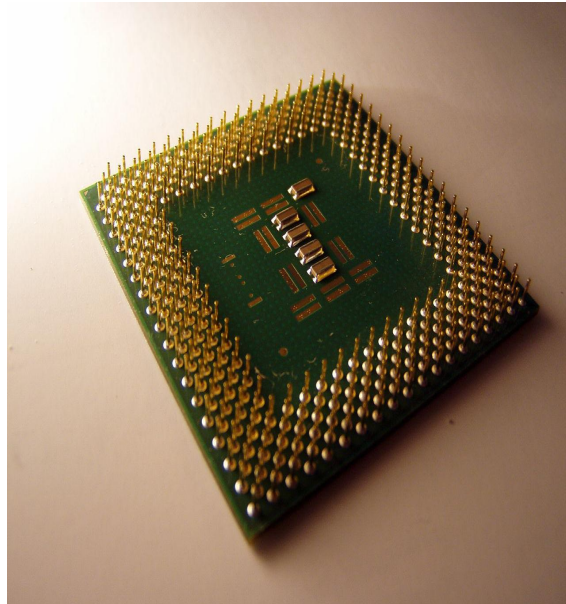


EE-224 Project

IITB-CPU



Team Members:

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State transition

1> ADD:-

S1:-

PC ← Memory Address	MRD
Memory data → T1	PCE
PC → ALU-A	ADD
+1 → ALU-B	
ALU-C → PC	

→

S2:

T1 ₁₁₋₉ → RF-A1	T2-E
T1 ₈₋₆ → RF-A2	T3-E
RF-D1 → T2	
RF-D2 → T3	

↓

S4:

T2 → RF-D3	RF-WR
T1 ₅₋₃ → RF-A3	

←

S3:

T3 → ALU-A	ADD
T3 → ALU-B	T2-E
ALU-C → T2	
if (T2=0) then Z=1;	

2> ADC :-

S1 → S2 $\xrightarrow[\text{if } CZ=10]{\text{if } C=1}$ S3 → S4

3> ADZ :-

S1 → S2 $\xrightarrow[\text{CZ=01}]{\text{if } Z=1}$ S3 → S4

4> ADI :-

S1 → S2 → S5:-

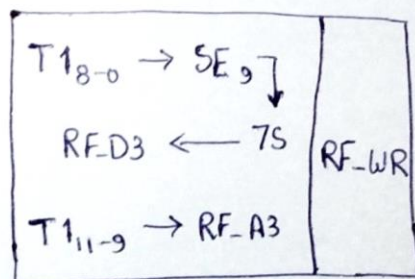
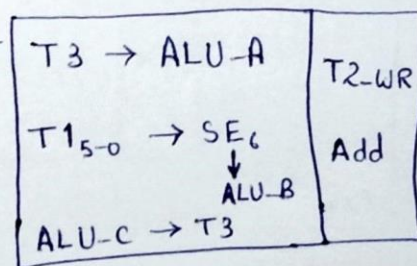
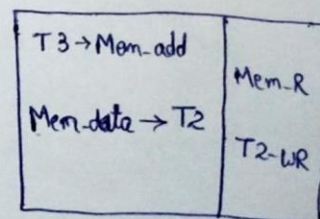
T2 → ALU-A	ADD
T1 ₅₋₀ → SE ₁₀ ↓ ALLB	T2-E
ALU-C → T2	

→

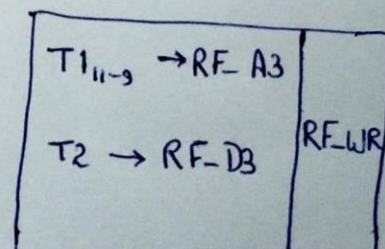
S6:-

T2 → RF-D3	RF-WR
T1 ₈₋₆ → RF-A3	

5

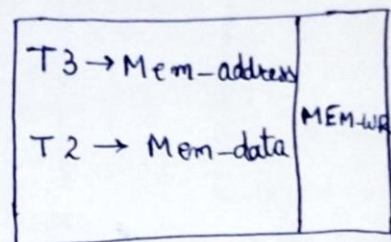
5> NDU :-S1 \rightarrow S2 \rightarrow S3 \rightarrow S46> NDZ :-S1 \rightarrow S2 $\xrightarrow[\text{CZ} \neq 01]{\text{if } Z=1}$ S3 \rightarrow S47> ND C :-S1 \rightarrow S2 $\xrightarrow[\text{CZ} \neq 10]{\text{if } C=1}$ S3 \rightarrow S48> LHI :-S1 \rightarrow S2 \rightarrow S7 :-9> LW :-S1 \rightarrow S2 \rightarrow S8 :- \rightarrow S9 :-

S10 :-



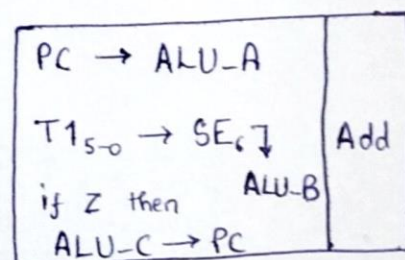
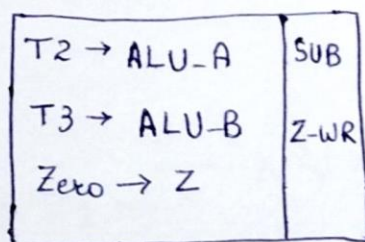
10> SW :-

S1 → S2 → S8 → S11 :-



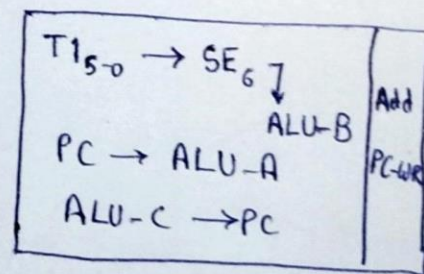
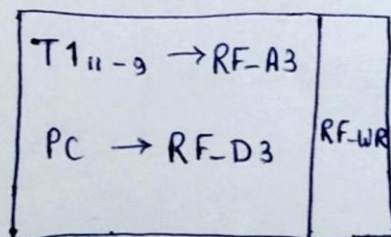
11> BEQ :-

S1 → S2 → S3 :- → S13 :-



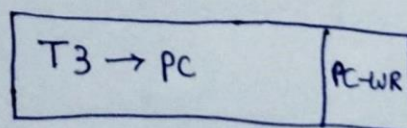
12> JAL :-

S1 → S2 → S14 :- → S15 :-



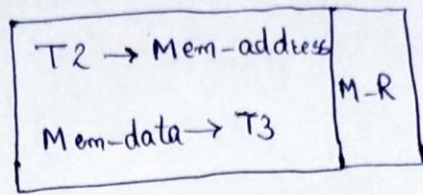
13> JLR :-

S1 → S2 → S14 → S16 :-

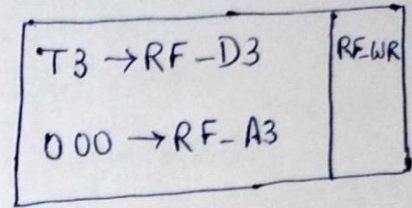


14) LM:-

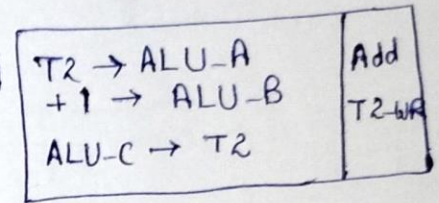
S1 → S2 $\xrightarrow{\text{if im}(0)=1}$ S9:-



S18:-

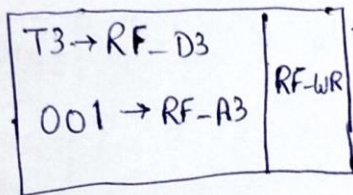


S17:-



S17 ←

S19:-

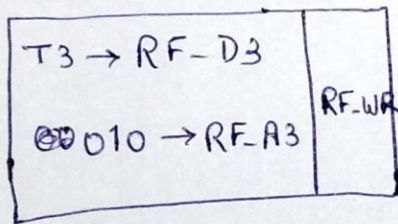


S9 ←

$\xrightarrow{\text{if im}(1)=1}$

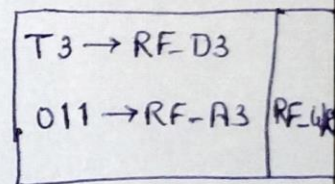
\downarrow if im(2)=1

S9 → S20:-



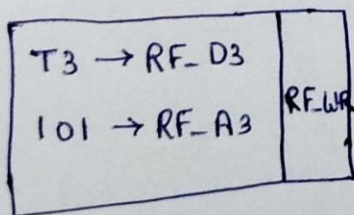
→ S17 $\xrightarrow{\text{if im}(3)=1}$

S9 → S21:-

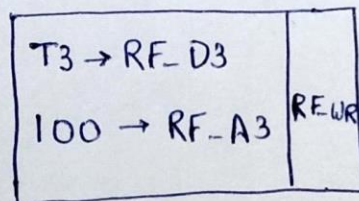


S9 ← S17 $\xleftarrow{\text{if im}(5)=1}$

S23:-



S22:-



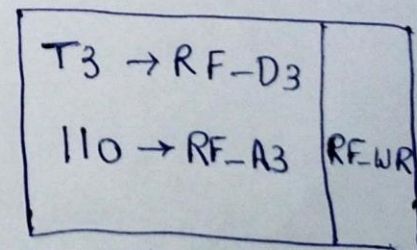
S9 ←

S17 $\xleftarrow{\text{if im}(4)=1}$

→ S17 $\xrightarrow{\text{if im}(6)=1}$

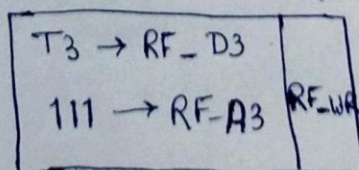
S9 →

S24:-



S17 ←

S25:-

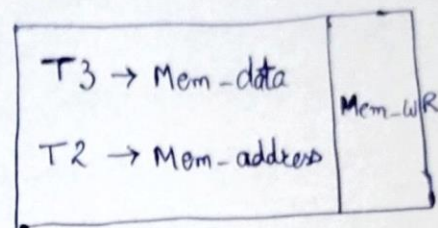
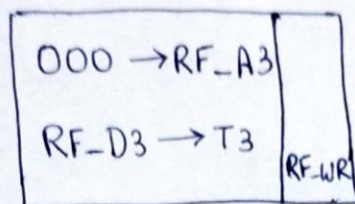


S9 ←

S17 $\xleftarrow{\text{if im}(7)=1}$

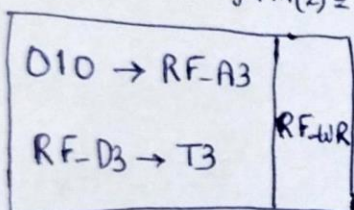
15> SM:-

S1 \rightarrow S2 $\xrightarrow{\text{if im}(0)=1}$ S26:- \rightarrow S11:-

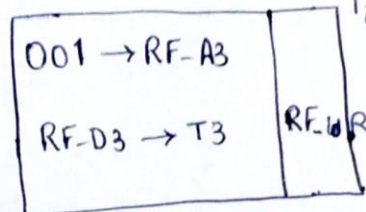


\downarrow
S17

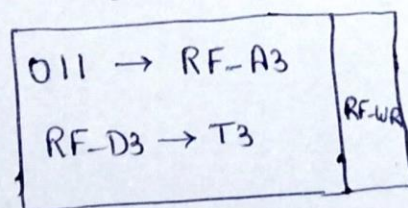
S28:- \leftarrow S17 \leftarrow S11 \leftarrow $\xrightarrow{\text{if im}(2)=1}$



S27:- \leftarrow $\xrightarrow{\text{if im}(1)=1}$



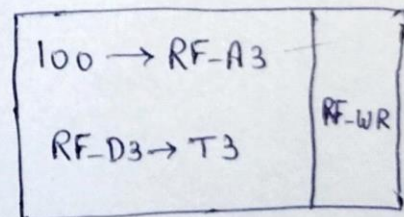
\rightarrow S11 \rightarrow S17 $\xrightarrow{\text{if im}(3)=1}$ S29:-



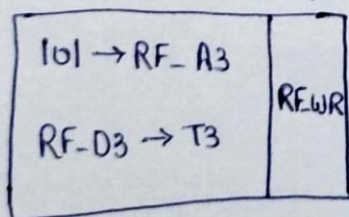
\rightarrow S11 \rightarrow S17

\downarrow
 $\text{if im}(4)=1$

S30:-

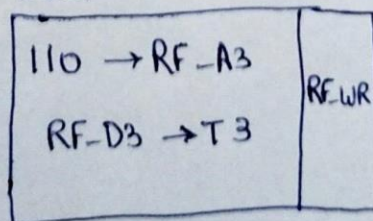


S31:- \leftarrow S17 \leftarrow S11 \leftarrow $\xrightarrow{\text{if im}(5)=1}$



\downarrow
S11 \rightarrow S17 $\xrightarrow{\text{if im}(6)=1}$

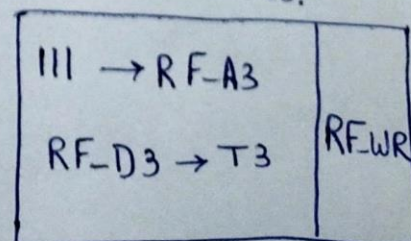
S32:-



\rightarrow S11 \rightarrow S17

\downarrow
 $\text{if im}(7)=1$

S33:-



S17 \leftarrow S11 \leftarrow