EEE204 - Introduction to Embedded Systems

Experiment 4

Objectives:
- Become familiar with the MSP430 instruction set data transfer instructions, arithmetic instructions, logic instructions, and the program control instructions.

Materials

- Code Composer Studio IDE
- MSP430F5529 USB LaunchPad development kit

Experimental Work

Ex. 1: Type in the given code into main.asm file and fill the table below according to C-flag and R5 register.

rla (rotate left arithmatically): it shifts one bit to left and write the MSB to carry flag and clears the LSB.

```
mov.b #11011111b,R5
clrc
rla.b R5
rla.b R5
rla.b R5
rla.b R5
rla.b R5
rla.b R5
rla.b R5
rla.b R5
rla.b R5
```

	C	R5.7	R5.6	R5.5	R5.4	R5.3	R5.2	R5.1	R5.0
1st Rotate									
2nd Rotate									
3rd Rotate									
4th Rotate									
5th Rotate									
6th Rotate									
7th Rotate									
8th Rotate									
9th Rotate									

Ex. 2: Type in the given code into main.asm file and fill the table below according to C-flag and R5 register.

rra(rotate right arithmetically): it shifts one bit to right and write the LSB to carry flag and clears the MSB.

```
mov.b #10101011b,R5
clrc
rra.b R5
rra.b R5
rra.b R5
rra.b R5
rra.b R5
rra.b R5
rra.b R5
rra.b R5
rra.b R5
```

	R5.7	R5.6	R5.5	R5.4	R5.3	R5.2	R5.1	R5.0	C
1st Rotate									
2nd Rotate									
3rd Rotate									
4th Rotate									
5th Rotate									
6th Rotate									
7th Rotate									
8th Rotate									
9th Rotate									

Ex. 3: Type in the given code into main.asm file and fill the table below according to C-flag and R5 register.

rlc (rotate left with carry): it shifts all the bits to left one bit and writes the MSB to Carry flag and writes the number in carry flag to the LSB.

```
mov.b #10101000b,R5
clrc
rlc.b R5
rlc.b R5
rlc.b R5
rlc.b R5
rlc.b R5
rlc.b R5
rlc.b R5
rlc.b R5
rlc.b R5
```

	C	R5.7	R5.6	R5.5	R5.4	R5.3	R5.2	R5.1	R5.0
1st Rotate									
2nd Rotate									

3rd Rotate								
4th Rotate								
5th Rotate								
6th Rotate								
7th Rotate								
8th Rotate								
9th Rotate								

Ex. 4: Type in the given code into main.asm file and fill the table below according to C-flag and R5 register.

rrc (rotate right with carry): it shifts all the bits to right one bit and writes the LSB to Carry flag and writes the number in carry flag to the MSB.

```
mov.b #10101000b,R5
clrc
rrc.b R5
rrc.b R5
rrc.b R5
rrc.b R5
rrc.b R5
rrc.b R5
rrc.b R5
rrc.b R5
rrc.b R5
```

	R5.7	R5.6	R5.5	R5.4	R5.3	R5.2	R5.1	R5.0	C
1st Rotate									
2nd Rotate									
3rd Rotate									
4th Rotate									
5th Rotate									
6th Rotate									
7th Rotate									
8th Rotate									
9th Rotate									