

## LAMPIRAN

### 1. Pengukuran Rata-rata

$$\text{Rata - Rata } (\bar{X}) = \frac{\sum Xi}{n}$$

- a. Waktu 5 menit

$$\frac{100.0725}{20} = 5.0036$$

- b. Waktu 15 menit

$$\frac{300.0808}{20} = 15.0030$$

- c. Waktu 30 menit

$$\frac{600.0967}{20} = 30.0048$$

### 2. Selisih Error

$$\text{Simpangan} = X - X_n$$

- a. Waktu 5 menit

$$5.0036 - 5 = 0.0036$$

- b. Waktu 15 menit

$$15.0040 - 15 = 0.0040$$

- c. Waktu 30 menit

$$30.0048 - 30 = 0.0048$$

### 3. Persentase Error

$$\% \text{Error} = \frac{X_n - X}{X_n} \times 100\%$$

- a. Waktu 5 menit



1	5	4	4	4	5	3	4	29	841
2	4	4	4	4	5	2	4	27	729
3	4	4	3	5	5	2	4	27	729
Jumlah (x)	13	12	11	13	15	7	12	83	2299
Jumlah <sup>2</sup> (x <sup>2</sup> )	57	48	41	57	75	17	48		

**a. Menghitung Total Varian Butir  $\sum \sigma_b^2$**

Berikut rumus  $\sigma_b^2$  dan  $\sigma_t^2$ :

$$\sigma_b^2 / \sigma_t^2 = \frac{x^2 - \frac{(x)^2}{n}}{n}$$

Keterangan:

$\sigma_t^2$  atau  $\sigma_b^2$ : Total varian butir

X : Jumlah dari butir pertanyaa

X<sup>2</sup>: Jumlah dari setiap butir pertanyaan di kuadratkan

N : Jumlah responden

$$1) \sigma_b^2 = \frac{57 - \frac{13^2}{3}}{3} = 0,23$$

$$2) \sigma_b^2 = \frac{48 - \frac{12^2}{3}}{3} = 0$$

$$3) \sigma_b^2 = \frac{41 - \frac{11^2}{3}}{3} = 0,23$$

$$4) \sigma_b^2 = \frac{57 - \frac{13^2}{3}}{3} = 0,23$$

$$5) \sigma_b^2 = \frac{75 - \frac{15^2}{3}}{3} = 0$$

$$6) \sigma_b^2 = \frac{17 - \frac{7^2}{3}}{3} = 0,23$$

$$7) \sigma_b^2 = \frac{48 - \frac{12^2}{3}}{3} = 0$$

$$8) \sum \sigma_b^2 = 0,23 + 0 + 0,23 + 0,23 + 0 + 0,23 + 0 = 0,92$$

**b. Menghitung Total Varians  $\sigma_t^2$**

$$\sigma_t^2 = \frac{2299 - \frac{83^2}{3}}{3} = 0.8$$

**c. Menghitung Koefisien Cronbach Alpha**

$$r = \left[ \frac{k}{k-1} \right] \left[ 1 - \frac{\sum \sigma_b^2}{\sigma_t^2} \right]$$

$$r = \left[ \frac{7}{7-1} \right] \left[ 1 - \frac{0.92}{0.8} \right] = \mathbf{0,69}$$

## 6. Program Arduino

```

//Bismillahirrohmaanirrohi
im
#include <Wire.h>
#include
<LiquidCrystal_I2C.h>

LiquidCrystal_I2C lcd(0x27,
16, 2);
int pembagi =0;
int
variabelPengaturWaktuPakaiT
ombol =0;

const int buttonStartPin =
2;
const int buttonKurangPin =
A1;
const int buttonTambahPin =
A2;

const int buzzer = 3;
const int laser_001 = 4;
const int laser_002 = 5;
const int laser_003 = 6;
const int laser_004 = 7;
const int laser_005 = 8;

int buttonStartState = 0;
int buttonKurangState = 0;
int buttonTambahState = 0;

void setup()
{
    Serial.begin(115200);
    pinMode(laser_001,
OUTPUT);
    pinMode(laser_002,
OUTPUT);
    pinMode(laser_003,
OUTPUT);
    pinMode(laser_004,
OUTPUT);
    pinMode(laser_005,
OUTPUT);
    pinMode(buzzer, OUTPUT);
    pinMode(buttonStartPin,
INPUT);
    lcd.init();
    lcd.backlight();
    lcd.clear();
    lcd.setCursor(0,0);

    lcd.print("Assalaamualaikum
");
    delay(2000);
    lcd.setCursor(0,0);
    lcd.print("          Laser
");
    lcd.setCursor(0,1);
    lcd.print("          Terapi
");
    delay(2000);
    lcd.setCursor(0,0);

```

```

    lcd.print("Endang
Wulandari");
    lcd.setCursor(0,1);
    lcd.print("    20163010014
");
    delay(2000);
}

void KaBoom()
{
    Serial.println("The world
has ended");
    while(1)
    {
        digitalWrite(buzer,
HIGH);
        delay(5000);
        digitalWrite(laser_001,
LOW);
        digitalWrite(laser_002,
LOW);
        digitalWrite(laser_003,
LOW);
        digitalWrite(laser_004,
LOW);
        digitalWrite(laser_005,
LOW);
        digitalWrite(buzer,
LOW);
        lcd.setCursor(0,0);
        lcd.print("Proses
Selesai");
        lcd.setCursor(0,1);

        lcd.print("Tekan
Reset");
        delay(1000000);
    }

void loop()
{
    buttonStartState      =
digitalRead(buttonStartPin)
;
    buttonKurangState     =
digitalRead(buttonKurangPin
);
    buttonTambahState     =
digitalRead(buttonTambahPin
);

    if (buttonKurangState ==
HIGH)
    {
        variabelPengaturWaktuPakaiT
ombol=
variabelPengaturWaktuPakaiT
ombol - 5;

        if
        (variabelPengaturWaktuPakai
Tombol<0)
        {
            variabelPengaturWaktuPakaiT
ombol=60;
        }
    }
}

```

```

    }

    if (buttonTambahState ==
HIGH)
    {
variabelPengaturWaktuPakaiT
ombol=
variabelPengaturWaktuPakaiT
ombol + 5;

        if
(variabelPengaturWaktuPakai
Tombol>60)
        {
variabelPengaturWaktuPakaiT
ombol=0;
        }
    }

    int a=0;
    int b=1000;
    int      min      =
variabelPengaturWaktuPakaiT
ombol;
    int sec = a;
    unsigned long oneSecond =
1000UL;
    unsigned long startTime;
    int jam;
    sec = sec + 60 * min;

    int displayMin = sec/60;

        jam = displayMin / 60;
        lcd.setCursor(0,1);

        lcd.print(variabelPengaturW
aktuPakaiTombol);
        lcd.print(" min ");
        lcd.print(sec % 60);
        lcd.print(" detik");
        lcd.setCursor(0,0);
        lcd.print(" tekan start
");
        delay(10);

        if (buttonStartState ==
LOW)
        {
        }

        if (buttonStartState ==
HIGH)
        {
            lcd.clear();
            while(1)
            {
                if (millis() -
startTime >= oneSecond)
                {
                    digitalWrite(laser_001,
HIGH);

                    digitalWrite(laser_002,
HIGH);
                }
            }
        }
    }

```

