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| **Assignment**: | Assignment 5 |
| **Class**: | ECE 351 |
| **Professor**: | Dr. Garrison Greenwood |
| **Term**: | Spring 2019 |

**Questions:**

1. **Briefly explain what “latch inference” means.**

Latch inference occurs when the synthesizer isn’t instructed on how to update a previous value, so a latch is created to store the last value since it never changes.

1. **What are two ways latch inference occurs. How can you prevent if from occurring?**

The two ways latch inference occurs, is if there is no default statement inside of a case statement, or if there is not a pre-defined value for an if-then-else statement (a default “else” case) which will always update a value based on the conditional statement evaluated. To prevent latch inference, include the default statements for both the if-then-else and case statements so that all values are updated, and no values are latched.

1. **What is a synthesis directive?**

The synthesis directive instructs the compiler to essentially auto-fill the default cases for a case statement, making it more readable then including every possible case to prevent latch inference.

1. **It is recommended that module outputs be registered. Why?**