yep

SYSC 3006 Lab 4 (Fall 2016)

Part 1 FSM Output ROM Table:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **3 1** | **3 0** | **2 9** | **2 8** | **2 7** | **2 6** | **2 5** | **2 4** | **2 3** | **2 2** | **2 1** | **2 0** | **1 9** | **1 8** | **1 7** | **1 6** | **1 5** | **1 4** | **1 3** | **1 2** | **1 1** | **1 0** | **9** | **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** | **0** |  |
| **State**  **Hex encoding** | **Unused (0)** | **IRCE** | **PCOE** | **C1OE** | **AADD** | **MARCE** | **MAROE** | **MDRCE** | **MDROE** | **MDRget** | **MDRput** | **IBRead** | **IBWrite** | **AOP** | **ANOP** | **DR** | **SXR** | **SYR** | **RegSEL** | **RegLD** | **T1CE** | **T1OE** | **T2CE** | **T2OE** | **Q7+** | **Q6+** | **Q5+** | **Q4+** | **Q3+** | **Q2+** | **Q1+** | **Q0+** | **Hex**  **Encoding** |
| **F0**  **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0002 0001** |
| **F1**  **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **0002 0002** |
| **F2**  **2** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **1** | **0002 0003** |
| **Decode**  **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |  |  |  |  |  |  |  |  |  |  |  | **0** | **0** | **0** | **0** | **0** | **1** | **1** | **1** | **000x xx07** |
| **E0**  **4** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |  |  |  |  |  |  |  |  |  |  |  | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **1** | **000x xx05** |
| **E1**  **5** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |  |  |  |  |  |  |  |  |  |  |  | **0** | **0** | **0** | **0** | **0** | **1** | **1** | **0** | **000x xx06** |
| **E2**  **6** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |  |  |  |  |  |  |  |  |  |  |  | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **000x xx00** |
| **Dead**  **7** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **1** | **1** | **000x xx07** |

FSM Decode ROM Table (For Parts 1 and 2): Part 1 Instruction Encoding Table

|  |  |  |
| --- | --- | --- |
| Instruction | Address  (hex) | Contents  (hex) |
| NOP | 00 |  |
| ADD | 01 | **04** |
| SUB | 02 |  |
| MOV | 03 |  |
| AND | 04 |  |
| OR | 05 |  |
| XOR | 06 |  |
| NOT | 07 |  |

|  |  |
| --- | --- |
| Instruction | Encoding  (hex) |
| NOT  R9 🡨 NOT RB |  |
| SUB  R8 🡨 RB – R9 |  |
| NOP |  |
| MOV  RA 🡨 R8 |  |

Part 2: Main Memory Table

|  |  |  |
| --- | --- | --- |
| Instruction | Address  (hex) | Contents  (hex) |
| NOT  R9 🡨 NOT RB | 00 |  |
| SUB  R8 🡨 RB – R9 | 01 |  |
| NOP | 02 |  |
| MOV  RA 🡨 R8 | 03 |  |

Part 2 FSM Output ROM Table:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **3 1** | **3 0** | **2 9** | **2 8** | **2 7** | **2 6** | **2 5** | **2 4** | **2 3** | **2 2** | **2 1** | **2 0** | **1 9** | **1 8** | **1 7** | **1 6** | **1 5** | **1 4** | **1 3** | **1 2** | **1 1** | **1 0** | **9** | **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** | **0** |  |
| **State**  **Hex encoding** | **Unused (0)** | **IRCE** | **PCOE** | **C1OE** | **AADD** | **MARCE** | **MAROE** | **MDRCE** | **MDROE** | **MDRget** | **MDRput** | **IBRead** | **IBWrite** | **AOP** | **ANOP** | **DR** | **SXR** | **SYR** | **RegSEL** | **RegLD** | **T1CE** | **T1OE** | **T2CE** | **T2OE** | **Q7+** | **Q6+** | **Q5+** | **Q4+** | **Q3+** | **Q2+** | **Q1+** | **Q0+** | **Hex**  **Encoding** |
| **F0**  **0** | **0** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** |  |
| **F1**  **1** | **0** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** |  |
| **F2**  **2** | **0** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **1** |  |
| **Decode**  **3** | **0** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **0** | **0** | **0** | **0** | **0** | **1** | **1** | **1** |  |
| **E0**  **4** | **0** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **0** | **0** | **0** | **0** | **0** |  |  |  |  |
| **E1**  **5** | **0** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **0** | **0** | **0** | **0** | **0** |  |  |  |  |
| **E2**  **6** | **0** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |  |
| **Dead**  **7** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **1** | **1** | **0000 0007** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **3 1** | **3 0** | **2 9** | **2 8** | **2 7** | **2 6** | **2 5** | **2 4** | **2 3** | **2 2** | **2 1** | **2 0** | **1 9** | **1 8** | **1 7** | **1 6** | **1 5** | **1 4** | **1 3** | **1 2** | **1 1** | **1 0** | **9** | **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** | **0** |  |
| **State**  **Hex encoding** | **Unused (0)** | **AADD** | **IRCE** | **IBWrite** | **IBRead** | **MDRget** | **MDRput** | **MDROE** | **MDRCE** | **MAROE** | **MARCE** | **PCOE** | **C1OE** | **AOP** | **ANOP** | **DR** | **SXR** | **SYR** | **RegSEL** | **RegLD** | **T1CE** | **T1OE** | **T2CE** | **T2OE** | **NextState7** | **NextState6** | **NextState5** | **NextState4** | **NextState3** | **NextState2** | **NextState1** | **NextState0** | **Hex**  **Encoding** |
| **F0**  **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **1** | **0** | **0** | **1** | **0** | **0** | **0** | **1** | **1** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0032 3801** |
| **F1**  **1** | **0** | **1** | **0** | **0** | **1** | **0** | **0** | **0** | **1** | **1** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **48C8 0602** |
| **F2**  **2** | **0** | **0** | **1** | **0** | **0** | **1** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **1** | **2502 0003** |
| **Decode**  **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **0** | **1** | **0** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0012 2100** |
| **E0**  **4** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **1** | **0** | **1** | **1** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **1** | **0002 B805** |
| **E1**  **5** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **0** | **0** | **1** | **1** | **1** | **0** | **1** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **1** | **0** | **0004 7606** |
| **E2**  **6** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **1** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0003 2100** |
| **Dead**  **7** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **1** | **1** | **0000 0007** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |