**Exercises.**

Determine whether the following Hoare triples are valid.

$\{y > 16\}\ x := x + 2\ \{y > 15\}$

$\{x = 4\}\ x := x + 1\ \{x > 4\}$

$\{y = z\}\ z := z + 1\ \{y - 1 > z\}$

$\{17 = 18\}\ x := x+1\ \{\ x > z\}$

$\{x = 4\}\ x := 4\ \{x = 4\}$

$\{x = 4\}\ x := x + 1\ \{x = 4\}$

Determine the Weakest Preconditions of the following.

$x := x + 1\ \{x = 12\}$

$x := y + 2\ \{x > 17\}$

$y := 4\ \{x = y + 2\}$

$x := y\ \{x \leq 0\}$

$x := 74\ \{x = 73\}$

What assignments would make the following into valid Hoare triples?

| | |
|---|---|
| $\{x = y + z\}$ | $\{x = z\}$ |
| $\{y * 2 = 12\}$ | $\{y = 24\}$ |
| $\{true\}$ | $\{y = 12\}$ |
| $\{x > y\}$ | $\{x < y\}$ |
| $\{x = X \wedge y = Y\}$ | $\{x = Y \wedge y = X\}$ |

Note, in the last problem x and y are variables and X and Y are the values they contain at the start.