

LAMPIRAN 1

SKETCH ALA UJI BANDUL MATEMATIS DAN FISIS BERBASIS MIKROKONTROLER ARDUINO UNO R3

```
#include<LiquidCrystal_I2C.h>      LiquidCrystal_I2C
lcd(0x27, 16, 2); int pinReset = 9; int ldr_pin = 8; int
counter = 0; int hitObject = false;
void setup() { Serial.begin(9600);   Serial.println
("CLEARDATA"); Serial.println("LABEL, Waktu
Komputer, Millidetik, Ayunan"); pinMode(ldr_pin,
INPUT);      pinMode(pinReset,      INPUT);
digitalWrite(pinReset, HIGH); lcd.begin(); lcd.clear();
lcd.setCursor(0, 0); lcd.print("ALAT UKUR");
lcd.setCursor(0, 1); lcd.print("PERIODE AYUNAN");
delay(1000); lcd.clear(); lcd.setCursor(0, 0);
lcd.print("READY"); delay(1000); }
void loop() { int val = digitalRead(ldr_pin); if((val==0)
&& (hitObject==true)){ counter++; hitObject=false;
Serial.print("DATA,          TIME,TIMER,");
Serial.println(counter); } else if((val==1) &&
(hitObject==false)){ hitObject=true; } if
(digitalRead(pinReset) == LOW) { counter = 0;
lcd.clear(); lcd.setCursor(0, 0); lcd.print("RESET . . .");
delay(1000); } lcd.clear(); lcd.setCursor(0, 0);
lcd.print("\n1"); lcd.setCursor(2, 0); lcd.print("=");
lcd.setCursor(3, 0); lcd.print(counter); delay(15); }
```

LAMPIRAN 2

 **PERPUSTAKAAN
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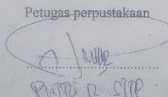
ASLI

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telah diserahkan dan memenuhi kriteria batas maksimal yang sudah ditentukan.

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LAMPIRAN 3



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021/PB-UMS/EL/1/2020

This letter is to certify that the abstract of the thesis below

Title : Mathematical and Physical Pendulum Test Design Based on Micro-Controller Arduino Uno R3


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has been endorsed by Pusat Bahasa *UMSurabaya* for further approval by the examining committee of the faculty.

Surabaya, 23 January 2020
Chair



Wabde Hamsia, M.Pd