- Professor Incharge

Mr. Yogesh Gholap

- Subject

Embedded Systems

- Team Members:

Bhushan Kolhe

Harshal Rathod

Jolly Bunga

Embedded Mini Project: Group – 03

Topic

Student Attendance & Health Monitoring PostCOVID19 Condition

DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION
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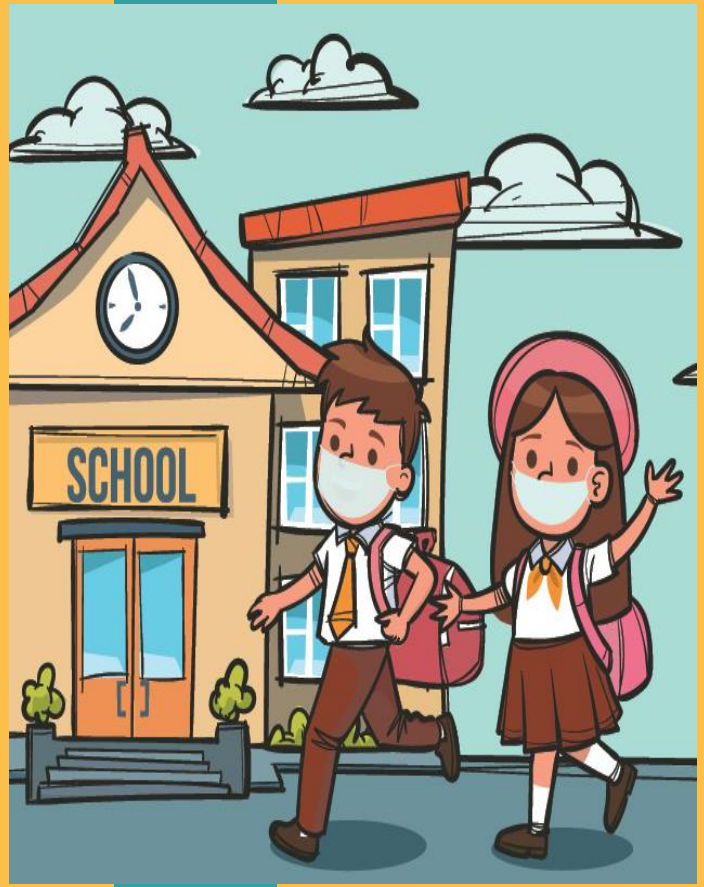
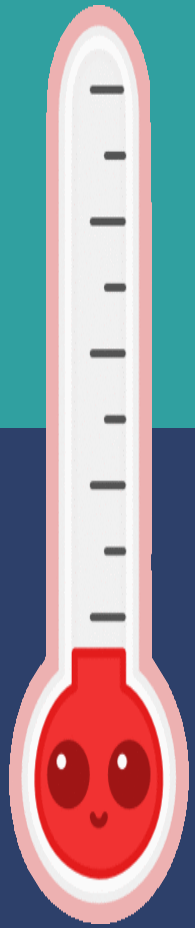
Contents





TASK

Student Attendace

Measuring student's HeartBeat(BPM)

Measuring student's temperature

Introduction

- Covid – 19
- Student Attendance Management
- Student's Health Monitoring
- Precautions

Concepts & Components Used

Concepts Used: Embedded Systems - Multitasking
RTOS [FreeRTOS in Arduino IDE]
Semaphores
Heart Beat Measurement Process
Temperature Measurement Process

Softwares Used: Arduino IDE , Proteus 8

Components used: Arduino MEGA 2560, Touch sensor, Heart beat sensor(HB01) , Temperature Sensor(LM35) Variable resistor(Potentiometer), LCD Display(Terminal for Demo).

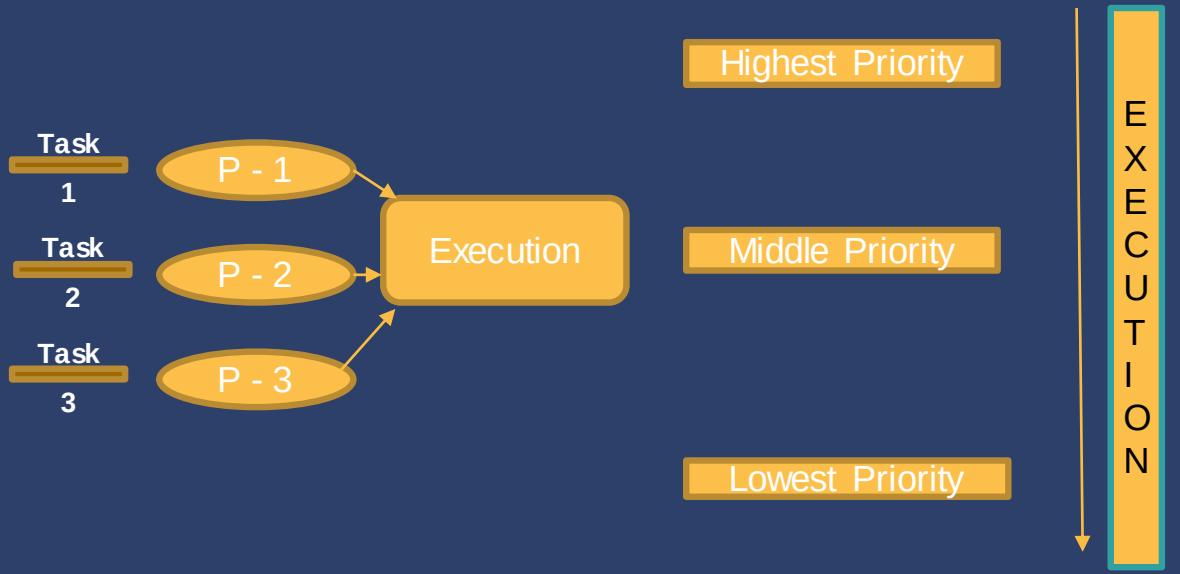
Libraries Used: FreeRTOS Library in Arduino IDE [#include <Arduino_FreeRTOS.h>]
Semaphore library [#include<semphr.h>]
Touch sensor Library,
Heart sensor Library.

Working

The project is divided into two stages :

1. Priority based Implementation

2. Semaphore based Implementation.



A. Priority based Implementation

Working

In Arduino IDE :

```
SemaphoreHandle_t
xSerialSemaphore;

xSerialSemaphore =
xSemaphoreCreateMutex();

xSemaphoreGive(
xSerialSemaphore);
```

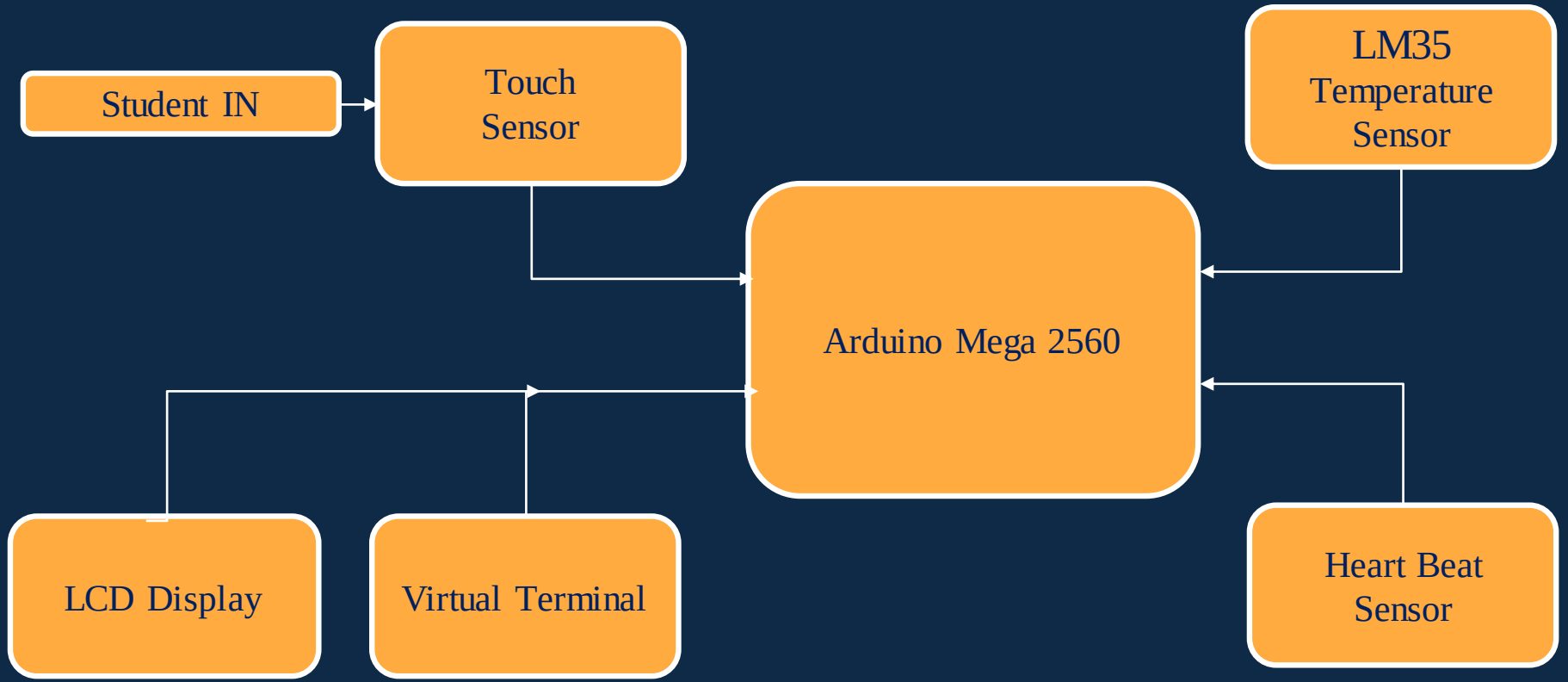
Mutex semaphores are *binary* semaphores that include a priority inheritance mechanism. Whereas binary semaphores are the better choice for implementing synchronisation (between tasks or between tasks and an interrupt), mutex semaphores are the better choice for implementing simple mutual exclusion (hence 'MUT'ual 'EX'clusion).

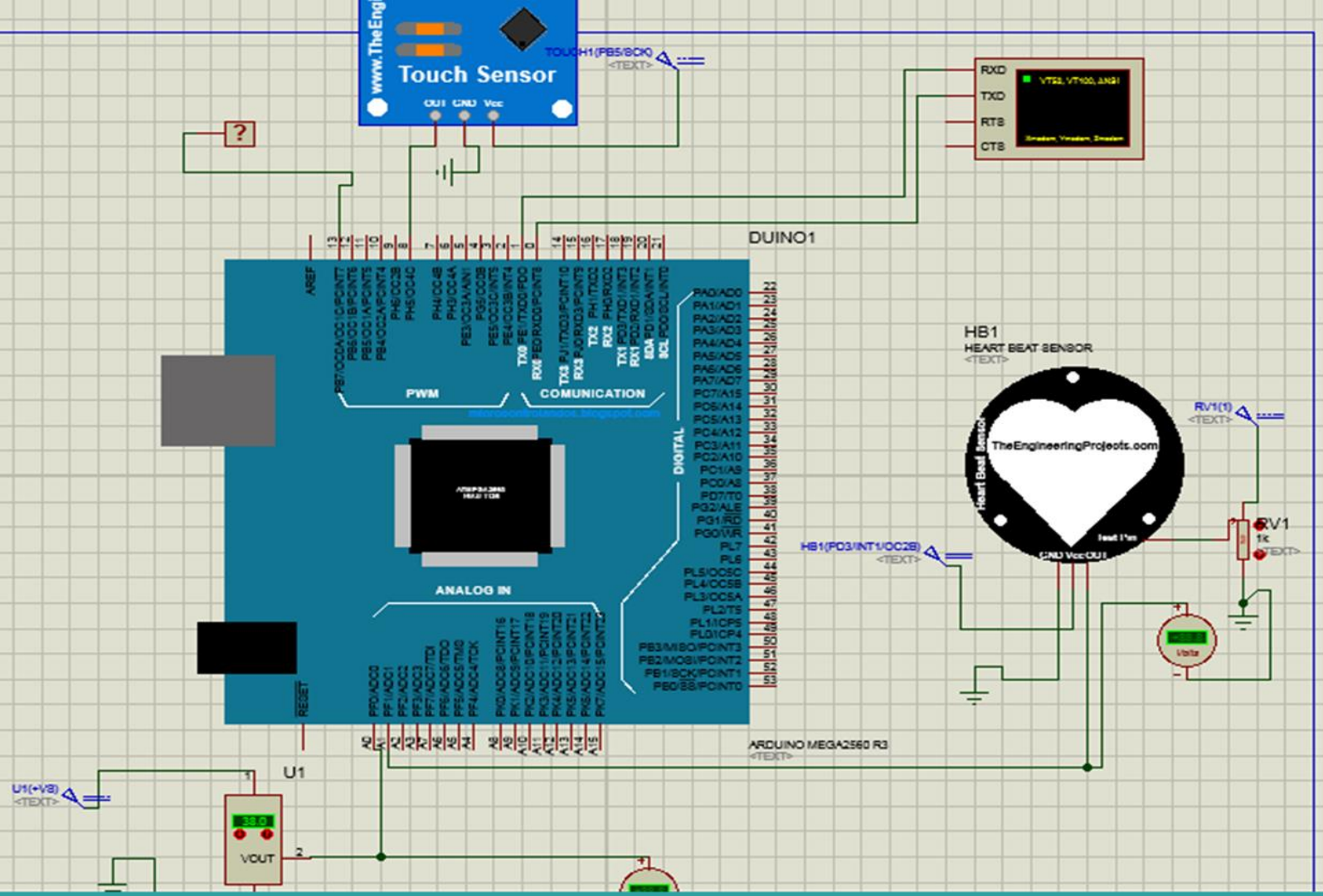
SEMAPHORES

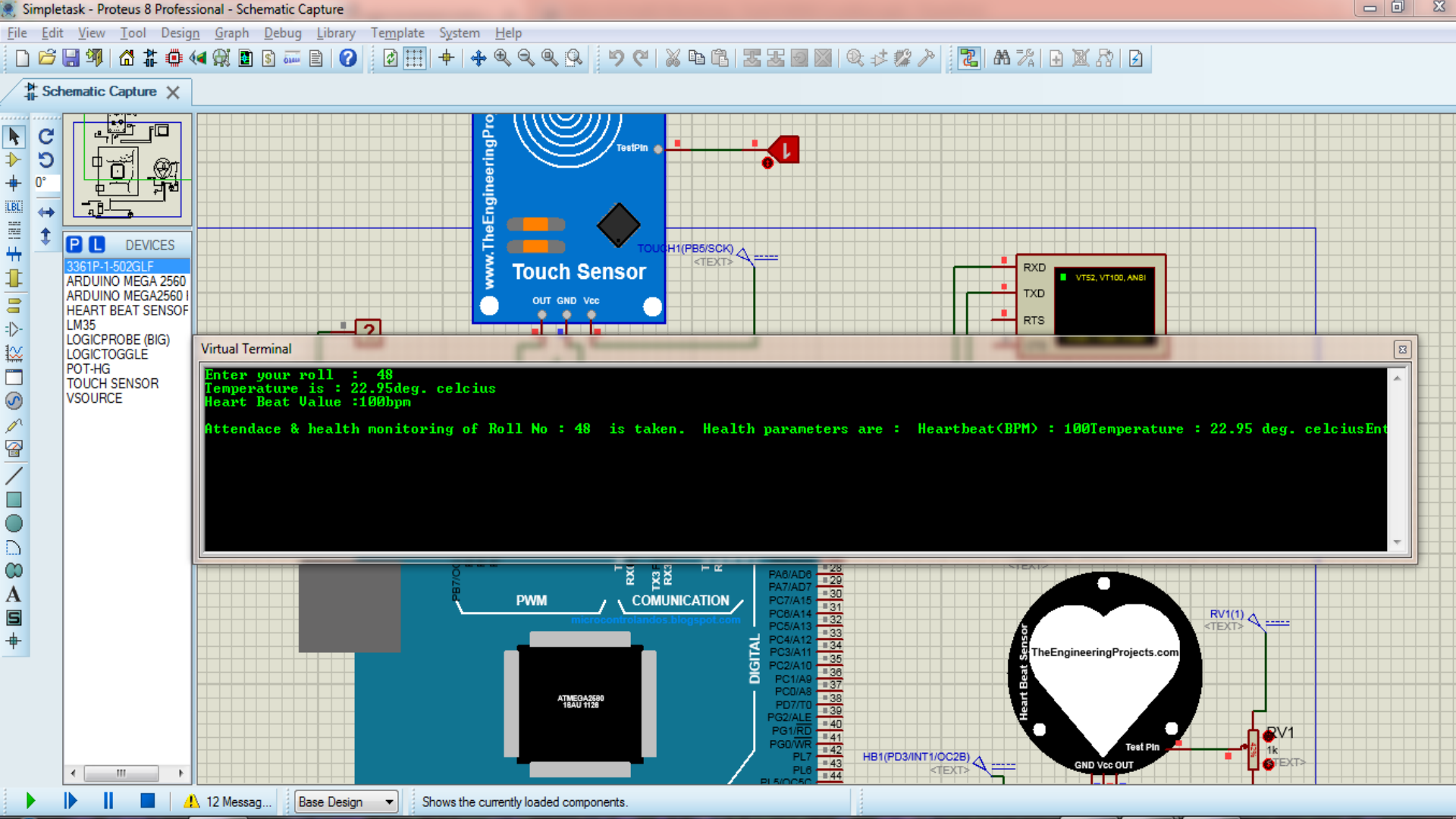
1. MUTEX [Mutual Exculsion]
   [Binary Semaphore]
2. Counting Semaphore

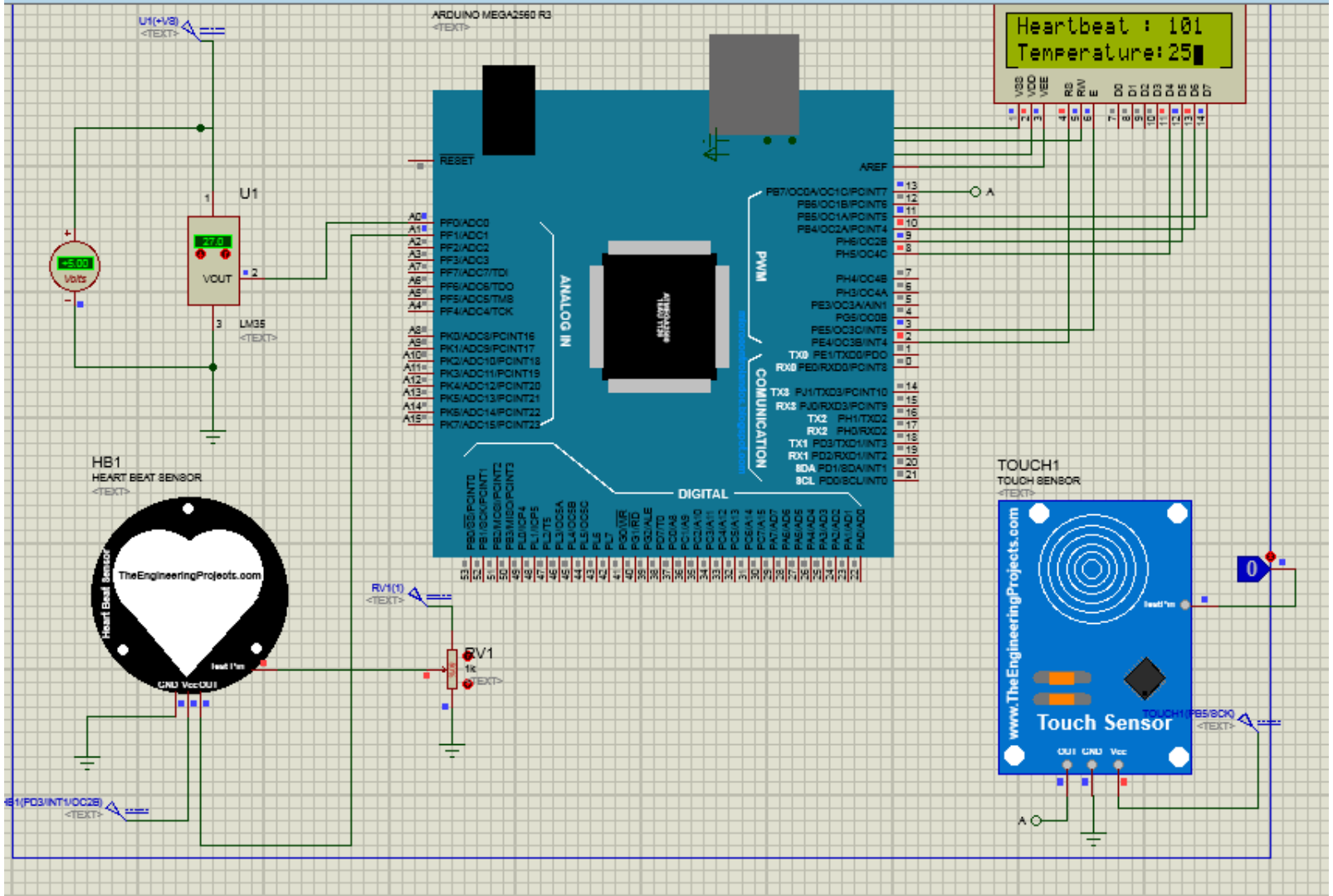
Semaphore based Implementation

Block Diagram




Touch Sensor
OUT GND Vcc
TOUCH1(PB5/SCK)
<TEXT>
RXD
TXD
RTS
CTS
DUINO1
HB1
HEART BEAT SENSOR
<TEXT>
TheEngineeringProjects.com
RV1(1)
<TEXT>
RV1
1K
<TEXT>
HB1(PD3/INT1/OC2B)
<TEXT>
PWM
COMUNICATION
ANALOG IN
DIGITAL
ARDUINO MEGA2560 R3
<TEXT>
U1
U1(+V3)
<TEXT>
VOUT


Simpletask - Proteus 8 Professional - Schematic Capture
File Edit View Tool Design Graph Debug Library Template System Help
Schematic Capture
DEVICES
3361P-1-502GLF
ARDUINO MEGA 2560
ARDUINO MEGA2560 I
HEART BEAT SENSOF
LM35
LOGICPROBE (BIG)
LOGICTOGGLE
POT-HG
TOUCH SENSOR
VSOURCE
www.TheEngineeringPro
TestPin
Touch Sensor
OUT GND Vcc
TOUCH1(PB5/SCK)
RXD
TXD
RTS
VT52, VT100, ANSI
Virtual Terminal
Enter your roll : 48
Temperature is : 22.95deg. celcius
Heart Beat Value :100bpm
Attendace & health monitoring of Roll No : 48 is taken. Health parameters are : Heartbeat(BPM) : 100Temperature : 22.95 deg. celciusEnt
PWM
COMUNICATION
microcontrolandos.blogspot.com
ATMEGA2560
16AU 1128
DIGITAL
PA6/AD6
PA7/AD7
PC7/A15
PC6/A14
PC5/A13
PC4/A12
PC3/A11
PC2/A10
PC1/A9
PC0/A8
PD7/T0
PG2/ALE
PG1/RD
PG0/WR
PL7
PL6
TheEngineeringProjects.com
Heart Beat Sensor
Test Pin
GND Vcc OUT
RV1(1)
RV1
1k
HB1(PD3/INT1/OC2B)
12 Messag...
Base Design
Shows the currently loaded components.


Heartbeat : 101
Temperature:25
ARDUINO MEGA2560 R3
U1(+V8)
U1
+5.00
Volts
87.0
VOUT
LM35
HB1
HEART BEAT SENSOR
TheEngineeringProjects.com
Heart Beat Sensor
GND Vcc OUT
RV1(1)
RV1
1k
TOUCH1
TOUCH SENSOR
www.TheEngineeringProjects.com
Touch Sensor
OUT GND Vcc
TOUCH1(PB5/SCK)
0
A
RESET
AREF
ANALOG IN
PWM
COMUNICATION
DIGITAL
PF0/ADC0
PF1/ADC1
PF2/ADC2
PF3/ADC3
PF7/ADC7/TDI
PF6/ADC6/TDO
PF5/ADC5/TMS
PF4/ADC4/TCK
PK0/ADC8/PCINT16
PK1/ADC9/PCINT17
PK2/ADC10/PCINT18
PK3/ADC11/PCINT19
PK4/ADC12/PCINT20
PK5/ADC13/PCINT21
PK6/ADC14/PCINT22
PK7/ADC15/PCINT23
PB7/OC0A/OC1C/PCINT7
PB6/OC1B/PCINT6
PB5/OC1A/PCINT5
PB4/OC2A/PCINT4
PH6/OC2B
PH5/OC4C
PH4/OC4B
PH3/OC4A
PE3/OC3A/AIN1
PG5/OC0B
PE5/OC3C/INT5
PE4/OC3B/INT4
TX0 PE1/TXD0/PDO
RX0 PE0/RXD0/PCINT8
TX3 PJ1/TXD3/PCINT10
RX3 PJ0/RXD3/PCINT9
TX2 PH1/TXD2
RX2 PH0/RXD2
TX1 PD3/TXD1/INT3
RX1 PD2/RXD1/INT2
SDA PD1/SDA/INT1
SCL PD0/SCL/INT0

Conclusion


thank you