A feladatok megoldása

1.

$(xx \in 0..100 \land yy \in 0..100 \land xx = yy) \Rightarrow$
$[op' := yy]\neg[op := xx]\neg(yy \in 0..100 \land xx = yy \land op' = op)$
$\Downarrow$
$(xx \in 0..100 \land yy \in 0..100 \land xx = yy) \Rightarrow$
$[op' := yy]\neg\neg(yy \in 0..100 \land xx = yy \land op' = xx)$
$\Downarrow$
$(xx \in 0..100 \land yy \in 0..100 \land xx = yy) \Rightarrow$
$(yy \in 0..100 \land xx = yy \land yy = xx)$

2.

$(xx \in 0..100 \land yy \in 0..100 \land xx = yy \land xx > 0) \Rightarrow$
$[op' := 0]\neg[ANY zz WHERE zz \in \mathbb{N} \land zz < xx THEN op := zz END]$
$\neg(yy \in 0..100 \land xx = yy \land op' = op)$

$\Downarrow$
$(xx \in 0..100 \land yy \in 0..100 \land xx = yy \land xx > 0) \Rightarrow$
$[op' := 0]\neg(\forall zz.(zz \in \mathbb{N} \land zz < xx \Rightarrow$
$[op := zz]\neg(yy \in 0..100 \land xx = yy \land op' = op)))$

$\Downarrow$
$(xx \in 0..100 \land yy \in 0..100 \land xx = yy \land xx > 0) \Rightarrow$
$[op' := 0]\neg(\forall zz.(zz \in \mathbb{N} \land zz < xx \Rightarrow$
$\neg(yy \in 0..100 \land xx = yy \land op' = zz)))$

$\Downarrow$
$(xx \in 0..100 \land yy \in 0..100 \land xx = yy \land xx > 0) \Rightarrow$
$[op' := 0](\exists zz.(zz \in \mathbb{N} \land zz < xx \land (yy \in 0..100 \land xx = yy \land op' = zz)))$
$\Downarrow$
$(xx \in 0..100 \land yy \in 0..100 \land xx = yy \land xx > 0) \Rightarrow$
$(\exists zz.(zz \in \mathbb{N} \land zz < xx \land (yy \in 0..100 \land xx = yy \land 0 = zz)))$
$\Downarrow$
$(xx \in 0..100 \land yy \in 0..100 \land xx = yy \land xx > 0) \Rightarrow$
$(0 \in \mathbb{N} \land 0 < xx \land (yy \in 0..100 \land xx = yy \land 0 = 0))$

3.

$[...]\neg[xx := \emptyset]\neg(yy \in 1..10 \longrightarrow BOOL \land xx = dom(yy \rhd TRUE))$
$\Downarrow$
$[...](yy \in 1..10 \longrightarrow BOOL \land \emptyset = dom(yy \rhd TRUE)$

$(ctr \in 0..10 \land dom(1..ctr \lhd yy \rhd TRUE) = \emptyset \land \neg(ctr < 10) \not\Rightarrow (yy \in 1..10 \longrightarrow BOOL)$

4.

$(xx \in \mathbb{N} \land yy \in \mathbb{N} \land xx = yy) \Rightarrow$
$[...]\neg[xx :\in 0..5]\neg(yy \in \mathbb{N} \land xx = yy)$
$\Downarrow$
$(xx \in \mathbb{N} \land yy \in \mathbb{N} \land xx = yy) \Rightarrow$
$[...]\neg(\forall zz.(zz \in 0..5 \Rightarrow [xx := zz]\neg(yy \in \mathbb{N} \land xx = yy)))$
$\Downarrow$
$(xx \in \mathbb{N} \land yy \in \mathbb{N} \land xx = yy) \Rightarrow$
$[...](\exists zz.(zz \in 0..5 \land (yy \in \mathbb{N} \land zz = yy)))$

$(xx \in \mathbb{N} \land yy \in \mathbb{N} \land xx = yy) \Rightarrow yy \in \mathbb{N}$

$(xx \in \mathbb{N} \land yy \in \mathbb{N} \land xx = yy) \Rightarrow$
$(yy \in \mathbb{N} \land \neg(yy > 5)) \Rightarrow \exists zz.(zz \in 0..5 \land (yy \in \mathbb{N} \land zz = yy)))$

$$(xx \in \mathbb{N} \land yy \in \mathbb{N} \land xx = yy) \Rightarrow$$
$$((yy \in \mathbb{N} \land yy > 5) \Rightarrow (yy \in \mathbb{N}))$$

$$(xx \in \mathbb{N} \land yy \in \mathbb{N} \land xx = yy) \Rightarrow$$
$$((yy \in \mathbb{N} \land yy > 5) \Rightarrow [yy := yy - 1](yy \in \mathbb{N}))$$
$$\Downarrow$$
$$(xx \in \mathbb{N} \land yy \in \mathbb{N} \land xx = yy) \Rightarrow$$
$$((yy \in \mathbb{N} \land yy > 5) \Rightarrow (yy - 1 \in \mathbb{N}))$$

$$(xx \in \mathbb{N} \land yy \in \mathbb{N} \land xx = yy) \Rightarrow$$
$$((yy \in \mathbb{N} \land yy > 5) \Rightarrow [zz := yy][yy := yy - 1](yy < zz))$$
$$\Downarrow$$
$$(xx \in \mathbb{N} \land yy \in \mathbb{N} \land xx = yy) \Rightarrow$$
$$((yy \in \mathbb{N} \land yy > 5) \Rightarrow (yy - 1 < yy))$$