Health Kit

By:

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Synopsis: Our project idea using the 8085 Microprocessor is to prototype an integrated health kit. It will have 2 sensors - a heart rate sensor and a body temperature sensor. The heart rate sensor will be implemented using IR LED - IR receiver pair and low pass filter, and the body temperature sensor using the LM35 IC. The output of both these sensors will be fed to the 8085 through an Analog to Digital Converter (ADC). The user can select which reading is to be displayed on a LCD screen using a switch. If any of the 2 parameters are above the normal health threshold then a warning LED will flash to tell the user to consult a doctor immediately.

Keywords: 8085, Microprocessor, Health Kit, Heart Rate Sensor, Body Temperature Sensor, Doctor Consultation Adviser

EC 316 Microprocessor Lab Project
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Introduction

The 8085 Microprocessor based project idea which we have chosen is to prototype an integrated health kit. This will be a portable PCB circuit which will include components such as the 8085 Microprocessor IC, ROM and RAM chips, power supply, switches, LEDs, LCD display screen and the self made circuitry for the sensors. These components will be encapsulated within a box/holder for greater mobility and protection of the circuit.

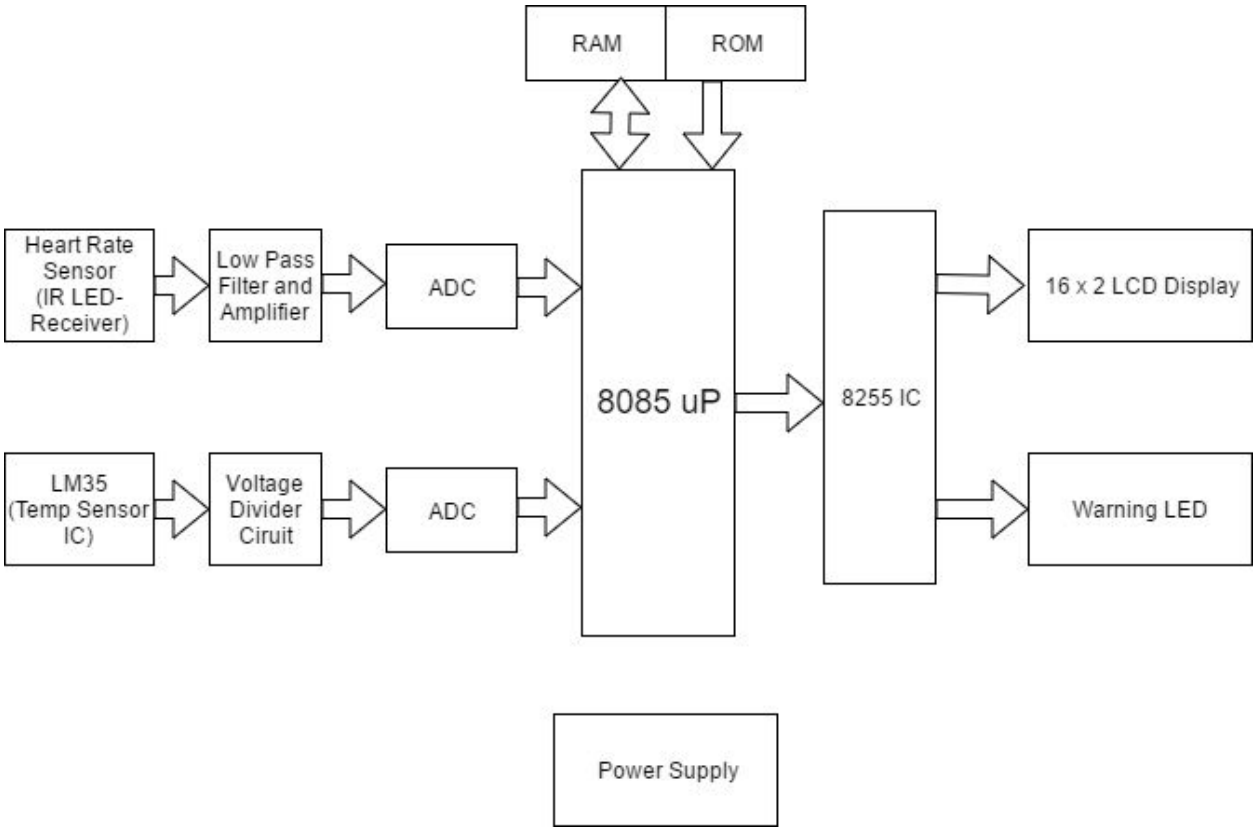
The 8085 Microprocessor is an 8-bit microprocessor introduced by Intel in 1976. It comes in a 40 pin DIP package IC using 5v DC supply and can utilize a maximum of 64KB memory, which can include both ROM and RAM. It has the feature of a multiplexed 8 bit Address and Data Bus to minimise the number of pins. It mostly uses the instruction set of the Intel 8080 with only 2 added input/output instructions. The electronic circuits for the heart rate and body temperature measuring sensors will be self built rather than purchased as a module from the market.

The motivation of the project is to have a portable, cheap and simple health station which can measure basic health parameters such as heart rate and temperature. Any significant rise in either of these parameters is a sure signal of deteriorating health and as such demands an immediate consultation with a doctor. By having the facility of checking both these parameters accurately in one portable kit we aim to reduce the time in which symptoms first appear and the consultation with the doctor takes place.

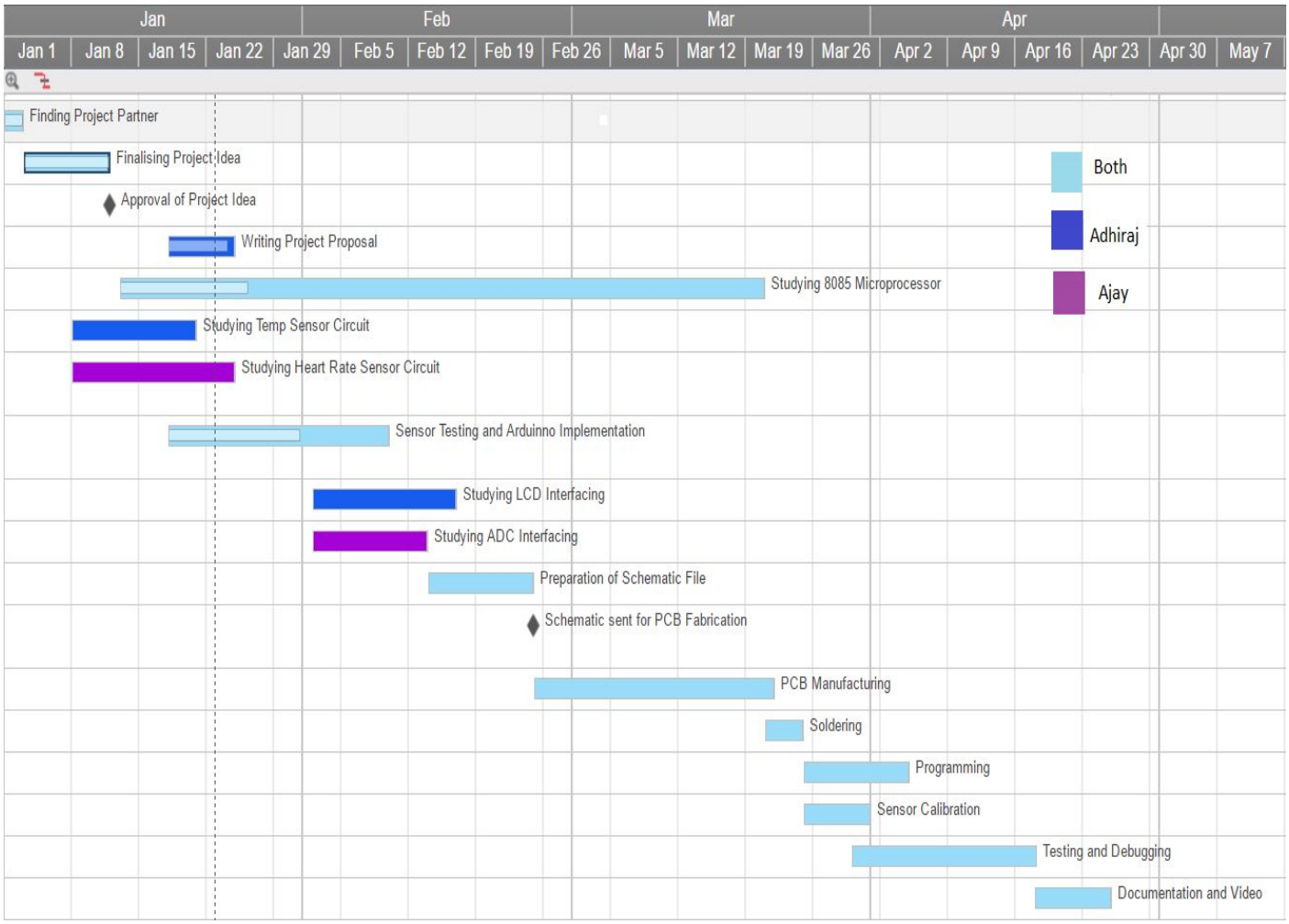
Project Description

The basic components of the Health Kit Project are:

- 8085 Microprocessor
- 8 bit RAM and ROM chips
- Heart Rate Sensor Circuit: Using IR LED-Receiver pair clip with low pass filter. The IR LED emits infrared light which will be made to pass through the user's finger. Blood pulsing through the finger will refract this IR light and through this change will introduce a signal in the output of the IR receiver. Noise will be removed using a low pass filter.
- Body Temperature Sensor Circuit: Using LM35 temperature IC. Voltage divider circuit will give output of 1mv/degree celsius.
- Analog to Digital Converter: To convert analog signal into serial digital data input.
- 8255 IC: To control LCD display and LED.
- LCD Display: Output the selected sensor data (heart rate or body temperature).
- Warning LED: LED will flash if any parameter is above normal as a signal to visit the doctor



Gantt Chart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Apr 2
Apr 9
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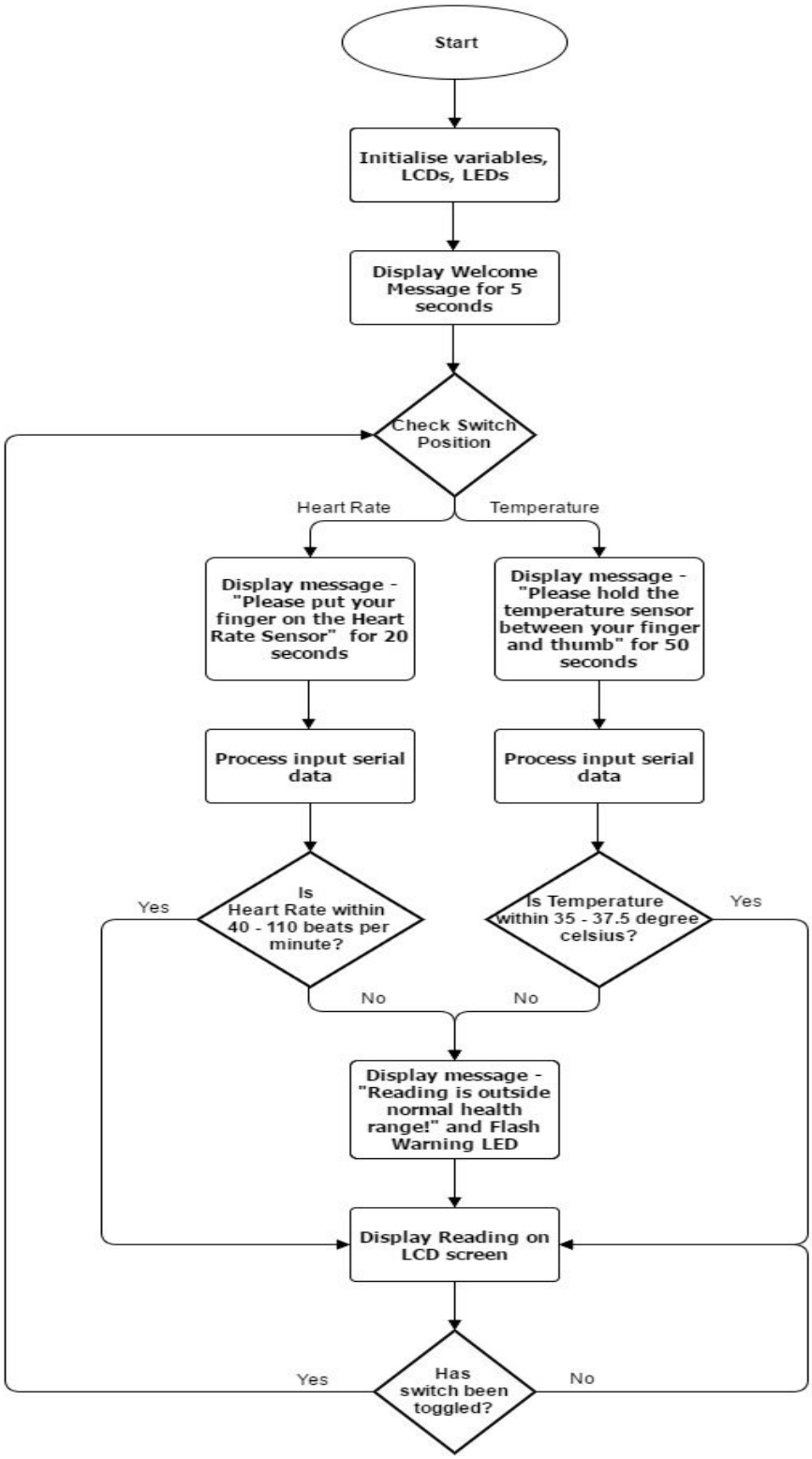
May 7
Finding Project Partner
Finalising Project Idea
Approval of Project Idea
Writing Project Proposal
Studying 8085 Microprocessor
Studying Temp Sensor Circuit
Studying Heart Rate Sensor Circuit
Sensor Testing and Arduinno Implementation
Studying LCD Interfacing
Studying ADC Interfacing
Preparation of Schematic File
Schematic sent for PCB Fabrication
PCB Manufacturing
Soldering
Programming
Sensor Calibration
Testing and Debugging
Documentation and Video
Both
Adhiraj
Ajay

Code Flowchart



Bill of Materials

S.No.	Component	Quantity
1	8085 Microprocessor IC	1
2	8255 IC	2
3	LM35 IC	1
4	UA741 Opamp IC	1
5	LM324 Opamp IC	1
6	8 KB ROM chips	1
7	8 KB RAM chips	2
8	IR LED	2
9	IR Receiver	2
10	Red LED	1
11	LCD Display Unit	1
12	Photodiode	1
13	9v Battery	2
14	0805 ADC IC	1
15	Switches	1
16	Resistors - 68k , 220, 39k, 1.8k, 470k, 90K, 10K, etc	10
17	Capacitors - 0.1uF, 1uF, etc	10

References

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5. https://www.elprocus.com/heartbeat-sensor-working-application/