

GROUP 15

COA - ISE*

TOPIC - REGISTERS AND CURRENT PROGRAM STATUS REGISTER

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REGISTERS

REGISTERS :

A processor register (CPU register) is one of a small set of data holding places that are part of the computer processor. A register may hold an instruction, a storage address, or any kind of data (such as a bit sequence or individual characters). Some instructions specify registers as part of the instruction.

WHY USE REGISTERS IN MICROPROCESSOR ?

TEMPORARY STORAGE REGISTERS ARE USED AS TEMPORARY STORAGE LOCATIONS FOR DATA THAT NEEDS TO BE PROCESSED BY THE MICROPROCESSOR

INPUT/OUTPUT REGISTERS ARE USED FOR COMMUNICATING WITH INPUT/OUTPUT (I/O) DEVICES.

STATUS INFORMATION REGISTERS ARE USED FOR STORING STATUS INFORMATION ABOUT THE STATE OF THE MICROPROCESSOR.

ADDRESSING REGISTERS ARE USED FOR ADDRESSING MEMORY LOCATIONS IN THE 8085 MICROPROCESSOR. THE PROGRAM COUNTER (PC) REGISTER KEEPS TRACK OF THE MEMORY LOCATION OF THE CURRENT INSTRUCTION

REGISTERS IN 8085 :

(a) General Purpose Registers – The 8085 has six general-purpose registers to store 8-bit data; these are identified as- B, C, D, E, H, and L. These can be combined as register pairs – BC, DE, and HL, to perform some 16-bit operation. These registers are used to store or copy temporary data, by using instructions, during the execution of the program.

REGISTERS IN 8085 :

(b) Specific Purpose Registers :-

Accumulator: The accumulator is an 8-bit register (can store 8-bit data) that is the part of the arithmetic and logical unit (ALU). After performing arithmetical or logical operations, the result is stored in accumulator.

Accumulator is also defined as register A.

REGISTERS IN 8085 :

FLAG REGISTER:

The flag register is a special purpose register and it is completely different from other registers in microprocessor. It consists of 8 bits and only 5 of them are useful

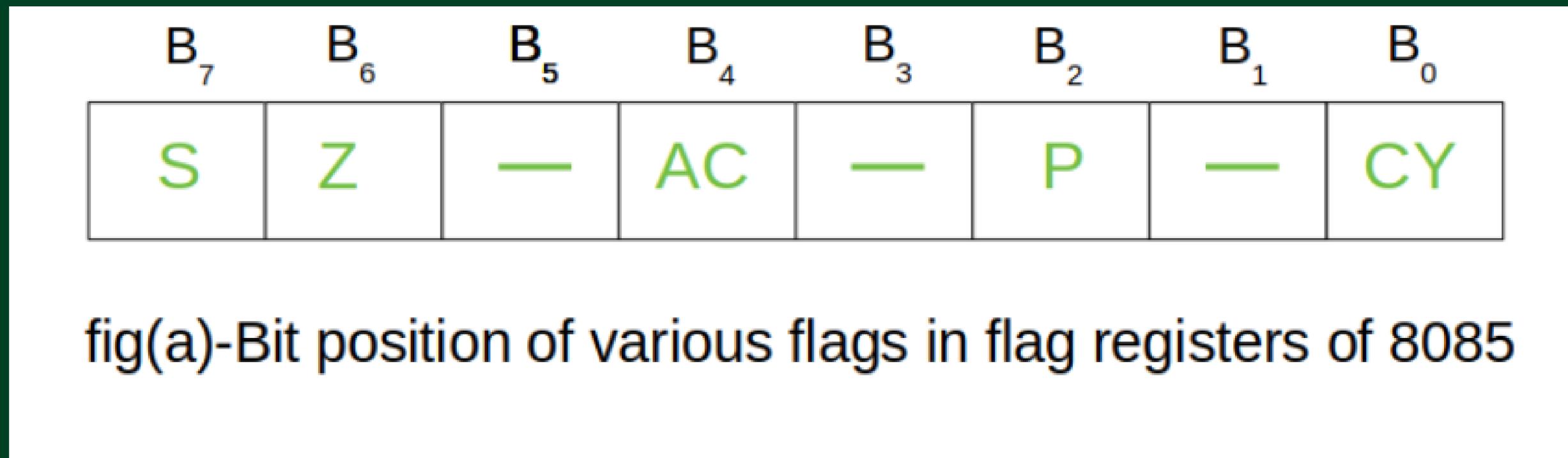
SIGN FLAG:

ZERO FLAG

CARRY FLAG

AUXILIARY CARRY FLAG

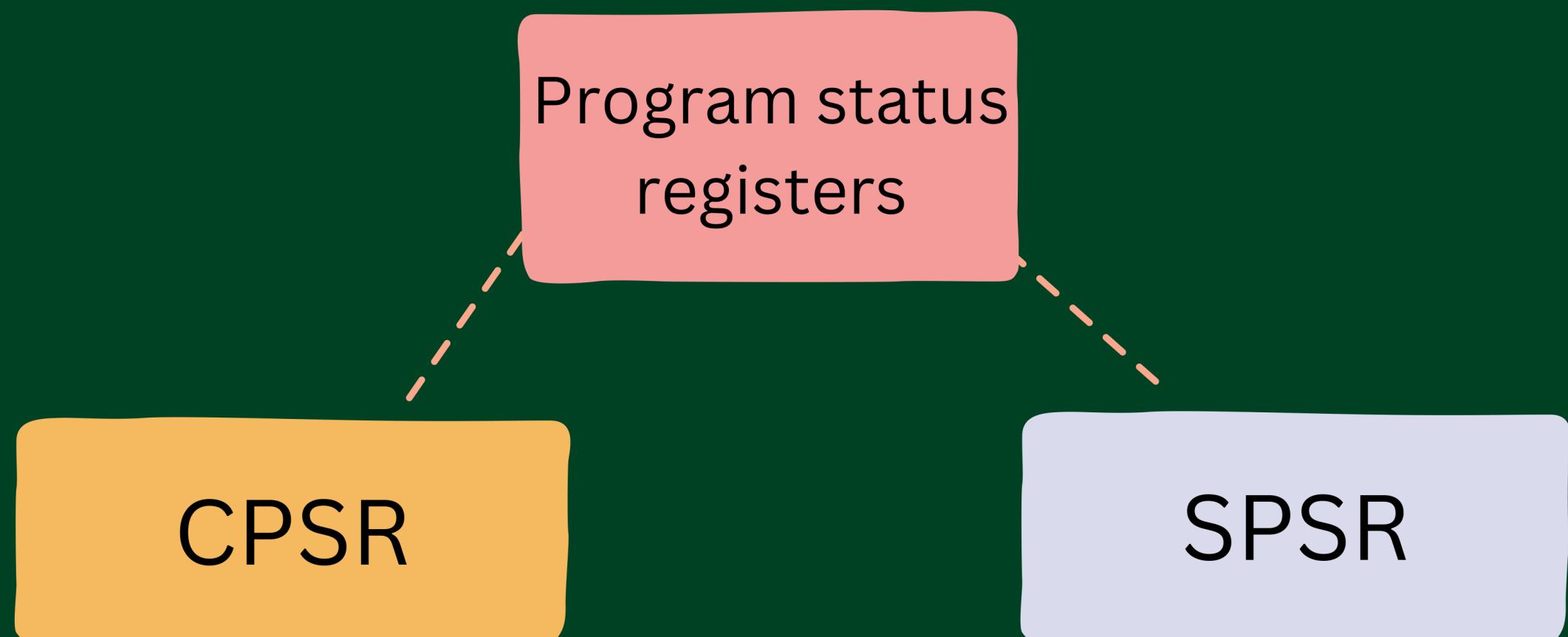
PARITY FLAG



DEEPAK VISHWAKARMA
CPSR

Current Program Status Register (CPSR)

The ARM architecture supports two program status registers. The current program status register (CPSR) and the stored program status register (SPSR) are the two registers (SPSR).



CSPR

01

CPSR is used by the ARM core to monitor and control internal functions. The vacant area has been set aside for future development.

02

THE CPSR IS A DEDICATED 32-BIT REGISTER AND RESIDES IN THE REGISTER FILE

03

FLAGS, STATUS, EXTENSION, AND CONTROL ARE THE FOUR FIELDS OF THE CPSR, EACH OF WHICH IS 8 BITS WIDE.

04

**STATUS AND EXTENSION FIELDS ARE KEPT FOR
FUTURE USE IN CURRENT DESIGNS.**

05

**SEVERAL ARM PROCESSOR CORES INCLUDE EXTRA BITS
ALLOCATED TO THE J BIT (AVAILABLE ONLY ON JAZELLE
ENABLED PROCESSING WHICH EXECUTES 8-BIT
INSTRUCTIONS).**

CPSR is 32 bit and each bit defining the status of the program



N – NEGATIVE
RESULT FROM ALU.

C – ALU OPERATION
CARRY OUT.

I BIT DISABLES
IRQ.

T BIT –
INDICATES
WHETHER
THE CORE
IS IN
THUMB
STATE.

Z – ZERO RESULT
FROM ALU.

C – ALU OPERATION
CARRY OUT.

F BIT DISABLES
FIQ.

SUBODH KANGALE
CPSR MODES

PROCESSOR MODES:

THE CPSR'S MODE BITS DETERMINE THE PROCESSOR MODE, WHICH CAN AFFECT
WHAT
INSTRUCTIONS CAN BE EXECUTED AND THE LEVEL OF PRIVILEGE THE PROCESSOR
OPERATES WITH.



Modes of ARM7

Mode Bits					Mode
1 0 0 0 0					User
1 0 0 0 1					FIQ
1 0 0 1 0					IRQ
1 0 0 1 1					Supervisor
1 0 1 1 1					Abort
1 1 0 1 1					Undefined
1 1 1 1 1					System

USER MODE: THE MODE IN WHICH GENERAL USER APPLICATIONS RUN.

SUPERVISOR MODE: A PRIVILEGED MODE THAT HAS ACCESS TO ALL RESOURCES AND CAN HANDLE SYSTEM CALLS AND EXCEPTIONS.

IRQ AND FIQ MODES: MODES THAT ARE USED FOR HANDLING INTERRUPTS. FIQ MODE IS FASTER AND HAS ACCESS TO A SET OF DEDICATED REGISTERS FOR FAST INTERRUPT HANDLING.