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Purpose: This project and code was created in fulfillment of the project requirement of the Makecourse at the University of South Florida (www.makecourse.com)

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```
// Libraries
```

```
#include "StepperMotor.h"
```

```
// Variables
```

```
#define down 9 // define down button to the desired pin
```

```
#define up 10 // define up button to desired pin
```

```
const int pump = 2; // define peristaltic pump to desired pin
```

```
const int reed = 3; // define reed switch to desired pin
```

```
#define STEPPER_PIN_STEP 5 // define motor steps to desired pin
```

```
#define STEPPER_PIN_DIR 6 // define motor direction to desired pin
```

```
StepperMotor stepper(STEPPER_PIN_STEP,STEPPER_PIN_DIR); //object (stepper motor)  
initialization
```

```
void setup() {
```

```
    digitalWrite(up, LOW); // make sure the up button is off
```

```
    digitalWrite(down, LOW); // make sure the down button is off
```

```
    pinMode(up, INPUT); // define up button as an input
```

```
    pinMode(down, INPUT); // define down button as input
```

```
    digitalWrite(up, HIGH); //this attaches an internal pull-up resistor that  
drives the pin HIGH as long as the button is not pressed
```

```
    //the button pulls the pin to ground, i.e. while  
the button is pressed the state of the pin is LOW
```

```
    digitalWrite(down, HIGH); //this attaches an internal pull-up resistor that  
drives the pin HIGH as long as the button is not pressed
```

```
    //the button pulls the pin to ground, i.e. while  
the button is pressed the state of the pin is LOW
```

```
    pinMode (pump, OUTPUT); // define pump as an output
```

```
    pinMode (reed, INPUT_PULLUP); // define reed switch as an input
```

```

    stepper.enable(); // enable the stepper motor, use .disable() to disable the
motor
    stepper.setStepDelay(stepperDelayTime); // set stepper motor speed by changing
the delay value, the higher the delay the slower the motor will turn
}

void loop(){
    if(digitalRead(reed) == HIGH){ // if normally closed (NC) switch is closed then
turn pump low
        digitalWrite(pump, LOW);
    }
    if(digitalRead(reed) == LOW){ // if normally closed (NC) switch is open then
turn pump high
        digitalWrite(light, HIGH);
    }

    if(digitalRead(up) == LOW){ // if the up button has been pressed turn the
motor numberOfSteps in one direction
        int numberOfSteps = 40; // defining numberOfSteps motor is to be turned
while(numberOfSteps>0){
            stepper.step(1, numberOfSteps); // move motor numberOfSteps in one
direction
            numberOfSteps -- ;//counting down the number of steps until 0 has been
reached
            if(digitalRead(reed) == HIGH){ // if normally closed (NC) switch is
closed then turn pump low
                digitalWrite(pump, LOW);
            }
            if(digitalRead(reed) == LOW){ // if normally closed (NC) switch is open
then turn pump high
                digitalWrite(pump, HIGH);
            }
        }
    }

    if(digitalRead(down) == LOW){ // if the d button ownhas been pressed turn the
motor numberOfSteps in the other direction
        int numberOfSteps = 40; // defining numberOfSteps motor is to be turned
while(numberOfSteps>0){
            stepper.step(0, numberOfSteps); // move motor numberOfSteps in the other
direction
            numberOfSteps -- ;//counting down the number of steps

```

```
    if(digitalRead(reed) == HIGH){ // if normally closed (NC) switch is
closed then turn pump low
        digitalWrite(pump, LOW);
    }
    if(digitalRead(reed) == LOW){ // if normally closed (NC) switch is open
then turn pump high
        digitalWrite(pump, HIGH);
    }
}
}
```

```
    if(digitalRead(reed) == HIGH){ // if normally closed (NC) switch is closed then
turn pump low
        digitalWrite(pump, LOW);
    }
    if(digitalRead(reed) == LOW){ // if normally closed (NC) switch is open then
turn pump high
        digitalWrite(pump, HIGH);
    }
}
```