Introduktion til Programmering og Problemløsning (PoP)

Halerekursion

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Hvordan kan sum gå galt?

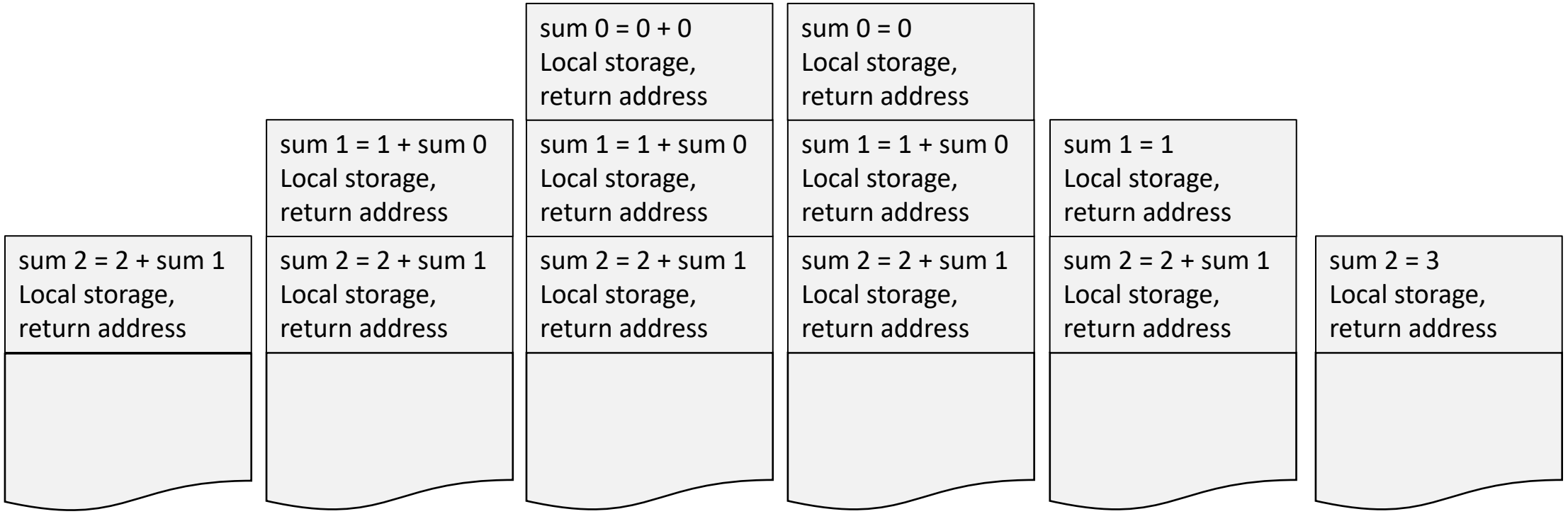
```
let rec sum n =
  if n = 0 then 0
  else n + sum (n - 1);;
val sum: n: int -> int

> sum 10000;;
val it: int = 50005000

> sum 100000;;
val it: int = 705082704

> sum 1000000;;
Stack overflow.
Repeat 261229 times:
--------------------------------
   at FSI_0002.sum(Int32)
--------------------------------
   at <StartupCode$FSI_0005>.$FSI_0005.main@()
   at System.RuntimeMethodHandle.InvokeMethod(System.Object, System.Span`1<Syste
…
```

64 bit?

```
let rec sum n =
  if n = 0UL then 0UL
  else n + sum (n - 1UL);;
val sum: n: uint64 -> uint64

> sum 1000000UL;;
Stack overflow.
Repeat 261229 times:
--------------------------------
   at FSI_0003.sum(UInt64)
--------------------------------
   at <StartupCode$FSI_0004>.$FSI_0004.main@()
   at System.RuntimeMethodHandle.InvokeMethod(System.Object, System.Span`1<Syste
…
```

Kaldestakken

```
let rec sum n =
  if n = 0 then 0
  else n + sum (n - 1);;
```

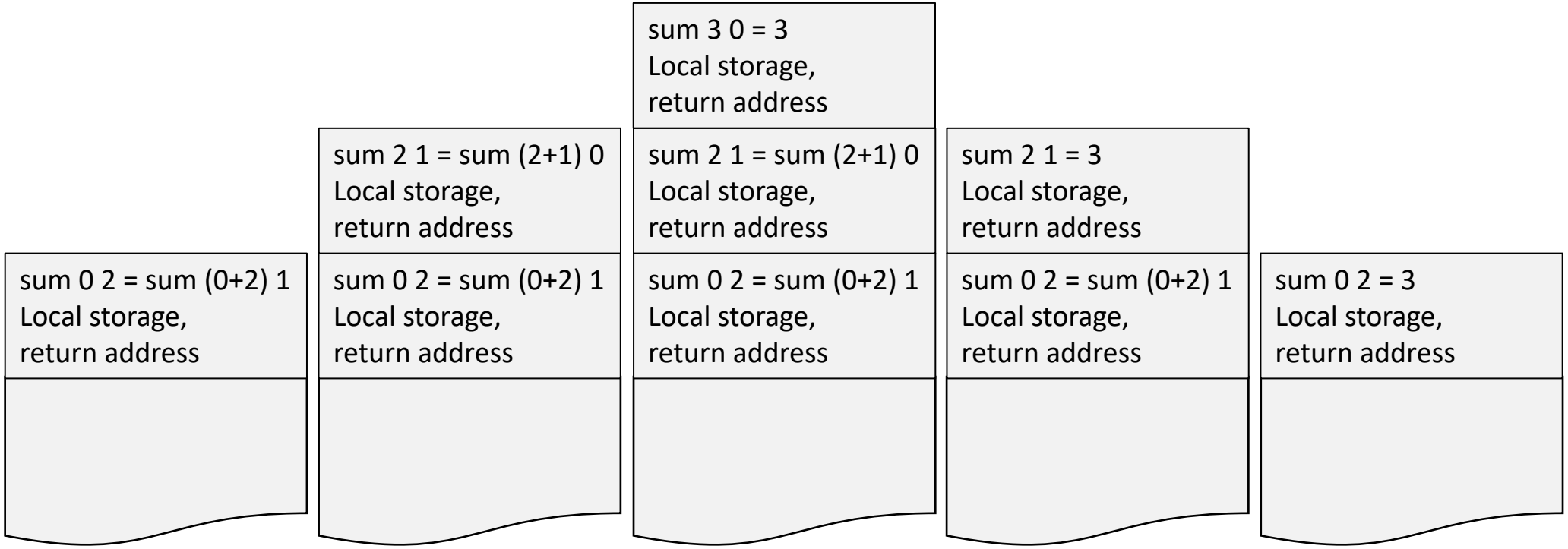


Kur: Halerekursion

```
> let rec sum s n =
-   if n = 0 then s
-   else sum (n + s) (n - 1);;
val sum: s: int -> n: int -> int

> sum 0 1000000;;
val it: int = 1784293664
```

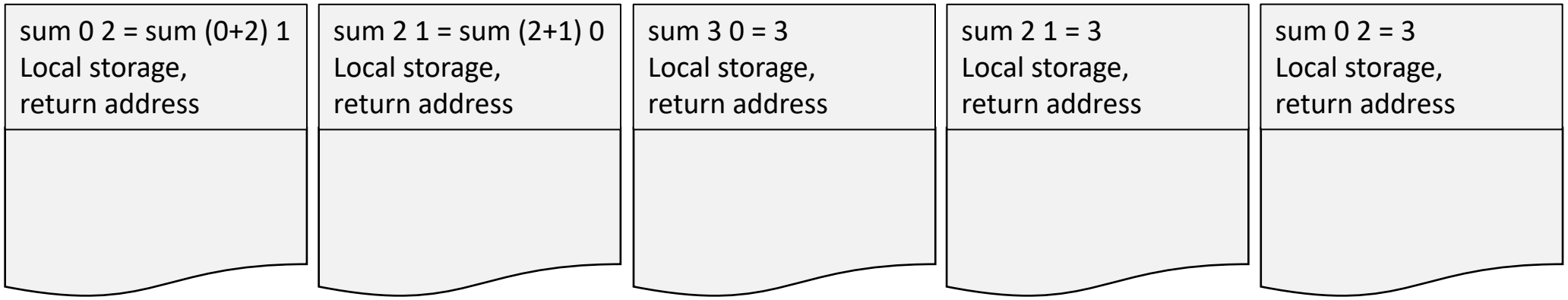
Kur: Halerekursion

```
> let rec sum s n =
-   if n = 0 then s
-   else sum (n + s) (n - 1);;
val sum: s: int -> n: int -> int

> sum 0 1000000;;
val it: int = 1784293664
```



Kur: Halerekursion

```
> let rec sum s n =
-   if n = 0 then s
-   else sum (n + s) (n - 1);;
val sum: s: int -> n: int -> int

> sum 0 1000000;;
val it: int = 1784293664
```



Resumé

- Kaldestakken
- Halerekursion