Chapter 34 : Symmetric Linear Search.

In which we start to apply the Searching by Elimination technique.

In a previous article we considered the generic searching by elimination algorithm. It is as follows where W is a finite non-empty set and F is a boolean function defined on the elements of W.

```
{⟨∃ w : w ε W :  F.w⟩}

V := W
;do #.V ≠ 1→ {P0 ∧ P1 ∧ #.V ≠ 1}

                "choose a, b ε V, where a ≠ b"
                if F.a ⇒  F.b → V := V \ {a}
                [] F.b ⇒  F.a → V := V \ {b}
                fi

                {P0 ∧ P1}
od
x := "the unique element in V"

{F.x}
```

In many cases the set we are dealing with is ordered and we can refere to it as

```
W = [M..N]              , M ≤ N
```

This gives us the following refinements of the algorithm

```
a, b := M, N
;do a ≠ b →     {M ≤ a < b ≤ N}

                if F.a ⇒ F.b → a := a + 1
                [] F.b ⇒ F.a → b := b – 1
                fi

od
; x := a
```

This known as the symmetric linear search.