Quiz Lesson 1

1. What is a dynamic model?
   * A model that represents something static.
   * A model that represents something changing over time.
   * A model that has a first-class notion of time.
2. How is time emulated in Alloy 5?
   * By using utility macros.
   * By placing an ordering on some signature.
   * By encoding it in the signature fields.
3. What is a trace in Alloy 5?
   * A fact that describes how the system will evolve.
   * A module that helps to model time.
   * A predicate that relates each state to the next state in the sequence.
4. What is the purpose of a time signature?
   * To represent complex specifications with multiple changing entities or properties.
   * To represent simple boolean properties that change over time.
   * To encode arbitrary properties with multirelations.
5. What does the 'var' keyword do in Alloy 6?
   * Specifies that a signature or field is constant over time
   * Specifies that a signature or field is mutable
   * Specifies that a signature or field is a trace
   * Specifies that a signature or field is a lasso trace
6. What is a static signature or field in Alloy 6?
   * A signature or field that is constant over time
   * A signature or field that is a trace
   * A signature or field that is a lasso trace
   * A signature or field that is mutable
7. What is linear-time temporal logic used for in Alloy 6?
   * Reasoning about future and past states along a trace
   * Reasoning about constant values
   * Reasoning about mutable values
   * Reasoning about lasso traces
8. What is the condition for the expression "F until G" to be true in state i?
   * G is true in some state j ≥ i and F is true in every state k such that i ≤ k < j
   * G is true in every state ≥ i up to and including a state k in which F is true
   * F is true in state i and G is true in state i + 1
9. What is the condition for the expression "F ; G" to be true in state i?
   * G is true in some state j ≥ i and F is true in every state k such that i ≤ k < j
   * G is true in every state ≥ i up to and including a state k in which F is true
   * F is true in state i and G is true in state i + 1
10. What is the condition for the expression "always F" to be true in state i?
    * F is true in some state ≥ i
    * F is true in every state ≥ i
    * F is true in state i + 1
11. What is the condition for the expression "eventually F" to be true in state i?
    * F is true in some state ≥ i
    * F is true in every state ≥ i
    * F is true in state i + 1
12. What is the condition for the expression "after F" to be true in state i?
    * F is true in some state ≤ i
    * F is true in every state ≤ i
    * F is true in state i + 1
13. What is the condition for the expression "before F" to be true in state i?
    * F is true in some state ≤ i
    * F is true in every state ≤ i
    * F is true in state i – 1
14. What is the condition for the expression "historically F" to be true in state i?
    * F is true in some state ≥ i
    * F is true in every state ≤ i
    * F is true in state i + 1
15. What is the condition for the expression "once F" to be true in state i?
    * F is true in some state ≤ i
    * F is true in every state ≤ i
    * F is true in state i + 1

Quiz Lesson 2

1. What is the time horizon in Alloy used for?
   * To specify the upper bound on the number of transitions in a lasso trace
   * To specify the lower bound on the number of transitions in a lasso trace
   * To specify the exact number of transitions in a lasso trace
   * To specify the type signature names in plain scopes
2. What is a lasso trace?
   * An infinite and non-repeating sequence of transitions
   * A finite and non-repeating sequence of transitions
   * An infinite and periodic sequence of transitions
   * A finite and periodic sequence of transitions
3. What is the purpose of the steps keyword in Alloy?
   * To specify the upper bound on the number of transitions in a lasso trace
   * To specify the lower bound on the number of transitions in a lasso trace
   * To specify the exact number of transitions in a lasso trace
   * To specify the type signature names in plain scopes
4. What is the difference between complete model-checking and bounded model checking?
   * Complete model-checking checks over all possible traces without bounding them upfront, while bounded model checking only checks a subset of possible traces with an upper bound on the number of transitions.
   * Complete model-checking checks only a subset of possible traces with an upper bound on the number of transitions, while bounded model checking checks over all possible traces without bounding them upfront.
   * Complete model-checking checks only the first and last states in a lasso trace, while bounded model checking checks all states in a lasso trace.
   * Complete model-checking and bounded model checking are the same thing.

Quiz Exercise session

1. How can we say that travelers start their journey from Milan and eventually they will come back?

* fact StartingFromMilanAndComingBack {all p:Person | p.loc.name = Milan and p.status = Travelling and (eventually (p.loc.name = Milan and p.status=AtDestination))}
* fact StartingFromMilanAndComingBack {all p:Person | p.loc.name = Milan and p.status = Travelling and after (eventually (always p.loc.name = Milan and p.status=AtDestination))}
* fact StartingFromMilanAndComingBack {all p:Person | p.loc.name = Milan and p.status = Travelling and after (eventually (p.loc.name = Milan and p.status=AtDestination))}