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#include <LiquidCrystal_I2C.h>
#include <Keypad.h>

LiquidCrystal_I2C lcd(0x27, 20, 4);

int inc = 0;

const byte ROWS = 4;
const byte COLS = 4;

char hexaKeys[ROWS][COLS] = {
  {'1', '2', '3', 'A'},
  {'4', '5', '6', 'B'},
  {'7', '8', '9', 'C'},
  {'*', '0', '#', 'D'}
};

// Change these if necessary
byte rowPins[ROWS] = {9, 8, 7, 6};
byte colPins[COLS] = {5, 4, 3, 2};

Keypad inputPad = Keypad(makeKeymap(hexaKeys), rowPins, colPins, ROWS,
COLS);

char inputKey;

struct scheduleItem {
  bool days [7]; // Y/N dispense on which day for Mon-Sun. For daily, all
should be set to true.
  int medicine; // Decide on which medicines correspond to which later
  int minute; // placeholder
  int hour;
  bool dispensed [7]; // Has the pill been (attempted to) dispense?
Corresponds to all days. For days where there is no dispensation, should
be set to true.
};

void setup() {
  lcd.begin();
  lcd.backlight();
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("Setting up");

  scheduleItem savedSchedule [30];
  Serial.begin(9600);
  delay(500);
}

void loop() {
  // put your main code here, to run repeatedly:
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("In main loop");
}

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    inputKey = inputPad.getKey();
    if(inputKey == 'D') {
        createNewTime();
    }
}

void createNewTime() {
    scheduleItem itemToAdd;

    setDays:

    inputKey = "";
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Please wait...");
    delay(500);

    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("Dispense Monday?");
    lcd.setCursor(4, 2);
    lcd.print("*=No #=Yes");
    while (inputKey != '*' && inputKey != '#') {
        inputKey = inputPad.getKey();
    }
    if (inputKey == '*') {
        itemToAdd.days[0] = false;
    }

    else if (inputKey == '#') {
        itemToAdd.days[0] = true;
    }

    inputKey = "";
    lcd.clear();
    lcd.print("Please wait...");
    delay(500);
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("Dispense Tuesday?");
    lcd.setCursor(4, 2);
    lcd.print("*=No #=Yes");
    while (inputKey != '*' && inputKey != '#') {
        inputKey = inputPad.getKey();
    }
    if (inputKey == '*') {
        itemToAdd.days[1] = false;
    }

    else if (inputKey == '#') {
        itemToAdd.days[1] = true;
    }
    inputKey = "";

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lcd.clear();
lcd.print("Please wait...");
delay(500);
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Dispense Wednesday?");
lcd.setCursor(4, 2);
lcd.print("*=No #=Yes");
while (inputKey != '*' && inputKey != '#') {
  inputKey = inputPad.getKey();
}
if (inputKey == '*') {
  itemToAdd.days[2] = false;
}

else if (inputKey == '#') {
  itemToAdd.days[2] = true;
}
inputKey = "";
lcd.clear();
lcd.print("Please wait...");
delay(500);
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Dispense Thursday?");
lcd.setCursor(4, 2);
lcd.print("*=No #=Yes");
while (inputKey != '*' && inputKey != '#') {
  inputKey = inputPad.getKey();
}
if (inputKey == '*') {
  itemToAdd.days[3] = false;
}

else if (inputKey == '#') {
  itemToAdd.days[3] = true;
}

inputKey = "";
lcd.clear();
lcd.print("Please wait...");
delay(500);
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Dispense Friday?");
lcd.setCursor(4, 2);
lcd.print("*=No #=Yes");
while (inputKey != '*' && inputKey != '#') {
  inputKey = inputPad.getKey();
}
if (inputKey == '*') {
  itemToAdd.days[4] = false;
}

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else if (inputKey == '#') {
    itemToAdd.days[4] = true;
}

inputKey = "";
lcd.clear();
lcd.print("Please wait...");
delay(500);
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Dispense Saturday?");
lcd.setCursor(4, 2);
lcd.print("*=No #=Yes");
while (inputKey != '*' && inputKey != '#') {
    inputKey = inputPad.getKey();
}
if (inputKey == '*') {
    itemToAdd.days[5] = false;
}

else if (inputKey == '#') {
    itemToAdd.days[5] = true;
}

inputKey = "";
lcd.clear();
lcd.print("Please wait...");
delay(500);
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Dispense Sunday?");
lcd.setCursor(4, 2);
lcd.print("*=No #=Yes");
while (inputKey != '*' && inputKey != '#') {
    inputKey = inputPad.getKey();
}
if (inputKey == '*') {
    itemToAdd.days[6] = false;
}

else if (inputKey == '#') {
    itemToAdd.days[6] = true;
}

inputKey = "";
lcd.clear();
lcd.print("Please wait...");
delay(500);
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Days chosen");
lcd.setCursor(0, 1);
lcd.print("MTWTFSS");

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for(int i = 0; i < 7; ++i) {
    lcd.setCursor(i, 2);
    if (itemToAdd.days[i] == true) {
        lcd.print("X");
    }
    else {
    }
}

lcd.setCursor(0, 3);
lcd.print("*=Restart #=Confirm");

while (inputKey != '*' && inputKey != '#') {
    inputKey = inputPad.getKey();
}
if (inputKey == '*') {
    goto setDays;
}

else if (inputKey == '#') {

}

//INPUT TIME

setTime:

//Hour
bool validTime = false;
while(!validTime){
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("Input hour (00-23): ");
    inputKey = "";
    while (!isdigit(inputKey)) {
        inputKey = inputPad.getKey();
    }
    String t1 = String(inputKey);
    inputKey = "";
    while (!isdigit(inputKey)) {
        inputKey = inputPad.getKey();
    }
    String t2 = String(inputKey);
    String t = t1+t2;
    int hour = t.toInt();
    if(hour<24){
        lcd.print(hour);
        itemToAdd.hour = hour;
        validTime = true;
    }else{
        lcd.print("Invalid. Try again...");
        delay(1000);
    }
}

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    }
}
delay(2000);
//Minute
validTime = false;
while(!validTime){
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("Input mins (00-59): ");
    inputKey = "";
    while (!isdigit(inputKey)) {
        inputKey = inputPad.getKey();
    }
    String t1 = String(inputKey);
    inputKey = "";
    while (!isdigit(inputKey)) {
        inputKey = inputPad.getKey();
    }
    String t2 = String(inputKey);
    String t = t1 + t2;

    int minute = t.toInt();
    if(minute<60){
        lcd.print(minute);
        itemToAdd.minute = minute;
        validTime = true;
    }else{
        lcd.print("Invalid. Try again...");
        delay(1000);
    }
}
delay(2000);
lcd.setCursor(0, 3);
lcd.print("*=Restart #=Confirm");
while (inputKey != '*' && inputKey != '#') {
    inputKey = inputPad.getKey();
}
if (inputKey == '*') {
    goto setTime;
}

return;
}

```