IA169: Model Checking

Seminar 4

Exercise 1 *Recall the definition of symbolic transition system (symbolically represented Kripke structure) from the lecture.*

Exercise 2 *Let P be a safety property. Explain bounded model checking algorithm for the property P and write the corresponding formula that needs to be checked.*

Exercise 3 *Write a symbolic transition system and a property P that is violated for bound $k = 4$, but is satisfied for all bounds $k < 4$. Check your answers in* NUXMV.

Feel free to use fish in your transition system.

Exercise 4 *Let P be a safety property. Explain k-induction algorithm for the property P and write the corresponding formulas that need to be checked.*

Exercise 5 *Write a symbolic transition system S and a property P such that*

- *S satisfies the property P, and*

- *P is inductive (1-inductive).*

Check your answers in NUXMV.

Exercise 6 *Write a symbolic transition system S and a property P such that*

- *S satisfies the property P, but*

- *P is not inductive (1-inductive).*

Check your answers in NUXMV.

Exercise 7 *Write a symbolic transition system S and a property P such that*

- *S satisfies the property P,*

- *P is 4-inductive, but*

- *P is not k-inductive for any $k < 4$.*

Check your answers in NUXMV.

Exercise 8 *Write a symbolic transition system S and a property P such that*

- *S satisfies the property P,*

- *P is not k-inductive for any k.*

You can check your answer in NUXMV, *but you will probably fail. The k-induction algorithm* NUXMV *uses simple path constraints and is thus complete for finite systems.*