

CLAD Homework 4 Solutions

1. **B**

In LabVIEW, simple state machines consist of a While Loop containing a case structure. The case structure allows the decision of which case to run to be determined programmatically. It is also scalable since it is easy to add new cases to the case structure.

2. **C**

A state machine can be used to achieve the same functionality as a sequence structure. However, state machines allow the developer to programmatically determine the sequence at run-time. This makes the state machine implementation more scalable.

3. **B**

The sequence local is first written to in frame 1. Thus, in frame zero, no data is available to read since no data has yet been written.

4. **A**

Queues, notifiers, and local variables are all designed to transfer data. Semaphores do not pass data. Instead, their sole purpose is to prevent certain sections of code from running while other critical sections are running.

5. **B**

Answer C is incorrect because semaphores cannot pass data. Answer A is incorrect because notifiers pass data, but they can only pass one element at a time. Data is overwritten and lost if the program writes to the notifier twice before data is read. Answer D is incorrect because local variables have no mechanism for determining when data is updated, so there is no way to tell if data is newly-acquired or not. Queues support multiple elements and operate using a FIFO principle, guaranteeing that no data is lost or overwritten.

6. **A**

The Tick Count (ms) function returns the value of the millisecond timer when it is called. Calling it twice and taking the difference will yield elapsed time in milliseconds between the calls. In this code snippet, SubVI is called between the two calls of the Tick Count (ms) function, therefore A is the correct answer.

7. **C**

Sequence locals store data between frames of Stacked Sequence structures. The sequence local is only written to in frame 0. Thus frame 1 has no impact on frame 2. The value in Result F2 is 8 times 5, which is 40.

8. **C**

Notify events simply inform LabVIEW that an event has occurred and been processed. Filter events allow the user to programmatically decide to discard events.

9. **C**

The Wait (ms) function does nothing to release or allocate memory or specify processor core. All it does is cause the execution of a VI to pause for a short time to allow the processor time to complete other tasks.

10. **C**

State machines consist of a While Loop, a Case structure, a shift register, and code for determining the transition.