Lab 3 report

Group FT_I

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1. Description of checking the definitions:
   Time spent: about 30 minutes for the formulas and 10 minutes for the testing.

   To check if the definitions we gave of the functions are correct we used the information given in the lecture. So, to check a tautology, we had to check if the negation of a tautology was satisfiable and also a contradiction. For a contradiction we checked if the formula was not satisfiable and if the negation was a tautology. For a satisfiable formula we only checked if the formula was no contradiction. The test function checks if a formula is one of the three options and if not returns false. Since it should not be possible that a formula is not a tautology, contradiction or satisfiable. The test entails function checks if you evaluate all of the possibilities of both functions and zip them together if (not function1 || f2) holds for all evaluations. This should be the case for when a formula entails another one. The equality test function is checked by checking if the both formulas imply each other. We also created a random test generator similar to the one in assignment 3. We applied the generator a few times and it gave all passing results.

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3. Test generator and test properties
   Time spent: It took some time to use the random functions correctly. The testable properties were pretty fast found. So total amount of time is something around 60 minutes.

   Again, the testable properties were mostly based on the information given in the lecture. The pre and post conditions of the CNF formula helped in creating testable properties. All properties test if a function in CNF is logically equivalent to the original formula, the arrow free formula, the NNF of the formula and if applying the CNF function again on a formula already in CNF also gives a logically equivalent formula. We created a testable property allProps out of the previous mentioned properties and used it in our test generator. The test generator uses the test function given in Week3.hs to 100 random formulas created by getRandomFs. We used it a few times and all gave passing results.

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