

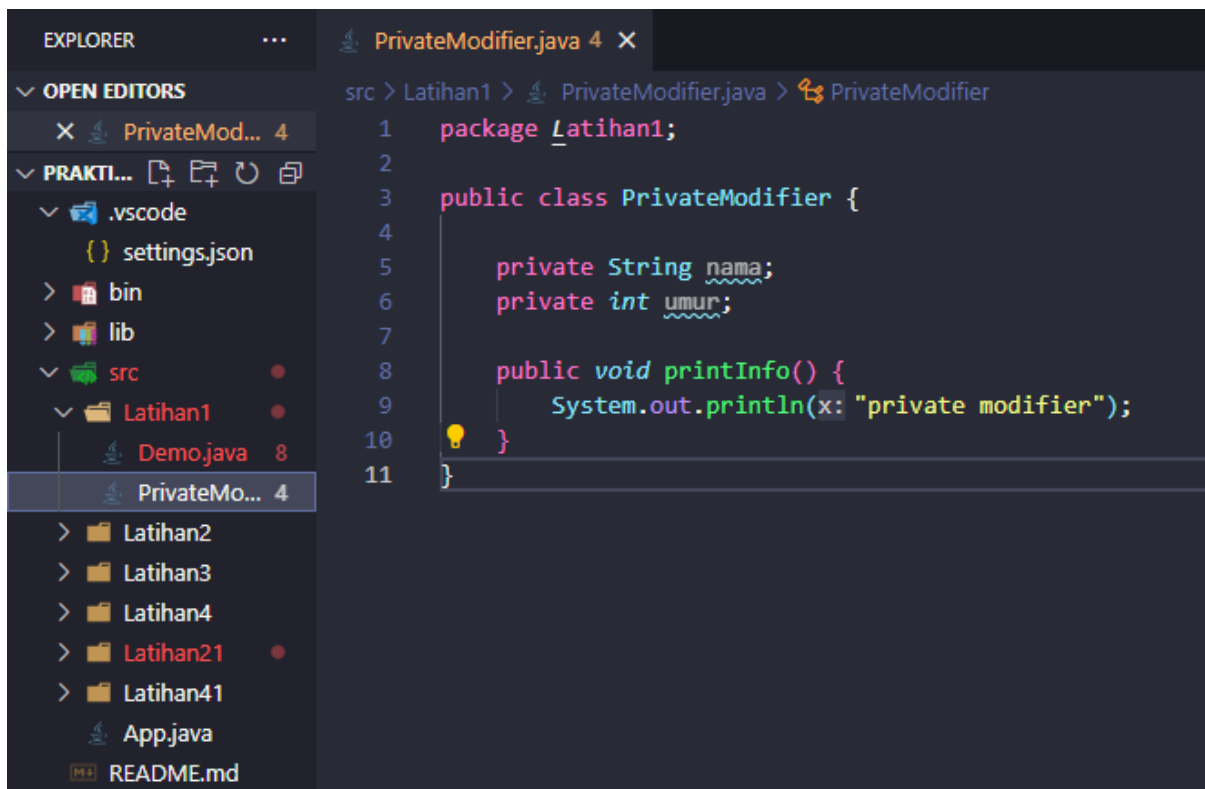
**PRAKTIKUM**  
**PEMROGRAMAN BERORIENTASI OBJEK**



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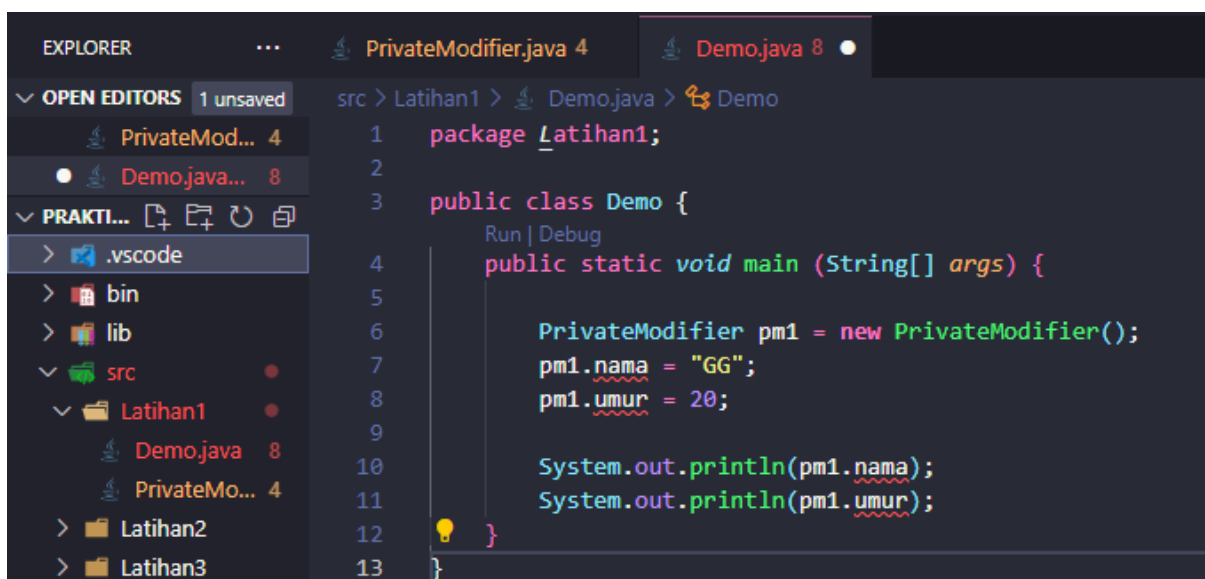
**PROGRAM STUDI TEKNIK INFORMATIKA**  
**FAKULTAS KOMUNIKASI DAN INFORMATIKA**  
**UNIVERSITAS MUHAMMADIYAH SURAKARTA**  
**TAHUN 2022/2023**

### 4.1.1 Latihan



The screenshot shows the Visual Studio Code editor with the Explorer sidebar on the left. The Explorer shows a project structure with folders 'Latihan1' through 'Latihan41' and files 'Demo.java' and 'PrivateMo...'. The main editor area displays the 'PrivateModifier.java' file with the following code:

```
1 package Latihan1;
2
3 public class PrivateModifier {
4
5     private String nama;
6     private int umur;
7
8     public void printInfo() {
9         System.out.println(x: "private modifier");
10    }
11 }
```



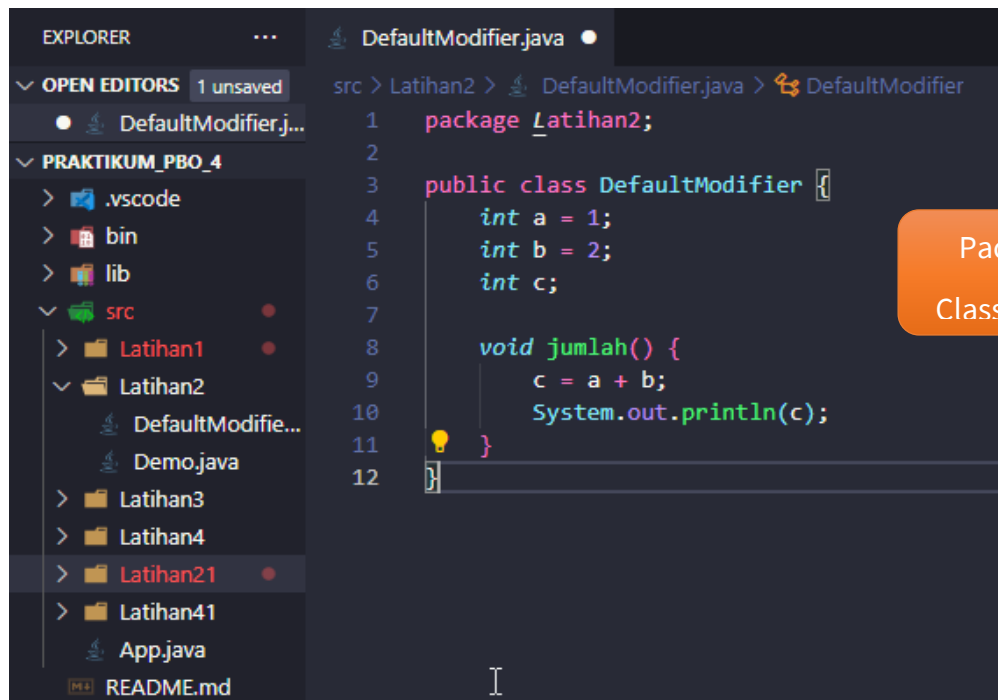
The screenshot shows the Visual Studio Code editor with the Explorer sidebar on the left. The Explorer shows a project structure with folders 'Latihan1' through 'Latihan3' and files 'Demo.java' and 'PrivateMo...'. The main editor area displays the 'Demo.java' file with the following code:

```
1 package Latihan1;
2
3 public class Demo {
4     Run | Debug
5     public static void main (String[] args) {
6
7         PrivateModifier pm1 = new PrivateModifier();
8         pm1.nama = "GG";
9         pm1.umur = 20;
10
11         System.out.println(pm1.nama);
12         System.out.println(pm1.umur);
13     }
14 }
```

Variabel nama dan umur tidak bisa diakses karena memiliki akses private, sehingga yang bisa mengakses variabel nama dan umur hanya class tertentu atau yang mendeklarasikan variabel tersebut. Class lain tidak bisa mengakses variabel tersebut walaupun berada dalam satu package yang sama.

## 4.2.1 Latihan

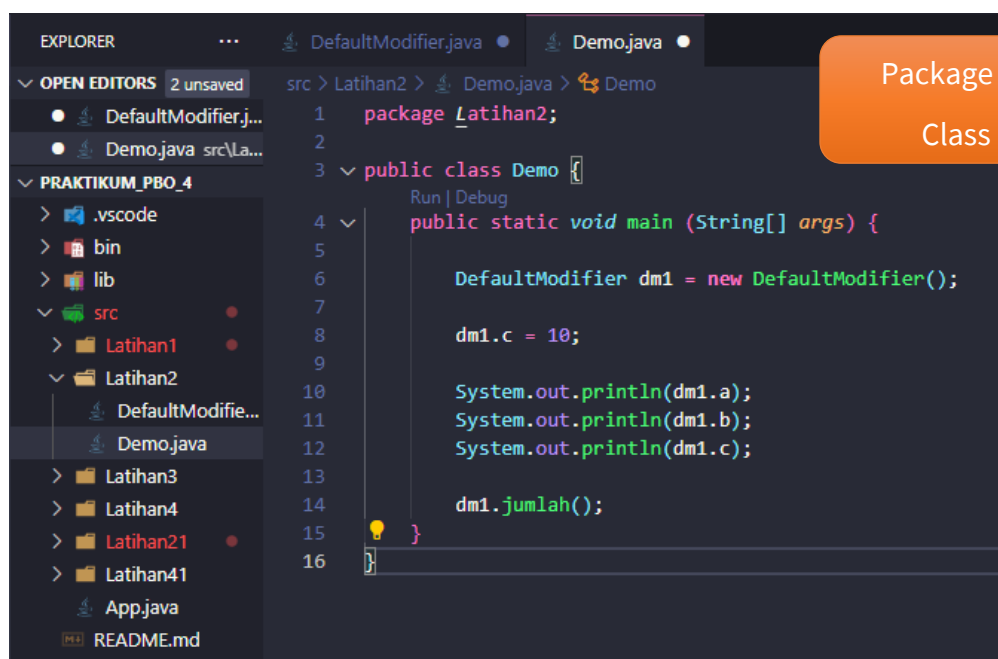
1.



The screenshot shows the VS Code interface with the Explorer panel on the left and the Editor panel on the right. The Explorer panel shows the project structure with the 'src' folder expanded, revealing the 'Latihan2' folder. The Editor panel shows the 'DefaultModifier.java' file with the following code:

```
1 package Latihan2;
2
3 public class DefaultModifier {
4     int a = 1;
5     int b = 2;
6     int c;
7
8     void jumlah() {
9         c = a + b;
10        System.out.println(c);
11    }
12 }
```

An orange callout box on the right side of the editor contains the text: "Package Latihan2" and "Class DefaultModifier".



The screenshot shows the VS Code interface with the Explorer panel on the left and the Editor panel on the right. The Explorer panel shows the project structure with the 'src' folder expanded, revealing the 'Latihan2' folder. The Editor panel shows the 'Demo.java' file with the following code:

```
1 package Latihan2;
2
3 public class Demo {
4     public static void main (String[] args) {
5
6         DefaultModifier dm1 = new DefaultModifier();
7
8         dm1.c = 10;
9
10        System.out.println(dm1.a);
11        System.out.println(dm1.b);
12        System.out.println(dm1.c);
13
14        dm1.jumlah();
15    }
16 }
```

An orange callout box on the right side of the editor contains the text: "Package Latihan2" and "Class Demo".

Variabel dan method pada class 'DefaultModifier' bisa diakses pada class 'Demo', karena variabel dan method dari program diatas memiliki akses default secara otomatis. Sehingga variabel maupun method bisa diakses class lain dalam satu package yang sama.

2.

```

src > Latihan21 > valo.java > valo
1  package Latihan21;
2
3  import Latihan2.DefaultModifier;
4
5  public class valo {
6      Run | Debug
7      public static void main (String[] args) {
8
9          DefaultModifier dm2 = new DefaultModifier();
10
11          dm2.c = 10;
12
13          System.out.println(dm2.a);
14          System.out.println(dm2.b);
15          System.out.println(dm2.c);
16
17          dm2.jumlah();
18      }

```

Package Latihan21  
Class valo

Pada package 'Latihan21' kemudian class 'valo' seperti program diatas. Variabel dan method pada class 'DefaultModifier' tidak bisa diakses class lain yang berbeda package, karena bertipe default. Sehingga class 'valo' tidak bisa mengakses karena berada di dalam package yang berbeda.

#### 4.3.1 Latihan

```

src > Latihan3 > ProtectedModifier.java > ProtectedModifier
1  package Latihan3;
2
3  public class ProtectedModifier {
4
5      protected void printInfo() {
6          System.out.println(x: "Protected Modifier");
7      }
8
9      protected void sendMessage() {
10         System.out.println(x: "this is a message");
11     }
12 }

```

The screenshot shows the VS Code interface with two files open: ProtectedModifier.java and Demo.java. Both files are located in the package Latihan3. The Demo.java file contains the following code:

```
1 package Latihan3;
2
3 public class Demo {
4     Run | Debug
5     public static void main (String[] args) {
6
7         ProtectedModifier prm1 = new ProtectedModifier();
8
9         prm1.printInfo();
10        prm1.sendMessage();
11    }
```

Method pada class 'ProtectedModifier' bisa diakses class 'Demo' dan berada dalam satu package yang sama yaitu 'Latihan3'. Jika dibandingkan dengan dua modifier sebelumnya yaitu private dan default modifier, protected modifier lebih fleksibel karena bisa diakses class lain dalam package sama serta seluruh subclass-nya meskipun berada di package yang berbeda.

#### 4.4.1 Latihan

1.

The screenshot shows the VS Code interface with three files open: PublicModifier.java, Demo.java, and Track.java. The PublicModifier.java file is located in the package Latihan4 and contains the following code:

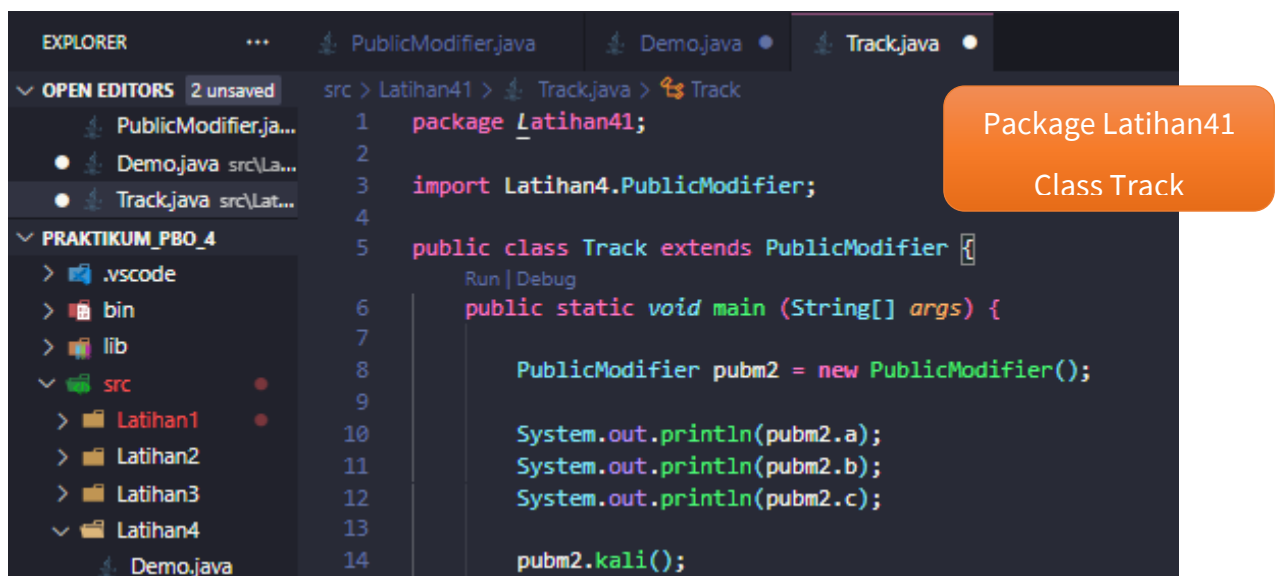
```
1 package Latihan4;
2
3 public class PublicModifier {
4
5     public int a = 2;
6     public int b = 5;
7     public int c = 9;
8
9     public void kali() {
10        int d = a*b*c;
11        System.out.println("Hasil kali = " + d);
12    }
13 }
```

An orange callout box on the right side of the code editor contains the text: "Package Latihan4" and "Class PublicModifier".



```
1 package Latihan4;
2
3 public class Demo {
4     public static void main (String[] args) {
5
6         PublicModifier pubm1 = new PublicModifier();
7
8         System.out.println(pubm1.a);
9         System.out.println(pubm1.b);
10        System.out.println(pubm1.c);
11
12        pubm1.kali();
13    }
14 }
```

Package Latihan4  
Class Demo



```
1 package Latihan41;
2
3 import Latihan4.PublicModifier;
4
5 public class Track extends PublicModifier {
6     public static void main (String[] args) {
7
8         PublicModifier pubm2 = new PublicModifier();
9
10        System.out.println(pubm2.a);
11        System.out.println(pubm2.b);
12        System.out.println(pubm2.c);
13
14        pubm2.kali();
15    }
16 }
```

Package Latihan41  
Class Track

Pada Latihan 4.2.1 variabel dan method pada class 'DefaultModifier' bisa diakses class lain dalam satu package yang sama. Class lain yang berada di package yang berbeda tidak bisa mengakses variabel dan method tersebut. Kemudian pada latihan 4.4.1 variabel dan method pada class 'PublicModifier' bisa diakses class lain dalam satu package yang sama maupun package yang berbeda.

2.

The screenshot shows the Visual Studio Code editor with the Explorer sidebar on the left. The Explorer shows a project structure with folders 'Latihan1', 'Latihan2', 'Latihan3', and 'Latihan4'. The 'Latihan4' folder is expanded, showing files 'Demo.java', 'PublicModifier.java', 'Latihan21', 'Latihan41', 'App.java', and 'README.md'. The 'PublicModifier.java' file is open in the editor. The code defines a package 'Latihan4', a public class 'PublicModifier', and several methods: 'kali()', 'tambah()', 'kurang()', 'bagi()', and 'rata\_rata()'. The 'rata\_rata()' method is highlighted with a yellow lightbulb icon. An orange callout box on the right contains the text 'Package Latihan4' and 'Class PublicModifier'.

```
src > Latihan4 > PublicModifier.java > PublicModifier > rata_rata()
1 package Latihan4;
2
3 public class PublicModifier {
4
5     public int a = 2;
6     public int b = 5;
7     public int c = 9;
8
9     public void kali() {
10         int d = a*b*c;
11         System.out.println("Hasil kali = " + d);
12     }
13
14     public void tambah() {
15         int d = a+b+c;
16         System.out.println("Hasil tambah = " + d);
17     }
18
19     public void kurang() {
20         int d = a-b-c;
21         System.out.println("Hasil kurang = " + d);
22     }
23
24     public void bagi() {
25         int d = a/b/c;
26         System.out.println("Hasil bagi = " + d);
27     }
28
29     public void rata_rata() {
30         int d = (a+b+c)/3;
31         System.out.println("Hasil rata-rata = " + d);
32     }
33 }
```

The screenshot shows the Visual Studio Code editor with the Explorer sidebar on the left. The Explorer shows a project structure with folders 'Latihan1', 'Latihan2', 'Latihan3', and 'Latihan4'. The 'Latihan4' folder is expanded, showing files 'Demo.java', 'PublicModifier.java', 'Latihan21', 'Latihan41', 'App.java', and 'README.md'. The 'Track.java' file is open in the editor. The code defines a package 'Latihan41', imports 'Latihan4.PublicModifier', and defines a public class 'Track' that extends 'PublicModifier'. The 'Track' class has a 'main' method that creates an instance of 'PublicModifier' and calls its methods. An orange callout box on the right contains the text 'Package Latihan41' and 'Class Track'.

```
src > Latihan41 > Track.java > Track
1 package Latihan41;
2
3 import Latihan4.PublicModifier;
4
5 public class Track extends PublicModifier {
6     public static void main (String[] args) {
7
8         PublicModifier pubm2 = new PublicModifier();
9
10        System.out.println(pubm2.a);
11        System.out.println(pubm2.b);
12        System.out.println(pubm2.c);
13
14        pubm2.kali();
15        pubm2.tambah();
16        pubm2.kurang();
17        pubm2.bagi();
18        pubm2.rata_rata();
19    }
20 }
```