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Efficient pulse rate monitoring and scheduling system for servers working in public sector

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Abstract – *The proposed system in this paper is concerned about the servers in public system. This system will come up with a schedule which is duly timed for all the employee based on their pulse rate and the number of hours they spent working. The main purpose is the employee to customer ratio which is an alarming number. To counter this, concern this system was come up with.*

***Key Words*: Public sector, Server, Pulse Rate and Heart Rate.**

1.INTRODUCTION

Public sector to government owned self-financing organisations which serve the public and private firms and which is plays major role in the society.

It includes such as defence, security, finance, banking and etc.

Here is a small picture depicting the workplace stressors Where there is a possibility of using our scheduling algorithm effectively.

The major public sector in India is Indian railways and banking sector. Both have a great scope of implementing this scheduling algorithm.

1.1 Problem Root cause

Before we begin we need to make sure about the employee sector we are considering. The high employee to customer ratio pushes the employee beyond their health limits. These scenarios lead to people sitting and working for long hours or overtime job. It affects them socially by decreasing their free time.

1.2 Proposed work

The above-mentioned effects of working overtime are very dangerous and might end fatally if not handled as early as possible. This paper proposes a system for this scenario which monitors the pulse rate and their work hours and comes up with a pre-emptive priority scheduling algorithm for all the employees in the office. This scheduling changes accordingly based on the pulse rate with the help of A NodeMCU recorded from the hardware which we designed for detecting the heart rate of the person who is working and will be reported accordingly. The pulse acquired from the pulse rate sensor through the NodeMCU board is sent to Adafruit IO server. The data transmission to the server is possible because the NodeMCU board is embedded with an ESP8266 Wi-Fi module embedded into it. The Adafruit IO is an IOT platform for monitoring values sent to the server. The pulse value sent to server can be monitored online on their websites. The values form the device accepted in the form of feeds. These feeds can have triggers set. The trigger is a function or a procedure when an initial condition is satisfied. These triggers can be set using an android application called IFTTT. This application has many services out of which one of the applications is monitoring an Adafruit feed. Different responses can be set for different initial conditions. For example, we can make a call or send a message or send an email, etc. when one of the feed values goes beyond a certain threshold.

2. Arduino Implementation and Priority scheduling program

We are using pre-emptive priority scheduling algorithm to identify an employee who is having less heartbeat rate which will be recorded from Arduino and will be manually entered into the program we choose and priority is given accordingly and in hardware part we use

Table -1: Sample table for Heart beat after priority clearance

Process	Arrival time	Heart beat rate	Priority	Waiting time
A	1	34	1	0
C	5	98	4	30

D	4	88	3	129
B	2	34	2	219

Arduino implementation is done using Arduino Uno r3 and pulse rate sensor. This is a microcontroller based on ATmega328. It has totally 14 digital I/O pins, 6 analog input pins, A USB interface where a power jack and a reset button is also included. This microcontroller can be coded using its own IDE. The programming based on the C language.

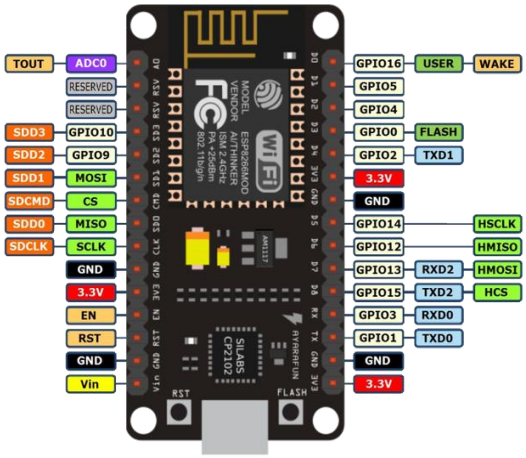

Fig -1: NodeMCU

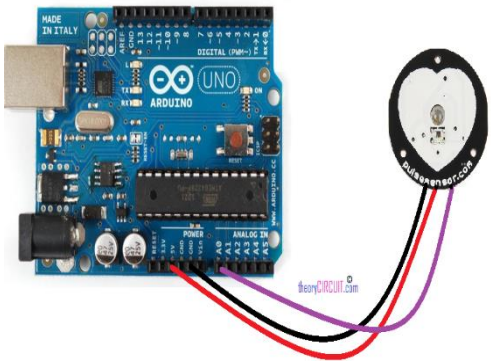

Fig-2: Pulse rate generator

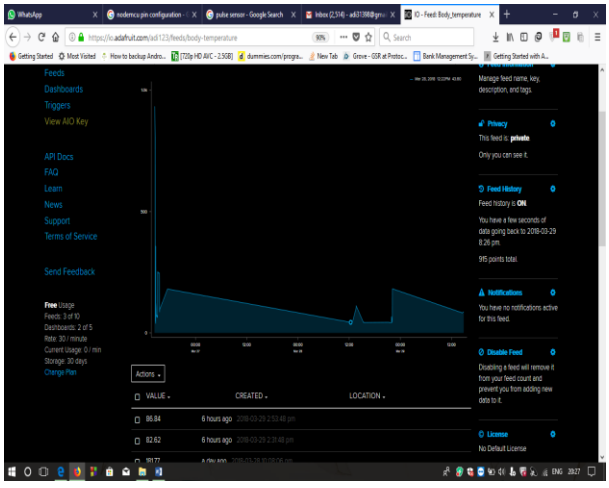

Fig-3: Graph for heart beat

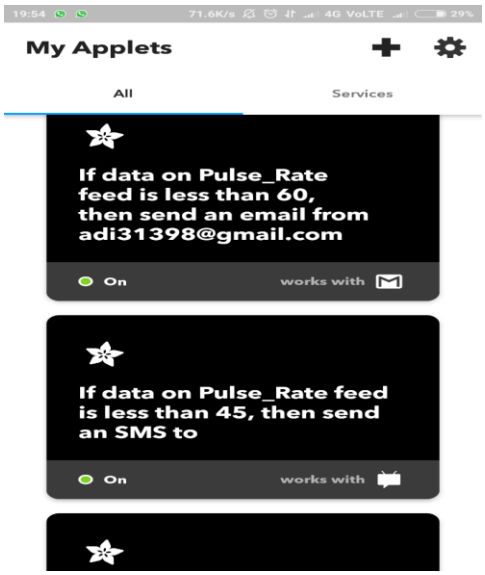

Fig-4: Applet Information

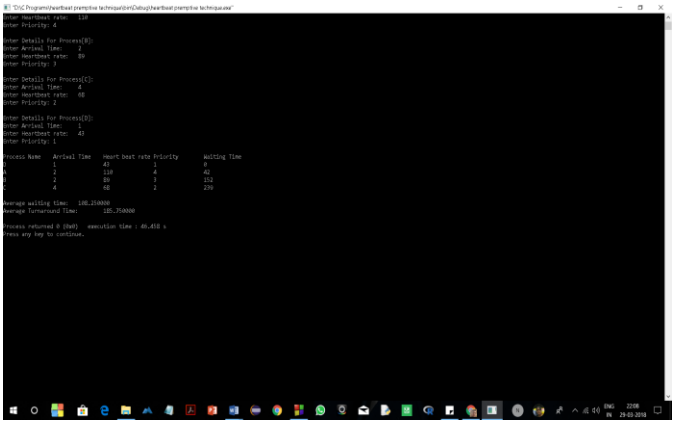

Fig-5: Scheduling implementation

There is another hardware instrument which we used is pulse rate generator which has a small plug and play sensor for measuring pulse rate sensor works on the principles of Photoplethysmography (PPG). This method is used to measure rate at skin surface at fingertip itself.

3. CONCLUSIONS

The conclusion here is we will be detecting Heartbeat using Arduino and the heartbeat will be taken in a priority order and if there is any fluctuations in their heart beat then a text message and an email will be sent to the concerned relatives or the family doctor.

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