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COMB SORTING

1. **Isi dari file pada folder lib**

    a. combsort.dart

```dart
1    import 'package:flutter/material.dart';
2
3    void main() {
4      runApp(MaterialApp(
5        home: MyCombSortPage(),
6      )); // MaterialApp
7    }
8
9    class MyCombSortPage extends StatefulWidget {
10     const MyCombSortPage({Key? key}) : super(key: key);
11
12     @override
13     _MyCombSortPageState createState() => _MyCombSortPageState();
14   }
15
16   class _MyCombSortPageState extends State<MyCombSortPage> {
17     final TextEditingController tecData = TextEditingController();
18     final TextEditingController tecSblmUrut = TextEditingController();
19     final TextEditingController tecStlhUrut = TextEditingController();
20     List<int> arr = [];
21     List<int> originalArr = [];
22
```

```
23    void addData() {
24      if (tecData.text.isNotEmpty) {
25        int newData = int.tryParse(tecData.text) ?? 0;
26        originalArr.add(newData);
27        tecData.clear();
28        updateDataTextFields();
29        setState(() {});
30      }
31    }
32
33    Future<void> sortNumbers() async {
34      tecSblmUrut.text = originalArr.toString();
35      setState(() {});
36
37      await combSort();
38    }
39
40    void sortData() {
41      arr = List<int>.from(originalArr);
42      arr.sort();
43      updateDataTextFields();
44      setState(() {});
45    }

47    void clearData() {
48      arr.clear();
49      originalArr.clear();
50      tecSblmUrut.clear();
51      tecStlhUrut.clear();
52      setState(() {});
53    }
54
55    Future<void> combSort() async {
56      int gap = arr.length;
57      bool swapped;
58
59      do {
60        gap = (gap * 10) ~/ 13;
61        if (gap < 1) {
62          gap = 1;
63        }
64
65        swapped = false;
66
67        for (int i = 0; i < arr.length - gap; i++) {
68          if (arr[i] > arr[i + gap] && arr[i] != arr[i + gap]) {
69            arr[i] ^= arr[i + gap];
```

```
70              arr[i + gap] ^= arr[i];
71              arr[i] ^= arr[i + gap];
72              swapped = true;
73              showGapBox(gap);
74          }
75        }
76      } while (gap > 1 || swapped);
77
78      updateDataTextFields();
79      setState(() {});
80    }
81
82    List<String> getLangkahPengerjaan() {
83      List<String> langkahPengerjaan = [];
84      List<int> tempArr = List<int>.from(originalArr);
85      int gap = tempArr.length;
86      bool swapped;
87
88      int stepNumber = 1;
89
90      do {
91        gap = (gap * 10) ~/ 13;
92        if (gap < 1) {
93          gap = 1;
94        }
```

```dart
 96          swapped = false;
 97          String stepDescription = 'Langkah-$stepNumber: ';
 98
 99          for (int i = 0; i < tempArr.length - gap; i++) {
100            if (tempArr[i] > tempArr[i + gap]) {
101              if (tempArr[i] != tempArr[i + gap]) {
102                int temp = tempArr[i];
103                tempArr[i] = tempArr[i + gap];
104                tempArr[i + gap] = temp;
105
106                stepDescription += 'Pertukaran: ${tempArr[i]} <-> ${tempArr[i + gap]}, ';
107                swapped = true;
108              }
109            }
110          }
111
112          stepDescription += 'Setelah iterasi gap: ${tempArr.join(", ")}';
113          langkahPengerjaan.add(stepDescription);
114
115          stepNumber++;
116        } while (gap > 1 || swapped);

118        return langkahPengerjaan;
119      }
120
121      void showLangkahPengerjaanDialog() {
122        List<String> langkahPengerjaan = getLangkahPengerjaan();
123        showDialog(
124          context: context,
125          builder: (context) => LangkahLangkahDialog(
126            langkahPengerjaan: langkahPengerjaan,
127            dataSebelumUrut: originalArr,
128          ),
129        );
130      }
131
132      void showGapBox(int gap) {
133        showDialog(
134          context: context,
135          builder: (context) => GapBoxDialog(
136            gap: gap,
137          ),
138        );
139      }
140
```

```dart
141        Widget buildNumberBoxes(List<int> numbers) {
142          return Wrap(
143            spacing: 8.0,
144            runSpacing: 8.0,
145            children: numbers.map((number) {
146              return Container(
147                padding: EdgeInsets.all(8.0),
148                decoration: BoxDecoration(
149                  border: Border.all(color: Colors.blueGrey.shade300),
150                  borderRadius: BorderRadius.circular(8.0),
151                  color: Colors.blueGrey.shade500,
152                ),  // BoxDecoration
153                child: Text(
154                  number.toString(),
155                  style: TextStyle(color: Colors.white),
156                ),  // Text
157              );  // Container
158            }).toList(),
159          );  // Wrap
160        }
161
162        void updateDataTextFields() {
163          tecSblmUrut.text = originalArr.toString();
164          tecStlhUrut.text = arr.toString();
165        }
166
167        @override
168        Widget build(BuildContext context) {
169          return Scaffold(
170            appBar: AppBar(
171              title: Text('Comb Sort'),
172              centerTitle: true,
173              backgroundColor: Colors.grey.shade100,
174            ),  // AppBar
175            backgroundColor: Colors.blueGrey,
176            body: SingleChildScrollView(
177              child: Padding(
178                padding: const EdgeInsets.all(16.0),
179                child: Column(
180                  mainAxisAlignment: MainAxisAlignment.start,
181                  crossAxisAlignment: CrossAxisAlignment.center,
182                  children: [
183                    Row(
```

```dart
184              children: [
185                Expanded(
186                  child: TextField(
187                    controller: tecData,
188                    keyboardType: TextInputType.number,
189                    decoration: InputDecoration(
190                      labelText: 'Masukkan data',
191                      filled: true,
192                      fillColor: Colors.grey[100],
193                      border: OutlineInputBorder(
194                        borderRadius: BorderRadius.circular(10.0),
195                      ), // OutlineInputBorder
196                    ), // InputDecoration
197                  ), // TextField
198                ), // Expanded
199                SizedBox(width: 16.0),
200                ElevatedButton(
201                  onPressed: () {
202                    addData();
203                  },
204                  style: ButtonStyle(
205                    backgroundColor: MaterialStateProperty.all<Color>(Colors.blueGrey.shade700),
206                  ), // ButtonStyle
207                  child: Text(
208                    'Tambah Data',
209                    style: TextStyle(color: Colors.white),
210                  ), // Text
211                ), // ElevatedButton
212              ],
213            ), // Row
214            SizedBox(height: 10.0),
215            Row(
216              mainAxisAlignment: MainAxisAlignment.spaceAround,
217              children: [
218                ElevatedButton(
219                  onPressed: () {
220                    sortData();
221                  },
222                  style: ButtonStyle(
223                    backgroundColor: MaterialStateProperty.all<Color>(Colors.blueGrey.shade700),
224                  ), // ButtonStyle
225                  child: Text(
226                    'Urutkan Data',
227                    style: TextStyle(color: Colors.white),
228                  ), // Text
229                ), // ElevatedButton
230                ElevatedButton(
231                  onPressed: () {
```

```dart
232                              clearData();
233                            },
234                            style: ButtonStyle(
235                              backgroundColor: MaterialStateProperty.all<Color>(Colors.blueGrey.shade700),
236                            ), // ButtonStyle
237                            child: Text(
238                              'Hapus Data',
239                              style: TextStyle(color: Colors.white),
240                            ), // Text
241                          ), // ElevatedButton
242                        ],
243                      ), // Row
244                      SizedBox(height: 16.0),
245                      Container(
246                        margin: EdgeInsets.symmetric(vertical: 8.0),
247                        padding: EdgeInsets.all(16.0),
248                        decoration: BoxDecoration(
249                          color: Colors.grey[100],
250                          borderRadius: BorderRadius.circular(10.0),
251                        ), // BoxDecoration
252                        child: Column(
253                          crossAxisAlignment: CrossAxisAlignment.start,
254                          children: [
255                            Text(
256                              'Data sebelum pengurutan:',
257                              style: TextStyle(fontSize: 18.0),
258                            ), // Text
259                            SizedBox(height: 8.0),
260                            buildNumberBoxes(originalArr),
261                          ],
262                        ), // Column
263                      ), // Container
264                      SizedBox(height: 8.0),
265                      Container(
266                        margin: EdgeInsets.symmetric(vertical: 8.0),
267                        padding: EdgeInsets.all(16.0),
268                        decoration: BoxDecoration(
269                          color: Colors.grey[100],
270                          borderRadius: BorderRadius.circular(10.0),
271                        ), // BoxDecoration
272                        child: Column(
273                          crossAxisAlignment: CrossAxisAlignment.start,
274                          children: [
275                            Text(
276                              'Data sesudah pengurutan:',
277                              style: TextStyle(fontSize: 18.0),
278                            ), // Text
279                            SizedBox(height: 8.0),
```

```
280                          └── buildNumberBoxes(arr),
281                        │   ],
282                        ),  // Column
283                      ),  // Container
284                  ──  SizedBox(height: 16.0),
285                  ──  ElevatedButton(
286                        onPressed: () async {
287                          await sortNumbers();
288                          showLangkahPengerjaanDialog();
289                        },
290                        style: ButtonStyle(
291   ▪                      backgroundColor: MaterialStateProperty.all<Color>(Colors.blueGrey.shade700),
292                        ),  // ButtonStyle
293                      ── child: Text(
294                          'Lihat Langkah-langkah',
295   ▫                      style: TextStyle(color: Colors.white),
296                        ),  // Text
297                      ),  // ElevatedButton
298                    ],
299                  ),  // Column
300                ),  // Padding
301              ),  // SingleChildScrollView
302            );  // Scaffold
303          }
304        }
304        }
305
306      class LangkahLangkahDialog extends StatelessWidget {
307        final List<String> langkahPengerjaan;
308        final List<int> dataSebelumUrut;
309
310        LangkahLangkahDialog({required this.langkahPengerjaan, required this.dataSebelumUrut});
311
312        @override
313   ◎↑   Widget build(BuildContext context) {
314          return Dialog(
315          ── child: SingleChildScrollView(
316            ── child: Container(
317                padding: EdgeInsets.all(16.0),
318              ── child: Column(
319                  mainAxisSize: MainAxisSize.min,
320                  crossAxisAlignment: CrossAxisAlignment.start,
321                  children: [
322                  ── Text(
323                      'Data Sebelum Diurutkan: ${dataSebelumUrut.toString()}',
324                      style: TextStyle(fontSize: 16.0, fontWeight: FontWeight.bold),
325                    ),  // Text
326                  ── SizedBox(height: 8.0),
327                  ── Divider(),
```

```
328             —— SizedBox(height: 8.0),
329             —— Text(
330                     'Langkah-langkah Pengurutan',
331                     style: TextStyle(fontSize: 18.0, fontWeight: FontWeight.bold),
332                 ), // Text
333             —— SizedBox(height: 8.0),
334             —— Column(
335                 crossAxisAlignment: CrossAxisAlignment.start,
336                 children: langkahPengerjaan
337                     .asMap()
338                     .entries
339                     .map(
340                       (entry) => Padding(
341                     padding: const EdgeInsets.only(bottom: 8.0),
342                     child: Container(
343                       padding: EdgeInsets.all(8.0),
344                       decoration: BoxDecoration(
345                         border: Border.all(color: Colors.blueGrey.shade300),
346                         borderRadius: BorderRadius.circular(8.0),
347                         color: Colors.blueGrey.shade500,
348                       ), // BoxDecoration
349                       child: Text(
350                         '${entry.value}',
351                         style: TextStyle(color: Colors.white),
352                       ), // Text
```

```
353                        ),  // Container
354                      ),  // Padding
355                    )
356                    .toList(),
357              ),  // Column
358          ── SizedBox(height: 8.0),
359          ── Divider(),
360          ── SizedBox(height: 8.0),
361          ── Align(
362                alignment: Alignment.center,
363              ─ child: TextButton(
364                onPressed: () {
365                  Navigator.of(context).pop();
366                },
367              ─ child: Text(
368                  'Tutup'.
369                ),  // Text
370              ),  // TextButton
371            ),  // Align
372          ],
373        ),  // Column
374      ),  // Container
375    ),  // SingleChildScrollView
376  );  // Dialog
377  }
378 }
379
380 class GapBoxDialog extends StatelessWidget {
381   final int gap;
382
383   GapBoxDialog({required this.gap});
384
385   @override
386 ⊙↑ Widget build(BuildContext context) {
387     return Dialog(
388     ─ child: Container(
389        padding: EdgeInsets.all(16.0),
390      ─ child: Column(
391          mainAxisSize: MainAxisSize.min,
392          children: [
393          ── Text(
394              'Gap pada Iterasi: $gap',
395              style: TextStyle(fontSize: 18.0, fontWeight: FontWeight.bold),
396            ),  // Text
397          ── SizedBox(height: 8.0),
398          ── Container(
399              padding: EdgeInsets.all(8.0),
400              decoration: BoxDecoration(
```

```
401          border: Border.all(color: Colors.blueGrey.shade300),
402          borderRadius: BorderRadius.circular(8.0),
403          color: Colors.blueGrey.shade500,
404        ), // BoxDecoration
405        child: Text(
406          'Iterasi Gap ke-$gap',
407          style: TextStyle(color: Colors.white),
408        ), // Text
409      ), // Container
410      SizedBox(height: 8.0),
411      Align(
412        alignment: Alignment.center,
413        child: TextButton(
414          onPressed: () {
415            Navigator.of(context).pop();
416          },
417          child: Text(
418            'Tutup',
419          ), // Text
420        ), // TextButton
421      ), // Align
422    ],
423    ), // Column
424    ), // Container
425    ); // Dialog
426  }
427 }
428
```

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b. main.dart (hanya sebagai contoh)

```dart
import 'package:flutter/material.dart';
import 'package:combsort/combsort.dart';

void main() {
  runApp(const MyApp());
}

class MyApp extends StatelessWidget {
  const MyApp({super.key});

  // This widget is the root of your application.
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      title: 'Flutter Demo',
      theme: ThemeData(
        colorScheme: ColorScheme.fromSeed(seedColor: Colors.deepPurple),
        useMaterial3: true,
      ),
      debugShowCheckedModeBanner: false,
      home: MyCombSortPage(),
    );
  }
}
```

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2. Ouput dari aplikasi

a. Gambar 1 (Tampilan design)

b. Gambar 2 (memasukkan data)

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c. Gambar 2 (langkah langkah combsort)

3. Link channel Youtube berisi penjelasan dan penggunaan aplikasi
Link : https://youtu.be/lpLZ0IEgjd4

Catatan:

- *Mohon masing-masing peserta ujian mengikuti template ini.*
- *Jika anda tidak mengikuti format template ini, maka akan menyulitkan proses penilaian dan akan mengurangi penilaian anda.*