SMART SOLUTION FOR RAILWAYS

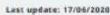| DATE	3 NOVEMBER 2022
TEAM ID	PNT2022TMID52171

Objective

- Basics of Arduino Uno.
- Arduino IDE.
- Hands-on using TinkerCad.

Arduino Uno

AVR® 8-Bit Microcontroller
Family

ARDUINO

D19/SCL   PC5   SCL   ADC[5]   SCL   PCINT[13]
D18/SDA   PC4   SDA   ADC[4]   SDA   PCINT[12]
AREF
GND

D13   PB5   SCK   SCK   PCINT[5]
D12   PB4   MISO   MISO   PCINT[4]
~D11 PB3   MOSI   MOSI   OC2A   PCINT[3]
~D10 PB2   SS   SS   OC1B   PCINT[2]
~D9   PB1   OC1A   PCINT[1]
D8   PB0   CLKO/ICP1 PCINT[0]

D7   PD7   AIN[1]   PCINT[23]
~D6   PD6   AIN[0]   OC0A   PCINT[22]
~D5   PD5   OC0B/T1   PCINT[21]
D4   PD4   T0/XCK   PCINT[20]
~D3   PD3   OC2B   PCINT[19]/INT[1]
D2   PD2   PCINT[18]/INT[0]
D1/TX PD1   TXD   PCINT[17]
D0/RX PD0   RXD   PCINT[16]

NC
IOREF
PCINT[14] RESET   PC6   RESET
+3V3
+5V
GND
GND
VIN

PCINT[8]   ADC[0] ADC[0] PC0   A0 D14
PCINT[9]   ADC[1] ADC[1] PC1   A1 D15
PCINT[10]   ADC[2] ADC[2] PC2   A2 D16
PCINT[11]   ADC[3] ADC[3] PC3   A3 D17
PCINT[12] SDA ADC[4] ADC[4] PC4   A4 D18
PCINT[13] SCL ADC[5] ADC[5] PC5   A5 D19

LED_BUILTIN   PB5
TX LED   PD5
RX LED   PD4

Power

I2C
SPI
UART

Ground
Power
Digital Pin
Analog Pin
Analog
Communication

MAXIMUM current per I/O pin is 20mA
VIN 6-20 V input to the board.

Specifications

- Microcontroller ATmega328P
- Digital I/O Pins 14 (of which 6 provide PWM output)
- Analog Input Pins 6
- Flash Memory 32 KB (ATmega328P) of which 0.5 KB used by bootloader
- SRAM 2 KB (ATmega328P)
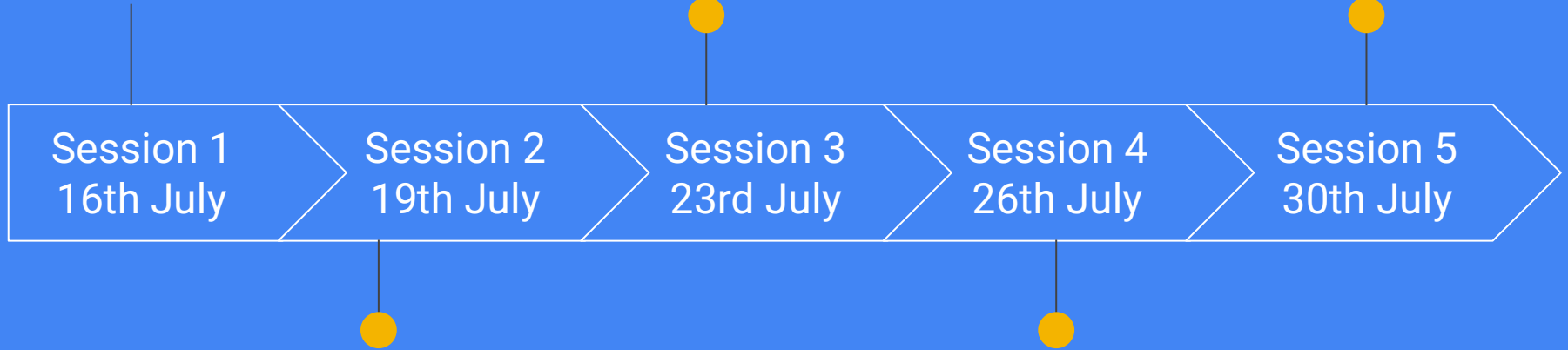- Clock Speed 16 MHz

Hands-on

Types of proximity

End to end integration of water level

monitoring system

sensors.

prototype 1 using
Node-red.

Session 1
16th July

Session 2
19th July

Session 3
23rd July

Session 4
26th July

Session 5
30th July

Introduction to MQTT

Basics of Arduino

Make a 3 bit counter with a delay of 500ms in between the count.

Use 3 separate LEDs.

Simulation tool - TinkerCad.

Description :

At 000; LED1 Low LED2 Low LED3 Low

At 001; LED1 Low LED2 Low LED3 HIGH

At 010; LED1 Low LED2 HIGH LED3 Low

...

At 111; LED1 HIGH LED2 HIGH LED3 HIGH