

### 1. Perhitungan rata-rata alat

$$\begin{aligned}\bar{X} &= \frac{\sum X_n}{n} \\ \bar{X} &= \frac{12 + 15 + 13 + 12 + 15}{5} \\ \bar{X} &= 13,4\end{aligned}$$

### Rata-Rata Pembanding

$$\begin{aligned}\bar{X} &= \frac{\sum X_n}{n} \\ \bar{X} &= \frac{12 + 12 + 12 + 15 + 15}{5} \\ \bar{X} &= 13,2\end{aligned}$$

Error:

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

$$Error \% = \frac{13.2 - \overline{13.4}}{13.2} \times 100\%$$

$$Error \% = -1,5\%$$

### STDV alat

$$\begin{aligned}STDV &= \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}} \\ STDV &= \sqrt{\frac{(12 - 13,4)^2 + (15 - 13,4)^2 + (13 - 13,4)^2 + (12 - 13,4)^2 + (15 - 13,4)^2}{5 - 1}} \\ &= 1,52\end{aligned}$$

STDV Pembanding

$$STDV = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$

$$STDV = \sqrt{\frac{(12 - 13,2)^2 + (12 - 13,2)^2 + (12 - 13,2)^2 + (15 - 13,2)^2 + (15 - 13,2)^2}{5 - 1}}$$
$$= 1,64$$

Ketidakpastian (UA) alat

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{1,52}{\sqrt{5}}$$

$$UA = 0,68$$

Ketidakpastian (UA) Pembanding

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{1,64}{\sqrt{5}}$$

$$UA = 0,73$$

2. Perhitungan rata-rata respirasi alat

$$\begin{aligned}\bar{X} &= \frac{\sum Xn}{n} \\ \bar{X} &= \frac{13 + 15 + 14 + 13 + 12}{5} \\ \bar{X} &= 13,4\end{aligned}$$

Rata-Rata Pembanding

$$\begin{aligned}\bar{X} &= \frac{\sum Xn}{n} \\ \bar{X} &= \frac{14 + 16 + 13 + 14 + 14}{5} \\ \bar{X} &= 14,2\end{aligned}$$

Error:

$$Error \% = \frac{Xn - \bar{X}}{\bar{X}n} \times 100\%$$

$$Error \% = \frac{14.2 - \overline{13.4}}{14.2} \times 100\%$$

$$Error \% = 5,6\%$$

STDV alat

$$\begin{aligned}STDV &= \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}} \\ STDV &= \sqrt{\frac{(13 - 13,4)^2 + (15 - 13,4)^2 + (14 - 13,4)^2 + (13 - 13,4)^2 + (12 - 13,4)^2}{5 - 1}} \\ &= 1,14\end{aligned}$$

STDV Pemandangan

$$STDV = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$

$$STDV = \sqrt{\frac{(14 - 14,2)^2 + (16 - 14,2)^2 + (13 - 14,2)^2 + (14 - 14,2)^2 + 14 - 14,2)^2}{5 - 1}}$$

$$= 1,10$$

Ketidakpastian (UA) alat

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{1,14}{\sqrt{5}}$$

$$UA = 0,51$$

Ketidakpastian (UA) Pemandangan

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{1,10}{\sqrt{5}}$$

$$UA = 0,49$$

### 3. Perhitungan rata-rata respirasi alat

$$\begin{aligned}\bar{X} &= \frac{\sum Xn}{n} \\ \bar{X} &= \frac{15 + 15 + 16 + 17 + 18}{5} \\ \bar{X} &= 16,2\end{aligned}$$

#### Rata-Rata Pembanding

$$\begin{aligned}\bar{X} &= \frac{\sum Xn}{n} \\ \bar{X} &= \frac{14 + 16 + 16 + 16 + 17}{5} \\ \bar{X} &= 1,10\end{aligned}$$

Error:

$$Error \% = \frac{Xn - \bar{X}}{\bar{X}n} \times 100\%$$

$$Error \% = \frac{15.8 - \overline{16.2}}{15.8} \times 100\%$$

$$Error \% = -2,5\%$$

STDV alat

$$\begin{aligned}STDV &= \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}} \\ STDV &= \sqrt{\frac{(15 - 16,2)^2 + (15 - 16,2)^2 + (16 - 16,2)^2 + (17 - 16,2)^2 + (18 - 16,2)^2}{5 - 1}}\end{aligned}$$

$$= 1,30$$

STDV Pemandang

$$STDV = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$

$$STDV = \sqrt{\frac{(14 - 15,8)^2 + (16 - 15,8)^2 + (16 - 15,8)^2 + (16 - 15,8)^2 + (17 - 15,8)^2}{5 - 1}}$$

$$= 1,10$$

Ketidakpastian (UA) alat

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{1,30}{\sqrt{5}}$$

$$UA = 0,59$$

Ketidakpastian (UA) Pemandang

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{1,10}{\sqrt{5}}$$

$$UA = 0,49$$

#### 4. Perhitungan rata-rata respirasi alat

$$\begin{aligned}\bar{X} &= \frac{\sum X_n}{n} \\ \bar{X} &= \frac{11 + 12 + 10 + 13 + 13}{5} \\ \bar{X} &= 11,8\end{aligned}$$

#### Rata-Rata Pembanding

$$\begin{aligned}\bar{X} &= \frac{\sum X_n}{n} \\ \bar{X} &= \frac{13 + 13 + 11 + 12 + 14}{5} \\ \bar{X} &= 1,14\end{aligned}$$

Error:

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

$$Error \% = \frac{12,6 - \overline{11,8}}{12,6} \times 100\%$$

$$Error \% = 6,3\%$$

STDV alat

$$\begin{aligned}STDV &= \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}} \\ STDV &= \sqrt{\frac{(11 - 11,8)^2 + (12 - 11,8)^2 + (10 - 11,8)^2 + (13 - 11,8)^2 + (13 - 11,8)^2}{5 - 1}} \\ &= 1,30\end{aligned}$$

STDV Pemandangan

$$STDV = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$

$$STDV = \sqrt{\frac{(13 - 12,6)^2 + (13 - 12,6)^2 + (11 - 12,6)^2 + (12 - 12,6)^2 + 14 - 12,6)^2}{5 - 1}}$$

$$= 1,14$$

Ketidakpastian (UA) alat

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{1,30}{\sqrt{5}}$$

$$UA = 0,59$$

Ketidakpastian (UA) Pemandangan

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{1,14}{\sqrt{5}}$$

$$UA = 0,51$$

4. Perhitungan rata-rata respirasi alat

$$\bar{X} = \frac{\sum Xn}{n}$$



$$\bar{X} = \frac{13 + 15 + 14 + 13 + 12}{5}$$

$$\bar{X} = 13,4$$

Rata-Rata Pemandangan

$$\bar{X} = \frac{\sum X_n}{n}$$

$$\bar{X} = \frac{14 + 16 + 13 + 14 + 14}{5}$$

$$\bar{X} = 14,2$$

Error:

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

$$\text{Error \%} = \frac{14,2 - 13,4}{14,2} \times 100\%$$

$$\text{Error \%} = 5,6\%$$

STDEV alat

$$STDEV = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$

$$STDEV = \sqrt{\frac{(13 - 13,4)^2 + (15 - 13,4)^2 + (14 - 13,4)^2 + (13 - 13,4)^2 + (12 - 13,4)^2}{5 - 1}}$$

$$= 1,14$$

STDEV Pemandangan

$$STDV = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$

$$STDV = \sqrt{\frac{(14 - 14,2)^2 + (16 - 14,2)^2 + (13 - 14,2)^2 + (14 - 14,2)^2 + 14 - 14,2)^2}{5 - 1}}$$

$$= 1,10$$

Ketidakpastian (UA) alat

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{1,14}{\sqrt{5}}$$

$$UA = 0,51$$

Ketidakpastian (UA) Pemanding

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{1,10}{\sqrt{5}}$$

$$UA = 0,49$$

## 5. Perhitungan rata-rata respirasi alat

$$\begin{aligned}\bar{X} &= \frac{\sum X_n}{n} \\ \bar{X} &= \frac{12 + 9 + 11 + 15 + 17}{5} \\ \bar{X} &= 12,8\end{aligned}$$

### Rata-Rata Pembanding

$$\begin{aligned}\bar{X} &= \frac{\sum X_n}{n} \\ \bar{X} &= \frac{11 + 10 + 13 + 14 + 15}{5} \\ \bar{X} &= 12,6\end{aligned}$$

Error:

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

$$Error \% = \frac{12,6 - 12,8}{12,6} \times 100\%$$

$$Error \% = 1,3\%$$

STDV alat

$$\begin{aligned}STDV &= \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}} \\ STDV &= \sqrt{\frac{(12 - 12,8)^2 + (9 - 12,8)^2 + (11 - 12,8)^2 + (15 - 12,8)^2 + (17 - 12,8)^2}{5 - 1}}\end{aligned}$$

$$= 3,19$$

STDV Pembanding

$$STDV = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$

$$STDV = \sqrt{\frac{(11 - 12,6)^2 + (10 - 12,6)^2 + (13 - 12,6)^2 + (14 - 12,6)^2 + 15 - 12,6)^2}{5 - 1}}$$

$$= 2,07$$

Ketidakpastian (UA) alat

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{3,19}{\sqrt{5}}$$

$$UA = 1,43$$

Ketidakpastian (UA) Pembanding

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{2,07}{\sqrt{5}}$$

$$UA = 0,92$$

### 1. Perhitungan rata-rata suhu alat

$$\bar{X} = \frac{\sum X_n}{n}$$
$$\bar{X} = \frac{35 + 36 + 36 + 36 + 36}{5}$$

$$\bar{X} = 35.8$$

### Rata-Rata Pembanding

$$\bar{X} = \frac{\sum X_n}{n}$$
$$\bar{X} = \frac{36.5 + 36.5 + 36.6 + 36.6 + 36.8}{5}$$

$$\bar{X} = 36.6$$

Error:

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

$$Error \% = \frac{36.6 - 35.8}{36.6} \times 100\%$$

$$Error \% = 2.18\%$$

### STDV alat

$$STDV = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$

$$STDV = \sqrt{\frac{(35 - 35.8)^2 + (36 - 35.8)^2 + (36 - 35.8)^2 + (36 - 35.8)^2 + (36 - 35.8)^2}{5 - 1}}$$

$$= 0.45$$

### STDV Pembanding

$$\begin{aligned}
 STDV &= \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}} \\
 &= \sqrt{\frac{(36.5 - 36.6)^2 + (36.5 - 36.6)^2 + (36.6 - 36.6)^2 + (36.6 - 36.6)^2 + (36.8 - 36.6)^2}{5 - 1}} \\
 &= 0.122
 \end{aligned}$$

Ketidakpastian (UA) alat

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{0.45}{\sqrt{5}}$$

$$UA = 0.20$$

Ketidakpastian (UA) Pembanding

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{0.122}{\sqrt{5}}$$

$$UA = 0.05$$

## 2. Perhitungan rata-rata suhu alat

$$\bar{X} = \frac{\sum X_n}{n}$$
$$\bar{X} = \frac{36 + 36 + 37 + 35 + 36}{5}$$

$$\bar{X} = 36$$

### Rata-Rata Pembanding

$$\bar{X} = \frac{\sum X_n}{n}$$
$$\bar{X} = \frac{36.3 + 36.5 + 36.5 + 36.8 + 36.9}{5}$$

$$\bar{X} = 36,6$$

Error:

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

$$Error \% = \frac{36.6 - \bar{36}}{36.6} \times 100\%$$

$$Error \% = 1,63\%$$

### STDV alat

$$STDV = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$

$$STDV = \sqrt{\frac{(36 - 36)^2 + (36 - 36)^2 + (37 - 36)^2 + (35 - 36)^2 + (36 - 36)^2}{5 - 1}}$$
$$= 0.70$$

STDV Pemandangan

$$STDV = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$
$$= \sqrt{\frac{(36.3 - 36.6)^2 + (36.5 - 36.6)^2 + (36.5 - 36.6)^2 + (36.8 - 36.6)^2 + (36.9 - 36.6)^2}{5 - 1}}$$
$$= 0.245$$

Ketidakpastian (UA) alat

$$UA = \frac{SD}{\sqrt{n}}$$
$$UA = \frac{0.70}{\sqrt{5}}$$
$$UA = 0.31$$

Ketidakpastian (UA) Pemandangan

$$UA = \frac{SD}{\sqrt{n}}$$
$$UA = \frac{0.245}{\sqrt{5}}$$
$$UA = 0.11$$

3. Perhitungan rata-rata suhu alat

$$\bar{X} = \frac{\sum X_n}{n}$$
$$\bar{X} = \frac{37 + 36 + 36 + 36 + 36}{5}$$
$$\bar{X} = 36,2$$



Rata-Rata Pembanding

$$\bar{X} = \frac{\sum X_n}{n}$$
$$\bar{X} = \frac{36.3 + 36.5 + 36.7 + 36.7 + 36.6}{5}$$
$$\bar{X} = 36,66$$

Error:

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

$$Error \% = \frac{36.66 - \overline{36,2}}{36.66} \times 100\%$$

$$Error \% = 1,25\%$$

STDV alat

$$STDV = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$
$$STDV = \sqrt{\frac{(37 - 36,2)^2 + (36 - 36,2)^2 + (37 - 36,2)^2 + (35 - 36,2)^2 + (36 - 36,2)^2}{5 - 1}}$$
$$= 0,84$$

STDV Pembanding

$$STDV = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$
$$STDV = \sqrt{\frac{(36.8 - 36.66)^2 + (36.5 - 36.66)^2 + (36.7 - 36.66)^2 + (36.7 - 36.66)^2 + 36.6 - 36.66)^2}{5 - 1}}$$

$$=0.114$$

Ketidakpastian (UA) alat

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{0.84}{\sqrt{5}}$$

$$UA = 0.2$$

Ketidakpastian (UA) Pemandangan

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{0.114}{\sqrt{5}}$$

$$UA = 0.05$$

4. Perhitungan rata-rata suhu alat

$$\bar{X} = \frac{\sum Xn}{n}$$

$$\bar{X} = \frac{35 + 36 + 36 + 37 + 36}{5}$$

$$\bar{X} = 36$$

Rata-Rata Pemandangan

$$\bar{X} = \frac{\sum Xn}{n}$$

$$\bar{X} = \frac{36.5 + 36.4 + 36.3 + 36.5 + 36.6}{5}$$

$$\bar{X} = 36,48$$

Error:

$$\text{Error \%} = \frac{Xn - \bar{X}}{\bar{X}n} \times 100\%$$

$$\text{Error \%} = \frac{36.48 - \bar{36}}{36.48} \times 100\%$$

$$\text{Error \%} = 1,31\%$$

STDV alat

$$\text{STDV} = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$

$$\begin{aligned} \text{STDV} &= \sqrt{\frac{(35 - 36)^2 + (36 - 36)^2 + (36 - 36)^2 + (37 - 36)^2 + (36 - 36)^2}{5 - 1}} \\ &= 0.70 \end{aligned}$$

STDV Pemandangan

$$\text{STDV} = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$

$$\begin{aligned} \text{STDV} &= \sqrt{\frac{(36.5 - 36.48)^2 + (36.4 - 36.48)^2 + (36.3 - 36.48)^2 + (36.5 - 36.48)^2 + (36.6 - 36.48)^2}{5 - 1}} \\ &= 0.13 \end{aligned}$$

Ketidakpastian (UA) alat

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{0.70}{\sqrt{5}}$$

$$UA = 0.31$$

Ketidakpastian (UA) Pemanding

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{0.13}{\sqrt{5}}$$

$$UA = 0.06$$

5. Perhitungan rata-rata suhu alat

$$\bar{X} = \frac{\sum Xn}{n}$$

$$\bar{X} = \frac{36 + 36 + 37 + 36 + 36}{5}$$

$$\bar{X} = 36$$

Rata-Rata Pemanding

$$\bar{X} = \frac{\sum Xn}{n}$$

$$\bar{X} = \frac{36.8 + 36.7 + 36.5 + 36.6 + 36.5}{5}$$

$$\bar{X} = 36,8$$

Error:

$$Error \% = \frac{Xn - \bar{X}}{\bar{X}n} \times 100\%$$

$$\text{Error \%} = \frac{36.8 - \bar{36}}{36.8} \times 100\%$$

$$\text{Error \%} = 2,17\%$$

STDV alat

$$\text{STDV} = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$

$$\text{STDV} = \sqrt{\frac{(36 - 36)^2 + (36 - 36)^2 + (37 - 36)^2 + (36 - 36)^2 + (36 - 36)^2}{5 - 1}}$$

$$= 0.70$$

STDV Pembanding

$$\text{STDV} = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}}$$

$$= \sqrt{\frac{(36.8 - 36.8)^2 + (36.7 - 36.8)^2 + (36.5 - 36.8)^2 + (36.6 - 36.8)^2 + (36.5 - 36.8)^2}{5 - 1}}$$

$$= 0.255$$

Ketidakpastian (UA) alat

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{0.70}{\sqrt{5}}$$

$$UA = 0.31$$

Ketidakpastian (UA) Pembanding

$$UA = \frac{SD}{\sqrt{n}}$$

$$UA = \frac{0.255}{\sqrt{5}}$$

$$UA = 0.11$$