Date

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HW13 Matematika Diskret

P. 798

1. Prove that the program segment

```
y := 1
z := x + y
```

is correct with respect to the initial assertion $x = 0$ and final assertion $z = 1$.

* Suppose that $x = 0$ at the initial assertion.
Then, program will assign $y = 1$.
Next, program will compute $x + y$ and will be assinged to z.
Since $x + y$ is $0 + 1$ and z is 1, the final assertion is satisfied and the proving is true.

□

4. Verify that the program segment

```
if x < y then
    min := x
else
    min := y
```

Is correct with respect to the inital assertion T and the final assertion $(x \leq y \wedge min) \vee (x > y \wedge min = y)$.

* Suppose that $x < y$ for the first case.
Then min = x. So, $(x \leq y \wedge min = x)$ is true.
* Supper that $x = y$ for the second case.
Then min = x. Since x equal to y, min is also min = y. So, $(x < y \wedge min = x)$ is true. ~~and $(x = y \wedge min = y)$~~
* Suppose than $x > y$ for the last case.
Then min = y. Since that, $(x > y \wedge min = y)$ is true.
* From all three cases, and the final assertion is disjunction. The final assertion $(x \leq y \wedge min = x) \vee (x > y \wedge min = y)$ is true.

□