COMP2120As4ChengHoMing

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1) The function SQ calculates the square of value of the input R10 and store the result in R11.

2) For CALL:

Instruction fetch step:

MAR ← PC

IR ← mem[MAR]

PC = PC + 4

Instruction decode step:

No data transfer is involved.

Instruction execute step:

MAR ← PC

MBR ← mem[MAR]

MAR ← MBR

PC = PC + 4

TEMP ← MAR

SP = SP - 4

MAR ← SP

MBR ← PC

mem[SP] ← MBR

PC ← TEMP

Which can be simplified as

MAR ← PC

TEMP ← mem[MAR]

PC = PC + 4

SP = SP - 4

MAR ← SP

mem[SP] ← PC

PC ← TEMP

For RET:

Instruction fetch step:

MAR ← PC

IR ← mem[MAR]

PC = PC + 4

Instruction decode step:

No data transfer is involved.

Instruction execute step:

MAR ← SP

SP = SP + 4

MBR ← mem[MAR]

PC ← MBR

Which can be simplified as

MAR ← SP

SP = SP + 4

PC ← mem[MAR]