

**Foundations of Computer Science 2004**  
**Paper 1 Question 5 (ACN)**

```
fun ndeep 0 N(v,_,_) = [v]
  | ndeep n N(_,l,r) = ndeep(n-1, l()) @
                        ndeep(n-1, r());
```

The append makes this slower than would be perfect,  
and experts can do the usual conversion to avoid that.

```
exception found of int;
```

```
fun throwifin [] = unit
  | throwifin (x::xs) =
    if x>100 then raise (found x)
    else throwifin n xs;
```

```
fun search z =
  let fun depth n =
    (throwifin (ndeep n z);
     depth (n+1));
```