

Assignment-2: Pipelining

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1 Question 1

i. optimized schedule without unrolling

```

Loop :   L.D   F1, o(R1)
         L.D   F2, o(R2)
         DADDUI R1, R1, #-8
         MUL   F3, F1, F2
         DADDUI R2, R2, #-8
         DADDUI R3, R3, #-8
         STALL
         BNE   R1, R4, Loop
         S.D   F3, 8(R3)

```

ii. With unrolling

```

Loop :   L.D   F1, o(R1)
         L.D   F2, o(R2)
         L.D   F11, -8(R1)
         MUL   F3, F1, F2
         L.D   F22, -8(R2)
         DADDUI R1, R1, #-16
         MUL   F33, F11, F22
         DADDUI R2, R2, #-16
         S.D   F3, o(R3)
         DADDUI R3, R3, #-16
         BNE   R1, R4, Loop
         S.D   F33, 8(R3)

```

iii. Software pipelined

```

Loop :   S.D  F3, 16(R3)
          MUL  F3, F1, F2
          L.D  F1, 0(R2)
          L.D  F2, 0(R1)
          DADDUI R1, R1, #-8
          DADDUI R2, R2, #-8
          BNE  R1, R4, Loop
          DADDUI R3, R3, #-8

```

2 Question 2*Optiized without unrolling*

```

Loop :   L.D  F2, 0(R2)
          L.D  F3, 0(R3)
          L.D  F4, 0(R4)
          MUL  F1, F2, F3
          ADD  F5, F4, F1
          DADDUI R2, R2, #-8
          DADDUI R3, R3, #-8
          DADDUI R4, R4, #-8
          DADDUI R5, R5, #-8
          BNE  R2, R1, Loop
          S.D  F5, 8(R5)

```