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LAMPIRAN

Lampiran 1.1 Source Code

```
from flask import Flask, render_template, request, jsonify, flash
from flask_mysqlldb import MySQL
from math import sqrt
from tabulate import tabulate

from hasil import Hasil
from kriteria import Kriteria

app = Flask(__name__)

app.secret_key = b'_5#y2L"F4Q8z\n\xec)/'

app.config['MYSQL_HOST'] = 'localhost'
app.config['MYSQL_USER'] = 'knn_user'
app.config['MYSQL_PASSWORD'] = 'Admin123456'
app.config['MYSQL_DB'] = 'knn_db'

db = MySQL(app)

@app.route('/', methods=['GET', 'POST'])
def home():
    if request.method == 'POST':
        form = request.form
        operating_system = form['operating_system']
        processor = form['processor']
        graphic = form['graphic']
        memory = form['memory']
        display = form['display']
        storage = form['storage']
        price = form['price']

        perhitungan = hitung(
            Kriteria(operating_system=int(operating_system), processor=int(processor),
                    graphics=int(graphic),
                    memory=int(memory),
                    display=int(display), storage=int(storage), name="",
            price=int(price)), 5)

        flash(perhitungan)

        return render_template('home.html')
    else:
```

```

        return render_template('home.html')

@app.route('/penguajian', methods=['POST', 'GET'])
def penguajian():
    if request.method == 'POST':
        k = int(request.form['k'])

        hasil_penguajian = penguajian3070(k=k)

        data = [k, hasil_penguajian[0]]
        return render_template('penguajian.html', data=data, dataset=map(data_string,
get_data()))

    else:
        data = map(data_string, get_data())

        return render_template('penguajian.html', dataset=data)

def get_data():
    cursor = db.connection.cursor()
    cursor.execute('SELECT * FROM knn_db.dataset')
    data = cursor.fetchall()
    cursor.close()

    dataset = []

    for row in data:
        dataset.append(Kriteria(row[1], row[2], row[3], row[4], row[5], row[6], row[7],
row[8], row[9]))

    return dataset

def hitung(data_test: Kriteria, k=1):
    dataset = get_data()

    result_list = []

    jenis = []

    x = []

    # hitung jarak setiap data testing satu persatu ke data training dengan rumus
    Euclidean Distance
    for d_train in dataset:

```

```

        operating_system = (data_test.operating_system - d_train.operating_system) ** 2
        processor = (data_test.processor - d_train.processor) ** 2
        graphics = (data_test.graphics - d_train.graphics) ** 2
        display = (data_test.display - d_train.display) ** 2
        memory = (data_test.memory - d_train.memory) ** 2
        storage = (data_test.storage - d_train.storage) ** 2
        price = (data_test.price - d_train.price) ** 2

        result = sqrt(operating_system + processor + graphics + display + memory +
storage + price)

        kriteria = Kriteria(operating_system=d_train.operating_system,
processor=d_train.processor,
                                graphics=d_train.graphics, display=d_train.display,
                                memory=d_train.memory, storage=d_train.storage,
jenis=d_train.jenis, name=d_train.name,
                                price=d_train.price)

        result_list.append(Hasil(result, d_train.jenis, d_train.jenis, d_train.name,
kriteria=kriteria))

        # sorting result berdasarkan jarak
        h = sorted(result_list, key=lambda z: z.jarak, reverse=False)

        x = h[:k]

        for i in x:
            jenis.append(i.jenis)

        # mengambil data yang paling banyak muncul jika k lebih dari 1
        # res = [item for item in x if item.jenis == max(jenis, key=jenis.count)]
        res = x # karena ingin dimunculkan semuanya maka tidak perlu di ambil yang paling
banyak muncul

        rekom_laptop = []

        for rl in res:
            detail_kriteria = map(data_string, [rl.kriteria])

            d = []

            for dk in detail_kriteria:
                d.append(dk)

            hasil = (
                f'<li>'
                f'<strong>{rl.name} ({d[0].jenis})</strong>'

```

```

        f'<br> operating system : <strong>{d[0].operating_system}</strong>'
        f'<br> processor : <strong>{d[0].processor}</strong>'
        f'<br> graphics : <strong>{d[0].graphics}</strong>'
        f'<br> display : <strong>{d[0].display}</strong>'
        f'<br> memory : <strong>{d[0].memory}</strong>'
        f'<br> storage : <strong>{d[0].storage}</strong>'
        f'<br> price : <strong>{d[0].price}</strong>'
        f'</li>'
    )

    rekom_laptop.append(hasil)

    return "hasil perhitungan di dapatkan bahwa Rekomendasi Laptop untuk anda adalah
<ol>" + ''.join(
        rekom_laptop) + "</ol>"

def data_string(data: Kriteria):
    if (data.operating_system == 1):
        data.operating_system = "Windows"
    elif (data.operating_system == 2):
        data.operating_system = "Linux"
    elif (data.operating_system == 3):
        data.operating_system = "Mac OS"
    else:
        data.operating_system = "Unknown"

    if (data.processor == 1):
        data.processor = "Intel"
    elif (data.processor == 2):
        data.processor = "AMD"
    else:
        data.processor = "Unknown"

    if data.graphics == 1:
        data.graphics = "NVIDIA Corporation"
    elif data.graphics == 2:
        data.graphics = "AMD Radeon"
    elif data.graphics == 3:
        data.graphics = "Intel HD"
    else:
        data.graphics = "Unknown"

    if data.display == 1:
        data.display = "Ukuran 11 hingga 12 inchi"
    elif data.display == 2:
        data.display = "Ukuran 13 inchi"
    elif data.display == 3:

```

```

        data.display = "Ukuran 14 hingga 15 inchi"
    elif data.display == 4:
        data.display = "Ukuran 17 hingga 18 inchi"
    else:
        data.display = "Unknown"

    if data.memory == 1:
        data.memory = "2 GB"
    elif data.memory == 2:
        data.memory = "4 GB"
    elif data.memory == 3:
        data.memory = "8 GB"
    elif data.memory == 4:
        data.memory = "12 GB"
    elif data.memory == 5:
        data.memory = "16 GB"
    else:
        data.memory = "Unknown"

    if data.storage == 1:
        data.storage = "Hard Disk Drive (HDD)"
    elif data.storage == 2:
        data.storage = "Solid State Drive (SSD)"
    else:
        data.storage = "Unknown"

    if data.jenis == 1:
        data.jenis = "Pelajar"
    elif data.jenis == 2:
        data.jenis = "Kantor"
    elif data.jenis == 3:
        data.jenis = "Bisnis"
    else:
        data.jenis = "Unknown"

    if data.price == 1:
        data.price = "4jt - 9.99jt"
    elif data.price == 2:
        data.price = "10jt - 15.99jt"
    elif data.price == 3:
        data.price = ">16jt"
    else:
        data.price = "Unknown"

    return data

def jenis_string(jenis):

```

```

if jenis == 1:
    return "Pelajar"
elif jenis == 2:
    return "Kantor"
elif jenis == 3:
    return "Bisnis"
else:
    return "Unknown"

def pengujian3070(k=3):
    # mengambil 100 dataset dari database
    dataset = get_data()

    # dalam pengujian kita akan mengambil 30 data latih dan 70 data testing data dari 100 dataset

    print(f'k : {k}')

    count_data = 2

    # ambil 10 data dengan jenis pelajar
    pelajar = [d for d in dataset if d.jenis == 1]

    data_training_pelajar = pelajar[:10] # data latih pelajar

    data_testing_pelajar = pelajar.copy()
    for dtp in data_training_pelajar:
        if dtp in pelajar:
            data_testing_pelajar.remove(dtp)

    # ambil 10 data dengan jenis kantor
    kantor = [d for d in dataset if d.jenis == 2]

    data_training_kantor = kantor[:10]

    data_testing_kantor = kantor.copy()
    for dtp in data_training_kantor:
        if dtp in kantor:
            data_testing_kantor.remove(dtp)

    # ambil 10 data dengan jenis bisnis
    bisnis = [d for d in dataset if d.jenis == 3]

    data_training_bisnis = bisnis[:10]

    data_testing_bisnis = bisnis.copy()

```

```

for dtp in data_training_bisnis:
    if dtp in bisnis:
        data_testing_bisnis.remove(dtp)

# data training dan testing
data_training = data_training_pelajar + data_training_kantor + data_training_bisnis
data_testing = data_testing_pelajar + data_testing_kantor + data_testing_bisnis

res = []

for d_train in data_training:
    result_list = []
    for d_testing in data_testing:
        operating_system = (d_train.operating_system - d_testing.operating_system) **
2
        processor = (d_train.processor - d_testing.processor) ** 2
        graphics = (d_train.graphics - d_testing.graphics) ** 2
        display = (d_train.display - d_testing.display) ** 2
        memory = (d_train.memory - d_testing.memory) ** 2
        storage = (d_train.storage - d_testing.storage) ** 2
        price = (d_train.price - d_testing.price) ** 2

        result = sqrt(operating_system + processor + graphics + display + memory +
storage + price)

        result_list.append(Hasil(result, d_train.jenis, d_testing.jenis))

    h = sorted(result_list, key=lambda z: z.jarak)

    x = h[:k]

    res.append(x)

aktual = []
prediksi = []

for item in res:
    j = []
    for i in item:
        j.append(i.jenis)

    common = [i for i in item if i.jenis == max(j, key=j.count)]

    aktual.append(common[0].actual_jenis)
    prediksi.append(common[0].jenis)

# print(f'Jenis : {jenis_string(common[0].jenis)}')
# print(f'Actual Jenis : {jenis_string(common[0].actual_jenis)}')

```

```

        return [round(accuracy(aktual, prediksi) * 100, 2)]

def pengujian(k=3, fold=3):
    # mengambil 100 dataset dari database
    dataset = get_data()

    # dalam pengujian kita akan mengambil 30 data dari 100 dataset
    # 6 data sebagai data training/latih
    # 24 data sebagai data testing

    # pengujian akan dilakukan sebanyak 3 fold

    print(f'k : {k}')
    print(f'fold : {fold}')

    init_index = 0
    count_data = 2

    accuracy_list = []

    for idx in range(fold):
        # ambil 10 data dengan jenis pelajar
        pelajar = [d for d in dataset if d.jenis == 1]
        pelajar = pelajar[:10]

        data_training_pelajar = pelajar[init_index:count_data]

        data_testing_pelajar = pelajar.copy()
        for dtp in data_training_pelajar:
            if dtp in pelajar:
                data_testing_pelajar.remove(dtp)

        # ambil 10 data dengan jenis kantor
        kantor = [d for d in dataset if d.jenis == 2]
        kantor = kantor[:10]

        data_training_kantor = kantor[init_index:count_data]

        data_testing_kantor = kantor.copy()
        for dtp in data_training_kantor:
            if dtp in kantor:
                data_testing_kantor.remove(dtp)

        # ambil 10 data dengan jenis bisnis
        bisnis = [d for d in dataset if d.jenis == 3]
        bisnis = bisnis[:10]

```

```

data_training_bisnis = bisnis[init_index:count_data]

data_testing_bisnis = bisnis.copy()

for dtp in data_training_bisnis:
    if dtp in bisnis:
        data_testing_bisnis.remove(dtp)

init_index = count_data
count_data += 2

# data training dan testing
data_training = data_training_pelajar + data_training_kantor +
data_training_bisnis
data_testing = data_testing_pelajar + data_testing_kantor + data_testing_bisnis

res = []

for d_train in data_training:
    result_list = []
    for d_testing in data_testing:
        operating_system = (d_train.operating_system -
d_testing.operating_system) ** 2
        processor = (d_train.processor - d_testing.processor) ** 2
        graphics = (d_train.graphics - d_testing.graphics) ** 2
        display = (d_train.display - d_testing.display) ** 2
        memory = (d_train.memory - d_testing.memory) ** 2
        storage = (d_train.storage - d_testing.storage) ** 2
        price = (d_train.price - d_testing.price) ** 2

        result = sqrt(operating system + processor + graphics + display + memory
+ storage + price)

        result_list.append(Hasil(result, d_train.jenis, d_testing.jenis))

    h = sorted(result_list, key=lambda z: z.jarak)

    x = h[:k]

    res.append(x)

aktual = []
prediksi = []

for item in res:
    j = []
    for i in item:

```

```

        j.append(i.jenis)

    common = [i for i in item if i.jenis == max(j, key=j.count)]

    aktual.append(common[0].actual_jenis)
    prediksi.append(common[0].jenis)

    print(f'akurasi {idx + 1}-fold : {accuracy(aktual, prediksi)}')
    accuracy_list.append(accuracy(aktual, prediksi))

print(f'total akurasi: {round(sum(accuracy_list) / len(accuracy_list) * 100, 2)}')

return accuracy_list

def accuracyNew(aktual, prediksi):
    tp = tn = fp = fn = 0
    n_classes = 3

    # Iterasi data aktual dan prediksi untuk mengisi matrix
    for i in range(len(aktual)):
        for j in range(n_classes):
            if aktual[i] == j and prediksi[i] == j:
                if j == 0:
                    tp += 1
                elif j == 1:
                    tn += 1
            else:
                fn += 1
            elif aktual[i] == j and prediksi[i] != j:
                if j == 0:
                    fn += 1
                elif j == 1:
                    fp += 1
            else:
                tn += 1
            elif aktual[i] != j and prediksi[i] == j:
                if j == 0:
                    fp += 1
                elif j == 1:
                    fn += 1
            else:
                tn += 1
        else:
            if j == 0:
                tn += 1
            elif j == 1:
                fp += 1

```

```

        else:
            fn += 1

# Print matrix dan akurasi
print("Confusion Matrix:")
print("Class 0 - True Positive (TP):", tp)
print("Class 0 - True Negative (TN):", tn)
print("Class 0 - False Positive (FP):", fp)
print("Class 0 - False Negative (FN):", fn)

print("Class 1 - True Positive (TP):", tn)
print("Class 1 - True Negative (TN):", tp)
print("Class 1 - False Positive (FP):", fn)
print("Class 1 - False Negative (FN):", fp)

print("Class 2 - True Positive (TP):", tn)
print("Class 2 - True Negative (TN):", tn)
print("Class 2 - False Positive (FP):", fp)
print("Class 2 - False Negative (FN):", tp)

# Format confusion matrix untuk ditampilkan dalam bentuk tabel
confusion_matrix = [
    ["Class 0", tp, fn, fp],
    ["Class 1", fn, tp, fp],
    ["Class 2", fp, tn, tp]]

# Cetak confusion matrix dalam bentuk tabel
print("Confusion Matrix:")
print(tabulate(confusion_matrix, headers=["", "Predicted 0", "Predicted 1",
    "Predicted 2"]))

accuracy = (tp + tn) / (tp + tn + fp + fn)
print("Accuracy:", accuracy)

return accuracy

def accuracy(aktual, prediksi):
    tp = 0
    for i in range(len(aktual)):
        if aktual[i] == prediksi[i]:
            tp += 1
    return tp / len(aktual)

if __name__ == '__main__':
    app.run(debug=True)

```

Lampiran 1.2 Kebutuhan Laptop

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
1	Asus M415	1	2	2	3	2	2	1	Pelajar
2	Asus E410	1	1	3	3	4	2	1	Pelajar
3	Asus A616	1	1	1	3	3	1	1	Pelajar
4	Asus X415	1	1	1	3	3	1	1	Pelajar
5	Asus E210	1	1	3	1	2	2	1	Pelajar
6	Asus A509	1	1	3	3	2	2	1	Pelajar
7	Asus M509	1	1	3	3	2	2	1	Pelajar
8	Asus A516	1	1	1	3	3	1	1	Pelajar
9	Asus A416	1	1	1	3	3	2	1	Pelajar
10	Asus M409	1	2	2	3	3	2	1	Pelajar
11	Asus X411	1	1	3	3	2	1	1	Pelajar
12	HP 14S-DK1515AU	1	2	2	3	3	2	1	Pelajar
13	HP 14S-FQ1005AU	1	2	2	3	3	2	1	Pelajar
14	HP 14S-DQ2053TU	1	1	3	3	3	2	1	Pelajar
15	HP 14S-FQ1037AU	1	2	2	3	3	2	1	Pelajar
16	HP 14S-FQ1036AU	1	2	2	3	3	2	1	Pelajar
17	HP 14S-DQ0508TU	1	1	3	3	2	2	1	Pelajar
18	HP 14S-DK1510AU	1	2	2	3	2	2	1	Pelajar
19	HP 240 G9 Notebook	1	1	3	3	2	2	1	Pelajar
20	HP 245 G8 Notebook	1	2	2	3	2	2	1	Pelajar
21	HP 14S-DK1524AU	1	2	2	3	2	2	1	Pelajar
22	HP 14S-DK1514AU	1	2	2	3	3	2	1	Pelajar
23	Lenovo Ideapad Slim 3	1	2	2	3	5	1	1	Pelajar
24	Lenovo X1 Carbon	1	1	3	3	5	2	1	Pelajar
25	Lenovo 13S Gen 4	1	2	2	2	5	2	1	Pelajar

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
26	Lenovo Thinkpad E490	1	1	3	3	5	2	1	Pelajar
27	Lenovo Thinkpad E490S	1	1	3	3	5	2	1	Pelajar
28	Lenovo Thinkbook 13S Gen 4	1	2	2	2	5	2	1	Pelajar
29	Lenovo Yoga Slim7i Gen 5	1	1	1	3	3	2	1	Pelajar
30	Lenovo Yoga Slim 7 Gen 5	1	2	2	3	5	2	1	Pelajar
31	Lenovo Thinkpad L390 Yoga	1	1	3	2	5	2	1	Pelajar
32	Lenovo Thinkpad X390 Yoga	1	1	3	2	5	2	1	Pelajar
33	Lenovo Thinkpad X270	1	1	3	1	5	2	1	Pelajar
34	Asus Zenbook UX5401	1	1	3	3	5	2	2	Kantor
35	Asus Zenbook UM325	1	2	2	2	5	2	2	Kantor
36	Asus Zenbook UX325	1	1	3	2	5	2	2	Kantor
37	ASUS VivoBook S14 S433EQ	1	2	2	3	5	2	2	Kantor
38	Asus Zenbook UX435	1	1	1	3	5	2	2	Kantor
39	Asus Zenbook UX325	1	1	3	2	5	2	2	Kantor
40	Asus Zenbook UX425	1	1	3	3	5	2	2	Kantor
41	ASUS VivoBook 14 M413DA	1	2	2	3	5	2	2	Kantor

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
42	Asus Zenbook UX5400	1	1	1	3	5	2	2	Kantor
43	ASUS VivoBook 14 X413DA	1	2	2	3	5	2	2	Kantor
44	Asus Zenbook UP5401	1	1	3	3	5	2	2	Kantor
45	HP Pavilion x360 14-dh2077	1	1	1	3	5	2	2	Kantor
46	HP ProBook 445 G7	1	2	2	3	5	2	2	Kantor
47	HP Envy 13-ba1015TU	1	1	1	2	5	2	2	Kantor
48	HP Pavilion x360 13-bb1030TU	1	2	2	3	5	2	2	Kantor
49	HP Pavilion x360 14-dw1036TU	1	1	3	3	5	2	2	Kantor
50	HP 14-DV0516TX	1	1	1	3	5	2	2	Kantor
51	HP 14-DV0514TX	1	1	3	3	5	2	2	Kantor
52	HP 17-by4314TX	1	2	2	4	5	2	2	Kantor
53	HP Pavilion Gaming 17-cd1010TX	1	2	1	4	5	2	2	Kantor
54	HP 17-ca2061TX	1	2	1	4	5	2	2	Kantor
55	HP Notebook - 17-by0063cl	1	2	2	4	5	2	2	Kantor
56	Lenovo IdeaPad 5 14ALC05	2	2	2	3	5	2	2	Kantor
57	Lenovo ThinkPad T14	2	1	1	3	5	2	2	Kantor
58	Lenovo ThinkPad P15s Gen 2	2	1	1	4	5	2	2	Kantor

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
59	Lenovo ThinkPad E495	2	1	1	3	5	2	2	Kantor
60	Lenovo ThinkPad E14 Gen 2	1	1	3	3	5	2	2	Kantor
61	Lenovo Thinkpad L480	1	1	3	3	5	2	2	Kantor
62	Lenovo Thinkpad L580	1	1	2	3	5	2	1	Kantor
63	Lenovo IdeaPad Flex 5i	2	1	1	3	5	2	2	Kantor
64	Lenovo ThinkPad L14 Gen 2	2	1	1	3	5	2	2	Kantor
65	Lenovo IdeaPad S540	1	1	1	3	5	2	2	Kantor
66	Lenovo IdeaPad 3 15ADA05	1	2	2	3	5	2	2	Kantor
67	Lenovo ThinkPad X1 Carbon Gen 9	1	1	1	3	3	2	3	Bisnis
68	ASUS ExpertBook P2451FA	1	1	1	3	3	2	3	Bisnis
69	Asus Zenbook UX425EA	1	1	1	3	3	2	3	Bisnis
70	Asus Zenbook UX425JA	1	1	1	3	3	2	3	Bisnis
71	ASUSPRO P5440FF-BQ1569R	1	1	1	3	3	2	3	Bisnis
72	ASUS ExpertBook P751	1	2	1	4	5	2	1	Bisnis
73	ASUS ROG Zephyrus G14	1	2	1	4	5	2	3	Bisnis

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
74	Asus ExpertBook B9	1	2	1	3	3	2	3	Bisnis
75	Asus ProArt StudioBook Pro 15	1	2	2	3	3	2	3	Bisnis
76	Asus ExpertBook B9400	1	1	1	3	3	2	3	Bisnis
77	Asus Vivobook TM420	1	2	2	3	5	2	3	Bisnis
78	HP Envy 13-BA1541TU	1	1	3	2	5	2	3	Bisnis
79	HP Envy 13-BA1033TX	1	1	1	2	5	2	3	Bisnis
80	HP Envy 13-BA1032TX	1	1	1	2	5	2	3	Bisnis
81	HP Envy 13-BA1517TU	1	1	3	2	5	2	3	Bisnis
82	HP EliteBook 830 G8 Notebook	1	1	3	2	3	2	3	Bisnis
83	HP Aero 13-BE0003AU	1	2	3	2	5	2	1	Bisnis
84	HP EliteBook 745 G6	1	2	2	3	3	2	3	Bisnis
85	HP 14S-DQ5000TU	1	1	3	3	3	2	1	Bisnis
86	HP EliteBook 840 G8	1	1	1	3	5	2	3	Bisnis
87	HP 14-DY0066TU	1	1	3	3	3	2	2	Bisnis
88	HP 14-EC0014AU	1	2	2	3	5	2	1	Bisnis
89	Lenovo Yoga Slim 9i Gen 7	1	1	3	3	5	2	3	Bisnis
90	Lenovo Yoga Slim 7 Pro	1	2	1	3	5	2	3	Bisnis
91	Lenovo Ideapad Flex 5 Gen 7	1	2	2	3	5	2	3	Bisnis

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
92	HP EliteBook x360 1030 G8	1	2	2	2	5	2	3	Bisnis
93	Lenovo Thinkbook 14S	1	1	2	3	5	2	1	Bisnis
94	Lenovo Legion 7 Gen 6	1	2	1	3	5	2	3	Bisnis
95	Lenovo Legion Slim 7i Gen 7	1	1	1	3	5	2	3	Bisnis
96	Lenovo Legion 5 Pro Gen 7	1	2	1	3	5	2	3	Bisnis
97	Lenovo Thinkpad T490s	1	1	3	3	5	2	1	Bisnis
98	Lenovo Thinkpad T590	1	1	1	3	5	2	3	Bisnis
99	Lenovo Thinkpad T495	1	2	2	3	5	2	1	Bisnis
100	Lenovo Thinkpad T480	1	1	3	3	5	2	1	Bisnis

Lampiran 1.3 Pemilihan 100 Data Laptop

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
1	Asus M415	1	2	2	3	2	2	1	Pelajar
2	Asus E410	1	1	3	3	4	2	1	Pelajar
3	Asus A616	1	1	1	3	3	1	1	Pelajar
4	Asus X415	1	1	1	3	3	1	1	Pelajar
5	Asus E210	1	1	3	1	2	2	1	Pelajar
6	Asus A509	1	1	3	3	2	2	1	Pelajar
7	Asus M509	1	1	3	3	2	2	1	Pelajar
8	Asus A516	1	1	1	3	3	1	1	Pelajar

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
9	Asus A416	1	1	1	3	3	2	1	Pelajar
10	Asus M409	1	2	2	3	3	2	1	Pelajar
11	Asus X411	1	1	3	3	2	1	1	Pelajar
12	HP 14S- DK1515AU	1	2	2	3	3	2	1	Pelajar
13	HP 14S- FQ1005AU	1	2	2	3	3	2	1	Pelajar
14	HP 14S- DQ2053TU	1	1	3	3	3	2	1	Pelajar
15	HP 14S- FQ1037AU	1	2	2	3	3	2	1	Pelajar
16	HP 14S- FQ1036AU	1	2	2	3	3	2	1	Pelajar
17	HP 14S- DQ0508TU	1	1	3	3	2	2	1	Pelajar
18	HP 14S- DK1510AU	1	2	2	3	2	2	1	Pelajar
19	HP 240 G9 Notebook	1	1	3	3	2	2	1	Pelajar
20	HP 245 G8 Notebook	1	2	2	3	2	2	1	Pelajar
21	HP 14S- DK1524AU	1	2	2	3	2	2	1	Pelajar
22	HP 14S- DK1514AU	1	2	2	3	3	2	1	Pelajar
23	Lenovo Ideapad Slim 3	1	2	2	3	5	1	1	Pelajar
24	Lenovo X1 Carbon	1	1	3	3	5	2	1	Pelajar
25	Lenovo 13S Gen 4	1	2	2	2	5	2	1	Pelajar

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
26	Lenovo Thinkpad E490	1	1	3	3	5	2	1	Pelajar
27	Lenovo Thinkpad E490S	1	1	3	3	5	2	1	Pelajar
28	Lenovo Thinkbook 13S Gen 4	1	2	2	2	5	2	1	Pelajar
29	Lenovo Yoga Slim7i Gen 5	1	1	1	3	3	2	1	Pelajar
30	Lenovo Yoga Slim 7 Gen 5	1	2	2	3	5	2	1	Pelajar
31	Lenovo Thinkpad L390 Yoga	1	1	3	2	5	2	1	Pelajar
32	Lenovo Thinkpad X390 Yoga	1	1	3	2	5	2	1	Pelajar
33	Lenovo Thinkpad X270	1	1	3	1	5	2	1	Pelajar
34	Asus Zenbook UX5401	1	1	3	3	5	2	2	Kantor
35	Asus Zenbook UM325	1	2	2	2	5	2	2	Kantor
36	Asus Zenbook UX325	1	1	3	2	5	2	2	Kantor
37	ASUS VivoBook S14 S433EQ	1	2	2	3	5	2	2	Kantor
38	Asus Zenbook UX435	1	1	1	3	5	2	2	Kantor
39	Asus Zenbook UX325	1	1	3	2	5	2	2	Kantor
40	Asus Zenbook UX425	1	1	3	3	5	2	2	Kantor

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
41	ASUS VivoBook 14 M413DA	1	2	2	3	5	2	2	Kantor
42	Asus Zenbook UX5400	1	1	1	3	5	2	2	Kantor
43	ASUS VivoBook 14 X413DA	1	2	2	3	5	2	2	Kantor
44	Asus Zenbook UP5401	1	1	3	3	5	2	2	Kantor
45	HP Pavilion x360 14-dh2077	1	1	1	3	5	2	2	Kantor
46	HP ProBook 445 G7	1	2	2	3	5	2	2	Kantor
47	HP Envy 13- ba1015TU	1	1	1	2	5	2	2	Kantor
48	HP Pavilion x360 13-bb1030TU	1	2	2	3	5	2	2	Kantor
49	HP Pavilion x360 14-dw1036TU	1	1	3	3	5	2	2	Kantor
50	HP 14- DV0516TX	1	1	1	3	5	2	2	Kantor
51	HP 14- DV0514TX	1	1	3	3	5	2	2	Kantor
52	HP 17-by4314TX	1	2	2	4	5	2	2	Kantor
53	HP Pavilion Gaming 17- cd1010TX	1	2	1	4	5	2	2	Kantor
54	HP 17-ca2061TX	1	2	1	4	5	2	2	Kantor
55	HP Notebook - 17-by0063cl	1	2	2	4	5	2	2	Kantor
56	Lenovo IdeaPad 5 14ALC05	2	2	2	3	5	2	2	Kantor

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
57	Lenovo ThinkPad T14	2	1	1	3	5	2	2	Kantor
58	Lenovo ThinkPad P15s Gen 2	2	1	1	4	5	2	2	Kantor
59	Lenovo ThinkPad E495	2	1	1	3	5	2	2	Kantor
60	Lenovo ThinkPad E14 Gen 2	1	1	3	3	5	2	2	Kantor
61	Lenovo Thinkpad L480	1	1	3	3	5	2	2	Kantor
62	Lenovo Thinkpad L580	1	1	2	3	5	2	1	Kantor
63	Lenovo IdeaPad Flex 5i	2	1	1	3	5	2	2	Kantor
64	Lenovo ThinkPad L14 Gen 2	2	1	1	3	5	2	2	Kantor
65	Lenovo IdeaPad S540	1	1	1	3	5	2	2	Kantor
66	Lenovo IdeaPad 3 15ADA05	1	2	2	3	5	2	2	Kantor
67	Lenovo ThinkPad X1 Carbon Gen 9	1	1	1	3	3	2	3	Bisnis
68	ASUS ExpertBook P2451FA	1	1	1	3	3	2	3	Bisnis
69	Asus Zenbook UX425EA	1	1	1	3	3	2	3	Bisnis
70	Asus Zenbook UX425JA	1	1	1	3	3	2	3	Bisnis

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
71	ASUSPRO P5440FF- BQ1569R	1	1	1	3	3	2	3	Bisnis
72	ASUS ExpertBook P751	1	2	1	4	5	2	1	Bisnis
73	ASUS ROG Zephyrus G14	1	2	1	4	5	2	3	Bisnis
74	Asus ExpertBook B9	1	2	1	3	3	2	3	Bisnis
75	Asus ProArt StudioBook Pro 15	1	2	2	3	3	2	3	Bisnis
76	Asus ExpertBook B9400	1	1	1	3	3	2	3	Bisnis
77	Asus Vivobook TM420	1	2	2	3	5	2	3	Bisnis
78	HP Envy 13- BA1541TU	1	1	3	2	5	2	3	Bisnis
79	HP Envy 13- BA1033TX	1	1	1	2	5	2	3	Bisnis
80	HP Envy 13- BA1032TX	1	1	1	2	5	2	3	Bisnis
81	HP Envy 13- BA1517TU	1	1	3	2	5	2	3	Bisnis
82	HP EliteBook 830 G8 Notebook	1	1	3	2	3	2	3	Bisnis
83	HP Aero 13- BE0003AU	1	2	3	2	5	2	1	Bisnis
84	HP EliteBook 745 G6	1	2	2	3	3	2	3	Bisnis

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
85	HP 14S-DQ5000TU	1	1	3	3	3	2	1	Bisnis
86	HP EliteBook 840 G8	1	1	1	3	5	2	3	Bisnis
87	HP 14-DY0066TU	1	1	3	3	3	2	2	Bisnis
88	HP 14-EC0014AU	1	2	2	3	5	2	1	Bisnis
89	Lenovo Yoga Slim 9i Gen 7	1	1	3	3	5	2	3	Bisnis
90	Lenovo Yoga Slim 7 Pro	1	2	1	3	5	2	3	Bisnis
91	Lenovo Ideapad Flex 5 Gen 7	1	2	2	3	5	2	3	Bisnis
92	HP EliteBook x360 1030 G8	1	2	2	2	5	2	3	Bisnis
93	Lenovo Thinkbook 14S	1	1	2	3	5	2	1	Bisnis
94	Lenovo Legion 7 Gen 6	1	2	1	3	5	2	3	Bisnis
95	Lenovo Legion Slim 7i Gen 7	1	1	1	3	5	2	3	Bisnis
96	Lenovo Legion 5 Pro Gen 7	1	2	1	3	5	2	3	Bisnis
97	Lenovo Thinkpad T490s	1	1	3	3	5	2	1	Bisnis
98	Lenovo Thinkpad T590	1	1	1	3	5	2	3	Bisnis
99	Lenovo Thinkpad T495	1	2	2	3	5	2	1	Bisnis
100	Lenovo Thinkpad T480	1	1	3	3	5	2	1	Bisnis

Lampiran 1.4 Estimasi penyelesaian aplikasi

No	Nama Kegiatan	Sub Kegiatan	Estimasi Selesai
1	Communication	-	-
		Pengumpulan Data	2 minggu
		Kebutuhan Fungsional	5 hari
		Kebutuhan Non Fungsional	2 hari
Total Penyelesaian			3 minggu
2	Modelling	-	-
		Rancangan Alur Aplikasi	3 hari
		Rancangan Tampilan	2 hari
		Rancangan Basis Data	2 hari
Total Penyelesaian			1 minggu
3	Construction	-	-
		Pengembangan Tampilan	3 hari
		Pengembangan Basis Data	4 hari
		Pengembangan Aplikasi	2 minggu
Total Penyelesaian			3 minggu
4	Deployment	-	-
		Pengujian ke responden	2 hari
Total Penyelesaian			2 hari

Lampiran 1.5 Rancangan *Table Dataset*

Name	Type	Null	Extra
ID	Int	No	Auto Increment Primary Key
Name	Varchar(100)	No	
Operating_System	Int	No	
Processor	Int	No	
Graphic	Int	No	
Display	Int	No	
Memory	Int	No	
Storage	Int	No	

Name	Type	Null	Extra
Class	Int	No	

Lampiran 1.6 Rancangan *Table Kriteria*

Name	Type	Null	Extra
ID	Int	No	Auto Increment Primary Key
Parent_ID	Int	No	
Title	Varchar(45)	No	
Value	Int	No	

Lampiran 1.7 *Data Latih (30) 1 fold*

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
1	Asus M415	1	2	2	3	2	2	1	Pelajar
2	Asus E410	1	1	3	3	4	2	1	Pelajar
3	Asus A616	1	1	1	3	3	1	1	Pelajar
4	Asus X415	1	1	1	3	3	1	1	Pelajar
5	Asus E210	1	1	3	1	2	2	1	Pelajar
6	Asus A509	1	1	3	3	2	2	1	Pelajar
7	Asus M509	1	1	3	3	2	2	1	Pelajar
8	Asus A516	1	1	1	3	3	1	1	Pelajar
9	Asus A416	1	1	1	3	3	2	1	Pelajar
10	Asus M409	1	2	2	3	3	2	1	Pelajar
11	Asus Zenbook UX5401	1	1	3	3	5	2	2	Kantor
12	Asus Zenbook UM325	1	2	2	2	5	2	2	Kantor
13	Asus Zenbook UX325	1	1	3	2	5	2	2	Kantor
14	ASUS VivoBook S14 S433EQ	1	2	2	3	5	2	2	Kantor
15	Asus Zenbook UX435	1	1	1	3	5	2	2	Kantor
16	Asus Zenbook UX325	1	1	3	2	5	2	2	Kantor
17	Asus Zenbook UX425	1	1	3	3	5	2	2	Kantor
18	ASUS VivoBook 14 M413DA	1	2	2	3	5	2	2	Kantor

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
19	Asus Zenbook UX5400	1	1	1	3	5	2	2	Kantor
20	ASUS VivoBook 14 X413DA	1	2	2	3	5	2	2	Kantor
21	Lenovo ThinkPad X1 Carbon Gen 9	1	1	1	3	3	2	3	Bisnis
22	ASUS ExpertBook P2451FA	1	1	1	3	3	2	3	Bisnis
23	Asus Zenbook UX425EA	1	1	1	3	3	2	3	Bisnis
24	Asus Zenbook UX425JA	1	1	1	3	3	2	3	Bisnis
25	ASUSPRO P5440FF-BQ1569R	1	1	1	3	3	2	3	Bisnis
26	ASUS ExpertBook P751	1	2	1	4	5	2	1	Bisnis
27	ASUS ROG Zephyrus G14	1	2	1	4	5	2	3	Bisnis
28	Asus ExpertBook B9	1	2	1	3	3	2	3	Bisnis
29	Asus ProArt StudioBook Pro 15	1	2	2	3	3	2	3	Bisnis
30	Asus ExpertBook B9400	1	1	1	3	3	2	3	Bisnis

Lampiran 1.8 Data Uji (70) 1 fold

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
11	Asus X411	1	1	3	3	2	1	1	Pelajar
12	HP 14S-DK1515AU	1	2	2	3	3	2	1	Pelajar
13	HP 14S-FQ1005AU	1	2	2	3	3	2	1	Pelajar
14	HP 14S-DQ2053TU	1	1	3	3	3	2	1	Pelajar
15	HP 14S-FQ1037AU	1	2	2	3	3	2	1	Pelajar
16	HP 14S-FQ1036AU	1	2	2	3	3	2	1	Pelajar
17	HP 14S-DQ0508TU	1	1	3	3	2	2	1	Pelajar

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
18	HP 14S-DK1510AU	1	2	2	3	2	2	1	Pelajar
19	HP 240 G9 Notebook	1	1	3	3	2	2	1	Pelajar
20	HP 245 G8 Notebook	1	2	2	3	2	2	1	Pelajar
21	HP 14S-DK1524AU	1	2	2	3	2	2	1	Pelajar
22	HP 14S-DK1514AU	1	2	2	3	3	2	1	Pelajar
23	Lenovo Ideapad Slim 3	1	2	2	3	5	1	1	Pelajar
24	Lenovo X1 Carbon	1	1	3	3	5	2	1	Pelajar
25	Lenovo 13S Gen 4	1	2	2	2	5	2	1	Pelajar
26	Lenovo Thinkpad E490	1	1	3	3	5	2	1	Pelajar
27	Lenovo Thinkpad E490S	1	1	3	3	5	2	1	Pelajar
28	Lenovo Thinkbook 13S Gen 4	1	2	2	2	5	2	1	Pelajar
29	Lenovo Yoga Slim7i Gen 5	1	1	1	3	3	2	1	Pelajar
30	Lenovo Yoga Slim 7 Gen 5	1	2	2	3	5	2	1	Pelajar
31	Lenovo Thinkpad L390 Yoga	1	1	3	2	5	2	1	Pelajar
32	Lenovo Thinkpad X390 Yoga	1	1	3	2	5	2	1	Pelajar
33	Lenovo Thinkpad X270	1	1	3	1	5	2	1	Pelajar
44	Asus Zenbook UP5401	1	1	3	3	5	2	2	Kantor
45	HP Pavilion x360 14-dh2077	1	1	1	3	5	2	2	Kantor
46	HP ProBook 445 G7	1	2	2	3	5	2	2	Kantor
47	HP Envy 13-ba1015TU	1	1	1	2	5	2	2	Kantor
48	HP Pavilion x360 13-bb1030TU	1	2	2	3	5	2	2	Kantor
49	HP Pavilion x360 14-dw1036TU	1	1	3	3	5	2	2	Kantor
50	HP 14-DV0516TX	1	1	1	3	5	2	2	Kantor
51	HP 14-DV0514TX	1	1	3	3	5	2	2	Kantor

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
52	HP 17-by4314TX	1	2	2	4	5	2	2	Kantor
53	HP Pavilion Gaming 17-cd1010TX	1	2	1	4	5	2	2	Kantor
54	HP 17-ca2061TX	1	2	1	4	5	2	2	Kantor
55	HP Notebook - 17-by0063cl	1	2	2	4	5	2	2	Kantor
56	Lenovo IdeaPad 5 14ALC05	2	2	2	3	5	2	2	Kantor
57	Lenovo ThinkPad T14	2	1	1	3	5	2	2	Kantor
58	Lenovo ThinkPad P15s Gen 2	2	1	1	4	5	2	2	Kantor
59	Lenovo ThinkPad E495	2	1	1	3	5	2	2	Kantor
60	Lenovo ThinkPad E14 Gen 2	1	1	3	3	5	2	2	Kantor
61	Lenovo Thinkpad L480	1	1	3	3	5	2	2	Kantor
62	Lenovo Thinkpad L580	1	1	2	3	5	2	1	Kantor
63	Lenovo IdeaPad Flex 5i	2	1	1	3	5	2	2	Kantor
64	Lenovo ThinkPad L14 Gen 2	2	1	1	3	5	2	2	Kantor
65	Lenovo IdeaPad S540	1	1	1	3	5	2	2	Kantor
66	Lenovo IdeaPad 3 15ADA05	1	2	2	3	5	2	2	Kantor
77	Asus Vivobook TM420	1	2	2	3	5	2	3	Bisnis
78	HP Envy 13-BA1541TU	1	1	3	2	5	2	3	Bisnis
79	HP Envy 13-BA1033TX	1	1	1	2	5	2	3	Bisnis
80	HP Envy 13-BA1032TX	1	1	1	2	5	2	3	Bisnis
81	HP Envy 13-BA1517TU	1	1	3	2	5	2	3	Bisnis
82	HP EliteBook 830 G8 Notebook	1	1	3	2	3	2	3	Bisnis
83	HP Aero 13-BE0003AU	1	2	3	2	5	2	1	Bisnis
84	HP EliteBook 745 G6	1	2	2	3	3	2	3	Bisnis

No	Nama	OS	PS	GP	DP	MM	SR	Price	Jenis
85	HP 14S-DQ5000TU	1	1	3	3	3	2	1	Bisnis
86	HP EliteBook 840 G8	1	1	1	3	5	2	3	Bisnis
87	HP 14-DY0066TU	1	1	3	3	3	2	2	Bisnis
88	HP 14-EC0014AU	1	2	2	3	5	2	1	Bisnis
89	Lenovo Yoga Slim 9i Gen 7	1	1	3	3	5	2	3	Bisnis
90	Lenovo Yoga Slim 7 Pro	1	2	1	3	5	2	3	Bisnis
91	Lenovo Ideapad Flex 5 Gen 7	1	2	2	3	5	2	3	Bisnis
92	HP EliteBook x360 1030 G8	1	2	2	2	5	2	3	Bisnis
93	Lenovo Thinkbook 14S	1	1	2	3	5	2	1	Bisnis
94	Lenovo Legion 7 Gen 6	1	2	1	3	5	2	3	Bisnis
95	Lenovo Legion Slim 7i Gen 7	1	1	1	3	5	2	3	Bisnis
96	Lenovo Legion 5 Pro Gen 7	1	2	1	3	5	2	3	Bisnis
97	Lenovo Thinkpad T490s	1	1	3	3	5	2	1	Bisnis
98	Lenovo Thinkpad T590	1	1	1	3	5	2	3	Bisnis
99	Lenovo Thinkpad T495	1	2	2	3	5	2	1	Bisnis
100	Lenovo Thinkpad T480	1	1	3	3	5	2	1	Bisnis

Lampiran 1.9 Menghitung Data Latih (10 data ke kanan dari 30 data)

No	Nama	1	2	3	4	5	6	7	8	9	10
1	Asus X411	1,73	2,24	2,24	2,24	2,24	1,00	1,00	2,24	2,45	2,00
2	HP 14S-DK1515AU	1,00	1,73	1,73	1,73	2,65	1,73	1,73	1,73	1,41	0,00
3	HP 14S-FQ1005AU	1,00	1,73	1,73	1,73	2,65	1,73	1,73	1,73	1,41	0,00
4	HP 14S-DQ2053TU	1,73	1,00	2,24	2,24	2,24	1,00	1,00	2,24	2,00	1,41
5	HP 14S-FQ1037AU	1,00	1,73	1,73	1,73	2,65	1,73	1,73	1,73	1,41	0,00
6	HP 14S-FQ1036AU	1,00	1,73	1,73	1,73	2,65	1,73	1,73	1,73	1,41	0,00
7	HP 14S-DQ0508TU	1,41	2,00	2,45	2,45	2,00	0,00	0,00	2,45	2,24	1,73
8	HP 14S-DK1510AU	0,00	2,45	2,00	2,00	2,45	1,41	1,41	2,00	1,73	1,00
9	HP 240 G9 Notebook	1,41	2,00	2,45	2,45	2,00	0,00	0,00	2,45	2,24	1,73
10	HP 245 G8 Notebook	0,00	2,45	2,00	2,00	2,45	1,41	1,41	2,00	1,73	1,00
11	HP 14S-DK1524AU	0,00	2,45	2,00	2,00	2,45	1,41	1,41	2,00	1,73	1,00
12	HP 14S-DK1514AU	1,00	1,73	1,73	1,73	2,65	1,73	1,73	1,73	1,41	0,00
13	Lenovo Ideapad Slim 3	3,16	2,00	2,45	2,45	4,00	3,46	3,46	2,45	2,65	2,24
14	Lenovo X1 Carbon	3,32	1,00	3,00	3,00	3,61	3,00	3,00	3,00	2,83	2,45

No	Nama	1	2	3	4	5	6	7	8	9	10
15	Lenovo 13S Gen 4	3,16	2,00	2,83	2,83	3,46	3,46	3,46	2,83	2,65	2,24
16	Lenovo Thinkpad E490	3,32	1,00	3,00	3,00	3,61	3,00	3,00	3,00	2,83	2,45
17	Lenovo Thinkpad E490S	3,32	1,00	3,00	3,00	3,61	3,00	3,00	3,00	2,83	2,45
18	Lenovo Thinkbook 13S Gen 4	3,16	2,00	2,83	2,83	3,46	3,46	3,46	2,83	2,65	2,24
19	Lenovo Yoga Slim7i Gen 5	1,73	2,24	1,00	1,00	3,00	2,24	2,24	1,00	0,00	1,41
20	Lenovo Yoga Slim 7 Gen 5	3,00	1,73	2,65	2,65	3,87	3,32	3,32	2,65	2,45	2,00
21	Lenovo Thinkpad L390 Yoga	3,46	1,41	3,16	3,16	3,16	3,16	3,16	3,16	3,00	2,65
22	Lenovo Thinkpad X390 Yoga	3,46	1,41	3,16	3,16	3,16	3,16	3,16	3,16	3,00	2,65
23	Lenovo Thinkpad X270	3,87	2,24	3,61	3,61	3,00	3,61	3,61	3,61	3,46	3,16
24	Asus Zenbook UP5401	3,46	1,41	3,16	3,16	3,74	3,16	3,16	3,16	3,00	2,65

No	Nama	1	2	3	4	5	6	7	8	9	10
25	HP Pavilion x360 14- dh2077	3,46	2,45	2,45	2,45	4,24	3,74	3,74	2,45	2,24	2,65
26	HP ProBook 445 G7	3,16	2,00	2,83	2,83	4,00	3,46	3,46	2,83	2,65	2,24
27	HP Envy 13- ba1015TU	3,61	2,65	2,65	2,65	3,87	3,87	3,87	2,65	2,45	2,83
28	HP Pavilion x360 13- bb1030TU	3,16	2,00	2,83	2,83	4,00	3,46	3,46	2,83	2,65	2,24
29	HP Pavilion x360 14- dw1036TU	3,46	1,41	3,16	3,16	3,74	3,16	3,16	3,16	3,00	2,65
30	HP 14- DV0516TX	3,46	2,45	2,45	2,45	4,24	3,74	3,74	2,45	2,24	2,65
31	HP 14- DV0514TX	3,46	1,41	3,16	3,16	3,74	3,16	3,16	3,16	3,00	2,65
32	HP 17- by4314TX	3,32	2,24	3,00	3,00	4,58	3,61	3,61	3,00	2,83	2,45
33	HP Pavilion Gaming 17- cd1010TX	3,46	2,83	2,83	2,83	4,90	4,00	4,00	2,83	2,65	2,65
34	HP 17- ca2061TX	3,46	2,83	2,83	2,83	4,90	4,00	4,00	2,83	2,65	2,65
35	HP Notebook -	3,32	2,24	3,00	3,00	4,58	3,61	3,61	3,00	2,83	2,45

No	Nama	1	2	3	4	5	6	7	8	9	10
	17- by0063cl										
36	Lenovo IdeaPad 5 14ALC05	3,32	2,24	3,00	3,00	4,12	3,61	3,61	3,00	2,83	2,45
37	Lenovo ThinkPad T14	3,61	2,65	2,65	2,65	4,36	3,87	3,87	2,65	2,45	2,83
38	Lenovo ThinkPad P15s Gen 2	3,74	2,83	2,83	2,83	4,90	4,00	4,00	2,83	2,65	3,00
39	Lenovo ThinkPad E495	3,61	2,65	2,65	2,65	4,36	3,87	3,87	2,65	2,45	2,83
40	Lenovo ThinkPad E14 Gen 2	3,46	1,41	3,16	3,16	3,74	3,16	3,16	3,16	3,00	2,65
41	Lenovo Thinkpad L480	3,46	1,41	3,16	3,16	3,74	3,16	3,16	3,16	3,00	2,65
42	Lenovo Thinkpad L580	3,16	1,41	2,45	2,45	3,74	3,16	3,16	2,45	2,24	2,24
43	Lenovo IdeaPad Flex 5i	3,61	2,65	2,65	2,65	4,36	3,87	3,87	2,65	2,45	2,83
44	Lenovo ThinkPad L14 Gen 2	3,61	2,65	2,65	2,65	4,36	3,87	3,87	2,65	2,45	2,83

No	Nama	1	2	3	4	5	6	7	8	9	10
45	Lenovo IdeaPad S540	3,46	2,45	2,45	2,45	4,24	3,74	3,74	2,45	2,24	2,65
46	Lenovo IdeaPad 3 15ADA05	3,16	2,00	2,83	2,83	4,00	3,46	3,46	2,83	2,65	2,24
47	Asus Vivobook TM420	3,61	2,65	3,32	3,32	4,36	3,87	3,87	3,32	3,16	2,83
48	HP Envy 13- BA1541TU	4,00	2,45	3,74	3,74	3,74	3,74	3,74	3,74	3,61	3,32
49	HP Envy 13- BA1033TX	4,00	3,16	3,16	3,16	4,24	4,24	4,24	3,16	3,00	3,32
50	HP Envy 13- BA1032TX	4,00	3,16	3,16	3,16	4,24	4,24	4,24	3,16	3,00	3,32
51	HP Envy 13- BA1517TU	4,00	2,45	3,74	3,74	3,74	3,74	3,74	3,74	3,61	3,32
52	HP EliteBook 830 G8 Notebook	2,83	2,45	3,16	3,16	2,45	2,45	2,45	3,16	3,00	2,65
53	HP Aero 13- BE0003AU	3,32	1,73	3,32	3,32	3,32	3,32	3,32	3,32	3,16	2,45

No	Nama	1	2	3	4	5	6	7	8	9	10
54	HP EliteBook 745 G6	2,24	2,65	2,65	2,65	3,32	2,65	2,65	2,65	2,45	2,00
55	HP 14S- DQ5000TU	1,73	1,00	2,24	2,24	2,24	1,00	1,00	2,24	2,00	1,41
56	HP EliteBook 840 G8	3,87	3,00	3,00	3,00	4,58	4,12	4,12	3,00	2,83	3,16
57	HP 14- DY0066TU	2,00	1,41	2,45	2,45	2,45	1,41	1,41	2,45	2,24	1,73
58	HP 14- EC0014AU	3,00	1,73	2,65	2,65	3,87	3,32	3,32	2,65	2,45	2,00
59	Lenovo Yoga Slim 9i Gen 7	3,87	2,24	3,61	3,61	4,12	3,61	3,61	3,61	3,46	3,16
60	Lenovo Yoga Slim 7 Pro	3,74	3,16	3,16	3,16	4,69	4,24	4,24	3,16	3,00	3,00
61	Lenovo Ideapad Flex 5 Gen 7	3,61	2,65	3,32	3,32	4,36	3,87	3,87	3,32	3,16	2,83
62	HP EliteBook x360 1030 G8	3,74	2,83	3,46	3,46	4,00	4,00	4,00	3,46	3,32	3,00
63	Lenovo Thinkbook 14S	3,16	1,41	2,45	2,45	3,74	3,16	3,16	2,45	2,24	2,24

No	Nama	1	2	3	4	5	6	7	8	9	10
64	Lenovo Legion 7 Gen 6	3,74	3,16	3,16	3,16	4,69	4,24	4,24	3,16	3,00	3,00
65	Lenovo Legion Slim 7i Gen 7	3,87	3,00	3,00	3,00	4,58	4,12	4,12	3,00	2,83	3,16
66	Lenovo Legion 5 Pro Gen 7	3,74	3,16	3,16	3,16	4,69	4,24	4,24	3,16	3,00	3,00
67	Lenovo Thinkpad T490s	3,32	1,00	3,00	3,00	3,61	3,00	3,00	3,00	2,83	2,45
68	Lenovo Thinkpad T590	3,87	3,00	3,00	3,00	4,58	4,12	4,12	3,00	2,83	3,16
69	Lenovo Thinkpad T495	3,00	1,73	2,65	2,65	3,87	3,32	3,32	2,65	2,45	2,00
70	Lenovo Thinkpad T480	3,32	1,00	3,00	3,00	3,61	3,00	3,00	3,00	2,83	2,45

Lampiran 1.10 Menghitung Data Latih (20 data ke kanan dari 30 data)

No	Nama	11	12	13	14	15	16	17	18	19	20
1	Asus X411	3,32	3,74	3,46	3,61	3,87	3,46	3,32	3,61	3,87	3,61
2	HP 14S-DK1515A U	2,65	2,45	2,83	2,24	2,65	2,83	2,65	2,24	2,65	2,24
3	HP 14S-FQ1005AU	2,65	2,45	2,83	2,24	2,65	2,83	2,65	2,24	2,65	2,24
4	HP 14S-DQ2053TU	2,24	2,83	2,45	2,65	3,00	2,45	2,24	2,65	3,00	2,65
5	HP 14S-FQ1037AU	2,65	2,45	2,83	2,24	2,65	2,83	2,65	2,24	2,65	2,24
6	HP 14S-FQ1036AU	2,65	2,45	2,83	2,24	2,65	2,83	2,65	2,24	2,65	2,24
7	HP 14S-DQ0508TU	3,16	3,61	3,32	3,46	3,74	3,00	3,16	3,46	3,74	3,46
8	HP 14S-DK1510A U	3,46	3,32	3,61	3,16	3,46	3,61	3,46	3,16	3,46	3,16
9	HP 240 G9 Notebook	3,16	3,61	3,32	3,46	3,74	3,32	3,16	3,46	3,74	3,46
10	HP 245 G8 Notebook	3,46	3,32	3,61	3,16	3,46	3,61	3,46	3,16	3,46	3,16
11	HP 14S-DK1524A U	3,46	3,32	3,61	3,16	3,46	3,61	3,46	3,16	3,46	3,16
12	HP 14S-DK1514A U	2,65	2,45	2,83	2,24	2,65	2,83	2,65	2,24	2,65	2,24

No	Nama	11	12	13	14	15	16	17	18	19	20
13	Lenovo Ideapad Slim 3	2,00	1,73	2,24	1,41	2,00	2,24	2,00	1,41	2,00	1,41
14	Lenovo X1 Carbon	1,00	2,00	1,41	1,73	2,24	1,41	1,00	1,73	2,24	1,73
15	Lenovo 13S Gen 4	2,00	1,00	1,73	1,41	2,00	1,73	2,00	1,41	2,00	1,41
16	Lenovo Thinkpad E490	1,00	2,00	1,41	1,73	2,24	1,41	1,00	1,73	2,24	1,73
17	Lenovo Thinkpad E490S	1,00	2,00	1,41	1,73	2,24	1,41	1,00	1,73	2,24	1,73
18	Lenovo Thinkbook 13S Gen 4	2,00	1,00	1,73	1,41	2,00	1,73	2,00	1,41	2,00	1,41
19	Lenovo Yoga Slim7i Gen 5	3,00	2,83	3,16	2,65	2,24	3,16	3,00	2,65	2,24	2,65
20	Lenovo Yoga Slim 7 Gen 5	1,73	1,41	2,00	1,00	1,73	2,00	1,73	1,00	1,73	1,00
21	Lenovo Thinkpad L390 Yoga	1,41	1,73	1,00	2,00	2,45	1,00	1,41	2,00	2,45	2,00
22	Lenovo Thinkpad X390 Yoga	1,41	1,73	1,00	2,00	2,45	1,00	1,41	2,00	2,45	2,00

No	Nama	11	12	13	14	15	16	17	18	19	20
23	Lenovo Thinkpad X270	2,24	2,00	1,41	2,65	3,00	1,41	2,24	2,65	3,00	2,65
24	Asus Zenbook UP5401	0,00	1,73	1,00	1,41	2,00	1,00	0,00	1,41	2,00	1,41
25	HP Pavilion x360 14-dh2077	2,00	1,73	2,24	1,41	0,00	2,24	2,00	1,41	0,00	1,41
26	HP ProBook 445 G7	1,41	1,00	1,73	0,00	1,41	1,73	1,41	0,00	1,41	0,00
27	HP Envy 13-ba1015TU	2,24	1,41	2,00	1,73	1,00	2,00	2,24	1,73	1,00	1,73
28	HP Pavilion x360 13-bb1030TU	1,41	1,00	1,73	0,00	1,41	1,73	1,41	0,00	1,41	0,00
29	HP Pavilion x360 14-dw1036TU	0,00	1,73	1,00	1,41	2,00	1,00	0,00	1,41	2,00	1,41
30	HP 14-DV0516TX	2,00	1,73	2,24	1,41	0,00	2,24	2,00	1,41	0,00	1,41
31	HP 14-DV0514TX	0,00	1,73	1,00	1,41	2,00	1,00	0,00	1,41	2,00	1,41
32	HP 17-by4314TX	1,73	2,00	2,45	1,00	1,73	2,45	1,73	1,00	1,73	1,00

No	Nama	11	12	13	14	15	16	17	18	19	20
33	HP Pavilion Gaming 17-cd1010TX	2,45	2,24	3,00	1,41	1,41	3,00	2,45	1,41	1,41	1,41
34	HP 17-ca2061TX	2,45	2,24	3,00	1,41	1,41	3,00	2,45	1,41	1,41	1,41
35	HP Notebook - 17-by0063cl	1,73	2,00	2,45	1,00	1,73	2,45	1,73	1,00	1,73	1,00
36	Lenovo IdeaPad 5 14ALC05	1,73	1,41	2,00	1,00	1,73	2,00	1,73	1,00	1,73	1,00
37	Lenovo ThinkPad T14	2,24	2,00	2,45	1,73	1,00	2,45	2,24	1,73	1,00	1,73
38	Lenovo ThinkPad P15s Gen 2	2,45	2,65	3,00	2,00	1,41	3,00	2,45	2,00	1,41	2,00
39	Lenovo ThinkPad E495	2,24	2,00	2,45	1,73	1,00	2,45	2,24	1,73	1,00	1,73
40	Lenovo ThinkPad E14 Gen 2	0,00	1,73	1,00	1,41	2,00	1,00	0,00	1,41	2,00	1,41
41	Lenovo Thinkpad L480	0,00	1,73	1,00	1,41	2,00	1,00	0,00	1,41	2,00	1,41
42	Lenovo Thinkpad L580	1,41	1,73	1,73	1,41	1,41	1,73	1,41	1,41	1,41	1,41

No	Nama	11	12	13	14	15	16	17	18	19	20
43	Lenovo IdeaPad Flex 5i	2,24	2,00	2,45	1,73	1,00	2,45	2,24	1,73	1,00	1,73
44	Lenovo ThinkPad L14 Gen 2	2,24	2,00	2,45	1,73	1,00	2,45	2,24	1,73	1,00	1,73
45	Lenovo IdeaPad S540	2,00	1,73	2,24	1,41	0,00	2,24	2,00	1,41	0,00	1,41
46	Lenovo IdeaPad 3 15ADA05	1,41	1,00	1,73	0,00	1,41	1,73	1,41	0,00	1,41	0,00
47	Asus Vivobook TM420	1,73	1,41	2,00	1,00	1,73	2,00	1,73	1,00	1,73	1,00
48	HP Envy 13- BA1541TU	1,41	1,73	1,00	2,00	2,45	1,00	1,41	2,00	2,45	2,00
49	HP Envy 13- BA1033TX	2,45	1,73	2,24	2,00	1,41	2,24	2,45	2,00	1,41	2,00
50	HP Envy 13- BA1032TX	2,45	1,73	2,24	2,00	1,41	2,24	2,45	2,00	1,41	2,00
51	HP Envy 13- BA1517TU	1,41	1,73	1,00	2,00	2,45	1,00	1,41	2,00	2,45	2,00
52	HP EliteBook	2,45	2,65	2,24	2,83	3,16	2,24	2,45	2,83	3,16	2,83

No	Nama	11	12	13	14	15	16	17	18	19	20
	830 G8 Notebook										
53	HP Aero 13-BE0003AU	1,73	1,41	1,41	1,73	2,65	1,41	1,73	1,73	2,65	1,73
54	HP EliteBook 745 G6	2,65	2,45	2,83	2,24	2,65	2,83	2,65	2,24	2,65	2,24
55	HP 14S-DQ5000TU	2,24	2,83	2,45	2,65	3,00	2,45	2,24	2,65	3,00	2,65
56	HP EliteBook 840 G8	2,24	2,00	2,45	1,73	1,00	2,45	2,24	1,73	1,00	1,73
57	HP 14-DY0066TU	2,00	2,65	2,24	2,45	2,83	2,24	2,00	2,45	2,83	2,45
58	HP 14-EC0014AU	1,73	1,41	2,00	1,00	1,73	2,00	1,73	1,00	1,73	1,00
59	Lenovo Yoga Slim 9i Gen 7	1,00	2,00	1,41	1,73	2,24	1,41	1,00	1,73	2,24	1,73
60	Lenovo Yoga Slim 7 Pro	2,45	1,73	2,65	1,41	1,41	2,65	2,45	1,41	1,41	1,41
61	Lenovo Ideapad Flex 5 Gen 7	1,73	1,41	2,00	1,00	1,73	2,00	1,73	1,00	1,73	1,00
62	HP EliteBook	2,00	1,00	1,73	1,41	2,00	1,73	2,00	1,41	2,00	1,41

No	Nama	11	12	13	14	15	16	17	18	19	20
	x360 1030 G8										
63	Lenovo Thinkbook 14S	1,41	1,73	1,73	1,41	1,41	1,73	1,41	1,41	1,41	1,41
64	Lenovo Legion 7 Gen 6	2,45	1,73	2,65	1,41	1,41	2,65	2,45	1,41	1,41	1,41
65	Lenovo Legion Slim 7i Gen 7	2,24	2,00	2,45	1,73	1,00	2,45	2,24	1,73	1,00	1,73
66	Lenovo Legion 5 Pro Gen 7	2,45	1,73	2,65	1,41	1,41	2,65	2,45	1,41	1,41	1,41
67	Lenovo Thinkpad T490s	1,00	2,00	1,41	1,73	2,24	1,41	1,00	1,73	2,24	1,73
68	Lenovo Thinkpad T590	2,24	2,00	2,45	1,73	1,00	2,45	2,24	1,73	1,00	1,73
69	Lenovo Thinkpad T495	1,73	1,41	2,00	1,00	1,73	2,00	1,73	1,00	1,73	1,00
70	Lenovo Thinkpad T480	1,00	2,00	1,41	1,73	2,24	1,41	1,00	1,73	2,24	1,73

Lampiran 1.11 Menghitung Data Latih (30 data ke kanan dari 30 data)

No	Nama	21	22	23	24	25	26	27	28	29	30
1	Asus X411	3,16	3,16	3,16	3,16	3,16	4,47	4,47	3,32	2,83	3,16
2	HP 14S- DK1515A U	2,45	2,45	2,45	2,45	2,45	3,16	3,16	2,24	2,00	2,45
3	HP 14S- FQ1005AU	2,45	2,45	2,45	2,45	2,45	3,16	3,16	2,24	2,00	2,45
4	HP 14S- DQ2053TU	2,83	2,83	2,83	2,83	2,83	3,74	3,74	3,00	2,45	2,83
5	HP 14S- FQ1037AU	2,45	2,45	2,45	2,45	2,45	3,16	3,16	2,24	2,00	2,45
6	HP 14S- FQ1036AU	2,45	2,45	2,45	2,45	2,45	3,16	3,16	2,24	2,00	2,45
7	HP 14S- DQ0508TU	3,00	3,00	3,00	3,00	3,00	4,36	4,36	3,16	2,65	3,00
8	HP 14S- DK1510A U	2,65	2,65	2,65	2,65	2,65	3,87	3,87	2,45	2,24	2,65
9	HP 240 G9 Notebook	3,00	3,00	3,00	3,00	3,00	4,36	4,36	3,16	2,65	3,00
10	HP 245 G8 Notebook	2,65	2,65	2,65	2,65	2,65	3,87	3,87	2,45	2,24	2,65
11	HP 14S- DK1524A U	2,65	2,65	2,65	2,65	2,65	3,87	3,87	2,45	2,24	2,65

No	Nama	21	22	23	24	25	26	27	28	29	30
12	HP 14S-DK1514A U	2,45	2,45	2,45	2,45	2,45	3,16	3,16	2,24	2,00	2,45
13	Lenovo Ideapad Slim 3	3,32	3,32	3,32	3,32	3,32	2,65	2,65	3,16	3,00	3,32
14	Lenovo X1 Carbon	3,46	3,46	3,46	3,46	3,46	3,16	3,16	3,61	3,16	3,46
15	Lenovo 13S Gen 4	3,32	3,32	3,32	3,32	3,32	3,00	3,00	3,16	3,00	3,32
16	Lenovo Thinkpad E490	3,46	3,46	3,46	3,46	3,46	3,16	3,16	3,61	3,16	3,46
17	Lenovo Thinkpad E490S	3,46	3,46	3,46	3,46	3,46	3,16	3,16	3,61	3,16	3,46
18	Lenovo Thinkbook 13S Gen 4	3,32	3,32	3,32	3,32	3,32	3,00	3,00	3,16	3,00	3,32
19	Lenovo Yoga Slim7i Gen 5	2,00	2,00	2,00	2,00	2,00	3,16	3,16	2,24	2,45	2,00
20	Lenovo Yoga Slim 7 Gen 5	3,16	3,16	3,16	3,16	3,16	2,45	2,45	3,00	2,83	3,16
21	Lenovo Thinkpad L390 Yoga	3,61	3,61	3,61	3,61	3,61	3,61	3,61	3,74	3,32	3,61

No	Nama	21	22	23	24	25	26	27	28	29	30
22	Lenovo Thinkpad X390 Yoga	3,61	3,61	3,61	3,61	3,61	3,61	3,61	3,74	3,32	3,61
23	Lenovo Thinkpad X270	4,00	4,00	4,00	4,00	4,00	4,24	4,24	4,12	3,74	4,00
24	Asus Zenbook UP5401	3,00	3,00	3,00	3,00	3,00	2,65	2,65	3,16	2,65	3,00
25	HP Pavilion x360 14-dh2077	2,24	2,24	2,24	2,24	2,24	1,73	1,73	2,45	2,65	2,24
26	HP ProBook 445 G7	2,65	2,65	2,65	2,65	2,65	1,73	1,73	2,45	2,24	2,65
27	HP Envy 13-ba1015TU	2,45	2,45	2,45	2,45	2,45	2,45	2,45	2,65	2,83	2,45
28	HP Pavilion x360 13-bb1030TU	2,65	2,65	2,65	2,65	2,65	1,73	1,73	2,45	2,24	2,65
29	HP Pavilion x360 14-dw1036TU	3,00	3,00	3,00	3,00	3,00	2,65	2,65	3,16	2,65	3,00
30	HP 14-DV0516TX	2,24	2,24	2,24	2,24	2,24	1,73	1,73	2,45	2,65	2,24
31	HP 14-DV0514TX	3,00	3,00	3,00	3,00	3,00	2,65	2,65	3,16	2,65	3,00

No	Nama	21	22	23	24	25	26	27	28	29	30
32	HP 17-by4314TX	2,83	2,83	2,83	2,83	2,83	1,41	1,41	2,65	2,45	2,83
33	HP Pavilion Gaming 17-cd1010TX	2,65	2,65	2,65	2,65	2,65	1,00	1,00	2,45	2,65	2,65
34	HP 17-ca2061TX	2,65	2,65	2,65	2,65	2,65	1,00	1,00	2,45	2,65	2,65
35	HP Notebook - 17-by0063cl	2,83	2,83	2,83	2,83	2,83	1,41	1,41	2,65	2,45	2,83
36	Lenovo IdeaPad 5 14ALC05	2,83	2,83	2,83	2,83	2,83	2,00	2,00	2,65	2,45	2,83
37	Lenovo ThinkPad T14	2,45	2,45	2,45	2,45	2,45	2,00	2,00	2,65	2,83	2,45
38	Lenovo ThinkPad P15s Gen 2	2,65	2,65	2,65	2,65	2,65	1,73	1,73	2,83	3,00	2,65
39	Lenovo ThinkPad E495	2,45	2,45	2,45	2,45	2,45	2,00	2,00	2,65	2,83	2,45
40	Lenovo ThinkPad E14 Gen 2	3,00	3,00	3,00	3,00	3,00	2,65	2,65	3,16	2,65	3,00
41	Lenovo Thinkpad L480	3,00	3,00	3,00	3,00	3,00	2,65	2,65	3,16	2,65	3,00

No	Nama	21	22	23	24	25	26	27	28	29	30
42	Lenovo Thinkpad L580	3,00	3,00	3,00	3,00	3,00	2,65	2,65	3,16	3,00	3,00
43	Lenovo IdeaPad Flex 5i	2,45	2,45	2,45	2,45	2,45	2,00	2,00	2,65	2,83	2,45
44	Lenovo ThinkPad L14 Gen 2	2,45	2,45	2,45	2,45	2,45	2,00	2,00	2,65	2,83	2,45
45	Lenovo IdeaPad S540	2,24	2,24	2,24	2,24	2,24	1,73	1,73	2,45	2,65	2,24
46	Lenovo IdeaPad 3 15ADA05	2,65	2,65	2,65	2,65	2,65	1,73	1,73	2,45	2,24	2,65
47	Asus Vivobook TM420	2,45	2,45	2,45	2,45	2,45	1,41	1,41	2,24	2,00	2,45
48	HP Envy 13-BA1541TU	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,16	2,65	3,00
49	HP Envy 13-BA1033TX	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,45	2,65	2,24
50	HP Envy 13-BA1032TX	2,24	2,24	2,24	2,24	2,24	2,24	2,24	2,45	2,65	2,24
51	HP Envy 13-BA1517TU	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,16	2,65	3,00

No	Nama	21	22	23	24	25	26	27	28	29	30
52	HP EliteBook 830 G8 Notebook	2,24	2,24	2,24	2,24	2,24	3,61	3,61	2,45	1,73	2,24
53	HP Aero 13- BE0003AU	3,74	3,74	3,74	3,74	3,74	3,46	3,46	3,61	3,16	3,74
54	HP EliteBook 745 G6	1,41	1,41	1,41	1,41	1,41	2,45	2,45	1,00	0,00	1,41
55	HP 14S- DQ5000TU	2,83	2,83	2,83	2,83	2,83	3,74	3,74	3,00	2,45	2,83
56	HP EliteBook 840 G8	2,00	2,00	2,00	2,00	2,00	1,41	1,41	2,24	2,45	2,00
57	HP 14- DY0066TU	2,24	2,24	2,24	2,24	2,24	3,32	3,32	2,45	1,73	2,24
58	HP 14- EC0014AU	3,16	3,16	3,16	3,16	3,16	2,45	2,45	3,00	2,83	3,16
59	Lenovo Yoga Slim 9i Gen 7	2,83	2,83	2,83	2,83	2,83	2,45	2,45	3,00	2,45	2,83
60	Lenovo Yoga Slim 7 Pro	2,24	2,24	2,24	2,24	2,24	1,00	1,00	2,00	2,24	2,24
61	Lenovo Ideapad Flex 5 Gen 7	2,45	2,45	2,45	2,45	2,45	1,41	1,41	2,24	2,00	2,45

No	Nama	21	22	23	24	25	26	27	28	29	30
62	HP EliteBook x360 1030 G8	2,65	2,65	2,65	2,65	2,65	2,24	2,24	2,45	2,24	2,65
63	Lenovo Thinkbook 14S	3,00	3,00	3,00	3,00	3,00	2,65	2,65	3,16	3,00	3,00
64	Lenovo Legion 7 Gen 6	2,24	2,24	2,24	2,24	2,24	1,00	1,00	2,00	2,24	2,24
65	Lenovo Legion Slim 7i Gen 7	2,00	2,00	2,00	2,00	2,00	1,41	1,41	2,24	2,45	2,00
66	Lenovo Legion 5 Pro Gen 7	2,24	2,24	2,24	2,24	2,24	1,00	1,00	2,00	2,24	2,24
67	Lenovo Thinkpad T490s	3,46	3,46	3,46	3,46	3,46	3,16	3,16	3,61	3,16	3,46
68	Lenovo Thinkpad T590	2,00	2,00	2,00	2,00	2,00	1,41	1,41	2,24	2,45	2,00
69	Lenovo Thinkpad T495	3,16	3,16	3,16	3,16	3,16	2,45	2,45	3,00	2,83	3,16
70	Lenovo Thinkpad T480	3,46	3,46	3,46	3,46	3,46	3,16	3,16	3,61	3,16	3,46