Assignment 3
Solution

Q1. Cyclic Dependency: Loop statement depend on itself from the previous iteration.

Q2.   Loop:

        Load R2, 0 (R0)

        STALL

        Inc R2

        Store R2, 4 (R0)

        Add R0, R0, 4

        STALL

        Jne R0, R1, Loop

        STALL

Q3. $a_0 = 0$

$a_1 = a_0 + 1 = 1$

$a_2 = a_1 + 1 = 2 \ldots$

$a_{99} = a_{98} + 1 = 99$

If compiler is able to detect $a_i = i$, then there won't be any dependency and the loop will become parallel.

Let's assume $R_q = 0$ (assume register R_q stores 0).

Then,

        Loop:

            Inc Rq

            Add R0, R0, 4

            STALL

            Jne R0, R1, Loop

            Store Rq, 0 (R0)