

Given  $f[0..100]$  of  $\text{int}$ , construct a program to determine whether the 2nd half of  $f$  is an exact copy of the 1st half of  $f$ .

WE HAVE 2 POSSIBLE OUTCOMES, EITHER IT IS AN EXACT COPY OR IT ISN'T.

WE CAN WRITE EACH OF THESE INDIVIDUALLY

IT ISN'T A COPY

$$\langle \forall j: 0 \leq j < n : f[j] = f[50+j] \rangle \wedge f[n] \neq f[50+n]$$

OR

IT IS A COPY

$$\langle \forall j: 0 \leq j < n : f[j] = f[50+j] \rangle \wedge n = 49 \wedge f[n] = f[50+n]$$

WE COMBINE TO GET THE POSTCONDITION

$$\underline{\text{POST}} : \langle \forall j: 0 \leq j < n : f[j] = f[50+j] \rangle \wedge \left( \underset{\vee}{f[n] \neq f[50+n]} \vee (n = 49 \wedge f[n] = f[50+n]) \right)$$

AND USING THE RULE FROM LOGIC

$$[P \vee (\neg P \wedge Q) \equiv P \vee Q]$$

WE CAN SIMPLIFY TO GET

$$\underline{\text{POST}} : \langle \forall j: 0 \leq j < n : f[j] = f[50+j] \rangle \wedge (f[n] \neq f[n+50] \vee n = 49)$$



## Model

$$* (o) C.n = \langle \forall j : 0 \leq j < n : f.j = f.(50+j) \rangle, \quad 0 \leq n \leq 50$$

ETC. REMAINDER IS EASY.