Laboratorio #2 Interrupts and Switch Debouncing
ICOM5217
Sección: 086
Instructor: Luis Malavé
28 de febrero de 2013
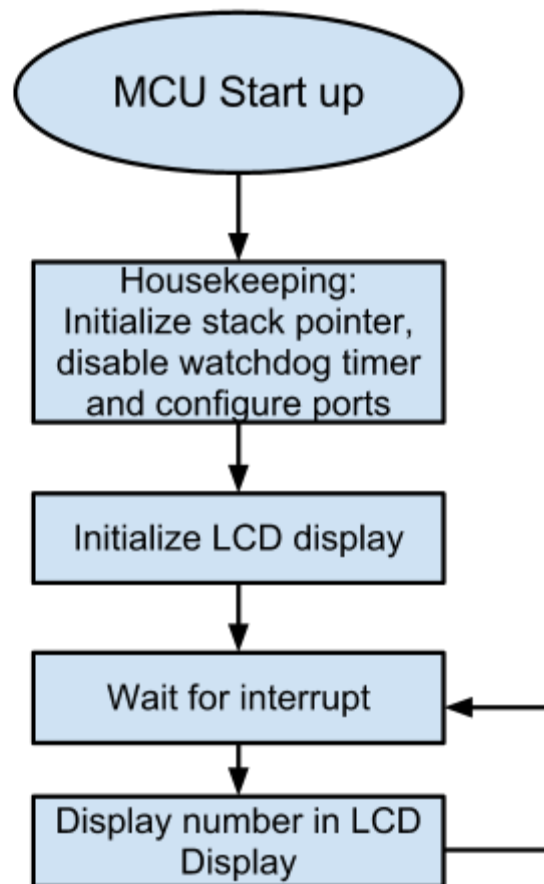
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Part I and III:

Part I

MCU Start up

Housekeeping:
Initialize stack pointer,
disable watchdog timer
and configure ports

Initialize LCD display

Wait for interrupt

Display number in LCD
Display

Button ISR

ISR

Did P1.7 generated the interrupt ? — Yes → Increment Counter

No

Did P1.6 generated the interrupt ? — Yes → Decrement Counter

No

reti → Modify PC in stack
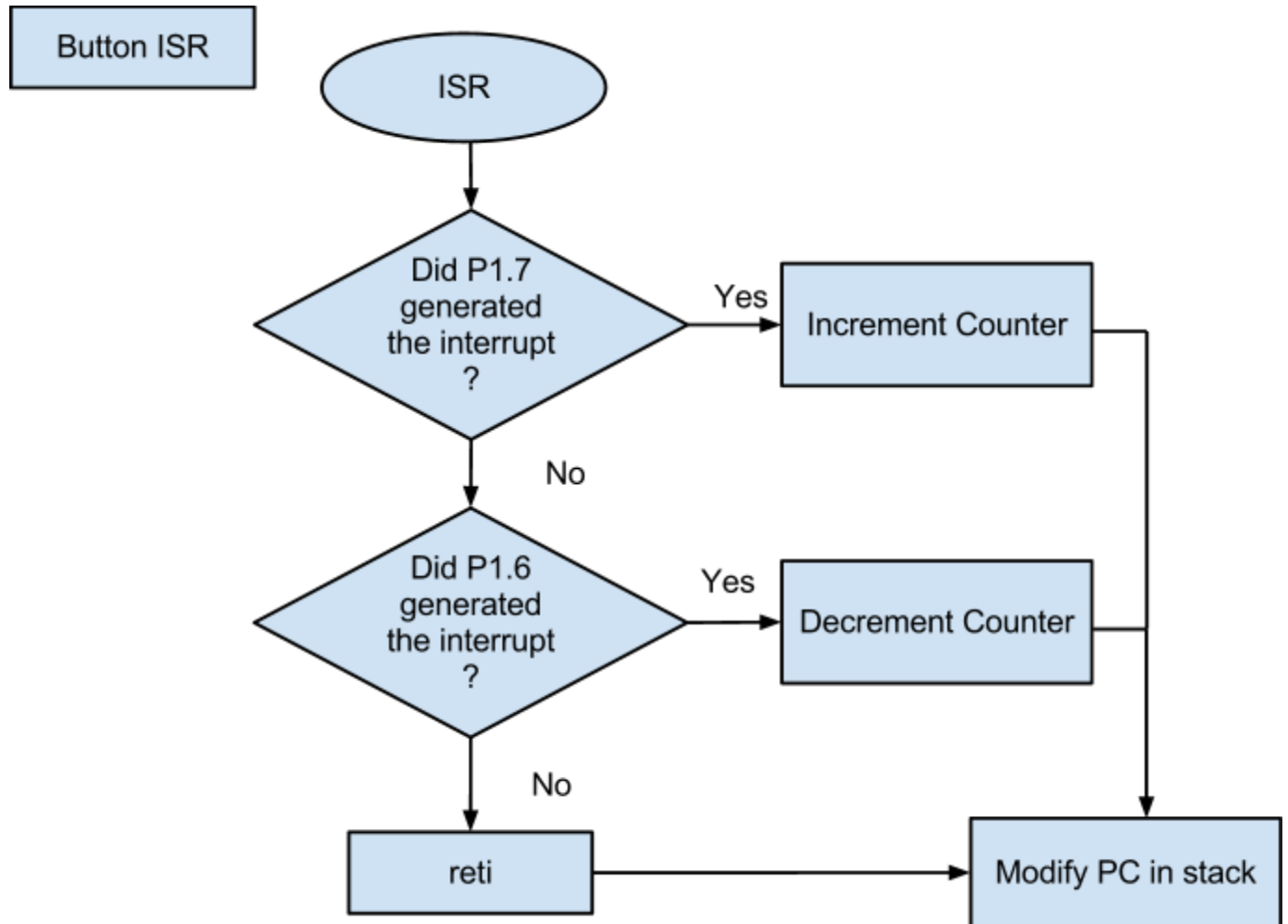
Part 2: Uses the suggested flow chart from the laboratory description

Part I

```
        ┌─────────────────────┐
        │    MCU Start up      │
        └─────────────────────┘
                   │
                   ▼
     ┌───────────────────────────────┐
     │      Housekeeping:            │
     │  Initialize stack pointer,    │
     │  disable watchdog timer       │
     │  and configure ports          │
     └───────────────────────────────┘
                   │
                   ▼
     ┌───────────────────────────────┐
     │      Initialize LCD display   │
     └───────────────────────────────┘
                   │
                   ▼
     ┌───────────────────────────────┐
     │      Wait for interrupt       │◄──┐
     └───────────────────────────────┘   │
                   │                      │
                   ▼                      │
     ┌───────────────────────────────┐   │
     │           Delay               │   │
     └───────────────────────────────┘   │
                   │                      │
                   ▼                      │
     ┌───────────────────────────────┐   │
     │   Display number in LCD       │───┘
     │   Display                     │
     └───────────────────────────────┘
```

Button ISR

ISR

Did P1.7 generated the interrupt ?

Yes → Increment Counter

No

Did P1.6 generated the interrupt ?

Yes → Decrement Counter

No

reti
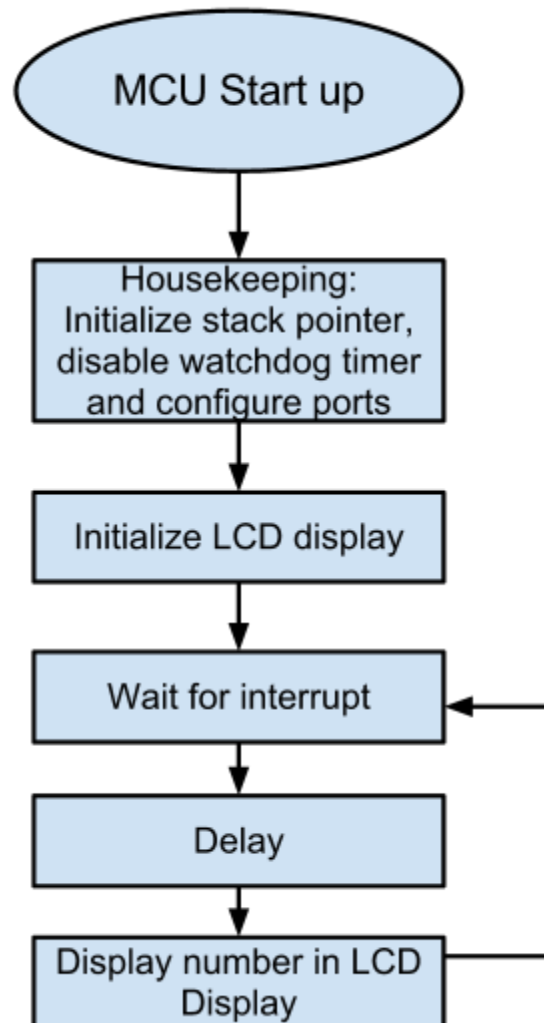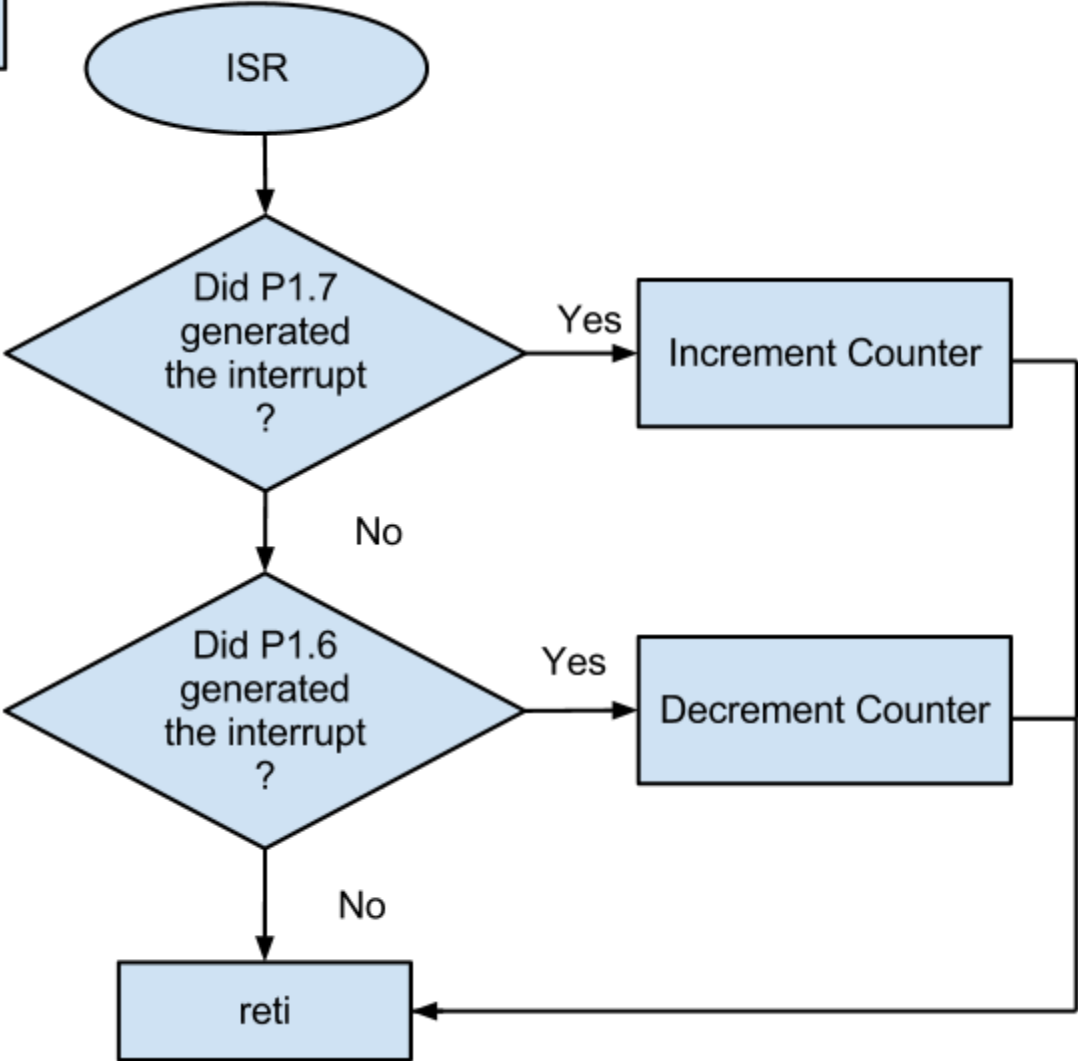
Home Work

Below this page you will find the handwritten flowchart for this part.

P1.6 → Track A   Use R.6 to hold:
P1.7 → Track B   Aold Bold Anew Bnew.

```
        ( ISR )
           |
    [ Save Register ]
           |
        /  IFG   \         Yes
       <  1.6 high? >----------------------+
        \         /                        |
           | No       Clear IFG            |
           |                        [ Move Anew to Aold ]
        /  IFG   \    No                    |
       < 1.7 high? >------( end )   [ Save PIN 1.6 to Anew ]
        \         /     Clear IFG           |
           | Yes                   [ Toggle P1.6 IES ]
           |                                |
   [ Move Bnew to Bold ]          ( Go to jump table )
           |                                ^
   [ Save PIN 1.7 in Bnew ]                 |
           |                                |
   [ Toggle P1.7 IES ]                      |
           |_____|
```