1 5F-1 Bookkeeping

- 0 pts Correct

5F-2 $VC(do_{Inv1, Iv2}\ c\ \text{while}\ b, B) = Inv1 \wedge VC(c; \text{while}_{Inv2}\ b\ \text{do}\ C, B)$

$$= Inv1 \wedge VC(c, VC(\text{while}_{Inv2}\ b\ \text{do}\ c, B))$$

$$= Inv1 \wedge (VC(c, Inv2 \wedge (\forall x_1, \dots x_n . Inv2 \Rightarrow (e \Rightarrow VC(c, Inv2) \wedge \neg e \Rightarrow B))))$$

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2 5F-2 VCGen Do-While

- **- 0 pts** Correct

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5F-3 Stark: A: $x \le 6$,

B: $x = 6$

σ: Any σ with $\sigma[x] = 5$

σ': $\sigma'[x] = 6$

c: while $x \le 5$ do $x := x+1$

$\langle c, \sigma \rangle \Downarrow \sigma'$ is true

$\sigma \models A$ is true as $\sigma[x] = 5 \le 6$

$\sigma' \models B$ is true as $\sigma'[x] = 6$

I think it's not possible to prove $\vdash \{x \le 6\}$ while $x \le 5$ do $x := x+1$ $\{x = 6\}$

Using Stark rule, we can show that $\vdash \{x \le 6\}$ while $x \le 5$ do $x := x+1$ $\{x \le 6\}$

but without a lower bound constraint, we cannot have something like $x > 5$ then

using consequence, so it's not possible to prove this.

Targaryen: A: $x \le 6$,

B: $x = 6$

σ: Any σ with $\sigma[x] = 5$

σ': $\sigma'[x] = 6$

c: while $x \le 5$ do $x := x+1$

$\langle c, \sigma \rangle \Downarrow \sigma'$ is true

$\sigma \models A$ is true as $\sigma[x] = 5 \le 6$

$\sigma' \models B$ is true as $\sigma'[x] = 6$ (The same context as Stark)

I think it's not possible to prove $\vdash \{x \le 6\}$ while $x \le 5$ do $x := x+1$ $\{x = 6\}$

Even we could have $\{x \le 6\} \wedge \{x > 5\}$ at the bottom, $\{x \le 6\}$ $x := x+1$ $\{x \le 6\}$

is not always true. When $x = 6$ it fails. So, 6 is also needed for

the precondition.

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3 5F-3 VCGen Mistakes

- 0 pts Correct