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Intelligent Obstructive Sleep Apnea Screening and Control System by Integrating Iot with Embedded System

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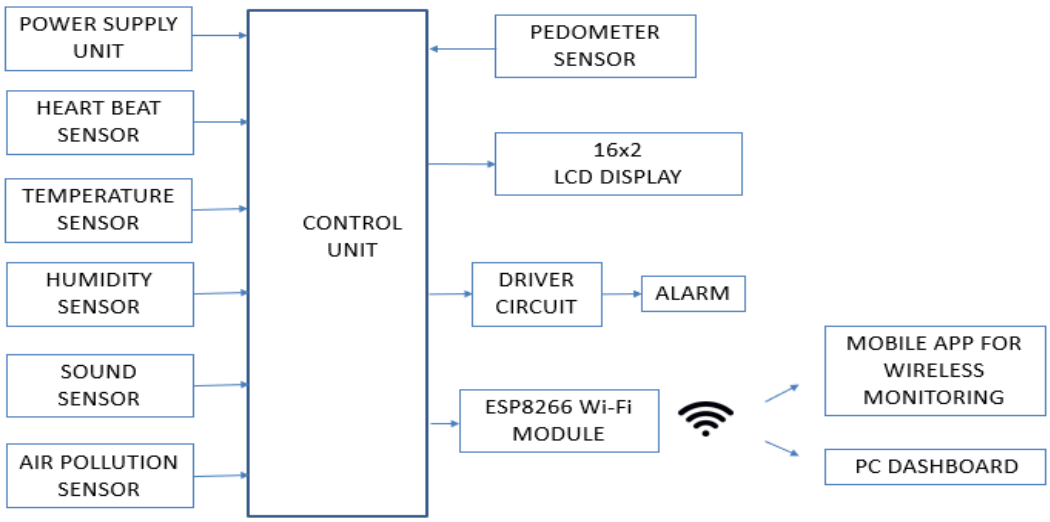
Abstract: *Obtrusive sleep apnea (OSA) is one of the most important sleep disorders because it has a direct adverse impact on the quality of life. Intellectual deterioration, decreased psychomotor performance, behaviour, and personality disorders are some of the consequences of OSA. Therefore, areal-time monitoring of this disorder is a critical need in healthcare solutions. For these reasons, this research presents an innovative system for both to detect and support of treatment of OSA of elderly people by monitoring multiple factors such as sleep environment, sleep status, physical activities, and physiological parameters as well as the use of data available in smart cities. To design an IoT based Sleep Monitoring System that can monitor the condition of the elderly persons and take a note on their health condition. To alert the close ones using IoT about any critical condition for taking necessary steps and saving life of the people. To save the life of the elderly people in the absence of people around them. To create a real time web application that can be applicable in all necessary places and do disease prediction.*

I. Introduction

Power Supply

The power supply circuit consists of step-down transformer which is 230v step down to 12v.In this circuit 4diodes are used to form bridge rectifier which delivers pulsating dc voltage & then fed to capacitor filter the output voltage from rectifier is fed to filter to eliminate any a.c. components present even after rectification. The filtered DC voltage is given to regulator to produce 12v constant DC voltage. 230V AC power is converted into 12V AC (12V RMS value wherein the peak value is around 17V), but the required power is 5V DC; for this purpose, 17V AC power must be primarily converted into DC power then it can be stepped down to the 5V DC. AC power can be converted into DC using one of the power electronic converters called as Rectifier. There are different types of rectifiers, such as half-wave rectifier, full-wave rectifier and bridge rectifier. Due to the advantages of the bridge rectifier over the half and full wave rectifier, the bridge rectifier is frequently used for converting AC to DC.

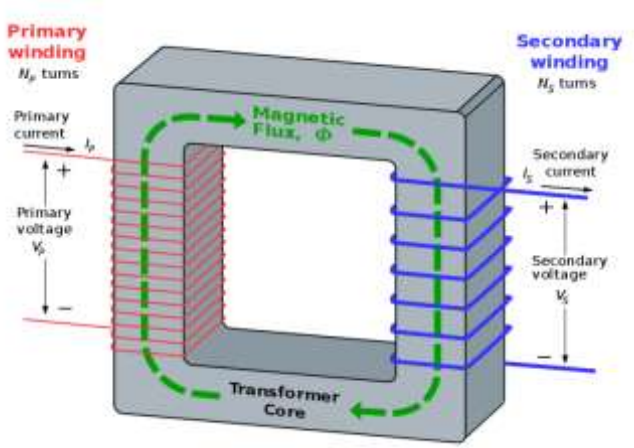
II. Blockdiagram:

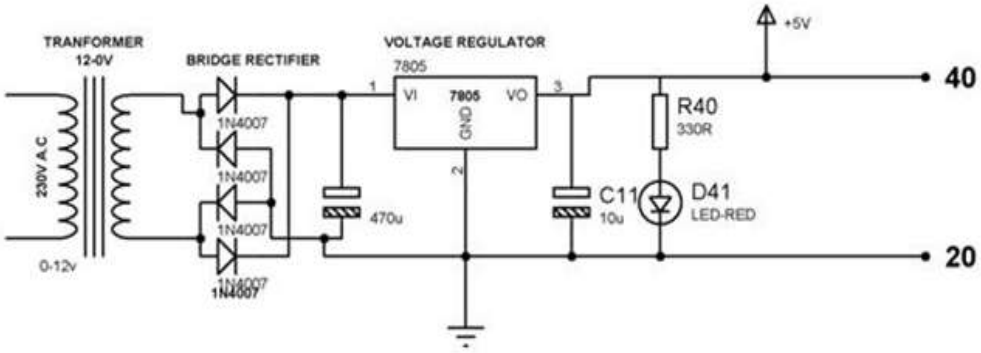


Transformer:

Transformer is static device which transfer electrical energy from on circuit to other circuit with change i n voltage or current without change in frequency. In this step down transformer is used. Usually, DC voltage s are require d to operate various electronic equipment and these voltages are 5V, 9V or 12V. But these voltages cannot be obtained directly. Thus the a.c input available at the mains supply i.e., 230V is to be brought own the required voltage level. This is done by a transformer. Principle of transformer is according to Faraday's law o electromagnetic induction. An electrical transformer works on the principle of Mutual Induction, which states that a uniform change in current in a coil will induce an E.M.F in the other coil which is inductively coupled to the first coil.In its basic form, a transformer consists of two coils with high mutual inductance that are electrically separated but have common magnetic circuit. The following image shows the basic construction of a Transformer. The first set of the coil, which is called as the Primary Coil or Primary Winding, is connected to an alternating voltage source called Primary Voltage. The other coil, which is called as Secondary Coil or Secondary Winding, is connected to the load and the load draws the resulting alternating voltage (stepped up or stepped down voltage).

The alternating voltage at the input excites the Primary Winding, an alternating current circulates the winding. The alternating current will result in an alternating magnetic flux, which passes through the iron magnetic core and completes its path. Since the secondary winding is also linked to the alternating magnetic flux, according to Faraday's Law, an E.M.F is induced in the secondary winding. The strength of the voltage at the secondary winding is dependent on the number of windings through which the flux gets passed through. Thus, without making an electrical contact, the alternating voltage in the primary winding is transferred to the secondary winding.





III. FIG POWER SUPPLY

Rectifier:

A rectifieris an electrical device that converts alternating current (AC), which periodically reverses direction, to direct current (DC), which flows in only one direction. The process is known as rectification. This type of single phase rectifier uses four individual rectifying diodes connected in a closed loop "bridge" configuration to produce the desired output. The main advantage of this bridge circuit is that it does not require a special Centre tapped transformer, thereby reducing its size and cost. The single secondary winding is connected to one side of the diode bridge network and the load to the other side.

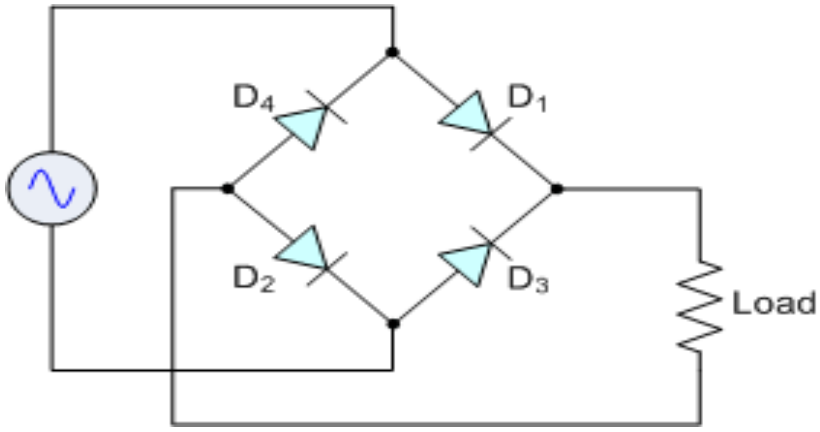


Fig Rectifier

Capacitors:

The capacitance is the amount of electric charge that is stored in the capacitor at voltage of 1Volt. The capacitance is measured in units ofFarad (F). The capacitor disconnects current in direct current circuits and short circuit in alternating current. A capacitor can store electric energy when disconnected from its charging circuit, so it can be used like a temporary battery, or like other types of rechargeable energy storage systems.

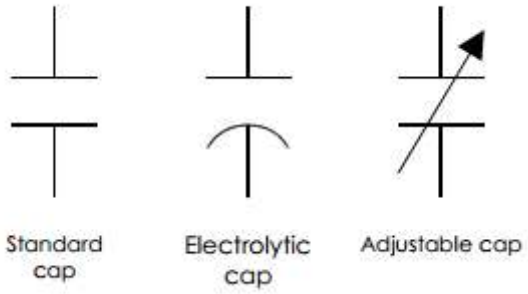


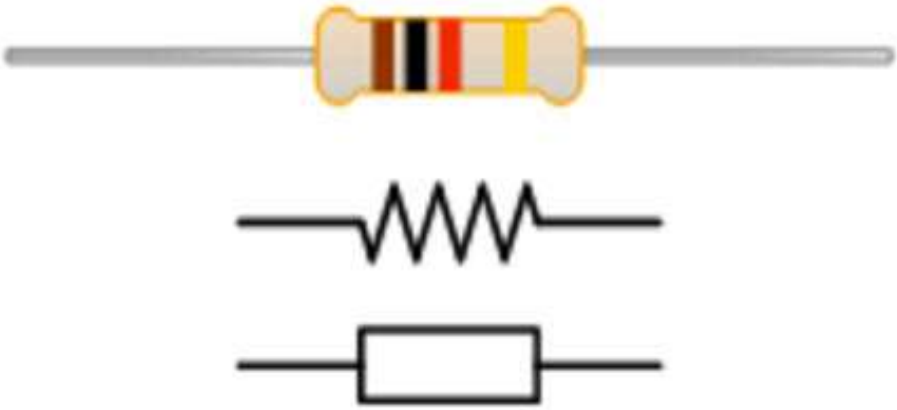
Fig Capacitors

Resistor:

A resistor is an electrical component that limits or regulates the flow of electrical current in an electronic circuit. Resistors can also be used to provide a specific voltage for an active device such as a transistor. All other factors being equal, in a direct-current (DC) circuit, the current through a resistor is inversely proportional to its resistance, and directly proportional to the voltage across it. This is the well-known Ohm's Law. In alternating-current (AC) circuits, this rule also applies as long as the resistor does not contain inductance or capacitance.

Resistors can be fabricated in a variety of ways. The most common type in electronic devices and systems is the carbon-composition resistor. Fine granulated carbon (graphite) is mixed with clay and hardened. The resistance depends on the proportion of carbon to clay; the higher this ratio, the lower the resistance. Another type of resistor is made from winding Nichrome or similar wire on an insulating form. This component, called a wire wound resistor, is able to handle higher currents than a carbon-composition resistor of the same physical size. However, because the wire is wound into a coil, the component acts as an inductors as well as

exhibiting resistance. This does not affect performance in DC circuits, but can have an adverse effect in AC circuits because inductance renders the device sensitive to changes in frequency.



IV. Conclusion

Customize every feature to your liking and install any number of third-party extensions. While most scenarios work "out of the box" with no configuration, VS Code also grows with you, and we encourage you to optimize your experience to suit your unique needs. VS Code is an open source project so you can also contribute to the growing and vibrant community on GitHub.

VS Code includes enriched built-in support for Node.js development with JavaScript and TypeScript, powered by the same underlying technologies that drive Visual Studio. VS Code also includes great tooling for web technologies such as JSX/React, HTML, CSS, SCSS, Less, and JSON.