Vcc

10µF

(9) RST

10K

GND

(18) XTAL1

11.0592 MHZ

(19) XTAL2

33pF

(30) ALE

Bypass capacitors

P1·7    ā
P1·6    b̄
P1·5    c̄
P1·4    d̄
P1·3    ē
P1·2    f̄
P1·1    ḡ
P1·0    d̄p

Vcc
com

A
F       B
    G
E       C
    D
        DP

P2·7
P2·6
P2·5
P2·4
P2·3
P2·2
P2·1
P2·0

(31) ĒĀ — Vcc

(40) Vcc    (20) GND

5V DC

GND

FULL
level2
HALF
level1
EMPTY

```
                        ┌─────────────┐
                        │    Start    │
                        └─────────────┘
                               │
                               ▼
              ┌────────────────────────────────┐
              │   Display nothing on FND        │
              │   Set P1 = #FFH                 │
              └────────────────────────────────┘
                               │
                               ▼
                      ╱────────────────────╲
                     ╱  Check if pin P2.0 is high ╲───────────── No
                     ╲   [P2.0 = '1']     ╱                       │
                      ╲────────────────────╱                      │
                               │                                  │
            Yes                                                   │
             │                                                    ▼
             ▼                                          ╱──────────────────╲
    ╱──────────────────────╲                          ╱ Check If pin P2.1 is high ╲
   ╱ Display symbol 'E' on FND ╲                       ╲    (P2.1 = '1')    ╱
   ╲ ie. empty   P1 = 61H    ╱                          ╲──────────────────╱
    ╲──────────────────────╱                                      │
                                                                  │
                                                       Yes        │        No
             │                                          │                   │
             ▼                                          ▼                   ▼
    ╱──────────────────────────╲              ╱──────────────────────────╲
   ╱ Display symbol 'H' on (A FND ╲          ╱ Display 'F' on FND indicating ╲
   ╲ ie. tank is half-filled/left ╲          ╲ Level is Full, P1 = 81H      ╱
   ╲      P1 = 91H          ╱                  ╲──────────────────────────╱
    ╲──────────────────────╱
             │                    │                      │
             ▼                    ▼                      ▼
              ┌──────────────────────────────────────┐
              │   Check again from 'start'           │
              └──────────────────────────────────────┘
```

# Algorithm for Water Level Indicator

* Consider PORT1 as output port which is connected to Common-Anode (CA) configured FND, and pins P2.0 and P2.1 as input pins.

* ## How it works?

  → Water conducts electricity.

  → So, whenever water reaches certain level, it forms a closed circuit as shown in figure and input port pins receive Low pulse ('0'), otherwise High pulse / port pins values are logic '1'.

  → Now, we continuously check the water level in tank with input pins P2.0, P2.1

  → First we check P2.0, if high signal/pulse on P2.0, then display 'E' on FND which means empty.

  → Otherwise, tank can be either half or full.

  → So, we check P2.1, if high pulse on P2.1, then we display 'H' on FND which means at half level.

  → Else, we can conclude that it is at full level and display 'F' on FND.

## Program :

```
        ORG  OH
        MOV  P1, #OFFH      ; No display on FND
UP:     JB   P2.0 , EMPTY
        JNB  P2.1 , FULL
        MOV  P1, #91H       ; 'H' is displayed on FND
        SJMP NXT
EMPTY:  MOV  P1, #61H       ; 'E' is displayed on FND
        SJMP NXT
FULL:   MOV  P1, #81H       ; 'F' is displayed on FND.
NXT:    SJMP UP             ; check continously.
```

## Logic :

| P2.0 | P2.1 | Status of Tank |
|------|------|----------------|
| 0 | 0 | Full |
| 0 | 1 | Half |
| 1 | 0 | Not possible |
| 1 | 1 | Empty |

display code of 'E' = 61H

display code of 'H' = 91H

display code of 'F' = 81H