

# Rule of Sequential Composition

1

$$wp(S_1; S_2, Q) \equiv wp(S_1, wp(S_2, Q))$$

# Rule of Sequential Composition

2

$$\text{wp}(S1;S2,Q) \equiv \text{wp}(S1, \text{wp}(S2,Q))$$

$$\text{wp}((x:= x+1; y := y+1), x = y)$$

# Rule of Sequential Composition

3

$$\text{wp}(S1;S2,Q) \equiv \text{wp}(S1, \text{wp}(S2,Q))$$

$$\begin{aligned} &\text{wp}((x:= x+1; y := y+1), x = y) \\ &\equiv \text{wp}(x := x+1, \text{wp}(y := y+1, x = y)) \end{aligned}$$

# Rule of Sequential Composition

$$\text{wp}(S1;S2,Q) \equiv \text{wp}(S1, \text{wp}(S2,Q))$$

$$\begin{aligned} & \text{wp}((x:= x+1; y := y+1), x = y) \\ & \equiv \text{wp}(x := x+1, \text{wp}(y := y+1, x = y)) \\ & \equiv \text{wp}(x := x+1, x = y+1) \end{aligned}$$

# Rule of Sequential Composition

5

$$\text{wp}(S1;S2,Q) \equiv \text{wp}(S1, \text{wp}(S2,Q))$$

$$\begin{aligned} &\text{wp}((x:= x+1; y := y+1), x = y) \\ &\equiv \text{wp}(x := x+1, \text{wp}(y := y+1, x = y)) \\ &\equiv \text{wp}(x := x+1, x = y+1) \\ &\equiv x+1 = y+1 \end{aligned}$$

# Rule of Sequential Composition

6

$$\text{wp}(S1;S2,Q) \equiv \text{wp}(S1, \text{wp}(S2,Q))$$

$$\begin{aligned} & \text{wp}((x:= x+1; y := y+1), x = y) \\ & \equiv \text{wp}(x := x+1, \text{wp}(y := y+1, x = y)) \\ & \equiv \text{wp}(x := x+1, x = y+1) \\ & \equiv x+1 = y+1 \\ & \equiv x = y \end{aligned}$$

# Rule of Sequential Composition

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$\text{wp}((x := 2 * x + 1; y := y - 1), y = 3 * x)$

# Rule of Sequential Composition

$$\begin{aligned} & \text{wp}((x := 2*x+1; y := y-1), y = 3*x) \\ & \equiv \text{wp}(x := 2*x+1, \text{wp}(y := y-1, y = 3*x)) \end{aligned}$$



# Rule of Sequential Composition

$$\begin{aligned} & \text{wp}((x := 2*x + 1; y := y - 1), y = 3*x) \\ & \equiv \text{wp}(x := 2*x + 1, \text{wp}(y := y - 1, y = 3*x)) \\ & \equiv \text{wp}(x := 2*x + 1, y - 1 = 3*x) \end{aligned}$$

# Rule of Sequential Composition

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$$\begin{aligned} & \text{wp}((x := 2*x+1; y := y-1), y = 3*x) \\ & \equiv \text{wp}(x := 2*x+1, \text{wp}(y := y-1, y = 3*x)) \\ & \equiv \text{wp}(x := 2*x+1, y-1 = 3*x) \\ & \equiv y-1 = 3*(2*x+1) \end{aligned}$$

# Rule of Sequential Composition

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$$\begin{aligned} & \text{wp}((x := 2*x + 1; y := y - 1), y = 3*x) \\ & \equiv \text{wp}(x := 2*x + 1, \text{wp}(y := y - 1, y = 3*x)) \\ & \equiv \text{wp}(x := 2*x + 1, y - 1 = 3*x) \\ & \equiv y - 1 = 3*(2*x + 1) \\ & \equiv y = 6*x + 4 \end{aligned}$$