

Final Project: Alarm System

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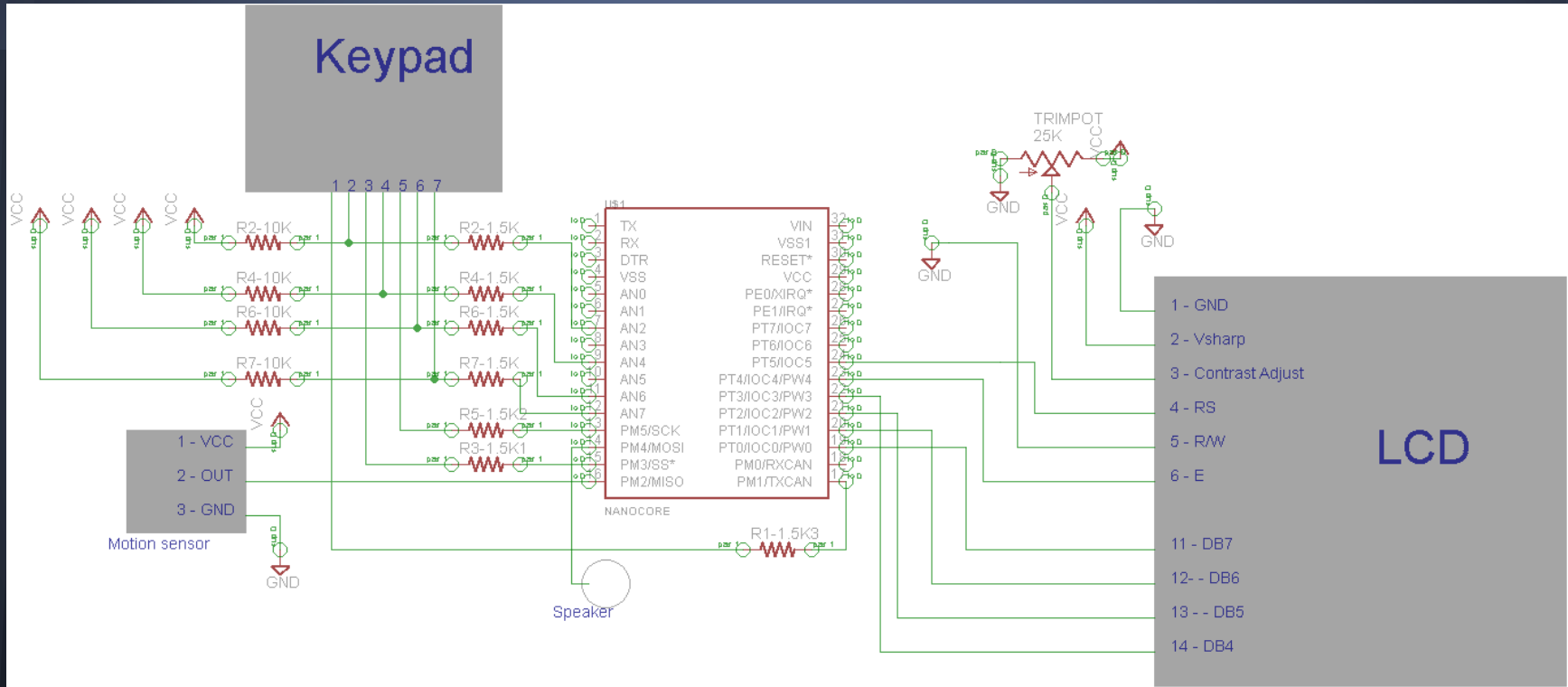
Project

- Arm with password
- 60 seconds to clear area after arm
- Motion or wrong password sets off alarm
- Disarm with password

Hardware

- Speaker
- Keypad
- LCD
- Motion detector

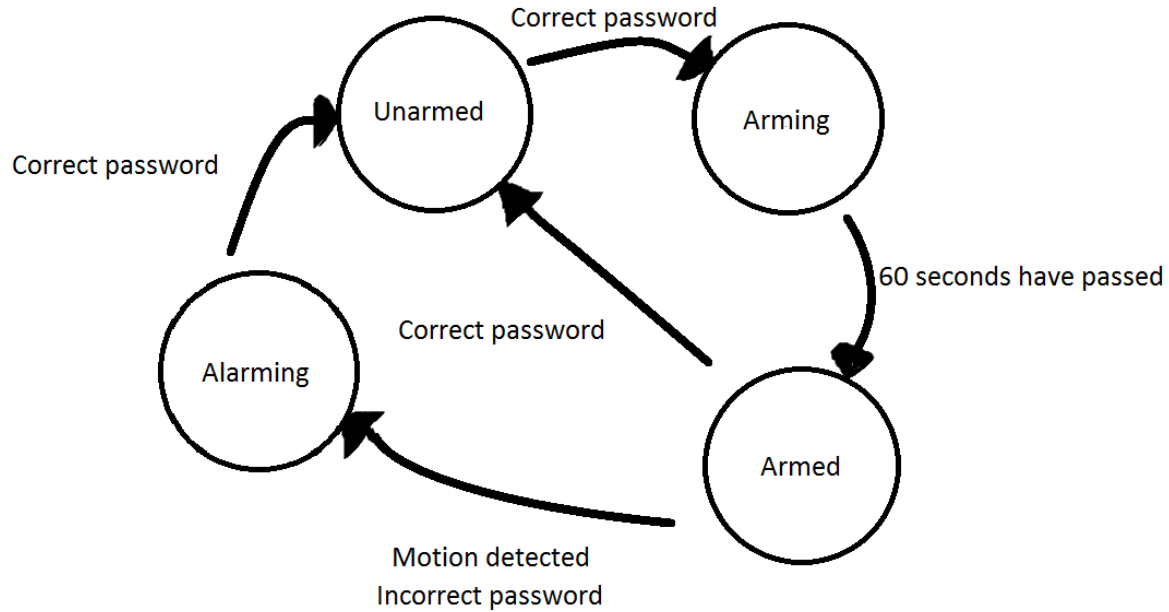
Schematic



Software

- State machine
 - Unarmed
 - Arming
 - Armed
 - Alarmed
- PWM on speaker for output
- Use functions from lecture for Keypad and LCD

State diagram



Pseudocode - Initialization

initializeLCD

initializeSpeaker

initializeKeypad

initializeMotionSensor

loop forever ... (state machine)

Pseudocode - Unarmed State

```
printToLCD("Unarmed")  
while(state is unarmed)  
  if correct password  
    state = arming
```


Pseudocode - Arming State

```
printToLCD("Arming")
```

```
beep .5 second every 2 seconds for 50  
seconds
```

```
beep .5 second every second for 10 seconds
```

```
state = armed
```

Pseudocode - Armed State

```
printToLCD("Armed")
while(state is armed)
  if (motion or incorrect password)
    state = alarmed
  else if (correct password)
    state = unarmed
```

Pseudocode - Alarmed State

```
printToLCD("Intruder Alart")
```

```
sirenSpeaker
```

```
while(state is alarmed)
```

```
  if( correct password)
```

```
    stop speaker
```

```
    state = unarmed
```

Challenges

- Convert A/D pins
 - general purpose pins for keypad
- Senioritis...

Extensions

- Change password
- More motion sensors