Beispiel: Codeerzeugung

Assignment = Designator "=" Expr .

Expr = Term { "+" Term } .

Term = Factor { "*" Factor } .

Factor = number | Designator.

Designator = ident ["." ident | "[" Expr "]"].

Sem. Aktionen für Codeerzeugung (1)


```
Designator↑item =        (.  Item item, x; Obj o; .)
   ident↑t               (.  o = Tab.find(t.string); item = new Item(o); .)
   [ "." ident↑t         (.  if (item.type.kind == Struct.Class) {
                                Code.load(item);
                                o = Tab.findField(t.string, item.type);
                                item.kind = Item.Fld;
                                item.type = o.type; item.adr = o.adr;
                                } else semError(...);
                         .)
   |  "["                (.  Code.load(item); .)
      Expr↑x             (.  if (item.type.kind == Struct.Arr) {
                                if (x.type != Tab.intType) semError(...);
                                Code.load(x);
                                item.kind = Item.Elem;
                                item.type = item.type.elemType;
                             } else semError(...);
                         .)
      "]"
   ] .
```

Klasse *Item* – Konstruktor *Item(Obj)*


```
public Item (Obj o) {
    type = o.type; adr = o.adr;
    switch (o.kind) {
        case Obj.Con:
            kind = Con; break;
        case Obj.Var:
            if (o.level == 0) kind = Static; else kind = Local; break;
        case Obj.Meth:
            kind = Meth; obj = o; break;
      default:
        Parser.Errors.semError("cannot create Item");
        throw new Error();  // don't: System.exit(0);
   }
}
```

Sem. Aktionen für Codeerzeugung (2)


```
Factor↑item =                (.  Item item = new Item(); .)
      number↑t               (.  item.kind = Item.Con;
                                 item.type = Tab.intType;
                                 item.adr = t.val;
                             .)
   |  Designator↑item .
```

```
Term↑x =
   Factor↑x
   {  "*" Factor↑y           (.  Code.load(x); Code.load(y);
                                 if (x.type==Tab.intType && y.type==Tab.intType) {
                                    Code.put(Code.mul);
                                    x.kind = Item.Stack;
                                 } else semError(...);
                             .)
   } .
```

Sem. Aktionen für Codeerzeugung (3)


```
Expr↑x =
   Term↑x
   {  "+" Term ↑y        (.  Code.load(x); Code.load(y);
                             if (x.type==Tab.intType && y.type==Tab.intType) {
                                Code.put(Code.add);
                                x.kind = Item.Stack;
                             } else semError(...);
                          .)
   } .


Assignment =
   Designator↑x
   "=" Expr↑y            (.  if (y.type.assignableTo(x.type))
                                Code.assign(x, y);
                             else semError(...);
                          .)
   .
```