



King Saud University

College of Computer and Information Sciences

Department of Computer Science

CSC 220: Computer Organization

Lab Project

Project Description: The aim of this project is to design the **8-bit** Function Unit Combining Arithmetic Logic Unit (ALU) and a Shifter that can perform the operations given in table 1 below.

- Use X and Y as 8 bits input and F as 8 bits output as shown in Figure 1.
- S0,S1,S2 and S3 represent the selection code in the operation set table
- Three statue bits V (over flow), C (carry), N (negative) and are related to arrithmetic operations and statue bit Z (zero) is relataed to both arrithmetic and logic operation.
- Test your designed Function Unit with necessary tables.

Marking: Total marks for the project is five (5). Each student needs to submit the project and demonestrate it individually.

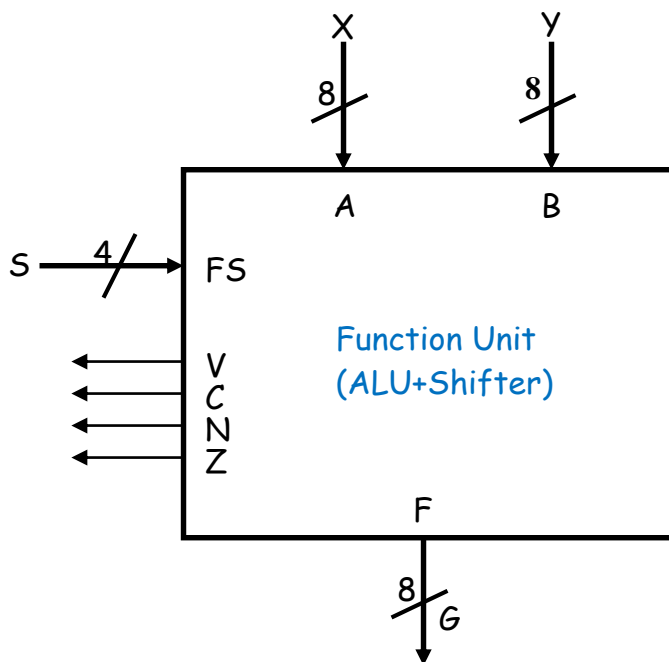


Figure 1: Block diagram of 8-bit Function Unit

Table1 : Set of operations

FS	Operation
0000	$F = A$
0001	$F = A + 1$
0010	$F = A + B'$
0011	$F = A + B' + 1$
0100	$F = A + B$
0101	$F = A + B + 1$
0110	$F = A - 1$
0111	$F = A$
1000	$F = A \wedge B$
1001	$F = A \vee B$
1010	$F = A \oplus B$
1011	$F = A'$
1100	$F = B$
1101	$F = sr\ B \text{ (rotate right)}$
1110	$F = sl\ B \text{ (rotate left)}$