ET 386L

Lab 8 Comparison, Subroutines, Rotations, Shifts

1. Connect the input/output assembly to the 68HC11 EVBU.
2. Create, assemble, make appropriate comments and save the following program:

```
            ORG    $0100        ;
**Prepare Port C (for use with separate switch and button assemblies)**
**          LDAA   #$FF         ; Port C configured for output          **
**          STAA   $1007        ;address of data direction register C   **

WATCH   LDAB   $100A        ;
        STAB   $1004        ;
**      STAB   $1003        ;address of Port C**
        CMPB   #$AA         ;
        BHI    WATCH        ;
        BLO    WATCH        ;

        LDY    #$10         ;
        LDAA   #$80         ;
        STAA   $1004        ;
**      STAA   $1003        ;address of Port C**
        JSR    SLOW         ;
SPIN    RORA                ;
        STAA   $1004        ;
**      STAA   $1003        ;address of Port C**
        JSR    SLOW         ;
        DEY                 ;
        BNE    SPIN         ;
        JMP    WATCH        ;

        ORG    $0130        ;
SLOW    LDX    #$FFFF       ;
LENTO   DEX                 ;
        BNE    LENTO        ;
        RTS                 ;
        END
```

3. Observe the operation of the program above.

4. Reload accumulator A with $08; replace RORA with ROLA and observe the results. What is the difference in the operation?

5. Repeat the previous step but replace the rotate commands first with ASRA and then with ASLA. What is the difference between the rotate and the shift operations?

6. New commands:

CMPB:	compare accumulator B
BHI:	branch if higher
BLO:	branch if lower
RORA;	rotate right accumulator A
ROLA;	rotate left accumulator A
ASLA:	arithmetic shift left accumulator A
ASRA:	arithmetic shift right accumulator A
JSR:	jump to subroutine
RTS:	return from subroutine