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***CLASS ID:*** *104486*

***COURSE:*** *COMPUTER ARCHITECTURE* ***(LAB)***

***TASK #:*** *10*

***SUBMITTED TO:*** *SIR ABUZAR ZAFAR*

***CODE:***

*#include <LiquidCrystal.h>*

*#include <Keypad.h>*

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

*char keys[ROWS][COLS] = {*

*{'1','2','3','A'},*

*{'4','5','6','B'},*

*{'7','8','9','C'},*

*{'\*','0','#','D'}*

*};*

*byte rowPins[ROWS] = { 0, 1, 2, 3 };*

*byte colPins[COLS] = { 4, 5, 6, 7 };*

*Keypad kpd = Keypad( makeKeymap(keys), rowPins, colPins, ROWS, COLS );*

*const int rs = 8, en = 9, d4 = 10, d5 = 11, d6 = 12, d7 = 13;*

*LiquidCrystal lcd(rs, en, d4, d5, d6, d7);*

*long Num1,Num2,Number;*

*char key,action;*

*boolean result = false;*

*void setup() {*

*lcd.begin(16, 2);*

*lcd.print("CALCULATOR");*

*delay(2000);*

*lcd.clear();*

*}*

*void loop() {*

*key = kpd.getKey();*

*if (key!=NO\_KEY)*

*DetectButtons();*

*if (result==true)*

*CalculateResult();*

*DisplayResult();*

*}*

*void DetectButtons()*

*{*

*lcd.clear();*

*if (key=='\*')*

*{Serial.println ("Button Cancel"); Number=Num1=Num2=0; result=false;}*

*if (key == '1')*

*{Serial.println ("Button 1");*

*if (Number==0)*

*Number=1;*

*else*

*Number = (Number\*10) + 1;*

*}*

*if (key == '4')*

*{Serial.println ("Button 4");*

*if (Number==0)*

*Number=4;*

*else*

*Number = (Number\*10) + 4;*

*}*

*if (key == '7')*

*{Serial.println ("Button 7");*

*if (Number==0)*

*Number=7;*

*else*

*Number = (Number\*10) + 7;*

*}*

*if (key == '0')*

*{Serial.println ("Button 0");*

*if (Number==0)*

*Number=0;*

*else*

*Number = (Number\*10) + 0;*

*}*

*if (key == '2')*

*{Serial.println ("Button 2");*

*if (Number==0)*

*Number=2;*

*else*

*Number = (Number\*10) + 2;*

*}*

*if (key == '5')*

*{Serial.println ("Button 5");*

*if (Number==0)*

*Number=5;*

*else*

*Number = (Number\*10) + 5;*

*}*

*if (key == '8')*

*{Serial.println ("Button 8");*

*if (Number==0)*

*Number=8;*

*else*

*Number = (Number\*10) + 8;*

*}*

*if (key == '#')*

*{Serial.println ("Button Equal");*

*Num2=Number;*

*result = true;*

*}*

*if (key == '3')*

*{Serial.println ("Button 3");*

*if (Number==0)*

*Number=3;*

*else*

*Number = (Number\*10) + 3;*

*}*

*if (key == '6')*

*{Serial.println ("Button 6");*

*if (Number==0)*

*Number=6;*

*else*

*Number = (Number\*10) + 6;*

*}*

*if (key == '9')*

*{Serial.println ("Button 9");*

*if (Number==0)*

*Number=9;*

*else*

*Number = (Number\*10) + 9;*

*}*

*if (key == 'A' || key == 'B' || key == 'C' || key == 'D')*

*{*

*Num1 = Number;*

*Number =0;*

*if (key == 'A')*

*{Serial.println ("Addition"); action = '+';}*

*if (key == 'B')*

*{Serial.println ("Subtraction"); action = '-'; }*

*if (key == 'C')*

*{Serial.println ("Multiplication"); action = '\*';}*

*if (key == 'D')*

*{Serial.println ("Devesion"); action = '/';}*

*delay(100);*

*}*

*}*

*void CalculateResult()*

*{*

*if (action=='+')*

*Number = Num1+Num2;*

*if (action=='-')*

*Number = Num1-Num2;*

*if (action=='\*')*

*Number = Num1\*Num2;*

*if (action=='/')*

*Number = Num1/Num2;*

*}*

*void DisplayResult()*

*{*

*lcd.setCursor(0, 0);*

*lcd.print(Num1); lcd.print(action); lcd.print(Num2);*

*if (result==true)*

*{lcd.print(" ="); lcd.print(Number);}*

*lcd.setCursor(0, 1);*

*lcd.print(Number);*

*}*

***ANSWER # 1:***

* *Arduino Programming Language is derived from C++.*

***ANSWER # 2:***

* *pinMode*
* *digitalWrite*
* *digitalRead*

***ANSWER # 3:***

* *Simple Calculator.*
* *Keyless Door Lock.*