

## LAMPIRAN A

### Contoh perhitungan data praktikum Boyle dengan alat nyata

Dengan menggunakan data percobaan 1 sebagai contoh perhitungan diperoleh nilai  $K = P y$

$$\begin{aligned} &= (10^5 + 13600 \cdot 9.8 \cdot h) \cdot y \\ &= (10^5 + 13600 \cdot 9.8 \cdot -0.03) \cdot 0.1 \\ &= (10^5 - 3998.4) \cdot 0.1 \\ &= 9600.16 \text{ Pa m} \end{aligned}$$

Nilai  $K$  diturunkan pada setiap variabel yang mempengaruhi perubahan nilai  $K$ , yakni terhadap  $y$  dan  $h$ :

$$\text{Terhadap } h: \frac{\partial K}{\partial h} = \rho \cdot g \cdot y = 13600 \cdot 9.8 \cdot 0.1$$

$$\text{Sehingga diperoleh nilai penurunan sebesar } \frac{\partial K}{\partial h} = 13328$$

$$\text{Terhadap } y: \frac{\partial K}{\partial y} = 10^5 + \rho \cdot g \cdot h = 10^5 + 13600 \cdot 9.8 \cdot -0.03$$

$$\text{Dan diperoleh nilai penurunan sebesar: } \frac{\partial K}{\partial y} = 96001.6$$

Kemudian ditentukan nilai  $\Delta K$  dengan persamaan

$$\begin{aligned} \Delta K &= \frac{\partial K}{\partial h} \Delta h + \frac{\partial K}{\partial y} \Delta y \\ &= 13328 \cdot 0.0005 + 96001.6 \cdot 0.0005 \end{aligned}$$

$$\Delta K = 54.6648$$

Dari perhitungan tersebut diperoleh Kesalahan relatif

$$KR = \frac{\Delta K}{K} \cdot 100\% = \frac{54.6648}{9600.16} \cdot 100\% = 0.5694\%$$

Dengan keseksamaan :

$$keseksamaan = 100\% - KR = 99.4306\%$$

Angka Berarti :

$$AB = 1 - \log \frac{\Delta K}{K} = 1 - \log \frac{54.6648}{9600.16} \approx 3$$

Harga Sebenarnya :

$$\text{Harga Sebenarnya} = (9,60 \pm 0,05) \times 10^3$$

## LAMPIRAN B

### Contoh perhitungan data praktikum Boyle dengan PSE

Dengan menggunakan data percobaan 1 sebagai contoh perhitungan diperoleh nilai  $K = P \cdot y$

$$\begin{aligned} &= (10^5 + 13600 \cdot 9.8 \cdot h) \cdot y \\ &= (10^5 + 13600 \cdot 9.8 \cdot 0.04869) \cdot 0.0944 \\ &= 10051.34 \text{ Pa m} \end{aligned}$$

Nilai  $K$  diturunkan pada setiap variabel yang mempengaruhi perubahan nilai  $K$ , yakni terhadap  $y$  dan  $h$ :

$$\text{Terhadap } h: \frac{\partial K}{\partial h} = \rho \cdot g \cdot y = 13600 \cdot 9.8 \cdot 0.0944$$

Sehingga diperoleh nilai penurunan sebesar  $\frac{\partial K}{\partial h} = 12581.63$

$$\text{Terhadap } y: \frac{\partial K}{\partial y} = 10^5 + \rho \cdot g \cdot h = 10^5 + 13600 \cdot 9.8 \cdot 0.04869$$

Dan diperoleh nilai penurunan sebesar:  $\frac{\partial K}{\partial y} = 106476.0752$

Kemudian ditentukan nilai  $\Delta K$  dengan persamaan

$$\begin{aligned} \Delta K &= \frac{\partial K}{\partial h} \Delta h + \frac{\partial K}{\partial y} \Delta y \\ &= 12581.63 \cdot 0.0005 + 106476.0752 \cdot 0.0005 \\ \Delta K &= 59.52885 \end{aligned}$$

Dari perhitungan tersebut diperoleh Kesalahan relatif

$$KR = \frac{\Delta K}{K} \cdot 100\% = \frac{59.52885}{10051.34} \cdot 100\% = 0.5922\%$$

Dengan keseksamaan :

$$keseksamaan = 100\% - KR = 99.4078\%$$

Angka Berarti :

$$AB = 1 - \log \frac{\Delta K}{K} = 1 - \log \frac{59.52885}{10051.34} \approx 3$$

Harga Sebenarnya :

$$\text{Harga Sebenarnya} = (1,01 \pm 0,01) \times 10^4$$

## LAMPIRAN C

### Contoh perhitungan data praktikum Gay Lussac dengan alat nyata

Dengan menggunakan data percobaan 1 sebagai contoh perhitungan

$$\text{diperoleh nilai } K = \frac{V_1}{T_1}$$

$$= \frac{y}{t + 273}$$

$$= \frac{0.103}{40 + 273}$$

$$= \frac{0.103}{313}$$

$$= 0.000329073 \text{ m}^0\text{K}$$

Nilai K diturunkan pada setiap variabel yang mempengaruhi perubahan nilai K, yakni terhadap y dan t:

$$\text{Terhadap } y : \quad \frac{\partial K}{\partial y} = \frac{1}{t + 273} = \frac{1}{40 + 273} = \frac{1}{313}$$

$$\text{Sehingga diperoleh nilai penurunan sebesar } \frac{\partial K}{\partial y} = 0.003195$$

$$\text{Terhadap } t : \quad \frac{\partial K}{\partial t} = - \frac{y}{(t + 273)^2} = - \frac{0.103}{(40 + 273)^2}$$

$$\text{Dan diperoleh nilai penurunan sebesar : } \frac{\partial K}{\partial t} = 1.05135 \times 10^{-6}$$

Kemudian ditentukan nilai  $\Delta K$  dengan persamaan

$$\begin{aligned}\Delta K &= \frac{\partial K}{\partial y} \Delta y + \frac{\partial K}{\partial t} \Delta t \\ &= 0.003195 \cdot 0.0005 + 1.05135 \cdot 10^{-6} \cdot 0.5 \\ \Delta K &= 2.12312 \times 10^{-6}\end{aligned}$$

Dari perhitungan tersebut diperoleh Kesalahan relatif

$$KR = \frac{\Delta K}{K} \cdot 100\% = \frac{2.12312 \times 10^{-6}}{0.000329073} \cdot 100\% = 0.6452\%$$

Dengan keseksamaan :

$$keseksamaan = 100\% - KR = 99.3548\%$$

Angka Berarti :

$$AB = 1 - \log \frac{\Delta K}{K} = 1 - \log \frac{2,12312 \times 10^{-6}}{0,000329073} \approx 3$$

Harga Sebenarnya :

$$\text{Harga Sebenarnya} = (3,29 \pm 0,02) \times 10^{-4}$$

## LAMPIRAN D

### Contoh perhitungan data praktikum Gay Lussac dengan PSE

Dengan menggunakan data percobaan 1 sebagai contoh perhitungan

$$\text{diperoleh nilai } K = \frac{V_1}{T_1}$$

$$= \frac{y}{t + 273}$$

$$= \frac{0.103}{40 + 273}$$

$$= \frac{0.103}{313}$$

$$= 0.000329073 \text{ m}^0\text{K}$$

Nilai K diturunkan pada setiap variabel yang mempengaruhi perubahan nilai K, yakni terhadap y dan t:

$$\text{Terhadap } y : \frac{\partial K}{\partial y} = \frac{1}{t + 273} = \frac{1}{40 + 273} = \frac{1}{313}$$

$$\text{Sehingga diperoleh nilai penurunan sebesar } \frac{\partial K}{\partial y} = 0.003195$$

$$\text{Terhadap } t : \frac{\partial K}{\partial t} = - \frac{y}{(t + 273)^2} = - \frac{0.103}{(40 + 273)^2}$$

$$\text{Dan diperoleh nilai penurunan sebesar : } \frac{\partial K}{\partial t} = 1.05135 \times 10^{-6}$$

Kemudian ditentukan nilai  $\Delta K$  dengan persamaan

$$\begin{aligned}\Delta K &= \frac{\partial K}{\partial y} \Delta y + \frac{\partial K}{\partial t} \Delta t \\ &= 0.003195 \cdot 0.0005 + 1.05135 \cdot 10^{-6} \cdot 0.5 \\ \Delta K &= 2.12312 \times 10^{-6}\end{aligned}$$

Dari perhitungan tersebut diperoleh Kesalahan relatif

$$KR = \frac{\Delta K}{K} \cdot 100\% = \frac{2.12312 \times 10^{-6}}{0.000329073} \cdot 100\% = 0.6452\%$$

Dengan keseksamaan :

$$keseksamaan = 100\% - KR = 99.3548\%$$

Angka Berarti :

$$AB = 1 - \log \frac{\Delta K}{K} = 1 - \log \frac{2,12312 \times 10^{-6}}{0,000329073} \approx 3$$

Harga Sebenarnya :

$$\text{Harga Sebenarnya} = (3,29 \pm 0,02) \times 10^{-4}$$



## LAMPIRAN E

### Contoh perhitungan data praktikum Boyle-Gay Lussac dengan alat nyata

Dengan menggunakan data percobaan 1 sebagai contoh perhitungan

$$\begin{aligned} \text{diperoleh nilai } K &= \frac{P_1 V_1}{T_1} \\ &= \frac{(10^5 + 13600.9,8. h).y}{t + 273} \\ &= \frac{(10^5 + 13600.9,8. 0,003).0,103}{40 + 273} \\ &= \frac{100399,84.0,103}{313} \\ &= 33,038925 \text{ Pa m}^0\text{K} \end{aligned}$$

Nilai K diturunkan pada setiap variabel yang mempengaruhi perubahan nilai K, yakni terhadap y, h dan t:

Terhadap y :

$$\frac{\partial K}{\partial y} = \frac{P_0 + \rho.g.h}{t + 273} = \frac{10^5 + 13600.9,8.0,003}{40 + 273}$$

Sehingga diperoleh nilai penurunan sebesar  $\frac{\partial K}{\partial y} = 320,76626$

Terhadap t :

$$\frac{\partial K}{\partial t} = - \frac{(P_0 + \rho.g.h).y}{(t + 273)^2} = - \frac{(10^5 + 13600.9,8.0,003).0,103}{(40 + 273)^2}$$

Dan diperoleh nilai penurunan sebesar :  $\frac{\partial K}{\partial t} = 0,1055557$

Terhadap h: 
$$\frac{\partial K}{\partial h} = \frac{\rho \cdot g \cdot y}{t + 273} = \frac{13600,9 \cdot 8,0 \cdot 103}{313}$$

Sehingga diperoleh nilai penurunan sebesar 
$$\frac{\partial K}{\partial h} = 43,85891$$

Kemudian ditentukan nilai  $\Delta K$  dengan persamaan

$$\begin{aligned} \Delta K &= \frac{\partial K}{\partial y} \Delta y + \frac{\partial K}{\partial t} \Delta t + \frac{\partial K}{\partial h} \Delta h \\ &= 320,76626 \cdot 0,0005 + 0,1055557 \cdot 0,5 + 43,85891 \cdot 0,0005 \end{aligned}$$

$$\Delta K = 0,23509$$

Dari perhitungan tersebut diperoleh Kesalahan relatif

$$KR = \frac{\Delta K}{K} \cdot 100\% = \frac{0,23509}{33,03892498} \cdot 100\% = 0,7116\%$$

Dengan keseksamaan :

$$keseksamaan = 100\% - KR = 99,2884\%$$

Angka Berarti :

$$AB = 1 - \log \frac{\Delta K}{K} = 1 - \log \frac{0,23509}{33,03892498} \approx 3$$

Harga Sebenarnya :

$$\text{Harga Sebenarnya} = (3,30 \pm 0,02) \times 10$$

## LAMPIRAN F

### Contoh perhitungan data praktikum Boyle-Gay Lussac dengan PSE

Dengan menggunakan data percobaan 1 sebagai contoh perhitungan

$$\begin{aligned} \text{diperoleh nilai } K &= \frac{P_1 V_1}{T_1} \\ &= \frac{(10^5 + 13600,9,8. h).y}{t + 273} \\ &= \frac{(10^5 + 13600,9,8. 0,005).0,103}{40 + 273} \\ &= \frac{10368,6392}{313} \\ &= 33,12664281 \text{ Pa m}^3\text{K} \end{aligned}$$

Nilai K diturunkan pada setiap variabel yang mempengaruhi perubahan nilai K, yakni terhadap y, h dan t:

Terhadap y :

$$\frac{\partial K}{\partial y} = \frac{P_0 + \rho.g.h}{t + 273} = \frac{10^5 + 13600.9,8.0,005}{40 + 273}$$

Sehingga diperoleh nilai penurunan sebesar  $\frac{\partial K}{\partial y} = 321,617891$

Terhadap t :  $\frac{\partial K}{\partial t} = - \frac{(P_0 + \rho.g.h).y}{(t + 273)^2} = - \frac{(10^5 + 13600,9,8.0,005).0,103}{(40 + 273)^2}$

Dan diperoleh nilai penurunan sebesar :  $\frac{\partial K}{\partial t} = 0,1058359$

Terhadap h :  $\frac{\partial K}{\partial h} = \frac{\rho.g.y}{t + 273} = \frac{13600,9,8.0,103}{313}$

Sehingga diperoleh nilai penurunan sebesar  $\frac{\partial K}{\partial h} = 43,85891$

Kemudian ditentukan nilai  $\Delta K$  dengan persamaan

$$\begin{aligned}\Delta K &= \frac{\partial K}{\partial y} \Delta y + \frac{\partial K}{\partial t} \Delta t + \frac{\partial K}{\partial h} \Delta h \\ &= 321,617891 \cdot 0,0005 + 0,1058359 \cdot 0,5 + 43,85891 \cdot 0,0005\end{aligned}$$

$$\Delta K = 0,235656$$

Dari perhitungan tersebut diperoleh Kesalahan relatif

$$KR = \frac{\Delta K}{K} \cdot 100\% = \frac{0,235656}{33,12664281} \cdot 100\% = 0,7114\%$$

Dengan keseksamaan :

$$keseksamaan = 100\% - KR = 99,2886\%$$

Angka Berarti :

$$AB = 1 - \log \frac{\Delta K}{K} = 1 - \log \frac{0,235656}{33,12664281} \approx 3$$

Harga Sebenarnya :

$$\text{Harga Sebenarnya} = (3,31 \pm 0,02) \times 10$$

## LAMPIRAN G

### Actionscript pada tombol “hapus” pertama

```
on (release) {
    y1 = y2;
    h1 = h2;
    t1 = t2;
    y2 = y3;
    h2 = h3;
    t2 = t3;
    y3 = y4;
    h3 = h4;
    t3 = t4;
    y4 = y5;
    h4 = h5;
    t4 = t5;
    y5 = "";
    h5 = "";
    t5 = "";
    if (y1 == "") {
        hap1._visible = 0;
    } else {
        hap1._visible = 1;
    }
    if (y2 == "") {
        hap2._visible = 0;
    } else {
        hap2._visible = 1;
    }
    if (y3 == "") {
        hap3._visible = 0;
    } else {
        hap3._visible = 1;
    }
    if (y4 == "") {
        hap4._visible = 0;
    } else {
        hap4._visible = 1;
    }
    if (y5 == "") {
```

```
        hap5._visible = 0;
    } else {
        hap5._visible = 1;
    }
}
```

## LAMPIRAN H

### Actionscript pada tombol “hapus” kedua

```
on (release) {
    y2 = y3
    h2 = h3
    t2 = t3
    y3 = y4
    h3 = h4
    t3 = t4
    y4 = y5
    h4 = h5
    t4 = t5
    y5 = ""
    h5 = ""
    t5 = ""
    if (y1 == "") {
        hap1._visible = 0;
    } else {
        hap1._visible = 1;
    }
    if (y2 == "") {
        hap2._visible = 0;
    } else {
        hap2._visible = 1;
    }
    if (y3 == "") {
        hap3._visible = 0;
    } else {
        hap3._visible = 1;
    }
    if (y4 == "") {
        hap4._visible = 0;
    } else {
        hap4._visible = 1;
    }
    if (y5 == "") {
        hap5._visible = 0;
    } else {
        hap5._visible = 1;
    }
}
```

} }



## LAMPIRAN I

### Actionscript pada tombol “hapus” ketiga

```
on (release) {
    y3 = y4
    h3 = h4
    t3 = t4
    y4 = y5
    h4 = h5
    t4 = t5
    y5 = ""
    h5 = ""
    t5 = ""
    if (y1 == "") {
        hap1._visible = 0;
    } else {
        hap1._visible = 1;
    }
    if (y2 == "") {
        hap2._visible = 0;
    } else {
        hap2._visible = 1;
    }
    if (y3 == "") {
        hap3._visible = 0;
    } else {
        hap3._visible = 1;
    }
    if (y4 == "") {
        hap4._visible = 0;
    } else {
        hap4._visible = 1;
    }
    if (y5 == "") {
        hap5._visible = 0;
    } else {
        hap5._visible = 1;
    }
}
```

## LAMPIRAN J

### Actionscript pada tombol “hapus” keempat

```
on (release) {
    y4 = y5
    h4 = h5
    t4 = t5
    y5 = ""
    h5 = ""
    t5 = ""
    if (y1 == "") {
        hap1._visible = 0;
    } else {
        hap1._visible = 1;
    }
    if (y2 == "") {
        hap2._visible = 0;
    } else {
        hap2._visible = 1;
    }
    if (y3 == "") {
        hap3._visible = 0;
    } else {
        hap3._visible = 1;
    }
    if (y4 == "") {
        hap4._visible = 0;
    } else {
        hap4._visible = 1;
    }
    if (y5 == "") {
        hap5._visible = 0;
    } else {
        hap5._visible = 1;
    }
}
```

## LAMPIRAN K

### Actionscript pada tombol “hapus” kelima

```
on (release) {
    y5 = ""
    h5 = ""
    t5 = ""
    if (y1 == "") {
        hap1._visible = 0;
    } else {
        hap1._visible = 1;
    }
    if (y2 == "") {
        hap2._visible = 0;
    } else {
        hap2._visible = 1;
    }
    if (y3 == "") {
        hap3._visible = 0;
    } else {
        hap3._visible = 1;
    }
    if (y4 == "") {
        hap4._visible = 0;
    } else {
        hap4._visible = 1;
    }
    if (y5 == "") {
        hap5._visible = 0;
    } else {
        hap5._visible = 1;
    }
}
```

## LAMPIRAN L

### Actionscript untuk tombol “Reset Data”

```
on (release) {
    y1 = "";
    y2 = "";
    y3 = "";
    y4 = "";
    y5 = "";
    h1 = "";
    h2 = "";
    h3 = "";
    h4 = "";
    h5 = "";
    t1 = "";
    t2 = "";
    t3 = "";
    t4 = "";
    t5 = "";
    if (y1 == "") {
        hap1._visible = 0;
    } else {
        hap1._visible = 1;
    }
    if (y2 == "") {
        hap2._visible = 0;
    } else {
        hap2._visible = 1;
    }
    if (y3 == "") {
        hap3._visible = 0;
    } else {
        hap3._visible = 1;
    }
    if (y4 == "") {
        hap4._visible = 0;
    } else {
        hap4._visible = 1;
    }
    if (y5 == "") {
```

```
        hap5._visible = 0;
    } else {
        hap5._visible = 1;
    }
}
```

## LAMPIRAN M

### Actionscript pada *layer* Termostat

```
fps = 0
ont.onPress = function (){
    tutup._visible=0
    indi.gotoAndStop(2);
    onEnterFrame = function (){
        Tt = nilai
        if (T > Tt){
            fps ++
            if(fps ==25){
                fps = 0
                T -= 1
                termo._y -=5
                isi_tbg1._y = (menu.ypos+dv-13.75-20.6+bar._y/8)
            }
        }
        if (T < Tt){
            fps ++
            if(fps ==25){
                fps = 0
                T += 1
                termo._y +=5
                isi_tbg1._y = (menu.ypos+dv-13.75-20.6+bar._y/8)
            }
        }
    }
}
}
}
sto.onPress = function(){
    tutup._visible=1
    indi.gotoAndStop(1);
    onEnterFrame = function(){
        T=T
        ijo.gotoAndStop(1);
    }
}
}
}
ijo.onEnterFrame = function() {
    if (T==Tt) {
        ijo.gotoAndStop(2);
    } else{
```

```
        ijo.gotoAndStop(1);  
    }  
};
```

## LAMPIRAN N

### Actionscript pada *layer* Grafik Hitung

```
graf.onEnterFrame = function() {  
    b1 = Number(_root.y1*4000-100);  
    b2 = Number(_root.y2*4000-100);  
    b3 = Number(_root.y3*4000-100);  
    b4 = Number(_root.y4*4000-100);  
    b5 = Number(_root.y5*4000-100);  
    a1 = Number(82084*Math.exp(_root.h1*1.976)/100+50);  
    a2 = Number(82084*Math.exp(_root.h2*1.976)/100+50);  
    a3 = Number(82084*Math.exp(_root.h3*1.976)/100+50);  
    a4 = Number(82084*Math.exp(_root.h4*1.976)/100+50);  
    a5 = Number(82084*Math.exp(_root.h5*1.976)/100+50);  
};
```



## LAMPIRAN O

### Actionscript pada *button* “simpan”

```
on (release) {
    yn = ny/100;
    hn = nh/100;
    tn = nt;
    if (y1 == "") {
        y1 = yn;
        h1 = hn;
        t1 = tn;
    } else if (yn>y1) {
        if (y2 == "") {
            y2 = yn;
            h2 = hn;
            t2 = tn;
        } else if (yn<y2) {
            y5 = y4;
            y4 = y3;
            y3 = y2;
            y2 = yn;
            y1 = y1;
            h5 = h4;
            h4 = h3;
            h3 = h2;
            h2 = hn;
            h1 = h1;
            t5 = t4;
            t4 = t3;
            t3 = t2;
            t2 = tn;
            t1 = t1;
        } else if (yn>y2) {
            if (y3 == "") {
                y3 = yn;
                h3 = hn;
                t3 = tn;
            } else if (yn<y3) {
                y5 = y4;
                y4 = y3;
                y3 = yn;
            }
        }
    }
}
```

```

y2 = y2;
y1 = y1;
h5 = h4;
h4 = h3;
h3 = hn;
h2 = h2;
h1 = h1;
t5 = t4;
t4 = t3;
t3 = tn;
t2 = t2;
t1 = t1;
} else if (yn>y3) {
    if (y4 == "") {
        y4 = yn;
        h4 = hn;
        t4 = tn;
    } else if (yn<y4) {
        y5 = y4;
        y4 = yn;
        y3 = y3;
        y2 = y2;
        y1 = y1;
        h5 = h4;
        h4 = hn;
        h3 = h3;
        h2 = h2;
        h1 = h1;
        t5 = t4;
        t4 = tn;
        t3 = t3;
        t2 = t2;
        t1 = t1;
    } else if (yn>y4) {
        if (y5 == "") {
            y5 = yn;
            h5 = hn;
            t5 = tn;
        } else if (yn<y5) {
            y5 = yn;
            h5 = hn;

```

```

t5 = tn;
    }
}
}
} else if (yn<y1) {
    y5 = y4;
    y4 = y3;
    y3 = y2;
    y2 = y1;
    y1 = yn;
    h5 = h4;
    h4 = h3;
    h3 = h2;
    h2 = h1;
    h1 = hn;
    t5 = t4;
    t4 = t3;
    t3 = t2;
    t2 = t1;
    t1 = tn;
} else if (yn<y2) {
    y5 = y4;
    y4 = y3;
    y3 = y2;
    y2 = yn;
    y1 = y1;
    h5 = h4;
    h4 = h3;
    h3 = h2;
    h2 = hn;
    h1 = h1;
    t5 = t4;
    t4 = t3;
    t3 = t2;
    t2 = tn;
    t1 = t1;
} else if (yn<y3) {
    y5 = y4;
    y4 = y3;
    y3 = yn;

```

```

        y2 = y2;
        y1 = y1;
        h5 = h4;
        h4 = h3;
        h3 = hn;
        h2 = h2;
        h1 = h1;
        t5 = t4;
        t4 = t3;
        t3 = tn;
        t2 = t2;
        t1 = t1;
    } else if (yn<y4) {
        y5 = y4;
        y4 = yn;
        y3 = y3;
        y2 = y2;
        y1 = y1;
        h5 = h4;
        h4 = hn;
        h3 = h3;
        h2 = h2;
        h1 = h1;
        t5 = t4;
        t4 = tn;
        t3 = t3;
        t2 = t2;
        t1 = t1;
    } else if (yn<y5) {
        y5 = yn;
        h5 = hn;
        t5 = tn;
    }
    ny = "";
    nh = "";
    nt = "";
    if (y1 == "") {
        hap1._visible = 0;
    } else {
        hap1._visible = 1;
    }
}

```

```
if (y2 == "") {
    hap2._visible = 0;
} else {
    hap2._visible = 1;
}
if (y3 == "") {
    hap3._visible = 0;
} else {
    hap3._visible = 1;
}
if (y4 == "") {
    hap4._visible = 0;
} else {
    hap4._visible = 1;
}
if (y5 == "") {
    hap5._visible = 0;
} else {
    hap5._visible = 1;
}
}
```

## LAMPIRAN P

### Actionscript pada layer Script

- Pada percobaan Boyle

```
fscommand("fullscreen", true);
stop();
gotoAndStop(_root.tujuan);
pud = 100000;
phg = 13600;
T = 30;
to = 30;
mud = 3.4*0.001;
bar._y = 275;
bg = batas.getBounds(this);
slider = bar.getBounds(this);
bar.onPress = function() {
    this.offset = _ymouse-this._y;
    this.aktif = true;
    rd
    (((random(9)+1)/100)+99.9)/(((random(9)+1)/100)+99.9);
};
bar.onRelease = function() {
    this.aktif = false;
    if (isi_tbg2._y>isi_tbg1._y) {
        nh = "-" + "";
    } else {
        nh = "";
    }
};
bar.onReleaseOutside = function() {
    this.aktif = false;
    if (isi_tbg2._y>isi_tbg1._y) {
        nh = "-" + "";
    } else {
        nh = "";
    }
};
bar.onMouseMove = function() {
    if (this.aktif) {
```

```

        if (this._y>=bg.yMin+this._height/2    &&
this._y<=bg.yMax-this._height/2) {
            this._y = _ymouse-this.offset;
        } else {
            if (this._y<bg.yMin+this._height/2) {
                this._y =
bg.yMin+this._height/2+1;
                this.aktif = false;
            } else {
                this._y = bg.yMax-
this._height/2-1;
                this.aktif = false;
            }
        }
    }
};
k = 10000;
g = 9.8;
bar.geser = 0;
isi_tbg1._y = 295;
isi_tbg2._y = 295;
mistar1._y = -175;
mistar2._y = -175;
isi2 = isi_tbg2._y;
menu.ypos = isi_tbg1._y;
bar.onEnterFrame = function() {
    if (this._y>=bg.yMin+this._height/2    &&
this._y<=bg.yMax-this._height/2) {
        this._y += this.geser;
    } else {
        this.geser = 0;
        if (this._y<bg.yMin+this._height/2) {
            this._y = bg.yMin+this._height/2+1;
        } else {
            this._y = bg.yMax-this._height/2-1;
        }
    }
}
//bagian real
dv = mud*(T-to)*10*5;
isi_tbg1._y = isi_tbg1._y+dv;
isi_tbg1._y = (menu.ypos-13.75-20.6+bar._y/8)*rd;

```

```

mistar1._y = (isi_tbg1._y-273.125)*-8;
mistar2._y = (bar._y-253.125)*-8;
maskisitbg2._y = bar._y-22;
isi_tbg2._y = bar._y+20;
maskslg._y = bar._y+60;
ntbg1 = (isi_tbg1._y-(59*5))/-5;
ntbgs1 = Math.round(((ntbg1-10)/-1)*10)/10;
slshtbg12 = Math.round(((isi_tbg2._y-isi_tbg1._y)/-
5)*10)/10;
};

```

- Pada percobaan Gay Lussac

```

fscommand("fullscreen",true)
stop();
gotoAndStop(_root.tujuan);
pud = 100000
phg = 13600
T = 30
to = 30
mud = 3.4*0.001
bar._y = 275
bg = batas.getBounds(this);
slider = bar.getBounds(this);
bar.onPress = function() {
    this.offset = _ymouse-this._y;
    this.aktif = true;
    rd =
(((random(9)+1)/100)+99.9)/(((random(9)+1)/100)+99.9)
};
bar.onRelease = function() {
    this.aktif = false;
};
bar.onReleaseOutside = function() {
    this.aktif = false;
};
bar.onMouseMove = function() {
    if (this.aktif) {
        if (this._y>=bg.yMin+this._height/2 &&
this._y<=bg.yMax-this._height/2) {
            this._y = _ymouse-this.offset;

```



```

        } else {
            if (this._y < bg.yMin + this._height/2) {
                this._y =
bg.yMin + this._height/2 + 1;
                this.aktif = false;
            } else {
                this._y = bg.yMax -
this._height/2 - 1;
                this.aktif = false;
            }
        }
    }
};

k = 10000
g = 9.8
bar.geser = 0;
isi_tbg1._y = 295
isi_tbg2._y = 295
mistar1._y = -175
mistar2._y = -175
isi2 = isi_tbg2._y
menu.ypos = isi_tbg1._y;

bar.onEnterFrame = function() {
    if (this._y >= bg.yMin + this._height/2 &&
this._y <= bg.yMax - this._height/2) {
        this._y += this.geser;
    } else {
        this.geser = 0;
        if (this._y < bg.yMin + this._height/2) {
            this._y = bg.yMin + this._height/2 + 1;
        } else {
            this._y = bg.yMax - this._height/2 - 1;
        }
    }
}

//bagian real
dv = mud * (T - to) * 10 * 5
isi_tbg1._y = (menu.ypos + dv - 13.75 - 20.6 + bar._y / 8) * rd
mistar1._y = (isi_tbg1._y - 273.125) * -8

```

```

mistar2._y=(bar._y-253.125-(0.5*dv))*-8
maskisitbg2._y = bar._y-22
isi_tbg2._y = bar._y + 20 -(dv*0.5)
maskslg._y = bar._y+60
ntbg1=(isi_tbg1._y-(59*5))/-5
};

```

- Pada percobaan Charles

```

fscommand("fullscreen",true)
stop();
gotoAndStop(_root.tujuan);
pud = 100000
phg = 13600
T = 30
to = 30
mud = 3.4*0.001
bar._y = 275
bg = batas.getBounds(this);
slider = bar.getBounds(this);
bar.onPress = function() {
    this.offset = _ymouse-this._y;
    this.aktif = true;
    rd
    =
(((random(9)+1)/100)+99.9)/(((random(9)+1)/100)+99.9)
};
bar.onRelease = function() {
    this.aktif = false;
    if (isi_tbg2._y>isi_tbg1._y) {
        ny = "-" + "";
    } else {
        ny = "";
    }
};
bar.onReleaseOutside = function() {
    this.aktif = false;
};
bar.onMouseMove = function() {
    if (this.aktif) {
        if (this._y>=bg.yMin+this._height/2 &&
this._y<=bg.yMax-this._height/2) {

```

```

        this._y = _ymouse - this.offset;
    } else {
        if (this._y < bg.yMin + this._height/2) {
            this._y =
bg.yMin + this._height/2 + 1;
            this.aktif = false;
        } else {
            this._y =
this._height/2 - 1;
            this.aktif = false;
        }
    }
};

```

```
k = 10000
```

```
g = 9.8
```

```
bar.geser = 0;
```

```
isi_tbg1._y = 295
```

```
isi_tbg2._y = 295
```

```
mistar1._y = -175
```

```
mistar2._y = -175
```

```
isi2 = isi_tbg2._y
```

```
menu.ypos = isi_tbg1._y;
```

```

bar.onEnterFrame = function() {
    if (this._y >= bg.yMin + this._height/2 &&
this._y <= bg.yMax - this._height/2) {
        this._y += this.geser;
    } else {
        this.geser = 0;
        if (this._y < bg.yMin + this._height/2) {
            this._y = bg.yMin + this._height/2 + 1;
        } else {
            this._y = bg.yMax - this._height/2 - 1;
        }
    }
}

```

```
//bagian real
```

```
dv = mud*(T-to)*10*5
```

```
isi_tbg1._y = (menu.ypos + dv - 13.75 - 20.6 + bar._y/8)*rd
```

```

mistar1._y=(isi_tbg1._y-273.125)*-8
mistar2._y=(bar._y-253.125-(0.5*dv))*-8
maskisitbg2._y = bar._y-22
isi_tbg2._y = bar._y + 20 -(dv*0.5)
maskslg._y = bar._y+60
ntbg1=(isi_tbg1._y-(59*5))/-5
};

```

- Pada percobaan Boyle-Gay Lussac

```

fscommand("fullscreen",true)
stop();
gotoAndStop(_root.tujuan);
pud = 100000
phg = 13600
T = 30
to = 30
mud = 3.4*0.001
bar._y = 275
bg = batas.getBounds(this);
slider = bar.getBounds(this);
bar.onPress = function() {
    this.offset = _ymouse-this._y;
    this.aktif = true;
    rd
    =
    (((random(9)+1)/100)+99.9)/(((random(9)+1)/100)+99.9)
};
bar.onRelease = function() {
    this.aktif = false;
    if (isi_tbg2._y>isi_tbg1._y) {
        nh = "-"+"";
    } else {
        nh = "";
    }
};
bar.onReleaseOutside = function() {
    this.aktif = false;
    if (isi_tbg2._y>isi_tbg1._y) {
        nh = "-"+"";
    } else {
        nh = "";
    }
};

```

```

    }
};
bar.onMouseMove = function() {
    if (this.aktif) {
        if (this._y>=bg.yMin+this._height/2    &&
this._y<=bg.yMax-this._height/2) {
            this._y = _ymouse-this.offset;
        } else {
            if (this._y<bg.yMin+this._height/2) {
                this._y =
bg.yMin+this._height/2+1;
                this.aktif = false;
            } else {
                this._y = bg.yMax-
this._height/2-1;
                this.aktif = false;
            }
        }
    }
};

```

```

k = 10000
g = 9.8
bar.geser = 0;
isi_tbg1._y = 295
isi_tbg2._y = 295
mistar1._y = -175
mistar2._y = -175
isi2 = isi_tbg2._y
menu.ypos = isi_tbg1._y;

```

```

bar.onEnterFrame = function() {
    if (this._y>=bg.yMin+this._height/2    &&
this._y<=bg.yMax-this._height/2) {
        this._y += this.geser;
    } else {
        this.geser = 0;
        if (this._y<bg.yMin+this._height/2) {
            this._y = bg.yMin+this._height/2+1;
        } else {
            this._y = bg.yMax-this._height/2-1;
        }
    }
};

```

```
    }  
}  
  
//bagian real  
dv = mud*(T-to)*10*5  
isi_tbg1._y = (menu.ypos+dv-13.75-20.6+bar._y/8)*rd  
mistar1._y =(isi_tbg1._y-273.125)*-8  
mistar2._y =(bar._y-253.125-(0.5*dv))*-8  
maskisitbg2._y = bar._y-22  
isi_tbg2._y = bar._y + 20 -(dv*0.5)  
maskslg._y = bar._y+60  
ntbg1=(isi_tbg1._y-(59*5))/-5  
  
};
```