

*D.S. Vidyasagar*

Learn  
**ARDUINO**  
in Easy Steps

Exclusively written for  
School, Engineering,  
B.Sc. & M.Sc. students

With number of worksheets  
for advanced study of  
applications of Arduino

**Contents**

Internal Structure of Arduino UNO ..... 5

Features of Arduino ..... 5

Coding Details of Arduino ..... 6

    Human Comments..... 6

    Linking a file in the program..... 6

    Definition Section ..... 6

    Global Declaration ..... 6

    Keywords..... 6

    Useful Functions ..... 6

    Body of Arduino Program ..... 7

    Example of void setup() function ..... 7

    Example of void setup() function ..... 7

    Example of void loop() function ..... 7

Character Set in C Language ..... 7

Rules of using variables..... 8

What is DataType?..... 8

Basic Commands in Arduino ..... 8

Blinking 8 LEDs simultaneously ..... 9

    Actual program for blinking 8 LEDs simultaneously ..... 9

Trick of using userDefined\_Function() function..... 10

Simultaneous Simulation Method ..... 11

Registers in ATmega 328p ..... 11

I/O PORT Addressing Technique ..... 12

Direct PORT Register Addressing Code ..... 12

Exercise ..... 12

Servo Motor Control in Arduino ..... 12

Pinout of Servo Motor ..... 13

    How to connect Servo to Arduino? ..... 13

The Code..... 13

    Code to control multiple servo motors ..... 14

Mapping Technique in Arduino ..... 14

POT Controlled Servo Motor..... 14

    The Code ..... 14

Automatic CCTV Camera Controlling Servo Code ..... 15

How to use LCD Display with Arduino?..... 15

LCD Display Simple Code ..... 16

How to scroll the message on LCD Display? ..... 16

How to read servo position?..... 16

Procedure to create New Project in Arduino Software ..... 17

## Vidyasagar Academy's STEM Education Worksheet

Problem Statement.....	18
Objectives .....	18
Description.....	18
Required Material .....	19
The Code .....	19
Problem Statement.....	20
Objectives .....	20
Description.....	20
Required Material .....	20
Connection Diagram .....	20
The Code .....	21
Problem Statement.....	22
Objectives .....	22
Description.....	22
Required Material .....	22
Connection Diagram .....	22
The Code .....	23
More Problem Statements .....	23
Problem Statement.....	24
Objectives .....	24
Description.....	24
Required Material .....	24
Connection Diagram .....	24
Relay Driver Circuit .....	25
The Code .....	25
More Problem Statements .....	25
Problem Statement.....	26
Objectives .....	26
Description.....	26
Required Material .....	26
Connection Diagram .....	26
The Code .....	27
More Problem Statements .....	27
Problem Statement.....	28
Objectives .....	28
Description.....	28
Required Material .....	28
Connection Diagram .....	28
The Code .....	29
The Mathematics behind the code .....	29
More Problem Statements .....	29

## Vidyasagar Academy's STEM Education Worksheet

Problem Statement.....	30
Objectives .....	30
Precautions .....	30
Required Material .....	30
Connection Diagram .....	30
The Code .....	31
Bluetooth Application for Android Phone .....	32
The 3 Commands .....	32
Motor Driver IC L293D Pinout.....	32
More Problem Statements .....	32
Problem Statement.....	33
Objectives .....	33
Required Material .....	33
Connection Diagram .....	33
Binary signals to LED Display.....	33
The Code .....	34
Problem Statement.....	35
Objectives .....	35
Required Material .....	35
Connection Diagram .....	35
Binary signals to LED Display.....	35
The Code .....	36