



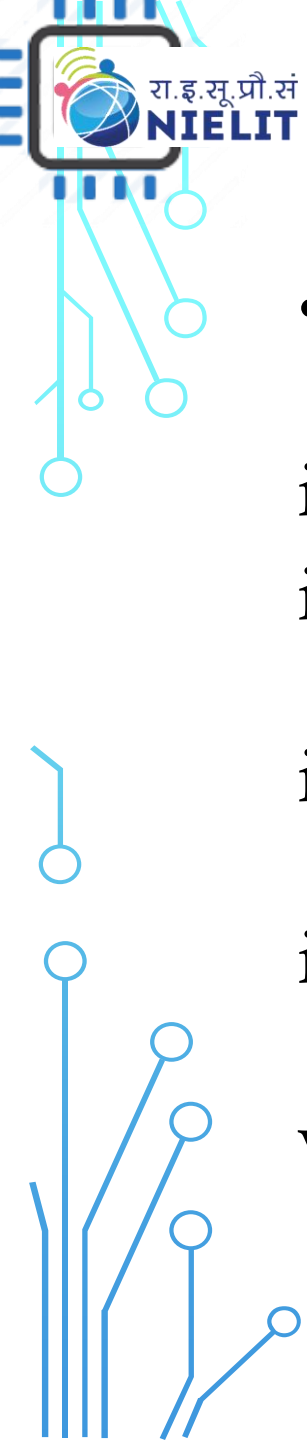
# LCD INTERFACING WITH ARDUINO



# LIQUID CRYSTAL DISPLAY

- LCDs (Liquid Crystal Displays) are used in embedded system applications for displaying various parameters and status of the system.
- LCD 16x2 is a 16-pin device that has 2 rows that can accommodate 16 characters each.
- LCD 16x2 can be used in 4-bit mode or 8-bit mode.
- It has 8 data lines and 3 control lines that can be used for control purposes.





# SOME IMPORTANT FUNCTIONS

- `LiquidCrystal object_name(rs,rw,en,d0,d1,d2,d3,d4,d5,d6,d7);`  
`LiquidCrystal object_name(rs,rw,en,d4,d5,d6,d7);`
  - i. This function defines an object named `object_name` of the class `LiquidCrystal`.
  - ii. `rs`, `rw` and `en` are the pin numbers of the Arduino board that are connected to `rs`, `rw` and `en` of LCD.
  - iii. `d0`, `d1`, `d2`, `d3`, `d4`, `d5`, `d6` and `d7` are the pin numbers of the Arduino board that are connected to data pins `D1`, `D2`, `D3`, `D4`, `D5`, `D6` and `D7` of LCD.
  - iv. Example, `LiquidCrystal lcd(13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3)`. This makes use of LCD in 8-bit mode.
  - v. Example, `LiquidCrystal lcd(13, 12, 11, 6, 5, 4, 3)`. This makes use of LCD in 4-bit mode.



- *lcd.begin(cols,rows)*
  - i. This function is used to define the number of rows and columns the LCD has and to initialize the LCD.
  - ii. Needs to be called before calling other functions, once the object is defined using the function.
  - iii. Example, for 16x2 LCD we write *lcd.begin(16,2)*. *lcd* is the name of the object of the class LiquidCrystal. 16 is the number of columns and 2 is the number of rows.



- `lcd.setCursor(col,row)`
  - i. This function positions the cursor of the LCD to a location specified by the row and column parameters.
  - ii. col is the column number at which the cursor should be at (0 for column 1, 4 for column 5 and so on).
  - iii. row is the row number at which the cursor should be at (0 for row 1, 1 for row 2).
  - iv. Example, for setting the cursor at the 5th column in the 2nd row, `lcd.setCursor(4,1)`. *lcd* is the name of the object of the class `LiquidCrystal`.



```
#include <LiquidCrystal.h>
```

```
/* Create object named lcd of the class LiquidCrystal */
```

```
LiquidCrystal lcd(13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3); /* For 8-bit mode */
```

```
//LiquidCrystal lcd(13, 12, 11, 6, 5, 4, 3); /* For 4-bit mode */
```

```
void setup()
```

```
{
```

```
lcd.begin(16,2); /* Initialize 16x2 LCD */
```

```
lcd.clear(); /* Clear the LCD }
```

```
void loop()
```

```
{
```

```
lcd.setCursor(0,0); /* Set cursor to column 0 row 0 */
```

```
lcd.print("Hello!!!!"); /* Print data on display */}
```

