SPRING 2016
CMPE 364

Microprocessor Based Design

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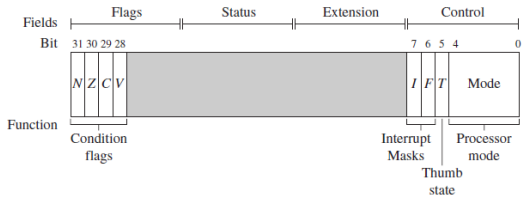
(Slides adapted from Dr. Mohamed Al-Meer)

ADC Instruction: Add with Carry

- Add with Carry bit

ADC DST, SRC1, SRC2



- Adds the SRC1 with SRC2 with Carry bit in CPSR register and places result in DST.
- SRC1 should be a register, while SRC2 can be a register or a immediate operand.

ADC Instruction: Add with Carry

- EXAMPLE: Get R6 after the execute of next instruction if R11 = 0x000E5FA9and R10 = 0x00005204 and if CF = 1?

```
ADC  R6, R11, R10
```

- SOLUTION: R11 = R10 + R11 + C = **0x000EB1AE**

ADC Instruction: Add with Carry

- EXAMPLE: Get R4 after the execution of next instruction, if R2 = 0x80040608 and **CPSR** = 0x**50000010**?

```
ADC  R4, R2, #134      ;(0x86)
```

- SOLUTION:R4 = R2 + 134 + **0** = **0x8004068E**

SBC Instruction

- SBC is subtract with carry.
- Subtracts the **SRC2** and **complement of carry bit** in CPSR register **from** SRC1 and places the result in DST
- DST = SRC1 – SRC2 – Not(C)

  SBC DST, SRC1, SRC2
- EXAMPLE: Get R4 if R2 = 0x000006A0 and R1 = 0x000003C4, and CPSR = 0x00000010?

  SBC R4, R2, R1

SOLUTION: 000006A0 – 000003C4 – 1 = **000002DB**

RSC Instruction

- **Reverse Subtract with Carry**
- Subtracts **SRC1** And **complement** of **Carry from SRC2** and places the result in **DST** register.
- DST = SRC2 – SRC1 – Not C

  RSC DST, SRC1, SRC2
- EXAMPLE: Get R3, if R0,and R2and CPSR = 0x08009420, 0x014520C0, and 0x0000010.
- SOLUTION: ????