Reflection.BindingFlags invokeAttr, System.Reflection.Binder binder, System.Object[] parameters, System.Globalization.CultureIn
fo culture) [0x0006a] in <baaab171478d4061bd9316f48a642f06>:0
Stopped due to error
> fromString "let z = (17) in z + 2 * 3 end";
val it : Absyn.expr =
  Let ("z", CstI 17, Prim ("*", Var "z", Prim ("+", CstI 2, CstI 3)))

> fromString "let z = 17) in z + 2 * 3 end";
System.Exception: parse error near line 1, column 11
at Microsoft.FSharp.Core.PrintModule<PrintFormatTostringThenFail@1433[TResult].Invoke (System.String message) [0x00000] in <b56f33d2f53c2e7533e6754e4d8591b5>:0
at FSI_0002.Parse.fromString (System.String str) [0x0009a] in <0a65b6739bc244cbbd8835e0a5b954a5>:0
at <StartupCode$FSI_0017>.$FSI_0017.main@ () [0x00000] in <0a65b6739bc244cbbd8835e0a5b954a5>:0
at (wrapper managed-to-native) System.Reflection.RuntimeMethodInfo.InternalInvoke(System.Reflection.RuntimeMethodInfo,object,object[],System.Exception)
at System.Reflection.RuntimeMethodInfo.Invoke (System.Object obj, System.Reflection.BindingFlags invokeAttr, System.Reflection.Binder binder, System.Object[] parameters, System.Globalization.CultureIn
fo culture) [0x0006a] in <baaab171478d4061bd9316f48a642f06>:0
Stopped due to error
> fromString "let in = (17) in z + 2 * 3 end";
System.Exception: parse error near line 1, column 6
at Microsoft.FSharp.Core.PrintModule<PrintFormatTostringThenFail@1433[TResult].Invoke (System.String message) [0x00000] in <b56f33d2f53c2e7533e6754e4d8591b5>:0
at FSI_0002.Parse.fromString (System.String str) [0x0009a] in <0a65b6739bc244cbbd8835e0a5b954a5>:0
at <StartupCode$FSI_0018>.$FSI_0018.main@ () [0x00000] in <0a65b6739bc244cbbd8835e0a5b954a5>:0
at (wrapper managed-to-native) System.Reflection.RuntimeMethodInfo.InternalInvoke(System.Reflection.RuntimeMethodInfo,object,object[],System.Exception)
at System.Reflection.RuntimeMethodInfo.Invoke (System.Object obj, System.Reflection.BindingFlags invokeAttr, System.Reflection.Binder binder, System.Object[] parameters, System.Globalization.CultureIn
fo culture) [0x0006a] in <baaab171478d4061bd9316f48a642f06>:0
Stopped due to error
> fromString "1 + let x=5 in let y=7*x in y+y end + x end";
val it : Absyn.expr =
  Prim
    ("+", CstI 1,
      Let
        ("x", CstI 5,
          Prim
            ("*",
              Let
                ("y", Prim ("*", CstI 7, Var "x"), Prim ("+", Var "y", Var "y")),
                Var "x"))))
```

3.6



```
fsharp — fsharpi -r FsLexYacc.Runtime.dll — fsharpi — mono /Library/Fra...  
  
> open Exercise_3.6_3.7.skillissue;;  
[> compString  
[- ;;  
[val it : (string → Expr.sinstr list) = <fun:it@9>  
  
> ;;  
[> compString "1 + 2 + 3";;  
[val it : Expr.sinstr list = [SCstI 1; SCstI 2; SCstI 3; SAdd; SAdd]  
  
> █
```

Refer to the file *ex36.fs* in the folder *Exercise_3.6-3.7*.

3.7

```
> fromString "3 ? 2 : 5"
- ;;
val it : Absyn.expr = If (CstI 3, CstI 2, CstI 5)
```

Refer to the files ***Absyn.fs***, *ExprLex.fsl* and *ExprPar.fsy* in the folder ***Exercise_3.6-3.7***.