HSI

Project Name: Digital Watch Project

Components:

- ATMEGA32
- Buzzer
- LCD (16*2)
- Three Pushbutton
- Crystal 8MH
- Two capacitor
- lithium battery 5v for each one
- Real Time Clock Module (RTC)

Connections:

- PORTA (from PIN0 to PIN7) → Connect to **DATA**_Pins of **LCD**
- PORTB (from PIN0 to PIN3) → Connect to **RS**_Pin & **R/W**_Pin & **E**_Pin of **LCD**
- PORTC (from PIN0) → Connect to **SCL** pin from **RTC** component
- PORTC (from PIN1) → Connect to **SDA** pin from **RTC** component
- PORTD (PIN4) → **Buzzer**
- PORTD (PIN5) → **Start** Pushbutton
- PORTD (PIN6) → **Reset** Pushbutton
- PORTD (PIN7) → **Stop** Pushbutton

Layers:

- **MCAL Layer** : **DIO**, **I2C**
- **HAL Layer** : **Pushbutton**, **LCD**, **RTC**

Pins & Ports of ATMEGA32 Connection:

XTAL1: One of the **Crystal** Pins which connect to one of **Capacitor** pins and other pin to **Ground**.

XTAL2: One of the **Crystal** Pins which connect to one of **Capacitor** pins and other pin to **Ground**.

VCC: To **Positive** pin of **lithium battery** (5v)

GND: To **Negative** pin of **lithium battery** (5v)

SCL (PC0-Pin-22):

SDA (PC1-Pin-23):

PORTA:

PIN0: **D0**_Pin from **LCD**

PIN1: **D1**_Pin from **LCD**

PIN2: **D2**_Pin from **LCD**

PIN3: **D3**_Pin from **LCD**

PIN4: **D4**_Pin from **LCD**

PIN5: **D5**_Pin from **LCD**

PIN6: **D6**_Pin from **LCD**

PIN7: **D7**_Pin from **LCD**

PORTB:

PIN0: **RS**_Pin from **LCD**

PIN1: **R/W**_Pin from **LCD**

PIN2: **E**_Pin from **LCD**

PIN3: NULL

PIN4: NULL

PIN5: NULL

PIN6: NULL

PIN7: NULL

PORTC:

PIN0: **SCL** pin from **RTC** component

PIN1: **SDA** pin from **RTC** component

PIN2: NULL

PIN3: NULL

PIN4: NULL

PIN5: NULL

PIN6: NULL

PIN7: NULL

PORTD:

PIN0: NULL

PIN1: NULL

PIN2: NULL

PIN3: NULL

PIN4: **Positive** pin from **Buzzer** and his **Negative** pin to the **Ground**

PIN5: One of the pins of **Start** Pushbutton and the other pin to **Ground**

PIN6: One of the pins of **Reset** Pushbutton and the other pin to **Ground**

PIN7: One of the pins of **Stop** Pushbutton and the other pin to **Ground**

Pins & Ports Configurations:

PORTA:

PIN0: DIO & OUTPUT & HIGH

PIN1: DIO & OUTPUT & HIGH

PIN2: DIO &OUTPUT & HIGH

PIN3: DIO &OUTPUT & HIGH

PIN4: DIO &OUTPUT & HIGH

PIN5: DIO &OUTPUT & HIGH

PIN6: DIO &OUTPUT & HIGH

PIN7: DIO &OUTPUT & HIGH

PORTB:

PIN0: DIO &OUTPUT & HIGH

PIN1: DIO &OUTPUT & HIGH

PIN2: DIO &OUTPUT & HIGH

PIN3: DIO &OUTPUT & HIGH

PIN4: DIO &OUTPUT & HIGH

PIN5: DIO &OUTPUT & HIGH

PIN6: DIO &OUTPUT & HIGH

PIN7: DIO &OUTPUT & HIGH

PORTC:

PIN0: DIO &OUTPUT & HIGH - SCL

PIN1: DIO &OUTPUT & HIGH - SDA

PIN2: DIO &OUTPUT & HIGH

PIN3: DIO &OUTPUT & HIGH

PIN4: DIO &OUTPUT & HIGH

PIN5: DIO &OUTPUT & HIGH

PIN6: DIO &OUTPUT & HIGH

PIN7: DIO &OUTPUT & HIGH

PORTD:

PIN0: DIO &OUTPUT & HIGH

PIN1: DIO &OUTPUT & HIGH

PIN2: DIO &OUTPUT & HIGH

PIN3: DIO &OUTPUT & HIGH

PIN4: DIO &OUTPUT & HIGH

PIN5: DIO & INPUT & Pullup

PIN6: DIO & INPUT & Pullup

PIN7: DIO & INPUT & Pullup