**Manus for the video presentation**

*Der vil kun blive skrevet manus til de scener hvor det er nødvendigt (daargh)*

**Scenes:**

*B-roll  
Intro  
Overview of the assignment  
  
Task Diagram  
Payment - FSM  
Coffee - FSM  
PC Interface - FSM  
Logging - accessing data  
FreeRTOS - Implementation  
Worth mention -*

*Digiswitch  
 Keypad  
 LCD  
 UART*

*DEMO  
  
  
SLUT*

**Intro**

Rasmus: “In this video group 30 would like to present theirs solution to the Coffee Vending Machine assignment. But first we would like to introduce ourselves. My name is Rasmus Gjerlund.”

Philip: “And I’am Philip Brodersen”

Simon: “My name is Simon Dockweiler”

Rasmus: “Before we introduce our solution and talk you through how we chose to solve the problem. I would give an overview of the desired functionality of the Coffee Vending Machine.

**Overview of the assignment**

Rasmus: “First of all, the program has to be implemented in C and it should work with the TIVA board and the EMP board. It has the SW1, SW2, LED’s, Digiswitch, LCD Display, Keypad and so on as seen in the little intro segment.  
  
To visualize better how this bord can simulate a coffee vending machine, lets set it up as a coffee vending machine, like so. Now I will talk about how this particular coffee vending machine should behave.

First of all, an user can chose between 3 different type of coffees, namly: espresso, cappuccino and filter coffee and has the following prices: 15 DKK, 24 DKK and 1DKK per centiliter.  
 So expresso cost 15 DKK for one cup, Cappuccino cost 24 for one cup and filter cost 1DKK per centiliter the user wants.

Moving on to how the vending machine is operated. The user will first pick between the 3 different items. Once the specific coffee type is selected, the next step is to specify whenever the user wants to pay with a credit card or simply with cash.

If cash is selected, now the digital encoder, or the name it is called on the board, digiswitch, is used to show how much money the user is paying. The machine only accepts 5DKK or 10DKK coins. Turning the digiswitch clockwise once add 5DKK to the total and turning it counterclockwise adds 10DKK to the total, until the user stops.

If there is a difference between the prepaid amount and the drink price, the machine gives change in the form of 1DKK coins. This is simulated by flashing the yellow LED for each 1DKK that must be paid back.

If the card payment method is chosen, the user has to enter its 8-digit card number, followed by a 4-digit PIN number. The combination is only accepted if the card number is odd and the pin number then is even or vice-versa.

Now the production of the coffee can start. However first when it detects a cup inside the machine, this is simulated by holding the SW1 button down. First when the system detects a cup presence the production can start by pressing the SW2.

Espresso is made by grinding for 5 seconds and brewing for 15 seconds. The grinding is simulated by flashing the red LED and brewing is indicated by flashing the yellow LED.  
  
Cappuccino is made in the same fashion, however here at the end milk is frothed for 3 seconds. This is showed by the flashing of the green LED.

Last but not least, we have the filter coffee. Here the display shows the amount dispensed, unit price and total price. The coffee vending machine will make filter coffee as long as the start button is being held down, and more coffee can be added on the way, but it will stop if it has been inactive for 5 seconds.

The dispensing of filter coffee will of course also stop once the total price has been reach.

After the production of the coffee the machine will ask the user to take, he or hers coffee, which is simulated by now releasing the SW1 button.

After each transaction the system has to log its data (time of day, product type, price, amount, payment card number or “CASH”. The shop owner will be able to set the prices of each coffee type directly from a PC. And the owner can get a report containing the total sles of coffee sorted by product, the sum of cash purchases, sum of all card purchases and the total operating time for the machine. This logging between the board and the PC is done through a UART communication protocol.

As one can tell there is a lot to take in and beware of. Therefor the first step we took to solve the assignment was to make a task diagram of the whole system followed by finite state machine for each element. So next up is the task diagram”.

**Task Diagram**

Simon

**Payment - FSM**

Philip

**Coffee - FSM**

Rasmus

**PC Interface - FSM**

Simon

**Logging - accessing data**

Rasmus

**FreeRTOS - Implementation**

Simon

**Worth mention -**

*Digiswitch  
 Keypad  
 LCD  
 UART*

Philip

**DEMO**

Rasmus