

Coen120

Professor Quinn

01/24/02

The Ultimate Home Burglary Alarm System

Consists of a main module, which will monitor, and control the entire system.

Connected to the main module will be many forms of sensors. There will be sensors on every door and window inside the house that will inform the state of the sensor. The sensor will be of one of the following states: closed, open, or damaged. There will also be motion detectors, which will monitor motion. The motion detectors can be one of the following states: active, inactive, or damaged. There will also be fire detectors connected to the main module. The fire detectors will monitor the smoke within the house. They can be of the following states: alarm, standby, or damaged. There will also be keypads connected to the main module. The keypads will have many functions. The keypads will be used to activate and deactivate the alarm system. You can check the status of any sensor from the keypad as well as bypass a sensor if needed. The keypad will also have control of administering secret pin codes, clock, date, memory of alarms, for panic alarms, and setting any type of delays for sensors before an alarm will sound. You will also be able to name all of the sensors however the user pleases through the keypad.

There will also be wireless sensors connected wirelessly to the main module. These modules will be used for panic buttons or for a wireless keypad for control of the entire system. The main module will be responsible for checking the state of all the sensors

every minute. If the main module receives a signal from any sensor it must relay that signal to the keypad to inform the user. If the alarm is activated and a sensor is of state open then the main module must trigger the alarm. This will consist of sounding the siren, which is connected to the main module, sending a signal to the keypad, sending a message to the alarm center to inform of an alarm. The main module will contain a backup battery in the case of a power outage and will inform the user of a power outage through the keypad. The system will be able to run for 1 week using the backup battery power. If the main module loses a signal to the phone line it will sound the alarm immediately, but will not be capable of sending a signal to the alarm center unless the user has an optional satellite connected to the main module. The main module will contain a database, which contains the status of every sensor, which is updated once a minute. If a sensor is damaged the main module will then send a warning message to the keypads and cause a type of alarm sound to alert the user that there is a damaged sensor in the house.



This is a good project and proposal. The battery can be ignored.

Personal Project Proposal

I want to build a processor for a music stereo. It has four components to it. One is the Radio, second the tape and third the CD player. The fourth component is the control for the output for music and has three components to it: the balance between speakers, the bass, and the treble. The Radio has three components too: AM, FM1 and FM2. There are two tape players and one CD player. There are definitely components that can be added as the project nears completion.

This is WAY too incomplete of a definition of what you are going to create. I want a DETAILED explanation of each of the functions that the user can select and exactly how the user will interact with the system.

What type of input and output will the system have.

Will the system be able to record from the radio/CD to tape?

What will the system display while the tape/CD/radio are playing?

How will stations on AM, FM1, FM2 be selected?

etc, etc, etc!!!!

Please explain each of the functions IN DETAIL and resubmit.

RESUBMIT

Digital Cable Box

The Cable box needs to tune to desired channels and decode the digital signal coming through the cable. The cable box takes input from the user through a remote. Using the remote, the user can change channels and browse the channel guide. The idea is to write the software for the cable box, not the remote. The main objects of the software would be the channels. Each channel would have a variety of attributes associated with it. These include channel number, frequency of channel, and a small timeline showing what is on the channel for a 24-hour period. The channel number and frequency of the channel can be stored in a variable but the timeline of what is going to be on the channel is also an object. The software will use inheritance to model different types of channels. The basic channel class will have basic channel attributes and operations. The types of channels that would inherit from the base class would be movie channels, music channels, pay per view channels, sports channels, and the basic channels. Another object found in the system would be the guide. The guide will contain all of the timelines for every channel offered, and it will provide an interface to the user. The Guide will also have the job of downloading channel information from the same source that is providing the channels themselves.

Inputs

- channel up/down
- volume up/down
- enter/exit guide mode
- choose channel
- page up/down

you are a bit premature to talk about objects. This is supposed to be a functional description of WHAT the system is supposed to be able to do.

I am not quite sure how you intend to simulate the various aspects of your system. I would suggest you use the PIC board display to show things like current channel, time, etc; and use the CRT display to show the current schedule of what is on each channel.

Main Objects

- channels (movie, pay per view, sports, standard)
- timelines
- channel browser (guide)



APPROVED

Thermostat System for an apartment with 4-8 different units.

This system would control the temperature of each unit. For each unit, users can set up:

- The temperature of each unit (manually).
- Maintaining temperature inside the unit.
- Time for the thermostat system to check the temperature inside the unit and maintain the specific temperature in certain time. (Scheduling the system.)

There would be temperature sensor to detect inside condition for each unit in the apartment.

Please let me know if there are something that I could improve my project.

This is a bit skimpy of a proposal. you will need to describe IN DETAIL the function of the controller for each unit. e.g. does the controller operate in heat mode only or does it have a heat/cool mode as well? How much hysteresis exists around the setpoint? Is it intended to be a single or dual point controller depending on the time of day?

Describe the exact nature of the user input.

Please resubmit with things included.



BigLake Productions Proudly Introduces The Chronamaticä Time Telling Experience

This state-of-the-art watch features such modern enabling technologies as:

- Automatic Internet time look up (ATTLUP™)
- Integrated Calendar & Messaging System (ICMS™)
- Hot-sync your messages and appointments with your personal computer over the internet from anywhere in the world (HSYMAWYPCOIFAW™)
- Hot-flashable RAM for downloading the latest upgrades
- Programmability using the included Chronamatic Development System
- Onboard support for up to 4000 independent alarms
- Download your favorite alarms (visual and/or audible)
- Sign up for the Chronamatic messaging service and chat with your friends

The level of detail is not sufficient for me to determine what you intend to do. Obviously flash RAM is not a feasible feature of what you can do on the target systems we have in the lab. Think about the actual "doable" features that you can accomplish, and describe them in detail. If there is a particular protocol you need in order to obtain the time from the internet, then explain it in detail. In concept, this is a GREAT project, but please resubmit.

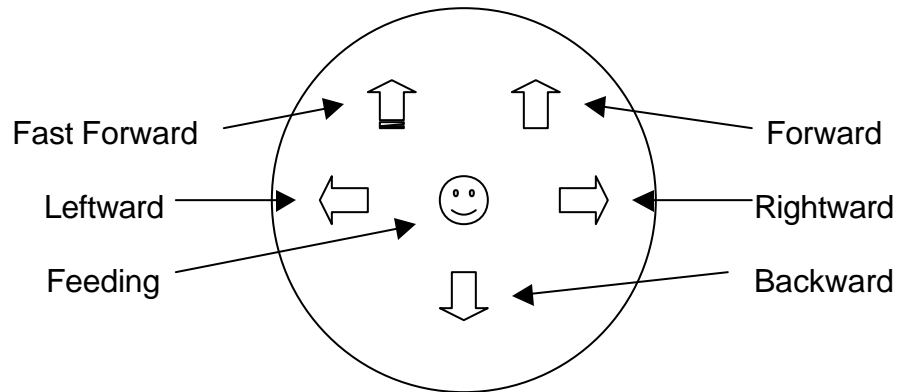
There you have it Dr. Quinn. My plan is to start simple, and to just get the "simulated watch" to tell time. Then, time permitting I will gradually add support for alarms, internet time lookup, interfacing with a PC, programmability, and inter-watch communication. The inputs to this device will come either through the network card (from a PC, or another watch) or using the buttons on the PIC board for manual operations (like the buttons on a regular watch.) The outputs at first will be just simple text which will then evolve into a graphical watch simulation if all goes well.

NOT APPROVED

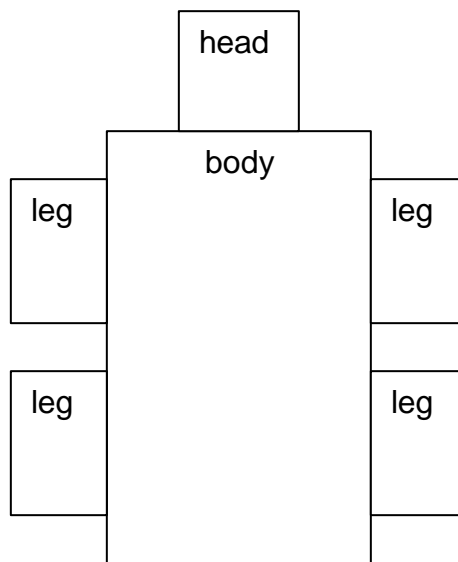
B.I.O BUG

The toy package contains two parts. (batteries not included)

1. remote control for the B.I.O bug,
 - six buttons for controlling the B.I.O bug



2. B.I.O bug.
 - one head containing one signal receiver and one flashing red light.
 - one body containing the batteries unit and the power switch.
 - four legs for mobility,



Requirements

The B.I.O bug requires four AA size batteries.
The remote control requires two AAA size batteries.

To play

Insert the required batteries.

Turn on the power switch of the B.I.O bug.

Initially, the B.I.O bug will move in a forward direction per 2 seconds.

At the same time, the B.I.O bug also makes a “chit-chit” sound per 2 seconds.

Motion:

Select any motion buttons to move the bug. All four legs will contribute in some form to the same direction.

1. Leftward (per 2 seconds)
2. Rightward (per 2 seconds)
3. Forward (per 2 seconds)
4. Backward (per 2 seconds)
5. fast Forward (per 1 second)

Feeding:

Every twenty minutes, a flashing red light will appear on the bug’s forehead at a rate of 1 second. This indicates the bug is hungry. To feed “energy” to the bug, press the feeding button on the control. The bug stops, makes three “ee-ee” sound and shivers for 3 seconds when receiving an energy feeding. Press the feeding button again to cease feeding. The flashing red light will turn off automatically and the bug will continue on its original motion direction.

End Play:

Turn off the power switch of the B.I.O bug.

This is a good project. Think about how you will simulate the actions of the device. What type of display and input will you use in order to test your device.



Individual Project Proposal

I'd like to design the embedded system for a safety restraint system (airbag system)

Here are my ideas for attributes and operations:

Attributes:

- Speed of vehicle
- Point of impact
- Force of impact

Operations:

- Arm system
- Deploy front airbags
- Deploy side airbags
- Deflate airbags
- Disengage system

The arm system operation will prepare the system to detect a collision when the car is turned on. Deploy front airbags and side airbags will detect a collision and decide immediately whether the collision was severe enough to deploy airbags and if so which airbags are necessary. The air bags will deflate after 30 seconds so that the passenger can exit the vehicle. The disengage system operation will turn the system off when the car is turned off. I will create various test programs to show at what speed and at what points the airbags are deployed.

Make sure that you incorporate a decelerometer so that the air bag does not inflate inadvertently.

By incorporating this the project is approved.



Personal Project Proposal

For my personal project, I would like to try to design my own embedded treadmill system that would control someone's workout. I like to workout regularly and one of my exercises to do is to run on the treadmill, but there is always something wrong about one treadmill or something better about another one. For my project, I would like to combine the attributes of the different treadmills I've used to design one of my own.

-Some key attributes will include:

- Speed
- Incline
- Distance
- Virtual Track (So a user can see his distance in relation to a mile long track)
- Timer
- Heart-rate
- Calories Burnt
- Runners' Weight (for purposes of calorie approximation)
- Runners' Age

-Operations:

- Start
- Stop
- Emergency Stop (If the runner slips)
- Pause/Resume (Will pause/resume by pressing pause again)
- Cooldown
- setspeed
- setincline
- settimer
- setweight
- setage
- setprogram

This treadmill will encompass all of the following features. Most of the operations that are listed are self explanatory. The only one that may be foggy is the setprogram operation. The treadmill will not have pre-set programs, but rather the user will have the option to record their current workout so they can replicate it at a later time without the trouble of changing the settings manually. With this project, hopefully I will finally be able to find a treadmill that will satisfy all of my needs.

Good project, go for it.



Individual Project Proposal

Juke Box

Equipment

- Display (to show CD title with corresponding numbers)
- Keypad (to have the CD and song #'s punched in by the user)
 - #'s (0...9)
 - Cancel button
 - Enter button
 - 2 scroll buttons (To search for CDs)
- Rotating CD holder
 - Motor
 - Sensor (to know what CD number it is on)
- CD Player (combined with the rotating holder)
 - Play and search functions available
 - Output to main device to let it know when the song is done playing
- Speakers
- Plug into wall outlet

Abilities

- Receive input from the keypad from the user
- Rotate to appropriate CD
- Retrieve CD and put it into the player (this will actually be included into the abilities of the CD player itself)
- Go to selected song and play it
- Put CD back into the holder once song is done (another quality that the player provides)

The playing of the CD should include displaying the length of the song and the current time remaining / time into the song. This display should update on a periodic (e.g. 1 second) basis.



In this project, I want to build an electronic toy, something like interactive robotic dogs or cats. I want the toy to be able to do the following things:

1. Say that it is an interactive dog. I want the puppy to respond by barking and wagging its tail when users pat him on the head or scratch his ears. For these, (in real life) I plan to use a movement sensor around the puppy's head and ear to detect the input from users.

2. I want the puppy to pretend like he's eating, whenever users put his interactive bone around his mouth and nose. In real life, I'll use magnetic in the bone and in the puppy to trigger the dog of this specific movement. I don't really know how to simulate this for the project though!

3. There should be one button on the puppy's front left leg and another on his front right leg. When users push this button, the puppy should raise the leg whose button is pressed & users can shake hands with the puppy (and press the button again so to trigger the dog to put his leg down). The same should occur if the right leg button is pushed.

In the case where users press the left leg button but then change his mind and decided to press the right leg button (as in decided to shake the puppy's right leg instead of the left). The puppy should automatically put his left leg down & raise the right (and the right button need to be press the second time to signal the puppy to put his right leg down.)

If after shake hands users forget to press the button, the puppy should wait for a couple of seconds, say 7 seconds then put his leg down.

4. If there is nothing going on for, say, 3 minutes while the switch is on, the puppy should bark to attract attention. Then, if users still

don't respond within a couple of seconds, the puppy should sing a song, snore, whatever till users get irritated and either play with him or turn the switch off.

This is a good project in concept, however I think that it may be too difficult to implement as your first project. Two reasons are, 1. you need to consider how to simulate the dog using the target systems we have, 2. the level of complexity of what you describe is beyond what I would expect for your personal project. I think you should rethink how you would simulate the functions you have described and also pair down the number of functions to about 3.

Please resubmit.



RESUBMIT

COEN 120 Personal Project Proposal

Cash Register/Produce Scale Interface

This will create a usable interface between a produce weight scale and the sale register. Based on the user input (to identify the particular type of produce), the weight received by the scale, and the correlated price of the type of produce. It will also be able to check for prices that are excessive (for the type of produce). It will create a receipt to list out what was purchased and all other relevant information involving the purchase and send this information to a printer, after the purchase is concluded.

Good project, go for it.



Personal Project
In-Store Bank Alarm

My alarm system is for an in-store Bank.

The alarm could be set on either of the following (or all of them):-

1. Safe
2. ATM
3. Night Drop
4. Premise

This is a good project, go for it.

There would be various types of sensors:

1. Motion Sensors
2. Door/ Vault Sensors
3. Magnetic Sensors

There would be several options on the keypad. For example :

- turn on,
- reset,
- quit
- turn off
- lesson

The keypad asks the user to enter a choice. In order to set the alarm the user should have an alarm code assigned. Once the user inputs the correct alarm code, the user must turn on the safe alarm first. If the safe doors are open, the alarm could not be set. Moreover, if the user tries to turn on any other alarm before the safe, the keypad display would not allow such a move. If there is any motion in the room or the premise door is open, the alarm will not get turned on.

When the user opens the premise door, the user is allowed one minute to deactivate the alarm using his/her alarm code. The user cannot enter a wrong code more than three times; in such a case, the user is blocked and the only way to deactivate the alarm is to call corporate security. If a burglar tries to tamper with the door or walls, the motion sensors would detect activity and the alarm goes off. Once the alarm goes off, the corporate security is automatically informed. The corporate security calls the branch and then calls the police in case of a burglary.

TIP:

Did you know that at Bank of America, you can get an Interest Maximizer account (interest rate >1.5%) for a minimum of \$2,500.00 instead of a Regular Savings account (interest rate =0.5%)? ☺



Individual Project

Prof. Quinn

The embedded system that I plan to implement in my individual project is that of a car alarm. This car alarm will be triggered upon entry to the vehicle being protected. The keypad on the handle of the driver's door will be the arming and disarming interface. The same code will be used for both actions. The original code is assigned to the user upon purchase but it can then be altered if desired by the user. All of the doors of the protected car need to be closed and locked before the alarm can be set. Once the user enters in the required code to set the alarm the alarm is on protective mode and can only be turned off by that same code from the keypad on the driver's door. If that door or any other door is forced open without the code, the alarm will sound. If windows are broken than the alarm will sound. Once the alarm is sounded it will not silence until the required code is entered into the keypad.

What about the hood or the trunk? This is a pretty simple project. i.e. push button - see light (alarm)
Are there any alarm modes. e.g. one where the windows can be rolled down and still have the alarm set so that when the car is hot wired, the alarm is activated? What about a convertible car?
Please resubmit with ALL of the possible alarm modes/conditions considered.

RESUBMIT

Project Proposal

For my project, I will try to implement a VCR. It will have all the basic features (and I am considering adding advanced and more inventive features if the basic features do not prove to be difficult enough). The VCR will be able to do the following:

Play

This will allow the VCR to play VHS tapes. I will have to figure out a way to handle the different types of tape speeds (EP, LP, SLP, SP).

Fast Forward/Search

This will allow the VCR to speed through the VHS. If it is currently on Play while this button is pushed, then the 'search' feature will be used. If it is on Stop when this button is pushed, then the VCR will use the 'fast forward' feature.

Rewind

This will allow the VCR to make the VHS go in reverse. If it is currently on Play while this button is pushed, then the rewind feature will go backwards at about twice the speed. If it is on Stop when this button is pushed, then it will go backwards at about 4 times the regular speed.

Stop/Eject

This feature will interrupt any action the VCR is in. If nothing is happening when this button is pushed, then it will release (eject) the tape (if it is in the VCR).

Record

This feature will record anything that is connected to the VCR's input terminal.

I am considering and will most likely be adding a "timing system" and a "record programming" option.

This will be acceptable if you add the record mode. in record mode, the FF and REW keys should have no effect.

The display should also indicate the number of minutes elapsed since the tape was started, and if rewind is pushed, this counter should go backwards.

With these modifications, your project is approved.

01/25/02
COEN 120

Individual Project Proposal

I plan to create a personal CD player which includes a radio tuner. It allows the user to program specific songs and radio stations as well as adjust the settings of the player such as volume, sound quality, etc.

All the inputs will be entered digitally using buttons including the volume and the radio tuner.

Inputs/Buttons:

Open – opens the CD player

On/Off – turns the player on and off

Radio/CD – selects current mode: CD or radio

- Vol – lowers the volume by one level each time it is pressed

+ Vol – raises the volume by one level each time it is pressed

xBass – with extra Bass or no Bass

For CD Player:

Play/Pause – plays the selected track when pressed once or (odd # of times
pauses the current track when pressed twice or even # of times)

Stop – stops the current track

Skip - skips the current track

Replay - replays the current track

Program – allows the user to program selected tracks

Clear – clears the programmed tracks list

For Radio Tuner:

FM/AM – selects AM or FM stations

Preset/Manual – allows the user to select preset stations or do a manual search

Set – allows the user to preset stations

Tune Up – decreases the tuner by .1 each time it is pressed

Tune Down – increases the tuner by .1 each time it is pressed

MONO/ST – allows the user to choose between stereo or mono

This is a good project, go for it.



Coen 120
Personal Project Proposal
1/25/02

Alcohol Breathalyzer

Purpose:

Many individuals question their sobriety before they drive a car, drink some more, or even do normal everyday activities. A personal alcohol breathalyzer can easily make life's difficult decisions when it comes to sobriety easier. With a pocket size breathalyzer, the user can carry the device anywhere and everywhere they go. This will monitor their continuous blood alcohol content (BAC) and keep track of how many "shots" the individual has consumed.

Attributes:

- Gender
- Age
- Weight
- Alcohol Consumed
- Time

Operations:

- Calculate Blood Alcohol Content
- Report on nightly drinking
 - Including # of shots v. time

The user will have the ability to input their personal statistics at the beginning of the night, which includes gender, age, and weight. Then as the night evolves, the user punches a button for every shot, beer, or glass of wine they consume. The machine then can continually calculate their blood alcohol content, and the next morning, when the hung over individual wakes up, can run a report on the previous night of drinking.

Are you in need of one of these devices???
Just kidding, this is a good project, go for it.



For my personal project, I propose a scuba companion. A diver needs to be aware of several factors during a dive such as pressure, oxygen level, dive time, and dive depth. Many of these factors are currently monitored with multiple independent gauges. The purpose of a waterproof, hand-held companion will be to integrate the data obtained by these gauges, relate the data to the user in a comprehensive fashion, make appropriate calculations, alert the diver to potential dangers, and assist in both proper descent and ascent.

Nitrogen provides a particular hazard for divers. There are two different effects of nitrogen on the body. The most important and dangerous is known as decompression sickness, or the bends, which can occur when too much nitrogen gets absorbed by the body due to the underwater pressure. To avoid this, a diver must be careful not to dive too deep for too long and must make sure to ascend slowly. The second effect of nitrogen on the body is called nitrogen narcosis. During narcosis, a person's judgment can be affected and it may appear that they are intoxicated.

One of the primary functions of the companion will be to monitor the diver's depth and pressure so that the diver can be warned when they are going too deep, and when they need to start ascending in order to avoid the bends before the oxygen level of their tank gets too low. Currently, a diver needs to consult a chart to determine if a safety stop at 15ft is required for decompression. These charts also provide pressure groups and determine when and how long the diver can safely dive again. With the companion I intend to automate all table calculations.

A display panel will act as the primary interface between the companion and the user. When the companion is activated, the display will initially prompt the user before the dive begins to determine if there have been previous dives, when they were, and what pressure group the diver is currently in. This information will determine the safe depth and duration of the current dive. Additionally, there will be an analog controller that will allow the user to control depth and buttons for the user to provide feedback to the companion. The companion will calculate descent rate to determine if the diver is descending slow enough and will provide a visual warning message when the diver needs to slow down or is going too deep. For added protection, the diver will have the option of automatic descent, but this function will be rarely used. The companion will also monitor time and provide a display of the time elapsed for each dive.

When it is time to ascend, the companion will alert the user through the visual display and ask if the user would like to utilize the automatic ascension feature. Additionally, the companion will monitor rise time and apply a safety stop to prevent decompression sickness if needed. The safety stop will be applied on most dives even though it may not be strictly required, in such cases, the user will have an override option.

When the dive is over, the companion will display the relevant and important information such as pressure group, actual bottom time, dive time, and dive depth.

This is a GREAT project, go for it.

APPROVED

I would like to design an embedded system that could be used in a green house. For many years my grandparents have raised orchids as a pastime, essentially trying to create the perfect climate for the plant, but indoors. Mimicking the best climate for the plants requires various devices such as a light, heater, humidifier, and of course a fan or some sort of device that can draw fresh air into house. Getting these devices to run at the appropriate times is cumbersome. The system would be composed of a box that contained inputs for the various electric devices as well as:

- Photo sensor-to ensure that certain operations occurred only when the plants are in there “sun” phase
- Thermostat-That activates either a heater or fan that would draw cool air in to maintain an optimal temperature.
- Barometer-To activate a humidifier when the climate becomes to dry

In addition, the unit would contain two timers. One that would control the light and a second timer that would control operation of the heater and fan. This is necessary to keep a constant temperature even when the plants are in the no light stage. The humidifier would be connected to the photo sensor to ensure moisture maintained when the light is on.

This is a GREAT project, go for it.



Car Auto Pilot (tentative)

Description:

The main function of the system is to drive the car automatically completely without any human assistance. The main concerns of this system is safety. The driver decides whether he wants to drive manually or using the auto pilot by pressing a button and he can switch back and forth only when the car is fully stopped or at least when there is no danger in switching control on the road. So for example , it detects all the traffic lights , it keeps track of the surrounding vehicles and humans , and it responds quickly to any unexpected hazard that might happen such as a tire blowing up or a kid jumping on the street or if the street is slippery. However , whenever the system is in control , the user will be restricted to all the regulations of safe driving such as the speed limit. The system includes a memory to keep track of the user's best places , access to GPS to get the shortest path , and access to police records to check if there is accidents on specific streets

There will some restrictions even when the system is off so the user can't watch TV or DVD when he is driving manually but he can when the auto pilot is on. Further more , the system estimates how many people in the car and drives accordingly. All of this includes by default full control on the wheels , brakes, engine , fuel tank ...etc. Whenever the system doubts that it may not perform at least 95% , it will shut down and convert to manual or Safe mode.

Assumptions and conditions:

The system interacts with infrared sensors that gather input from the surrounding world and also interacts with satellites using the global positioning system , also with nodes that are already on the streets to guide the decision making and control of the car. The system will not accept to turn on if there is anything wrong with the car so it must check all parts of the car first.

Overview of design:

The system can be Off or On or Safe mode at any time. In the off case there will be only one or two states. In the ON case there would be a lot of states and sequences taking place at the same time. In Safe mode ... the car behaves on extreme caution depending on the situation.

This is a complex project. you should eliminate the things highlighted in yellow.
There will be plenty of difficulty with the remaining things.
How do you plan on simulating the infrared positioning system? The GPS should just return Longitude and latitude. Think about how you will display the current direction and steering of the car.



Project Proposal

Basketball Scoreboard

I would like to model a basketball scoreboard. It displays the score for two teams, which team controls the possession arrow, how many team fouls each team has, whether either team is in the bonus and the last person to commit a foul has his number displayed with the number of personal fouls he has.

Mike, this is not a real time embedded type of system. It is simply a system where someone types in something and the system displays it on a scoreboard.

I am looking for something that deals with asynchronous events occurring in time that affect the response of the system.

TIME is an important factor in the projects.

Please rethink your project and resubmit.

RESUBMIT

Project Proposal

I was thinking of implementing a common device, like a CD player or vending machine, but I thought it would be cool to think of some new product that can be very useful. I was watching my sister take care of my newborn niece the other day, and the idea came to me that it would be nice to have a computerized baby nursery system to maintain a pleasant and soothing environment for a baby.

This system can be mounted on the wall of the baby's room. It will consist of a digital screen to display the features, and a touch-pad to select and adjust the features. There will be three main features:

1. A thermostat that will control the temperature in the nursery. You can set a certain temperature in the room for different times of the day. For example late night to early morning, the room should be warm, and during the day it can be cool. The thermostat can also automatically detect when it is chilly in the room and can adjust the temperature to make it warmer.
2. A feature that will adjust the lighting in the room. Babies usually don't want it completely dark when they are sleeping at night, so you can set a dim light to turn on at a certain time, for example at seven o'clock in the evening. The light will have three intensities to choose from, from brighter to dimmer.
3. Lastly, there will be a music feature that has ten different lullabies programmed in the system. You can program it to play however many songs you want in whichever order, and of course there will be a volume setting.

These features will be set according to the time that the user picks, so there must be a timer that keeps track of when to do what. The settings that the user makes are saved once they are modified. This idea sounds a bit complex, but hopefully it can work.

GREAT project, go for it.



Coen 120
1-25-02

Personal Project Proposal

I want to create a bomb deployment system for jet fighters. The system will manage the holding on the bomb under the fighter. If for some reason the locking mechanism starts to break away without the pilot pressing the trigger then it must engage a bomb kill mechanism to kill the detonator of the bomb. The system will also take the temperature of the locking mechanism to ensure that when the pilot does press the trigger the lock can unlock. Therefore there also must be a heating coil to warm up any ice that forms on the lock and the system must activate this to a certain degree depending on the temperature. The system must also ensure that when the pilot presses the trigger the bomb falls and if it doesn't it must blow a charge to make sure the bomb falls to keep from blowing up the plane. The system must constantly be checking to make sure that there is a bomb attached to its locking arm, that the lock is locked, that the temp is within limits. If any of these fail during normal operation, without interrupt from pilot, then the system must do certain things to make sure that the pilot is safe and the plane doesn't blow up. The pilot can do three things to interrupt the system. He/She can pull the trigger to deploy the bomb, get a systems check on the deployment system, and pull the eject system which will deploy to bombs.

This is a good project. Go for it.



This is a great project, go for it.

The only suggestion is to detect what item the customer is requesting and make sure that there is one in the machine and that the customer has deposited enough money.

You have seen the machines that require you to enter a "B16 or C04" to select what you want.

1/25/02
COEN 120

Personal Project Proposal- Soda Vending Machine

LEDs

There will be a red LED next to every soda brand that indicates whether the soda is available or not.

Money Transaction

There will be a dollar and change acceptor. If there are not enough coins in the machine to return to the customer, there will be a red LED that says exact change is needed. When the customer has not given enough money for their requested beverage, there will be an LED displayed that indicates more money needed.

Since this is also an on campus vending machine, there will be a reader that checks if the access card has enough money on its flex account.

Unless its too much trouble, I would like to have a small screen that can have outputs. For example, I'd rather have the screen say, "Not enough change given. Please deposit \$ (whatever amount of money here)" than just having a simple LED. **the display is fine**

Temperature Control

Since this is a soda machine, the beverages need to be kept at a cool temperature. So the default temperature will be kept at a certain temperature. But once the outside temperature increases, it makes the vending machine decrease its temperature to make sure the sodas keep cool. If the external environment is colder than what is needed inside the machine, the temperature will remain at its default degree.



Coen 120 Personal Project

My proposed project is a digital watch. This digital watch has a few features, it display time, has feature of an alarm clock and has an illuminator. This watch displays time in hour, minutes and seconds, date and day. It also indicates if the state of the alarm clock, on or off. There are three button on the watch which I named them Mode, INCR. and Light. These buttons allow the user to set the time or turn on the illuminator.

Time: The time is displayed in hour, minutes and seconds. For instance, nine o'clock is shown as 11:00:23. The second digits start from 00 to 59. After the 59th seconds, it returns to 00 and the minutes get incremented by 1. The minute also starts from 00 to 59. After the 59th minutes the hour get by 1 and the minutes is reset to 00. The hour goes from 00 to 12; "am" or "pm" will be displayed to distinguish morning from afternoon. After a total of 24 hours, the day and date get incremented by 1. For instance, Monday (MO) gets incremented by one to Tuesday (TU). The days are displayed as SU, MO, TU, WE, TH, FRI and SA for Sunday, Monday, Tuesday, ... and Saturday respectively. The month gets incremented by 1 according to the number of days that it has. Months will be reset to 1 after the 12th month. **Make sure that you implement leap year. Find the formula on the web.**

Set time: To change the time, we have to make use of the three buttons. At the original state (assume that the original state to be that when none of the button is being activated) push Mode twice. This will cause the seconds digits to blink. To reset second to zero push the Light button once. To change the hour, push the Light button again and it will start blinking. Push the INCR button to increment the hour as desired. Push the Light button when done and this will cause the minutes digits to blink. You can change the minutes by pushing the INCR button. By continuing the above process you can set the month (which is not displayed), day and date as well. After all is set, push the Mode button and it returns to the original state.

Set Alarm: In the original state, push the Mode button once. "AL" which indicates alarm is displayed. To set the time, push the Light button once and then push INCR to increment the time. To set the minute, repeat the above steps. When all is set, push the Light button once. To set the desired state of the alarm, push the INCR button until the on or off is displayed. Push the Mode button until you are back in the original state.

Illuminator: Push the Light button in the original state.
This is a good project. go for it.



Proposal: Vendor Machine

Vendor Machine is a machine that distributes products, usually snacks and sodas, in exchange for money.

There will be two levels of interaction between a user and the machine. The level of interaction between the customer and the machine is limited to purchasing which is giving money or credit to the system, making a selection and receiving the chosen product. Money should only be accepted if it's a real American coin and money should only be taken when a valid selection is made and when the product isn't empty. Another option available to the customer is a debit system where the customer can use credit on his or her student identification card to make a purchase. In this style of purchasing, authentication of the card is required and the amount within the account should be known to the degree of no more than the cost of the maximum purchase. After a valid selection is made, the account of how much was total sold prior to the purchase should be updated to include this purchase. If money was debited, a record of purchase should be sent with the average time and the day to the accounting office and an account of the total credit purchase made should be increased by purchase amount. If cash was given, the correct change should be given and if not enough change is available, the service should revoke the transaction and return the money given.

The vendor has the ability to access the storage compartment upon some sort of authentication. Upon authentication, the vendor could restock the machine and obtain accounting information for his reference. The vendor should also be able to reset the accounting information back to the initial value and set the purchasing price for each product. The vendor can also empty the cash box and refill the change box.

The machine should regulate the temperature to a degree where the product would be in its best or suitable condition or where the product wouldn't melt or taste warm. Also to conserve energy, the machine should only operate from 5:00 Am – 10 Pm. All these are the basic constraints the machine has to follow not including the time constraints.

1. Control on and off states
2. Monitor and change temperature
3. Report accounting information
4. Control product distribution and handle its constraints
5. Monitor monetary input from customers, handle crediting
6. Acknowledgement of vendor and switching of states.

this is a good project. go for it. You can ignore the items in yellow.



For my personal project I would like to design a slot machine. It will be a standard three column machine, which will have several values (I need to research more about slot machines to find how many different symbols are appropriate). The values will randomly rotate through and stop at some random point, one after another. If the values match the winning combination, the user is given a corresponding amount of credits.

In order to make this system work my system will need to allow some sort of input, which will give the player credit(s). The system will have to be random, but at the same time some sort of algorithm must be created so that proper winning odds are maintained. My friend has one of these machines at his house, and it has different levels of difficulty to win the jackpot, perhaps mine can have several different modes.

Well, I like the idea of doing something involving odds-making and casinos, but if this is going to be too abstract to demonstrate on a target system, maybe I can simplify or change my idea. I would appreciate your feedback.

This is a GREAT idea. Go for it.



This is a good project. go for it.



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HOME SECURITY SYSTEM

SYNOPSIS:

My project will consist of software for a home security system. There will be several input and output devices that will be needed to be programmed to implement this. The program will be made flexible so that the user can modify the devices that will be set and the ones that won't.

INPUT/OUTPUTS:

Doors: input device for a breach of security

Windows: input device for a breach of security

Motion Sensors: input device for a breach of security

Number Keypad: input device for the user to set the security system and enter the code upon entry of the building

LCD: output device for communication between the system and the user

Sound System: output device that will go off upon system breach

IMPLEMENTATION:

When the system is first turned on, it will be in setup mode. This allows the programmer (aka the security company) to specify all the different input devices to the customer's system (the doors, windows and motion sensors). It will also set up the user's initial password. The program will then leave the setup and go into the normal function mode. The assumption here is that the system will never be turned off, so the customer will never use this mode.

Implementing this home security system will be a fine mixture of input and output devices. The 3 input devices with concern of the system being breached are the doors, windows and motion sensors. When one of these devices is triggered, a message will be displayed on the LCD to disengage the alarm. The person will have 10 seconds to do this. After the 10 seconds the alarm will go off. The door and window devices will be mocked using the keyboard as the standard input. The motion sensors will be mocked using the analogue device on the PIC serial board. A sensor will be triggered only after a certain strength has been received, not when any motion has been detected (it will be sensitive enough to detect threatening motion). The sound system will be mocked by displaying output on the LEDs.

The heart of the program will be the numeric keypad, which will be the interface between the user and the security system. The user will use the keypad to set the system by entering the password. The system will be set only if all 3 of the input devices are not active at that time (i.e. the doors and windows are shut and there is no motion from the sensors). After the system is set, if the system is breached the user will have to provide the correct password through this keypad. If they enter the correct password using the keypad within the allotted 10 seconds, the system will go back to the neutral state. Otherwise, the alarm will sound. The only way the alarm can be turned off is through typing the correct password into the system. The keypad will also be used to allow the user to set up the system, meaning which devices will be set. For instance, if you have a pet you wouldn't want the motion sensors to be set. They can also do other things, such as set a new password.

Throughout this entire process messages will be prompt to the user so they know what to do or what the current status is of the system. All of this is done through the LCD.

Traffic Signal Control

Basically the whole idea of this project is to create an embedded control system for the same traffic signals we see whenever we're out for a drive. First and foremost, these lights will regulate traffic flow with the traditional red, yellow, and green signals. Perhaps, during peak traffic times, such as between 6am-9am and 5pm-7pm, a timer within the system will regulate the signals. For the rest of the time, the signals will rely on a combination of a car detection system in addition to the timer. For example, the busier of the two streets at the intersection will have the green light for a minimum of, say, 15 seconds. After these 15 seconds, if a car wanting to cross the intersection is detected, that car shall be granted the green until there are no more cars detected for that direction, then the green light shall once again revert to the busier street. If a car wants to cross before this 15-second minimum is up, they will wait until the completion of the 15 seconds, then be granted the green light.

Another must for this system is an override setting for emergency vehicles. Pretty much, if an emergency vehicle is in pursuit, all traffic signals in their direction will turn green and allow them to reach their destination without impedance from crossing traffic.

Some other wrinkles to add into the mix are green arrow light that allows drivers to have "protection" while making turns, particularly at busy intersections. Another possibility would be to add a sensor for not only detecting and recording a driver running a red light, but perhaps there can also be a sensor to detect speeders in the intersection.

This is a good project. You can ignore the item in yellow. Go for it. Make sure that you implement the left turn arrows.

