

Introduktion til Programmering og Problemløsning (PoP)

Torsdagsforelæsning

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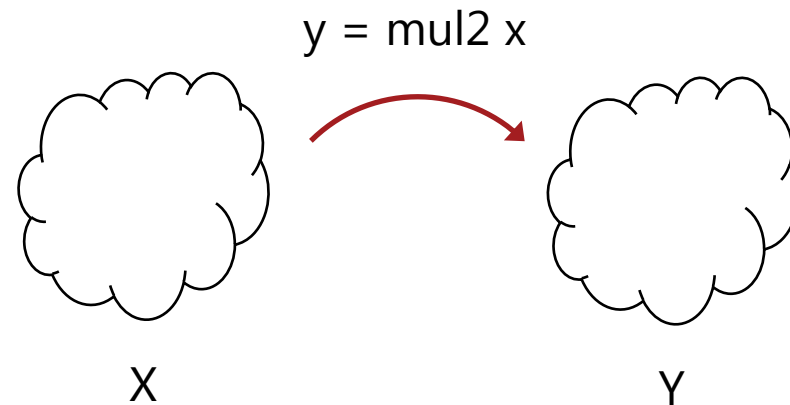


Lidt om jer

<https://tinyurl.com/32s9caf7>

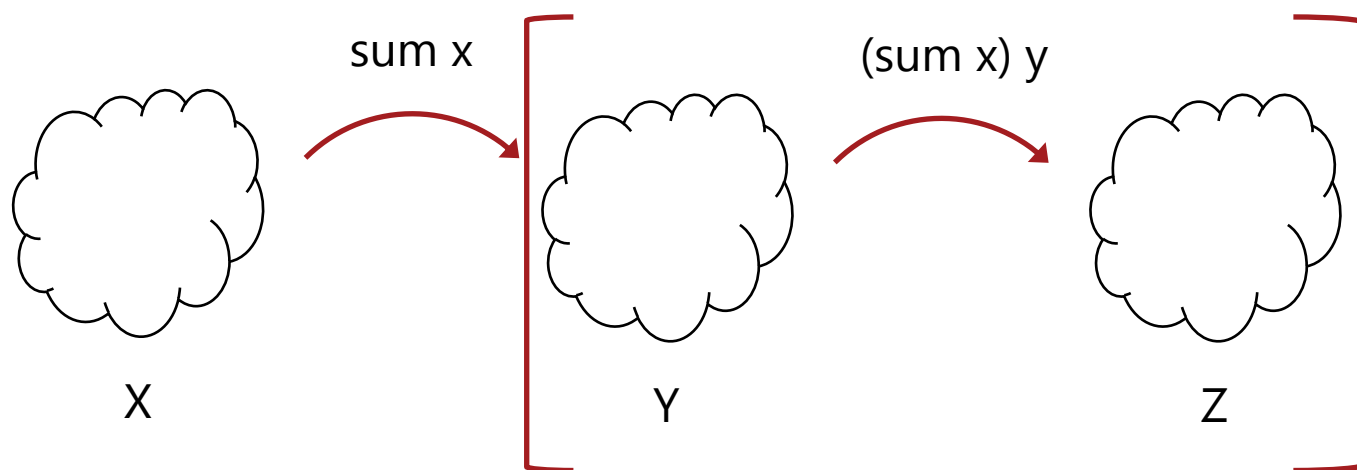
Funktioner: afbildninger mellem mængder

```
> let mul2 x = 2*x;;  
val mul2: x: int -> int  
> mul2 3;;  
val it: int = 6
```

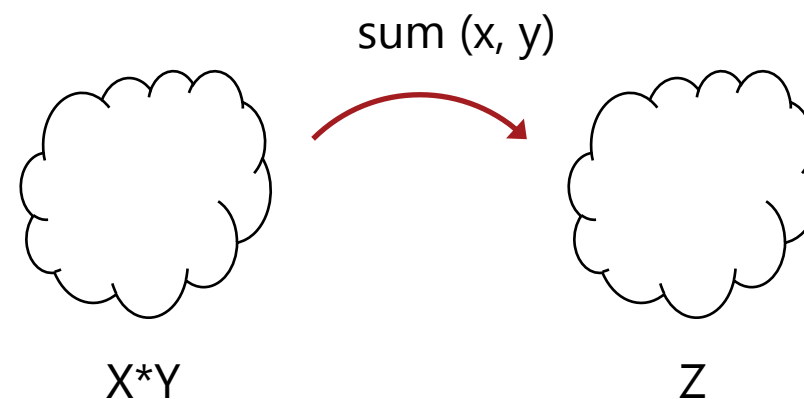


Funktioner: tuple argumenter

```
> let sum x y = x + y;;  
val sum: x: int -> y: int -> int  
> sum 3 4;;  
val it: int = 7
```



```
> let sum (x, y) = x + y;;  
val sum: x: int * y: int -> int  
> sum (3, 4);;  
val it: int = 7
```



Brugerininput: Tastaturet

Bibliotek i bibliotek

```
> let str = System.Console.ReadLine ();;
```

abcdefg

Brugeren taster og slutter med <enter>

```
val str: string = "abcdefg"
```

Resultat er altid en tekststreng

Dette er ikke et tal: "3"

Tallet 3 har mange repræsentationer

```
> let str = "3";;
```

```
val str: string = "3"
```

```
> let a = 3;;
```

```
val a: int = 3
```

Konvertering (casting)

```
> int ("3");;
```

```
val it: int = 3
```

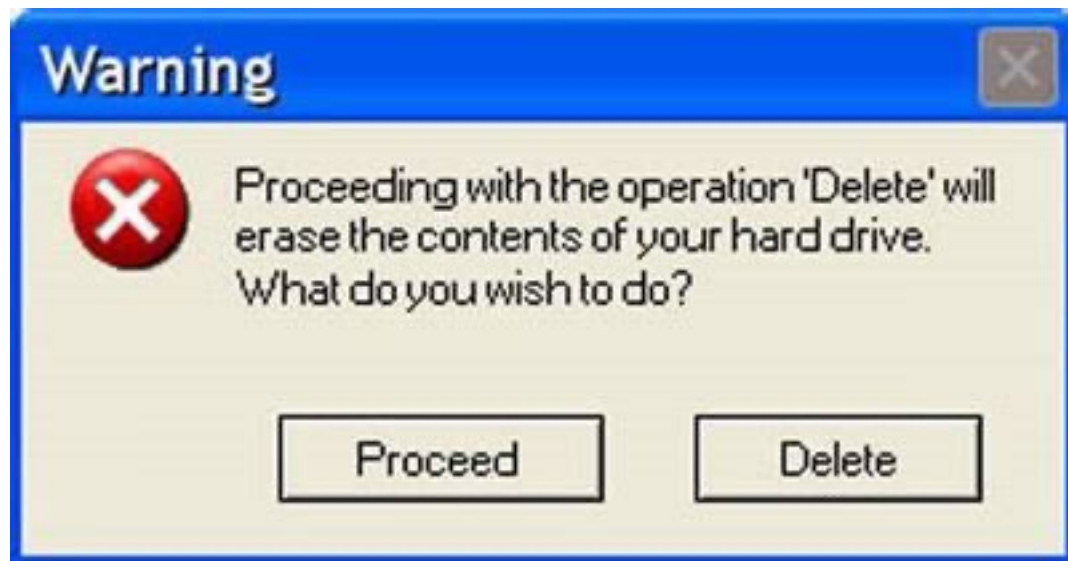
```
> string (3);;
```

```
val it: string = "3"
```



René Magritte, 1929

Design af dialog med brugeren



<http://www.teixeira-soft.com/bluescreen/wp-content/uploads/2016/03/proceed-delete-erase-hard-drive-error-funny-error-messages.jpg>

Eksempel:

Lav et system, som kan svare på, hvor mange mennesker der på i København, Aarhus, Odense og Aalborg.

```
printfn "Antal indbyggere: Indtast et bynavn"
```

```
let by = System.Console.ReadLine ()
```

```
let antal =
```

```
    match by with
```

```
        "København" -> 1345562
```

```
    | "Aarhus" -> 285273
```

```
    | "Odense" -> 180863
```

```
    | "Aalborg" -> 119862
```

```
    | _ -> -1
```

```
match antal with
```

```
    -1 -> printfn "Kender ikke %A" by
```

```
    | _ -> printfn "I %A bor der %A mennesker (wikipedia, 2022)" by antal
```

```
% dotnet fsi byer.fsx
```

```
Antal indbyggere: Indtast et bynavn
```

```
København
```

```
I "København" bor der 1345562 mennesker (wikipedia, 2022)
```

Løkker er lykken

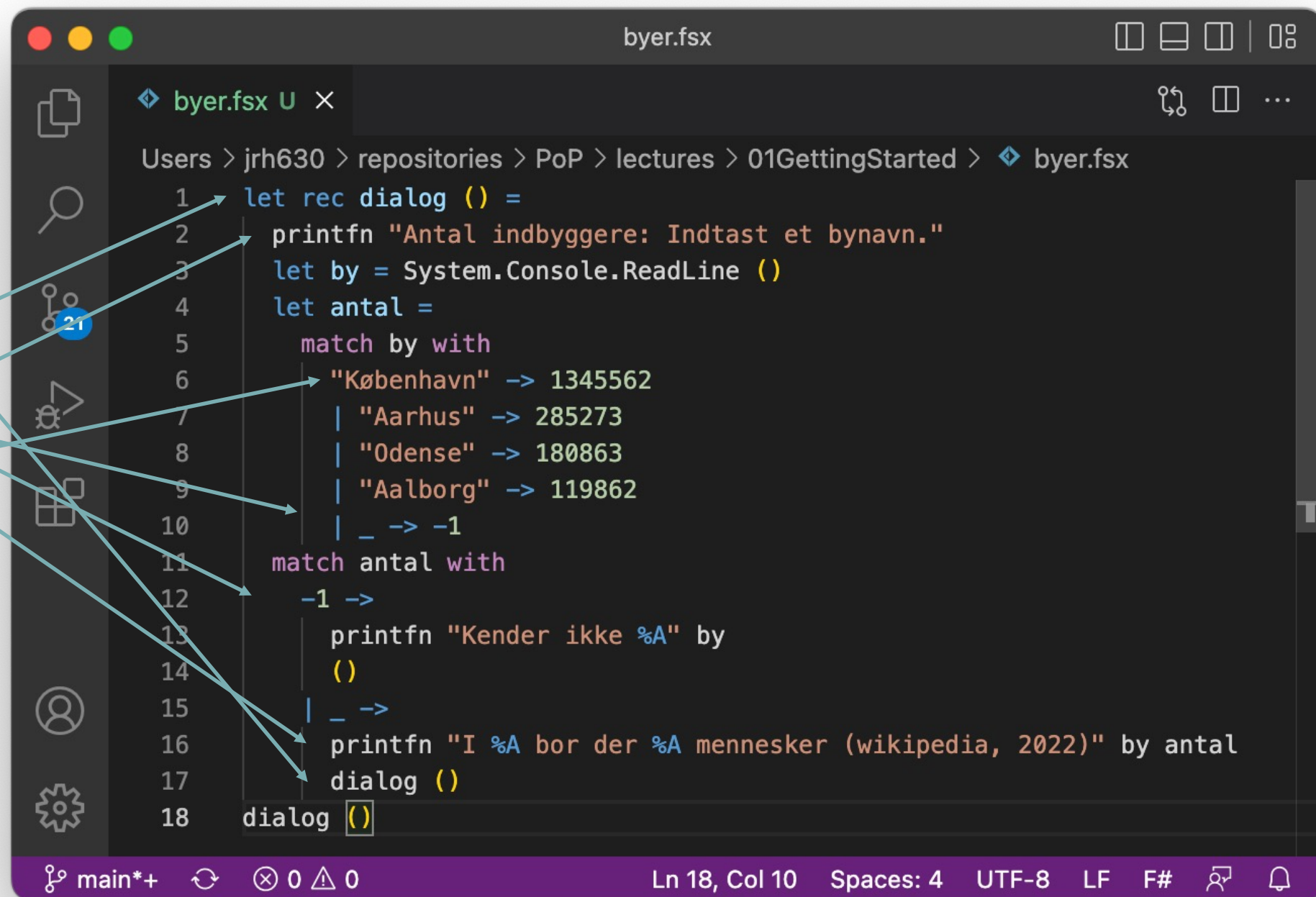
<https://tinyurl.com/2suk4v8p>

Dialogløkke

Valg:

1. Rekursion eller while
2. Hjælpefunktion eller ej
3. Afslutningssignal
4. Et eller flere printfn

Opgave: Udvid eksemplet fra før med en løkke som stopper, når brugeren intaster en ukendt by.



The screenshot shows an F# IDE window titled 'byer.fsx' with the following code:

```
1 let rec dialog () =  
2     printfn "Antal indbyggere: Indtast et bynavn."  
3     let by = System.Console.ReadLine ()  
4     let antal =  
5         match by with  
6         | "København" -> 1345562  
7         | "Aarhus" -> 285273  
8         | "Odense" -> 180863  
9         | "Aalborg" -> 119862  
10        | _ -> -1  
11    match antal with  
12    | -1 ->  
13        printfn "Kender ikke %A" by  
14        ()  
15    | _ ->  
16        printfn "I %A bor der %A mennesker (wikipedia, 2022)" by antal  
17        dialog ()  
18    dialog ()
```

Annotations (arrows) point from the list on the left to the code:

- Arrow 1 points to line 1: `let rec dialog () =`
- Arrow 2 points to line 2: `printfn "Antal indbyggere: Indtast et bynavn."`
- Arrow 3 points to line 11: `match antal with`
- Arrow 4 points to line 16: `printfn "I %A bor der %A mennesker (wikipedia, 2022)" by antal`

The status bar at the bottom shows: `main*+`, `Ln 18, Col 10`, `Spaces: 4`, `UTF-8`, `LF`, `F#`.



Spørgetime