

# ECE 376 - Homework #5

Keypads in C, Stepper Motors in C.

Please make the subject "ECE 376 HW#5" if submitting homework electronically to Jacob\_Glower@yahoo.com (or on blackboard)

Design an embedded system which uses the keypad and the stepper motor. Some suggestions are...

## Combination Lock

1) Requirements:

Inputs:

- Keypad,
- Button RB0

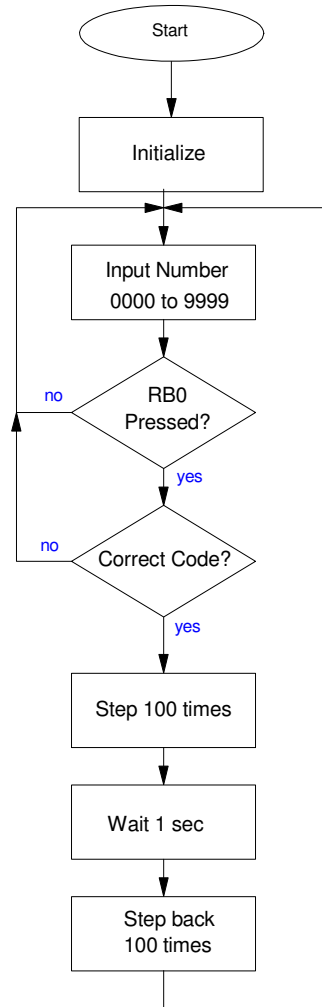
Outputs:

- Stepper Motor

Relationship

- Input a four digit number on the keypad
- Press \*
- If the number is 1234, then
  - Rotate the motor 100 steps at a rate of 20ms/step
  - Pause 1 second
  - Rotate back 100 steps at a rate of 20ms/step
  - Then wait for a new input
- If the number is not 1234, then do nothing.

2) C code, flow chart, and resulting number of lines of assembler



< insert C code >

```

Memory Summary:
  Program space      used 109Ah ( 4250) of 10000h bytes ( 6.5%)
  Data space         used  2Fh (   47) of   F80h bytes ( 1.2%)
  EEPROM space       used  0h (    0) of   400h bytes ( 0.0%)
  ID Location space  used  0h (    0) of     8h nibbles ( 0.0%)
  Configuration bits used  0h (    0) of     7h words ( 0.0%)
  
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3) Validation: Collect data in lab to verify you met the requirements.

In theory, check all possible combinations.

In practice, to a random sample

Verify that the requirements are met

*Input numbers from 0000 to 9999*

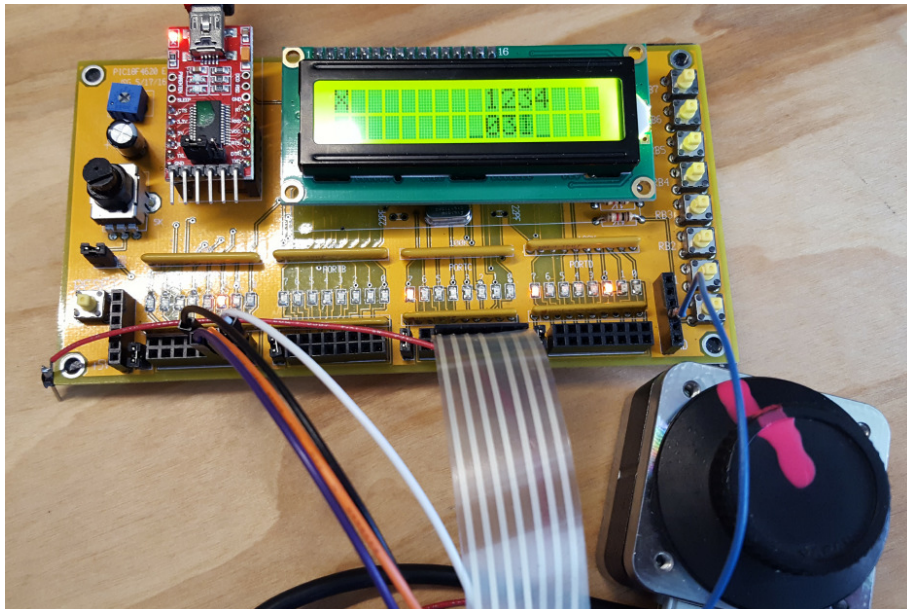
- *1234 accepted*
- *5678 accepted*
- *1932 accepted*
- *9999 accepted*

*Press \*. If the code is incorrect, nothing happens*

- *7341 \* resulted in no action (incorrect code)*
- *8312 \* resulted in no action (incorrect code)*
- *2222 \* resulted in no action (incorrect code)*

If the code is correct, step 100 times, wait 1 second, return

- *1234 is input*
- *Motor steps 100 times*
- *Pauses 1.0 second*
- *Motor returns to original spot*



4) Demo. Video or in person.