10. Übung Programmierung

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Previously on ...

- Hoare-Kalkül (Schleifeninvariante)
- H_0

1

$SI =$

1

$SI = (z = \prod_{j=1}^{i} j^2) \wedge (i \leq n)$
$A = (n \geq 0) \wedge (z = 1) \wedge (i = 0)$, $B = C$
$C = SI$, $D = SI \wedge \neg(i < n)$
$E = D$, $F = (z = \prod_{j=1}^{n} j^2)$
$G = SI \wedge (i < n)$, $H = SI$

2

```
f1 x1 x2 = f2 x1 1;
f2 x1 x2 = if (x1 > 0) then f21 x1 x2
   else f3 x1 x2
f21 x1 x2 = f211 x1 x2
f211 x1 x2 = f212 x1 (x2 * x1)
f212 x1 x2 = f2 (x1-1) x2
f3 x1 x2 = x2
main = do x1 <- readLn
  print(f1 x1 0)
```

3 a)

```
h:    LOAD 3; LOAD 1; GT; JMC h.1;
      LOAD 2; LIT 1; SUB; STORE 1; WRITE 1; JMP 0;
h.1:  LOAD 2; LOAD 1; LOAD 3; SUB; LOAD 2;
      STORE 3; STORE 2; STORE 1; JMP h;
```

3 b)

```
/*A*/   flag = 1;
        scanf("%d", &x1);
        x1 = 3 * x1;
        x2 = 5;
/*B*/   x2 == x1
/*C*/   result = 30;
        flag = 0;
```

3 b)

```
/*D*/   result = x2;
        flag = 0;
/*E*/   function == 2
/*F*/   if(10 <= x2){x1 = x1 - x1; x2 = x2 - 1;}
        else{x1 = x1 + x2; x2 = 10;
        function = 1;}
```