Uebungsstunde 16.11.01

1. Sichtbarkeit von Variablen, Parameterübergabe

```
MODULE Var1;
        IMPORT Out;
        PROCEDURE b(t:INTEGER);
                BEGIN
                        s:=5;
                        t:=4;
                END b;

        PROCEDURE a*();
                VAR s,t:INTEGER;
                BEGIN
                        s:=3;
                        t:=9;
                        b(s);
                        Out.Int(s,8);
                        Out.Int(t,8);
                END a;
END Var1.

Var1.a~
```

a) 3 9
b) 5 9
c) error 0: undeclared identifier
d) 5 4

```
MODULE Var3;
        IMPORT Out;
        PROCEDURE b(VAR p:INTEGER);
                BEGIN
                        p:=2;
        END b;

        PROCEDURE a*();
                VAR m:INTEGER;
                BEGIN
                        m:=7;
                        b(m);
                        Out.Int(m,8);
        END a;
END Var3.

Var3.a~
```

a) error 0: undeclared identifier
b) 2
c) 7

```
MODULE Var2;
        IMPORT Out;
        VAR y:INTEGER;
        PROCEDURE b(x:INTEGER);
                VAR y:INTEGER;
                BEGIN
                        y:=7;
        END b;

        PROCEDURE a*();
                VAR x:INTEGER;
                BEGIN
                        x:=4;
                        y:=5;
                        b(x);
                        Out.Int(x,8);
                        Out.Int(y,8);
        END a;
END Var2.

Var2.a~
```

a) 4 5
b) error 0: undeclared identifier
c) 4 7
d) 7 4

```
MODULE Var4;
        IMPORT Out;
        PROCEDURE b(f:INTEGER);
                BEGIN
                        f:=11;
        END b;

        PROCEDURE a*();
                VAR w,v:INTEGER;
                BEGIN
                        v:=14;
                        w:=1;
                        b(v);
                        b(w);
                        Out.Int(v,8);
                        Out.Int(w,8);
        END a;
END Var4.

Var4.a~
```

a) 11 11
b) 14 1
c) error 0: undeclared identifier

2. EBNF für Oberon Expressions (vereinfacht)

expression = SimpleExpression [relation SimpleExpression].
relation = "=" | "#" | "<" | "<=" | ">" | ">=" | IN | IS.
SimpleExpression = ["+"|"-"] term {AddOperator term}.
AddOperator = "+" | "-" | OR .
term = factor {MulOperator factor}.
MulOperator = "*" | "/" | DIV | MOD | "&" .
factor = number | CharConstant | string | "(" expression ")" | "~" factor.
CharConstant = "" character "".
string = "" {character} "" .
assignment = string „:=“ expression.

3. Weakest precondition

Regel für Zuweisung: wp(„x:=E“,Q) = Q| x:= E
Regel für Sequenz: wp(„S;T“,Q) = wp (S, wp(T,Q))

Bsp:

x :=x + y; y := x - y; x := x - y; { xe = xa & ye = ya }