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Traffic Signal Control System

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The idea is to design a traffic signal control system at an intersection that monitors waiting vehicles and pedestrians using sensors and buttons, and accordingly schedules the lights that allow the traffic or pedestrians to cross the intersection.

For added complexity, this could be a busy intersection with different traffic patterns at different times of day (such as peak vs. off-peak) with different scheduling algorithms in each case.

Of course, if that proves to be *\*too\** complex, this could be as simple as a controller for the lights outside an unpopular apartment complex which only change when a car wants to turn into or drive out.



I plan on making a Security System for a Bank – with additional security features for the vault – such as the dual-key unlock system and stuff like that. Also, an emergency override if there is some sort of robbery-alert switch pressed.



## Individual Project Proposal

I'd like to design the embedded system for a treadmill...I haven't decided exactly how sophisticated it's going to be, but here are my ideas for attributes and operations:

Attributes:

- speed
- incline
- time interval

Operations:

- start
- stop
- pause
- resume
- cooldown
- setspeed
- setincline
- setinterval
- setprogram (manual, cardio, fatburn, marathon, etc)

The start operation will prompt the user to enter a program. Stop clears all operations and sets speed to zero. Pause will save the current settings and reduce speed to zero, meanwhile wait for the user to resume. Certain programs will have predefined speeds, inclines, and interval times...the manual program will have default values but will always be waiting user input. At any point, the cooldown operation can override all other operations and start a cooling down mode which moves the treadmill at a reduces speed and low incline for a short period of time, and then stops.



Project:

I plan on creating an embedded system for a Surveillance system.

Functions:

- 1) Turning on camera when motion is detected.
- 2) Distinguishing different types of motion (so a leaf falling wont cause it to turn on)
- 3) What to do when video memory is filled
- 4) What to do if there is inadequate light
- 5) Sensitivity settings



Saturday, April 14, 2001

### Individual Project Proposal

I would like to develop a robot controller. There is a robot, and this software is for controlling the robot. There is a joystick for the person to control which direction it is going. The robot can be in many modes, linear motion (going forward, going backward), turning around, receiving inputs from sensors that take input from its environment, etc. It can also view its surroundings and display this on a screen on the controller.

The robot itself has many components. The controller would send signals to the brain, its central processing unit (its brain, the head), which control all its actions. The brain would then send messages to the corresponding “body parts” to do certain tasks. For example, to pick up something, it would have to bend down and pick up the material. This would require bending of the knee, ankle, and back (to bend down) and bending of its elbow and wrist accordingly. Walking would require bending of the knee and ankle. Furthermore, it can remember a sequence of instructions, and execute without a person actually controlling it.

Although making this a multi-threaded application would greatly enhance the robot’s performance (such as allowing it to run, which need simultaneous functionality of both legs), it would also greatly increase the complexity of implementation, especially for me because I have not have much experience with multi-threaded applications.


Moreover, due to our time constraint, I would not able to learn to program with multi-threaded application while simultaneously try to learn how to utilize Rhasody and other tools, which is the focus of this course. Therefore, this simplification is almost necessary.



Coen 120  
4/12/2001

*Individual Project Proposal*  
***Home Security System with Motion Sensors***

My project will consist of creating a home security system with motion sensors or noise activated sensors, like the one at my house. This type of alarm system will monitor anyone's entrance to the house through motion, rather than detecting if a door has been opened, except for the garage door and the windows, which will not have motion detectors. This security device will have several predefined areas so when a motion sensor detects movement it will report its area location so the user will know where the "thief" has entered. On the other hand, if the movement caught by the sensor is too quick, like that of a mosquito, it will not report an entrance. The user will have one minute to deactivate the alarm before it goes off and when activated the user will have one minute to exit the house and if this condition is not met on time, the alarm will also go off. The user will be able to activate the alarm and disable a specific area, like the second floor where the sleeping rooms are, while having the rest of the house secure. The windows and garage door will have magnetic detectors that will detect if the doors are being closed or opened indifferently, so if the user activates the alarm while inside the house and disables one sleeping room area for example but leaves the window open, the security system will load as usual but if the user then decides to close the window with the alarm on, the magnetic detector will detect this and make the alarm go off. Also, if the house is accessed through the back door, the alarm will automatically go off without giving the user one minute to deactivate it.

These are most of the actions I've thought of, so far, for the motion sensor security system I nd to work on hoping it makes a challenging project to be good enough.

Food Vending Machine Real Time System  
COEN 120 Project Proposal

Im going to do my project on a vending machine like the ones on campus. It will check that the correct change was given or if the customers access card has enough money to buy the selected item. If the right amount of change was given or the access card has enough money it will turn the coil that is identified with the letter and number that the customer entered which will drop the item down and it will release any excess change to the change slot.



COEN 120  
Personal Project Proposal I  
April 12, 2001

## **Personal CD Player**

My project will be a personal CD player consisting of the basic functions or features.

### **Description:**

The Personal CD Player's features include playing a CD, stopping a CD, fastforwarding songs on the CD, rewinding songs on the CD, and programming playlists of songs from the CD.

#### Playing

The Personal CD player will play songs in the order according to the CD or the programmed playlist of songs.

#### Stopping

The Personal CD player will stop playing the CD and resets the memory. The programmed playlist, if there is one programmed, must be re-programmed.

#### Fastforwarding

Fastforwarding a song on the CD is skipping that whole song and the player will play the next song. Therefore, it is not possible to start listening to a song from the middle of a song.

#### Rewinding

Rewinding a song on the CD is repeating that whole song from the beginning. Therefore, like *fastforwarding*, it is not possible to start listening to a song from the middle of the song.

#### Programming

Programming a playlist of songs from the CD is saving a selected list of songs from the CD, and the Personal CD Player will play the playlist (with the option of repeating the playlist) until the player is *stopped*. When the player is *stopped*, the playlist must be re-programmed, if desired to have one, the next time playing the player.



Coen 120  
Project Proposal

For my project, I plan to design a car alarm. The car alarm will be able to detect if the hood, trunk, or door is being opened. The alarm will also have a starter kill does not allow the car to start if the alarm is on. The alarm will be connected to a pager that the owner carries. It pages the owner if the car is being tampered with or being broken into. It will also page the owner if the for some reason, the thief gets to the main system and disconnects it from the batter or disables it. It will have a two-way paging system. The pager will be able to warn the user even if the main system has been killed. This will allow the user know at all times whether his/her car is being stolen.

If the car is broken into and no sirens are going off, the thieves will take more time than usual to steal things because they think no one knows what they are doing. But during this time, you already know that your car has been broken into and can call the authorities or go stop them yourself. One of the main functions of the alarm is to prevent the car from being stolen. When a thief tries to start the car and it does not start, he/she will likely try to disconnect the alarm so that the starter kill will no longer function. If the thief tries this, the pager will go off and hopefully you can get to your car before it is stolen.

Most car alarms out in the market today do nothing to stop a thief from stealing your car. The main purpose is to deter potential thieves. I want a system that will help in actually stopping theft.

Well, I hope this is an adequate proposal.



Project Proposal  
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For my project I will implement software for a digital answering machine - voicemail. It would have different mailboxes, remote access, different settings (like remote access password, number of rings before pickup...),...



COEN 120  
Individual Project Proposal

I was thinking of making a program that monitors signal lights at an intersection. This is pretty self-explanatory. I'm not sure how I would display my program without graphics. If this isn't a valid proposal then I was thinking of doing a stereo system, with a CD and tape player, and radio. There would be a main switch to change from each mode. CD player would have play, next track, previous track, stop, pause, fast-forward, rewind. Tape player would have the same features of the CD without the next track and previous track. The radio station would just be set to the radio station that is set. You can e-mail me back on your suggestions.



## Individual Project Proposal

For my individual project, I would like to work on a wireless cycling computer. Today's cycling computers have enough functions to make this a viable, and worthwhile project. There would be at least two sensors, one for speed and all relevant ride information, as well as one to track pedal cadence. Features would include 24 hour clock, an automatic shutoff controlled by a timer, constant display of the speed (updated at either one half, or one second intervals), average speed, maximum speed, time for current ride, distance for current ride, total distance since installation of the computer, pedal cadence, and also altitude gain for individual rides.



COEN 120  
4/12/01

## Project One Proposal

Telephone with answering machine:

The Telephone's default state is idle. There are a number of events that can trigger an action. One is that if a call is received. In this case there are also a number of events. The call can be picked up by the user or after a certain number of rings picked up by the answering machine. This would trigger the counter to add a message to the display allowing the user to know that a message was received while they were away. The other scenario is where the user answers the telephone before the answering machine picks up. The phone is then in active mode while the user is talking. The system is returned to the default state once the user hangs up the phone. For increased difficulty a call waiting feature could also be implemented, in which if a call was received while the user was on the other line then a \*beep would sound notifying them of the call. An alternative would be a line busy transmitted by the telephone. Additional features could be caller ID, and redial and phone number storage which would be implemented from the on state.

States

Idle: Waiting for call

On: User has picked up the handset, waiting for input.

Active: Talking

Is this too easy or too boring?

Thank you.



## COEN 120 Project Proposal

### Digital automotive instrument display ("digital dash")

Inspired by modern formula race cars, the digital dash allows the driver to see all relevant vehicle information such as engine speed or gear information in a very small footprint. For race cars that take advantage of data acquisition systems, the dash allows monitoring of the information in real time. My project is to simulate a digital dash for use on modern street cars, based and modified slightly on the Honda S2000 dash (<http://www.honda2001.com/models/s2000/images/photos/3-big.jpg>). The system will display most of the regular information available on current cars, with the possibility of interfacing with data acquisition systems in the future.

The number of outputs and sensor readings is limitless; for the sake of simplicity I have reduced the outputs to a reasonable number listed below (or so I hope). Unfortunately, the accuracy of these outputs requires baseline values that I have no information about.

#### Engine speed

Process of continuously taking engine speed value through ignition voltage or from computer (ECU) and representing the value with a sequence of LEDs in increments of 100 to 250 RPMs, from zero on up to the engine redline. ex: 4700 RPM will light 47 bars.

#### Three stage shift light

Sequentially lit, the lights will respond to three preset RPM values, the last one being just before redline. This allows the driver a quick way of determining when to shift without looking at the bar display. ex: stage 1: 5600, stage 2: 6500; stage 3: 7500.

#### Gear number

Based on the gear selected via the car's computer (ECU), or corresponding an electronic switch value based on the shift lever position, a 7 segment LED will display a value corresponding to gear number (1-6), neutral (n), or reverse (r).

#### Vehicle speed

Similar to getting data from engine speed sensor, vehicle speed will take the information and light up three 7 segment LEDs to display speed (0-299).

#### Warning lights: Oil and Water

Temperature sensors placed within the individual streams will report a voltage that when detected will set off their respective warning light.

#### Bar gauges: Water and Gas.

Water temperature and gas gauge values will be read in from sensors and similar to RPM display, will light LED bars in increments respective of the system. Ex: one LED bar per 50 degrees F up to max, or per unit of gas capacity (1/6 tank) up to full.

#### Numeric mileage displays: Odometer and trip meter (w/ reset)

Using a wheel sensor, information about the tire size will be computed with the number of revolutions to calculate number of miles traveled. Unlike the other parts of the dash which are event based and calculate values on the spot, mileage will require memory to store values—something that adds to the complexity to the overall project and might be removed later on.



## Smart Car:

The idea is to have a computer system in a car which will maintain custom features of any given driver.

The system will keep track of what the seating distance from the steering wheel is, the angles of the rear and side view mirrors, the driver's fav. audio preferences etc. There will also be security implemented through this system.

The above are just a few to mention.

When a driver gets into the car the system will request the driver's name and based on its database of drivers it will upload all the features mentioned above and perform the necessary adjustments to suit the current driver.

Access to change settings on the system will be allowed only upon authorized voice activation codes.



# **The Ultimate Saltwater Fish Tank Maintenance Machine (Personal Project Proposal)**

## **Abstract**

Maintaining a saltwater fish tank can be tedious and stressful. Sometimes even limiting the lifestyle of the aquarium owner. Since the underwater animals needs to be fed everyday and the water must undergo intensive tests every week, it is extremely difficult for the owner to take long vacation/business trips.

## **Purpose**

My Ultimate Saltwater Fish Tank Maintenance Machine will solve this problem for the saltwater aquarium owner. It will **fed**, maintain the aquarium and alert the owner when the fish tank needs a water change. My Ultimate Machine will reduce work from 365 times per year to 12 times per year.

## **Scope**

Since it is virtually impossible to recreate nature, we can only maintain the saltwater aquarium to the best of my knowledge. For the purpose of this short-term project, I will only design the controlling aspects of this Ultimate Machine. The details of each individual sensing component will not be implemented.

## **Requirements**

My Ultimate Machine must **fed** the fishes three times per day and one time for the algae eaters. Once per week, the Ultimate Machine must test the following and make adjustments accordingly: pH levels, salt concentration, ammonia level, nitrate level, and water hardness. After one month of water change, machine will flash it's LEDs for owners' attention. At this time, the owner should do a water change and check if all supplies are full. After 5 weeks, the machine will start beeping like an alarm clock.

## **Testing**

For each state, I will give it a value. Then I will go through my use cases and make sure my Ultimate Machine has correct state for every use case.



Coen 120  
Dr. Quinn  
October 5, 2001

### Personal Project Proposal

#### Household Thermostat System:

I plan to make a computerized thermostat system for a house. This thermostat would control the heating and air conditioning for a house, and contain a temperature sensor to detect inside atmospheric conditions. The thermostat would contain the following programmable characteristics:

- 1.) Contain settings for the four seasons: spring, summer, fall, and winter.
- 2.) Each season can be programmed to start the heating and/or air conditioning at certain times during the day.
- 3.) Can set the thermostat to maintain the desired temperature in the house +/- 2 degrees Fahrenheit.
- 4.) A manual mode to accept user input for a temperature to raise or lower the house to.
- 5.) Contain a few algorithms that will enhance the users settings for the four seasons in order to help with energy conservation. For example: schedule longer times to cool or warm the house.

**APPROVED**

**AS IS**

## Personal Project Proposal

I also plan to do a traffic light controller. I had actually planned to do this before I looked at the sample projects, and because of this mine will be a bit different. It might be between a busy road and a not so busy road, or two busy roads depending on the complexity I decide on. I plan to simulate a traffic stop light system that includes the following objects:

- Stop Light (goes green, yellow, and red)
- Timer (reports time)
- Pedestrian button (a human input)
- Car detector (in low traffic serves as a human input)
- Car ran red detector (checks all the time for people running reds)
- Camera (uses timer and detector data to take a perfect picture of car running red)
- Controller (ties the other objects together)



## Coen120 Project Proposal

Ok folks! Here it is. The state of the art, 21<sup>st</sup> century of exercise equipment....NassarTrack11

It is more than any old treadmill and a little less than a miracle. It is better than any trainer and cheaper than any gym.

NassarTrack11 is equipped with **5 equipped programs** that get you into shape the fast and dirty way.

**JailBreak():** A 20 minute heart pumper that starts at 5.0 mph and at 0 incline. Every minute that passes, the speed will increase by .1 mph and after every 5 minutes, the incline will increase by 1.0. The speed and incline can be increased and decreased by the user at any time

**RaceAway():** A 25 minute leg toner that requires stamina and endurance. This program starts at 6.0 mph and increases by 1 mph every 5 minutes. The speed and incline can be increased and decreased by the user at any time

**Manual():** the health of the user is up to the user. Controls speed, incline and time.

### *2 custom made programs for men and women*

**Superman():** A 30 minute fat burner for those overweight beer bellies. Starts at 6.0 mph and increases by .5 mph every 5 minutes. Incline begins at 1.0 incline and increases by 1 every 10 minutes. Speed and incline can only be increased by the user to ensure max fat burn.

**SuperWoman():** a 30 minute full body workout for those healthy-conscious women. Starts at 5.0 mph and increases by 1 mph every 10 minutes. Incline begins at 2.0 and increases by 1 every 10 minutes. Speed and incline can only be increased by the user to ensure full body workout.

### **Normal Operations:**

Start(): asks user to enter the program

Stop(): sets speed and incline to zero

Pause(): sets speed and incline to 0 for 1 minute, saving the current settings, waiting for user to press resume button. After 1 minute, program is stopped

Resume(): resume program during a pause.

Cooldown(): automatic 2 minute cool down at 4 mph after completion of any program. Or user can cool down in the middle of any program if they want

Setspeed(): increases or decreases speed

Setincline(): increases or decreases incline

Settime(): setting the amount of time in the manual program.

/\*\*I am not sure if this is too much or too little... I was also thinking about asking for the users weight and depending on the program he chooses, tell the user how many calories he has burned(This will be a very standard chart). For instance superman(), if the man's weight is between 120 -150(300 cal), 151-180(400 cal), 180-210(500)





## Project Proposal

For my project proposal, I want to do an automated drive-thru system. Rather than the driver talking to a person, he or she will use a touch screen to order. The touch screen will have simple operations such as value meals, individual items, delete the order and start over, and finish or total. I think this is a good idea because it would GREAT to get rid of all the miscommunication that is involved between the driver and the person behind the window.

**This is a good project, make sure that you can handle more than one order at a time, maybe 3-4 ahead.**

My proposal is for a massage chair for the back and feet. It would be operated using the standard armchair control panel, and I'd like to incorporate a good amount of features including:

- Automatic reclining
- Whole body, upper body, or lower body presets
- 3 massage methods: rolling, tapping, and kneading
- 6 (or so) different degrees of speed
- Heat control (on/off)
- Automatic timer to shut off after set amount of time
- Seat cushion vibration
- Footrest massage – which requires speed and method adjustments
- Options to save settings, clear settings, start, stop, pause, resume, turn on, turn off

I hope this proposal is both realistic and worthy of a decent complexity grade. If you have any suggestions or questions please let me know, thanks.

When you get done, I want one of these chairs!

**APPROVED**

**AS IS**

PROJECT PROPOSAL

Last evening I was standing in my Garden and the sprinklers turned on, and then it struck me that this will be a nice project for my Coen 120 personal project. So, for my personal project I would like to propose a sprinkler control system for Home Gardening. The control system should provide the following features to the users.

- . The user should be able to set the timer for the valves to go on and off.
- . The user should be able to start and close the valves manually.
- . The system should be efficient enough to start different valves at different times.
- . The system should allow the user to set the rate of water for the valves.

I dont know whether it's too simple or not. Let me know if I can add something to it.

**APPROVED**

**AS IS**

Professor Quinn  
Coen 120  
October 5, 2001

## **Personal Project Proposal** *Elliptical Machine*

The goal is to design an elliptical machine that is usually found in any common gym. Once the user wants to use the machine, he/she will either have to press Enter to go through a series of steps for a custom work out or press Start to work out manually. If the user presses Enter the machine prompts him/her to enter his/her body weight, workout time and a specific course. The user can manually, during the work out at any time, change the resistance and time.

The display will show the user what parts of their lower body he/she is working out. Other information will be included such as calories, heart rate, time left, time of each interval, what level the elliptical is on, etc.

To make it more complex I can add a sensor onto the steps so when a person places their feet on them or starts to work out, the screen will prompt them to enter information.

**APPROVED**

**AS IS**

COEN 120  
Prof. Quinn  
10.05.01

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Project Proposal  
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The idea i have for my project is a home alarm system. This alarm system will have sensors to detect a burglar.

My home alarm system will have different ways of detecting a burglar.

- 1)Motion Sensors
- 2)Door Sensors
- 3)Window Sensors
- 4)Personal Vault Sensor
- 5)Tampering Sensor(If a professional burglar tampers with the alarm system, e.g. shoots the alarm system box!)

If any of these sensors are disturbed the alarm system will go off.

My home alarm system can be turned on or off. If the user is home that person can turn off the alarm system so the alarm won't go off. If the user leaves the house that person can turn on the alarm system so it will go off if someone tries to break into the house.

My home alarm system can be personalized to each user. Let's say a user has a dog in the house. He can personalize the alarm system so only the door, window, vault, tamper sensors will be turned on(motion sensors will be disabled). Another user may only want to activate the vault sensor because they don't want anyone in the family stealing his personal stuff. Another user may want all the sensors on. All they have to do is enter a code and that personalized setting will be activated. Also, if someone enters the wrong code the alarm will go off.

My home alarm system will also have a feature telling you which sensor went off. If the burglar enters the back door the alarm system will tell you that. If the burglar tampers with the vault the alarm system will tell you that. So you will be able to locate the burglar and shoot his ass!

**Make sure that you incorporate a method of turning the alarm system off. This will require an alarm code and a time delay so that the owner can enter the home and have time to deactivate the alarm.**

