

TUGAS PEMROGRAMAN BERORIENTASI OBJEK

PRAKTIKUM 6

(Abstract Dan Interface)



Disusun oleh :

TEGUH ALDIANTO

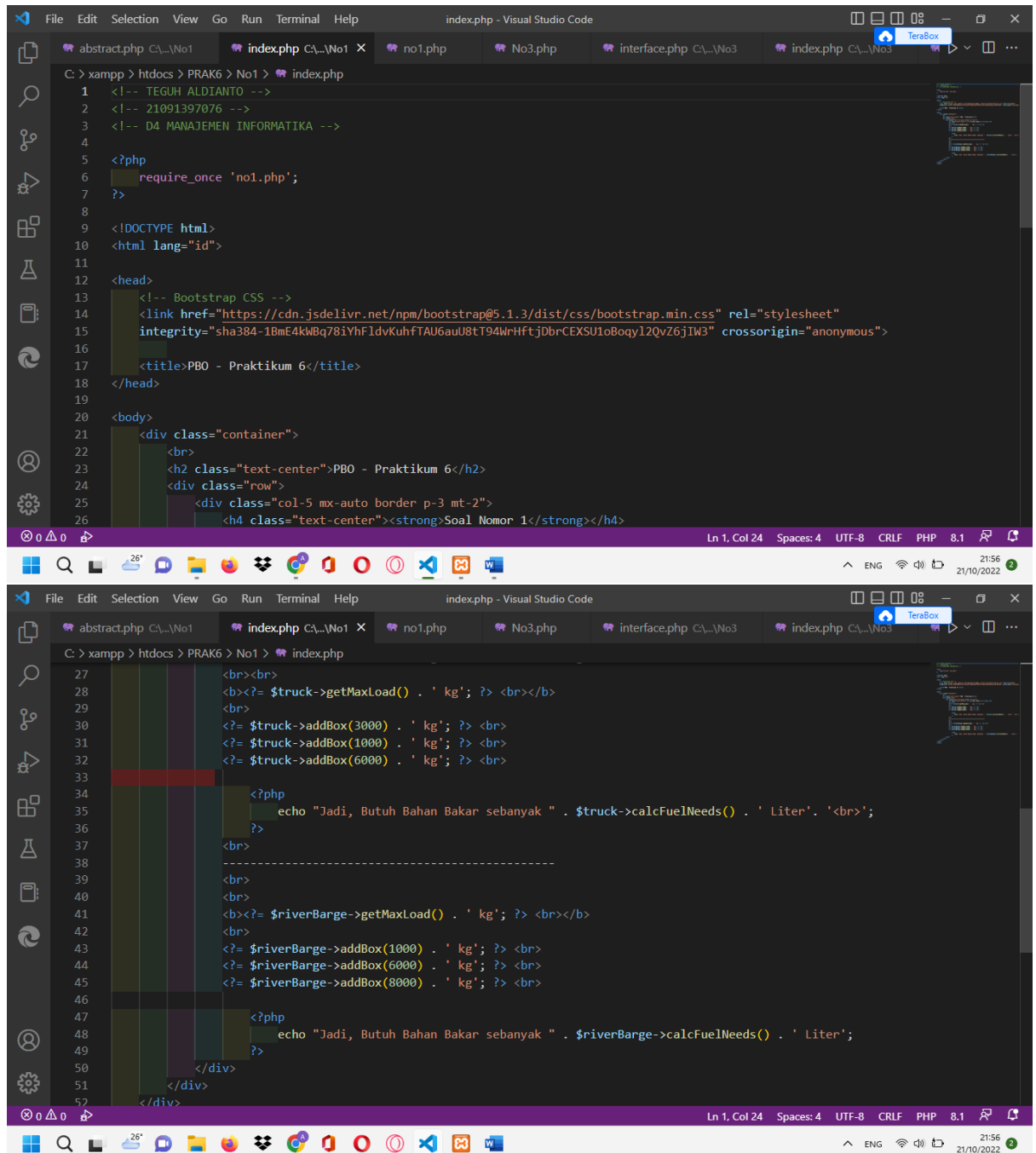
21091397076

D4 MANAJEMEN INFORMATIKA

UNIVERSITAS NEGERI SURABAYA

2022

1. Source code :



```
1 <!-- TEGUH ALDIANTO -->
2 <!-- 21091397076 -->
3 <!-- D4 MANAJEMEN INFORMATIKA -->
4
5 <?php
6     require_once 'no1.php';
7 >
8
9 <!DOCTYPE html>
10 <html lang="id">
11
12 <head>
13     <!-- Bootstrap CSS -->
14     <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.3/dist/css/bootstrap.min.css" rel="stylesheet"
15         integrity="sha384-1BmE4kWBq78iYhF1dvKuhfTAU6auU8tT94WtHftjDbrCEXSU1oBoqyl2QvZ6jIW3" crossorigin="anonymous">
16
17     <title>PBO - Praktikum 6</title>
18 </head>
19
20 <body>
21     <div class="container">
22         <br>
23         <h2 class="text-center">PBO - Praktikum 6</h2>
24         <div class="row">
25             <div class="col-5 mx-auto border p-3 mt-2">
26                 <h4 class="text-center"><strong>Soal Nomor 1</strong></h4>
27
28                 <br><br>
29                 <b><?=> $truck->getMaxLoad() . ' kg'; ?> <br></b>
30                 <br>
31                 <?=> $truck->addBox(3000) . ' kg'; ?> <br>
32                 <?=> $truck->addBox(1000) . ' kg'; ?> <br>
33                 <?=> $truck->addBox(6000) . ' kg'; ?> <br>
34
35                 <?php
36                     echo "Jadi, Butuh Bahan Bakar sebanyak " . $truck->calcFuelNeeds() . ' Liter'. '<br>';
37                 ?>
38
39                 <br>
40                 <br>
41                 <b><?=> $riverBarge->getMaxLoad() . ' kg'; ?> <br></b>
42                 <br>
43                 <?=> $riverBarge->addBox(1000) . ' kg'; ?> <br>
44                 <?=> $riverBarge->addBox(6000) . ' kg'; ?> <br>
45                 <?=> $riverBarge->addBox(8000) . ' kg'; ?> <br>
46
47                 <?php
48                     echo "Jadi, Butuh Bahan Bakar sebanyak " . $riverBarge->calcFuelNeeds() . ' Liter';
49                 ?>
50             </div>
51         </div>
52     </div>
53 </body>
54 </html>
```

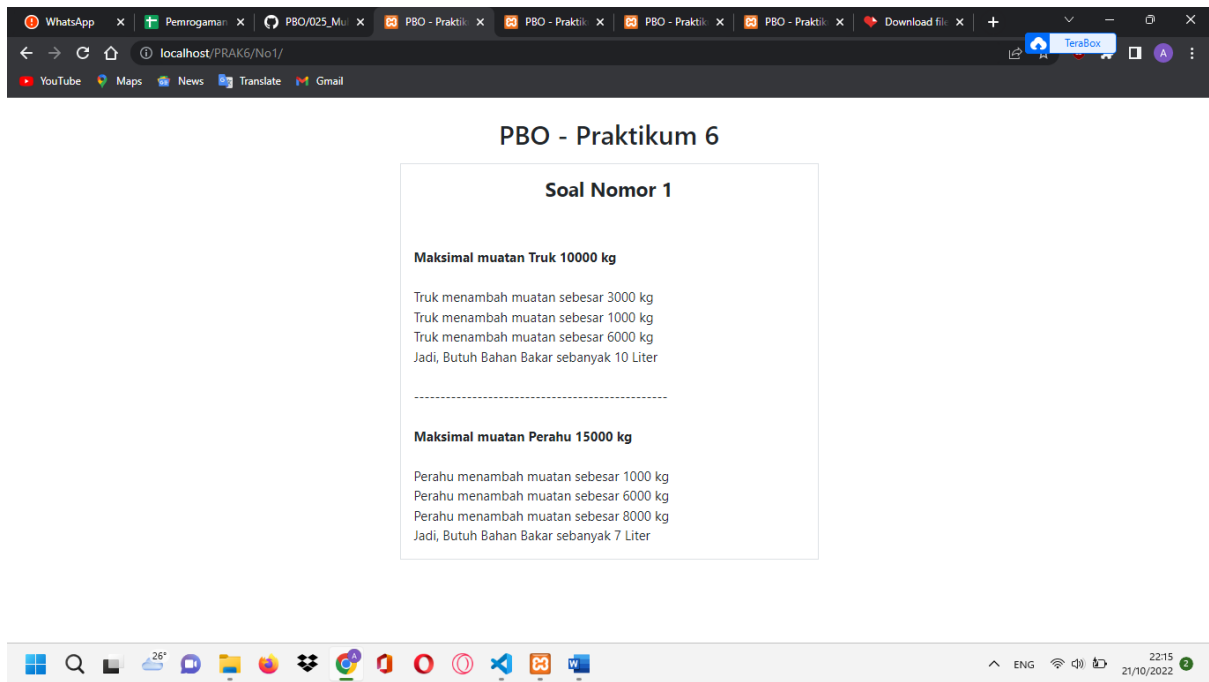
```
File Edit Selection View Go Run Terminal Help no1.php - Visual Studio Code
abstract.php C:\...No1 index.php C:\...No1 no1.php x No3.php interface.php C:\...No3 index.php C:\...No3
C:\> xampp > htdocs > PRAK6 > No1 > no1.php > ...
1 <!-- TEGUH ALDIANTO -->
2 <!-- 21091397076 -->
3 <!-- D4 MANAJEMEN INFORMATIKA -->
4
5 <?php
6
7 require_once '../no1/abstract.php';
8
9 5 references | 0 implementations
10 class Truck extends Vehicle {
11     5 references | 0 overrides | prototype
12     public function __construct($maxLoad, $name)
13     {
14         $this->maxLoad = $maxLoad;
15         $this->name = $name;
16     }
17
18     10 references | 0 overrides | prototype
19     public function calcFuelNeeds()
20     {
21         $fuel = $this->calcFuelEfficiency();
22         $strip = $this->calcTripDistance();
23         return ceil($fuel /= $strip);
24     }
25 }
```

```
File Edit Selection View Go Run Terminal Help no1.php - Visual Studio Code
abstract.php C:\...No1 index.php C:\...No1 no1.php x No3.php interface.php C:\...No3 index.php C:\...No3
C:\> xampp > htdocs > PRAK6 > No1 > no1.php > ...
19 $strip = $this->calcTripDistance();
20
21 return ceil($fuel /= $strip);
22 }
23
24
25 5 references | 0 implementations
26 class RiverBarge extends Vehicle {
27     5 references | 0 overrides | prototype
28     public function __construct($maxLoad, $name)
29     {
30         $this->maxLoad = $maxLoad;
31         $this->name = $name;
32     }
33
34     10 references | 0 overrides | prototype
35     public function calcFuelNeeds()
36     {
37         $fuel = $this->calcFuelEfficiency();
38         $strip = $this->calcTripDistance();
39         return ceil($fuel /= $strip);
40     }
41 }
42 $truck = new Truck(10000, 'Truk');
43 $riverBarge = new RiverBarge(15000, 'Perahu');
```

The image displays two screenshots of a Visual Studio Code editor window, showing PHP code for an abstract class and its methods. The top screenshot shows the beginning of the `abstract.php` file, starting with a comment block and the definition of the `abstract class Vehicle`. The bottom screenshot shows the continuation of the code, including the `addBox` method and two abstract methods: `calcFuelNeeds` and `calcFuelEfficiency`.

```
C:\> xampp > htdocs > PRAK6 > No1 > abstract.php > ...  
1 <!-- TEGUH ALDIANTO -->  
2 <!-- 21091397076 -->  
3 <!-- D4 MANAJEMEN INFORMATIKA -->  
4  
5 <?php  
6  
7 14 references | 15 implementations  
8 abstract class Vehicle {  
9     24 references  
10     private $load = 0;  
11     protected $maxLoad = 0, $name;  
12  
13     0 references | 14 overrides  
14     protected function __construct($maxLoad, $name) {  
15         $this->$maxLoad = $maxLoad;  
16         $this->$name = $name;  
17     }  
18  
19     0 references | 0 overrides  
20     public function getLoad() {  
21         return $this->load;  
22     }  
23  
24     10 references | 0 overrides  
25     public function getMaxLoad() {  
26         echo 'Maksimal muatan ' . $this->name . ' ' ;  
27         return $this->maxLoad;  
28     }  
29  
30     30 references | 0 overrides  
31     public function addBox($weight) {  
32         if ($this->load >= $this->maxLoad) {  
33             echo "$this->name menambah muatan sebesar $weight <br>";  
34             echo 'Muatan telah penuh tidak bisa menambah lagi';  
35         } else {  
36             $this->load += $weight;  
37             echo "$this->name menambah muatan sebesar $weight";  
38         }  
39     }  
40  
41     10 references | 14 overrides  
42     abstract public function calcFuelNeeds();  
43  
44     14 references | 0 overrides  
45     protected function calcFuelEfficiency() {  
46         $range = 500000000;  
47         $range /= $this->load;  
48         return $range;  
49     }  
50  
51     14 references | 0 overrides  
52     protected function calcTripDistance() {  
53         return 500;  
54     }  
55 }
```

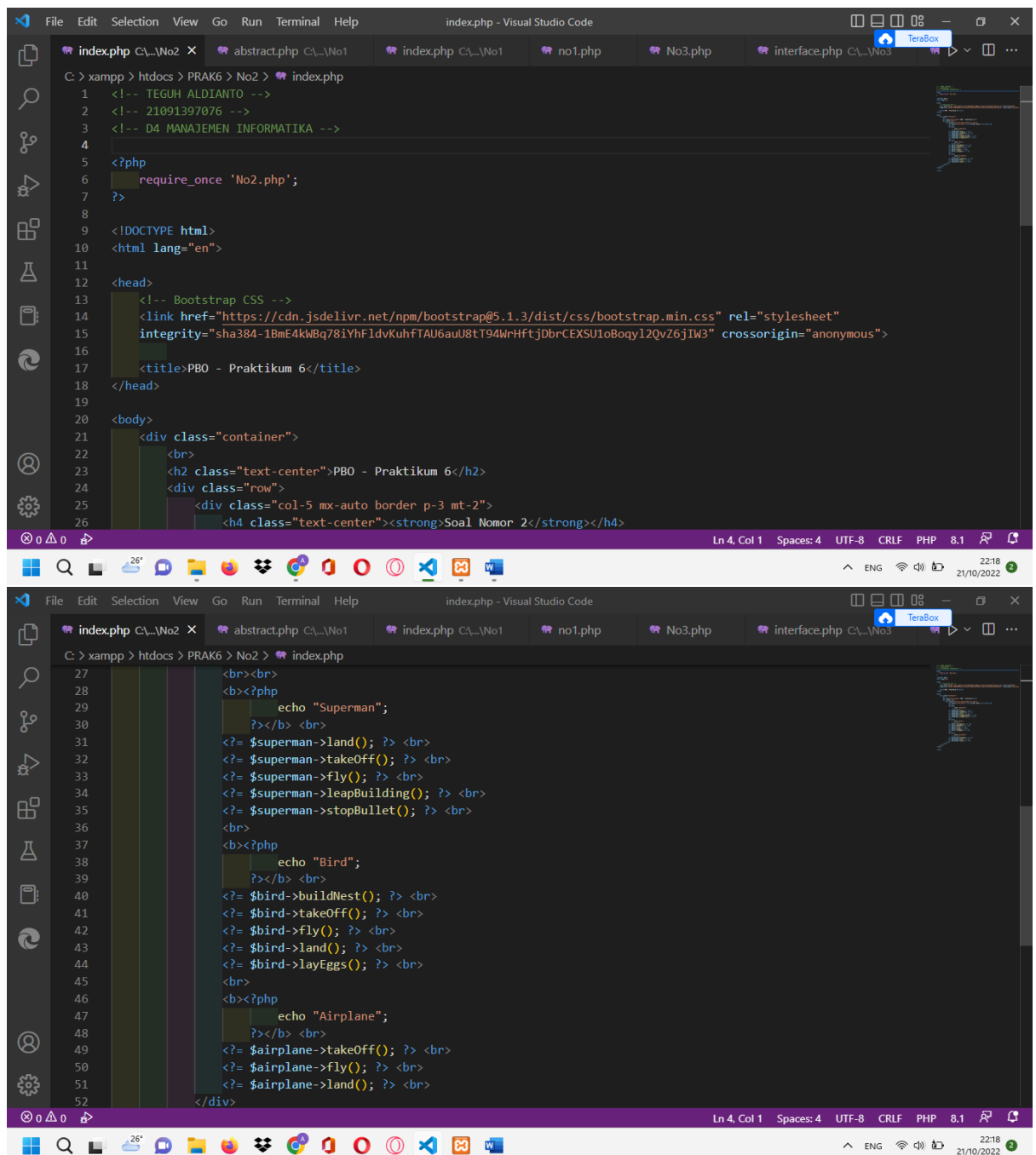
OUTPUT :



Analisis :

Implementasi dari abstract class pada class Vehicle, method calcFuelNeeds digunakan untuk menghitung bahan bakar yang digunakan. Abstract method di letakkan pada class Vehicle sebagai parent class dan diakses oleh child classnya yaitu class Truk, dan class RiverBarge yang akan mengembalikan nilai yang dihasilkan dari pembagian 2 method yaitu calcFuelEfficiency dan calcTripDistance.

2. Source code :



```
index.php - Visual Studio Code
index.php C:\...\No2 X abstract.php C:\...\No1 index.php C:\...\No1 no1.php No3.php interface.php C:\...\No3 TeraBox

C: > xampp > htdocs > PRAK6 > No2 > index.php
1 <!-- TEGUH ALDIANTO -->
2 <!-- 21091397076 -->
3 <!-- D4 MANAJEMEN INFORMATIKA -->
4
5 <?php
6     require_once 'No2.php';
7 >
8
9 <!DOCTYPE html>
10 <html lang="en">
11
12 <head>
13     <!-- Bootstrap CSS -->
14     <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.3/dist/css/bootstrap.min.css" rel="stylesheet"
15         integrity="sha384-1BmE4kWBq78iYhF1dvKuhfTAU6auU8tT94WtHfjDbrCEXSU1oBoqyl12QvZ6jIW3" crossorigin="anonymous">
16
17     <title>PBO - Praktikum 6</title>
18 </head>
19
20 <body>
21     <div class="container">
22         <br>
23         <h2 class="text-center">PBO - Praktikum 6</h2>
24         <div class="row">
25             <div class="col-5 mx-auto border p-3 mt-2">
26                 <h4 class="text-center"><strong>Soal Nomor 2</strong></h4>
27
28                 <br><br>
29                 <b><?php
30                     echo "Superman";
31                     ?></b> <br>
32                     <?= $superman->land(); ?> <br>
33                     <?= $superman->takeOff(); ?> <br>
34                     <?= $superman->fly(); ?> <br>
35                     <?= $superman->leapBuilding(); ?> <br>
36                     <?= $superman->stopBullet(); ?> <br>
37                 <b><?php
38                     echo "Bird";
39                     ?></b> <br>
40                     <?= $bird->buildNest(); ?> <br>
41                     <?= $bird->takeOff(); ?> <br>
42                     <?= $bird->fly(); ?> <br>
43                     <?= $bird->land(); ?> <br>
44                     <?= $bird->layEggs(); ?> <br>
45                 <b><?php
46                     echo "Airplane";
47                     ?></b> <br>
48                     <?= $airplane->takeOff(); ?> <br>
49                     <?= $airplane->fly(); ?> <br>
50                     <?= $airplane->land(); ?> <br>
51                 </div>
52             </div>
53         </div>
54     </div>
55 </body>
56 </html>
```

```
File Edit Selection View Go Run Terminal Help no2.php - Visual Studio Code
No4.php interface.php C:\...No4 index.php C:\...No4 abstract.php C:\...No4 interface.php C:\...No2 no2.php
C:\> xampp > htdocs > PRAK6 > No2 > no2.php > ...
1 <!-- TEGUH ALDIANTO -->
2 <!-- 21091397076 -->
3 <!-- D4 MANAJEMEN INFORMATIKA -->
4
5 <?php
6
7 require_once '../No2/interface.php';
8
9 1 reference | 0 implementations
class Airplane implements Flyer {
10     5 references | 0 overrides
    public function takeOff() {
11         return 'Pesawat lepas landas..';
12     }
13
14     5 references | 0 overrides
    public function land() {
15         return 'Pesawat mendarat';
16     }
17
18     5 references | 0 overrides
    public function fly() {
19         return 'Pesawat dalam perjalanan';
20     }
21 }
22
```

```
File Edit Selection View Go Run Terminal Help no2.php - Visual Studio Code
No4.php interface.php C:\...No4 index.php C:\...No4 abstract.php C:\...No4 interface.php C:\...No2 no2.php
C:\> xampp > htdocs > PRAK6 > No2 > no2.php > ...
22
23 1 reference | 0 implementations
class Bird implements Flyer {
24     5 references | 0 overrides
    public function takeOff() {
25         return 'Burung mencari makan';
26     }
27
28     5 references | 0 overrides
    public function land() {
29         return 'Burung kembali pulang';
30     }
31
32     5 references | 0 overrides
    public function fly() {
33         return 'Burung terbang';
34     }
35
36     1 reference | 0 overrides
    public function buildNest() {
37         return 'Burung membuat sarang';
38     }
39
40     1 reference | 0 overrides
    public function layEggs() {
41         return 'Burung bertelur';
42     }
43 }
```

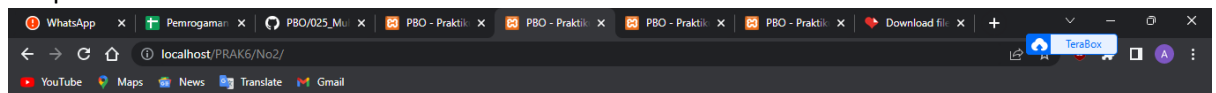
```
File Edit Selection View Go Run Terminal Help no2.php - Visual Studio Code
No4.php interface.php C:\...No4 index.php C:\...No4 abstract.php C:\...No4 interface.php C:\...No2 no2.php
C:\> xampp > htdocs > PRAK6 > No2 > no2.php > ...
42 }
43 }
44
45 1 reference | 0 implementations
class Superman implements Flyer {
46     5 references | 0 overrides
    public function takeOff() {
47         return 'Superman mengejar Batman';
48     }
49
50     5 references | 0 overrides
    public function land() {
51         return 'Superman melawan Batman';
52     }
53
54     5 references | 0 overrides
    public function fly() {
55         return 'Superman melancarkan pukulan';
56     }
57
58     1 reference | 0 overrides
    public function leapBuilding() {
59         return 'Batman terpendak menabrak bangunan pencakar langit';
60     }
61
62     1 reference | 0 overrides
    public function stopBullet() {
```

```
File Edit Selection View Go Run Terminal Help no2.php - Visual Studio Code
No4.php interface.php C:\...No4 index.php C:\...No4 abstract.php C:\...No4 interface.php C:\...No2 no2.php
C:\> xampp > htdocs > PRAK6 > No2 > no2.php > ...
48 }
49
50     5 references | 0 overrides
    public function land() {
51         return 'Superman melawan Batman';
52     }
53
54     5 references | 0 overrides
    public function fly() {
55         return 'Superman melancarkan pukulan';
56     }
57
58     1 reference | 0 overrides
    public function leapBuilding() {
59         return 'Batman terpendak menabrak bangunan pencakar langit';
60     }
61
62     1 reference | 0 overrides
    public function stopBullet() {
63         return 'Polisi menembaki superman namun ditangkis';
64     }
65 }
66
67 $airplane = new Airplane;
68 $bird = new Bird;
69 $superman = new Superman;
```



```
1 <!-- TEGUH ALDIANTO -->
2 <!-- 21091397076 -->
3 <!-- D4 MANAJEMEN INFORMATIKA -->
4
5 <?php
6
7 6 references | 6 implementations
8 interface Flyer {
9     5 references | 6 overrides
10     public function takeOff();
11     5 references | 6 overrides
12     public function land();
13     5 references | 6 overrides
14     public function fly();
15 }
16
17 2 references | 2 implementations
18 interface Sailer {
19     2 references | 2 overrides
20     public function dock();
21     2 references | 2 overrides
22     public function cruise();
23 }
```

Output :



PBO - Praktikum 6

Soal Nomor 2

Superman

Superman melawan Batman
Superman mengejar Batman
Superman melancarkan pukulan
Batman terpenggal menabrak bangunan pencakar langit
Polisi menembaki superman namun ditangkis

Bird

Burung membuat sarang
Burung mencari makan
Burung terbang
Burung kembali pulang
Burung bertelur

Airplane

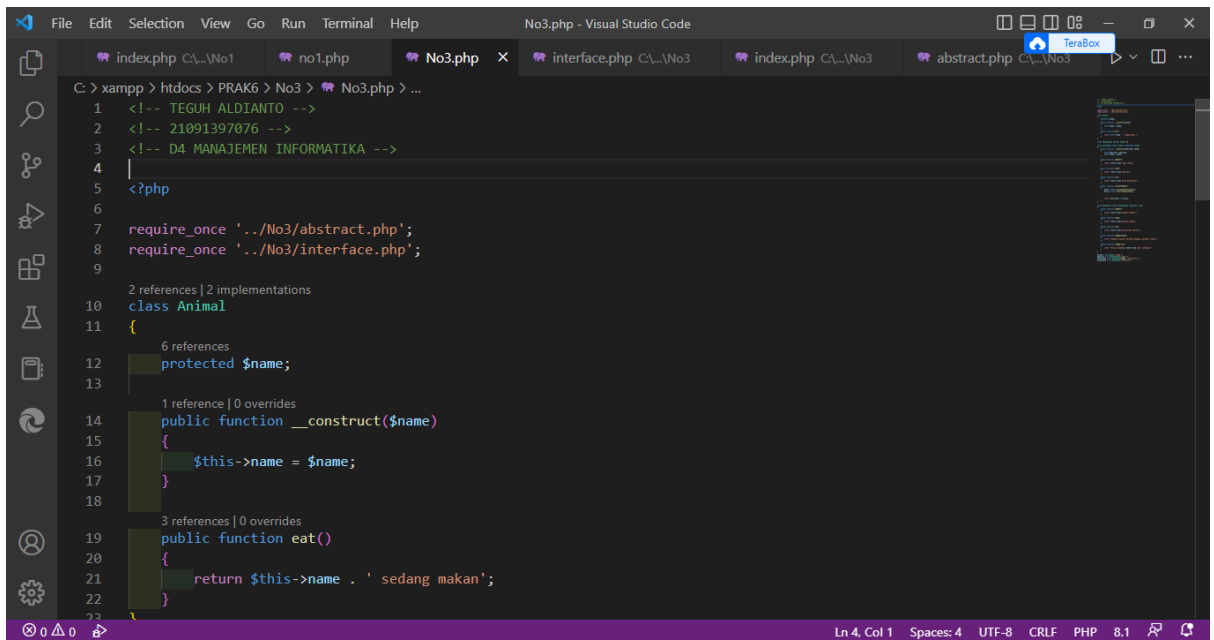
Pesawat lepas landas..
Pesawat dalam perjalanan
Pesawat mendarat

Analisis :

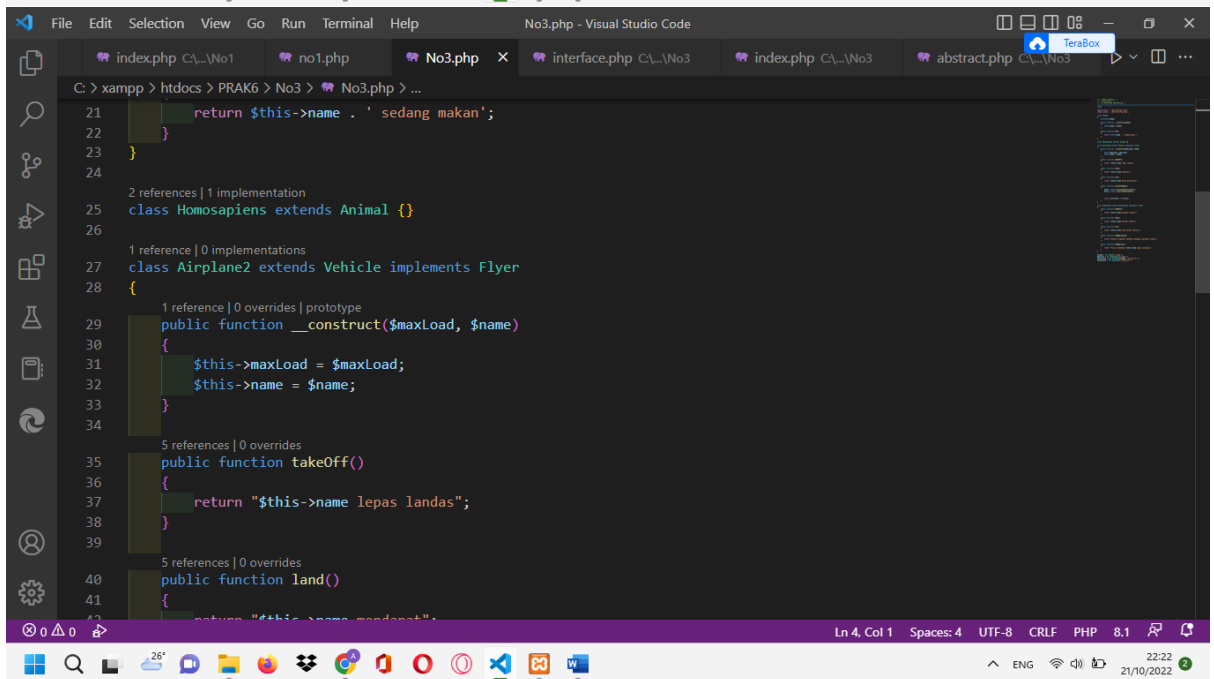
Implementasi Polymorphism dengan penggunaan Interface Flyer sehingga semua class yang Implements dari interface Flyer harus memiliki method takeoff, land, dan fly.

3. Source code :

```
C:\> xampp > htdocs > PRAK6 > No3 > index.php
1  <!-- TEGUH ALDIANTO -->
2  <!-- 21091397076 -->
3  <!-- D4 MANAJEMEN INFORMATIKA -->
4
5  <?php
6      require_once 'No3.php';
7  ?>
8
9  <!DOCTYPE html>
10 <html lang="id">
11
12 <head>
13     <!-- Bootstrap CSS -->
14     <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.3/dist/css/bootstrap.min.css" rel="stylesheet"
15         integrity="sha384-1BmE4kWBq78iYhF1dvKuhfTAU6auU8tT94W4H7tJdBrCEXSU1oBoqy12QvZ6jIW3" crossorigin="anonymous">
16
17     <title>PBO - Praktikum 6</title>
18 </head>
19 <body>
20     <div class="container">
21         <h2 class="text-center">PBO - Praktikum 6</h2>
22         <div class="row">
23             <div class="col-5 mx-auto border p-3 mt-2">
24                 <h4 class="text-center"><strong>Soal Nomor 3</strong></h4>
25                 <br><br>
26                 <?= $singa->eat(); ?> <br>
27
28                 <?= $manusia->eat(); ?> <br>
29
30                 <b><?= $airplane2->getMaxLoad() . ' kg'; ?> <br></b>
31                 <?= $airplane2->addBox(5000) . ' kg'; ?> <br>
32                 <?= $airplane2->addBox(7000) . ' kg'; ?> <br>
33                 <?= $airplane2->addBox(3000) . ' kg'; ?> <br>
34                 <?= $airplane2->addBox(4000) . ' kg'; ?> <br>
35                 <?= $airplane2->takeOff(); ?> <br>
36                 <?= $airplane2->fly(); ?> <br>
37                 <?= $airplane2->land(); ?> <br>
38
39                 <?php
40                     echo "Jadi, Butuh Bahan Bakar sebanyak " . $airplane2->calcFuelNeeds() . ' Liter'. '<br>';
41                 ?>
42                 <br>
43                 <?= $superman2->eat(); ?> <br>
44                 <?= $superman2->land(); ?> <br>
45                 <?= $superman2->takeOff(); ?> <br>
46                 <?= $superman2->fly(); ?> <br>
47                 <?= $superman2->leapBuilding(); ?> <br>
48                 <?= $superman2->stopBullet(); ?> <br>
49             </div>
50         </div>
51     </div>
52 </body>
```



```
1 <!-- TEGUH ALDIANTO -->
2 <!-- 21091397076 -->
3 <!-- D4 MANAJEMEN INFORMATIKA -->
4
5 <?php
6
7 require_once '../No3/abstract.php';
8 require_once '../No3/interface.php';
9
10 2 references | 2 implementations
11 class Animal
12 {
13     6 references
14     protected $name;
15
16     1 reference | 0 overrides
17     public function __construct($name)
18     {
19         $this->name = $name;
20     }
21
22     3 references | 0 overrides
23     public function eat()
24     {
25         return $this->name . ' sedang makan';
26     }
27
28 }
```



```
21     return $this->name . ' sedang makan';
22 }
23
24 2 references | 1 implementation
25 class Homosapiens extends Animal {}
26
27 1 reference | 0 implementations
28 class Airplane2 extends Vehicle implements Flyer
29 {
30     1 reference | 0 overrides | prototype
31     public function __construct($maxLoad, $name)
32     {
33         $this->maxLoad = $maxLoad;
34         $this->name = $name;
35     }
36
37     5 references | 0 overrides
38     public function takeOff()
39     {
40         return $this->name . ' lepas landas';
41     }
42
43     5 references | 0 overrides
44     public function land()
45     {
46         return $this->name . ' mendarat';
47     }
48 }
```

```
File Edit Selection View Go Run Terminal Help No3.php - Visual Studio Code
index.php C:\...\No1 no1.php No3.php x interface.php C:\...\No3 index.php C:\...\No3 abstract.php C:\...\No3
C:\> xampp > htdocs > PRAK6 > No3 > No3.php > ...
42     return "$this->name mendarat";
43 }
44
5 references | 0 overrides
45 public function fly()
46 {
47     return "$this->name dalam perjalanan";
48 }
49
10 references | 0 overrides | prototype
50 public function calcFuelNeeds()
51 {
52     $fuel = $this->calcFuelEfficiency();
53     $trip = $this->calcTripDistance();
54
55     return ceil($fuel / $trip);
56 }
57
1 reference | 0 implementations
58 class Superman2 extends Homosapiens implements Flyer
59 {
60     5 references | 0 overrides
61     public function takeOff()
62     {
63         return "$this->name mengejar Batman";
64     }
65
66     5 references | 0 overrides
67     public function land()
68     {
69         return "$this->name melawan Batman";
70     }
71
72     5 references | 0 overrides
73     public function fly()
74     {
75         return "$this->name melancarkan pukulan";
76     }
77
78     1 reference | 0 overrides
79     public function leapBuilding()
80     {
81         return "Batman terpentak menabrak bangunan pencakar langit";
82     }
83
84     1 reference | 0 overrides
85     public function stopBullet()
86     {
87         return "Batman menghentikan peluru";
88     }
89 }
```

```
File Edit Selection View Go Run Terminal Help No3.php - Visual Studio Code
index.php C:\...\No1 no1.php No3.php x interface.php C:\...\No3 index.php C:\...\No3 abstract.php C:\...\No3
C:\> xampp > htdocs > PRAK6 > No3 > No3.php > ...
63     public function takeOff()
64     {
65         return "$this->name mengejar Batman";
66     }
67
68     5 references | 0 overrides
69     public function land()
70     {
71         return "$this->name melawan Batman";
72     }
73
74     5 references | 0 overrides
75     public function fly()
76     {
77         return "$this->name melancarkan pukulan";
78     }
79
80     1 reference | 0 overrides
81     public function leapBuilding()
82     {
83         return "Batman terpentak menabrak bangunan pencakar langit";
84     }
85
86     1 reference | 0 overrides
87     public function stopBullet()
88     {
89         return "Batman menghentikan peluru";
90     }
91 }
```

```
File Edit Selection View Go Run Terminal Help No3.php - Visual Studio Code
index.php C:\...\No1 no1.php No3.php x interface.php C:\...\No3 index.php C:\...\No3 abstract.php C:\...\No3
C:\> xampp > htdocs > PRAK6 > No3 > No3.php > ...
71 }
72
73 5 references | 0 overrides
74 public function fly()
75 {
76     return "$this->name melancarkan pukulan";
77 }
78
79 1 reference | 0 overrides
80 public function leapBuilding()
81 {
82     return "Batman terpelant menabrak bangunan pencakar langit";
83 }
84
85 1 reference | 0 overrides
86 public function stopBullet()
87 {
88     return "Polisi menembaki $this->name namun ditangkis";
89 }
90
91 $singa = new Animal('Singa');
92 $manusia = new Homosapiens('Andi');
93 $airplane2 = new Airplane2(20000, 'Garuda Air');
94 $superman2 = new Superman2('Superman');
```

```
File Edit Selection View Go Run Terminal Help interface.php - Visual Studio Code
index.php C:\...\No1 no1.php No3.php interface.php C:\...\No3 x index.php C:\...\No3 abstract.php C:\...\No3
C:\> xampp > htdocs > PRAK6 > No3 > interface.php > ...
1 <!-- TEGUH ALDIANTO -->
2 <!-- 21091397076 -->
3 <!-- D4 MANAJEMEN INFORMATIKA -->
4
5 <?php
6
7 6 references | 6 implementations
8 interface Flyer {
9     5 references | 6 overrides
10     public function takeOff();
11     5 references | 6 overrides
12     public function land();
13     5 references | 6 overrides
14     public function fly();
15 }
16
17 2 references | 2 implementations
18 interface Sailer {
19     2 references | 2 overrides
20     public function dock();
21     2 references | 2 overrides
22     public function cruise();
23 }
```

The image displays two screenshots of a Visual Studio Code editor window, showing PHP code for an abstract class and its methods. The editor is titled "abstract.php - Visual Studio Code". The top screenshot shows the beginning of the file, including a header with comments and the start of the `abstract class Vehicle`. The bottom screenshot shows the continuation of the class, including the `addBox` method and two protected methods: `calcFuelNeeds` and `calcTripDistance`. The code is written in PHP 8.1 syntax.

```
C:\> xampp > htdocs > PRAK6 > No3 > abstract.php > ...  
1 <!-- TEGUH ALDIANTO -->  
2 <!-- 21091397076 -->  
3 <!-- D4 MANAJEMEN INFORMATIKA -->  
4  
5 <?php  
6  
7 14 references | 15 implementations  
8 abstract class Vehicle {  
9     24 references  
10     private $load = 0;  
11     protected $maxLoad = 0, $name;  
12  
13     0 references | 14 overrides  
14     protected function __construct($maxLoad, $name) {  
15         $this->$maxLoad = $maxLoad;  
16         $this->$name = $name;  
17     }  
18  
19     0 references | 0 overrides  
20     public function getLoad() {  
21         return $this->load;  
22     }  
23  
24     10 references | 0 overrides  
25     public function getMaxLoad() {  
26         echo 'Maksimal muatan ' . $this->name . ' ' ;  
27         return $this->maxLoad;  
28     }  
29  
30     30 references | 0 overrides  
31     public function addBox($weight) {  
32         if ($this->load >= $this->maxLoad) {  
33             echo "$this->name menambah muatan sebesar $weight <br>";  
34             echo 'Muatan telah penuh tidak bisa menambah lagi';  
35         } else {  
36             $this->load += $weight;  
37             echo "$this->name menambah muatan sebesar $weight";  
38         }  
39     }  
40  
41     10 references | 14 overrides  
42     abstract public function calcFuelNeeds();  
43  
44     14 references | 0 overrides  
45     protected function calcFuelEfficiency() {  
46         $range = 50000000;  
47         $range /= $this->load;  
48         return $range;  
49     }  
50  
51     14 references | 0 overrides  
52     protected function calcTripDistance() {  
53         return 500;  
54     }  
55 }
```

Output :

WhatsApp x Pemrograman x PBO/025_Mu x PBO - Prakti x PBO - Prakti x PBO - Prakti x PBO - Prakti x Download fil x + TeraBox

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PBO - Praktikum 6

Soal Nomor 3

Singa sedang makan
Andi sedang makan

Maksimal muatan Garuda Air 20000 kg
Garuda Air menambah muatan sebesar 5000 kg
Garuda Air menambah muatan sebesar 7000 kg
Garuda Air menambah muatan sebesar 3000 kg
Garuda Air menambah muatan sebesar 4000 kg
Garuda Air lepas landas
Garuda Air dalam perjalanan
Garuda Air mendarat
Jadi, Butuh Bahan Bakar sebanyak 6 Liter

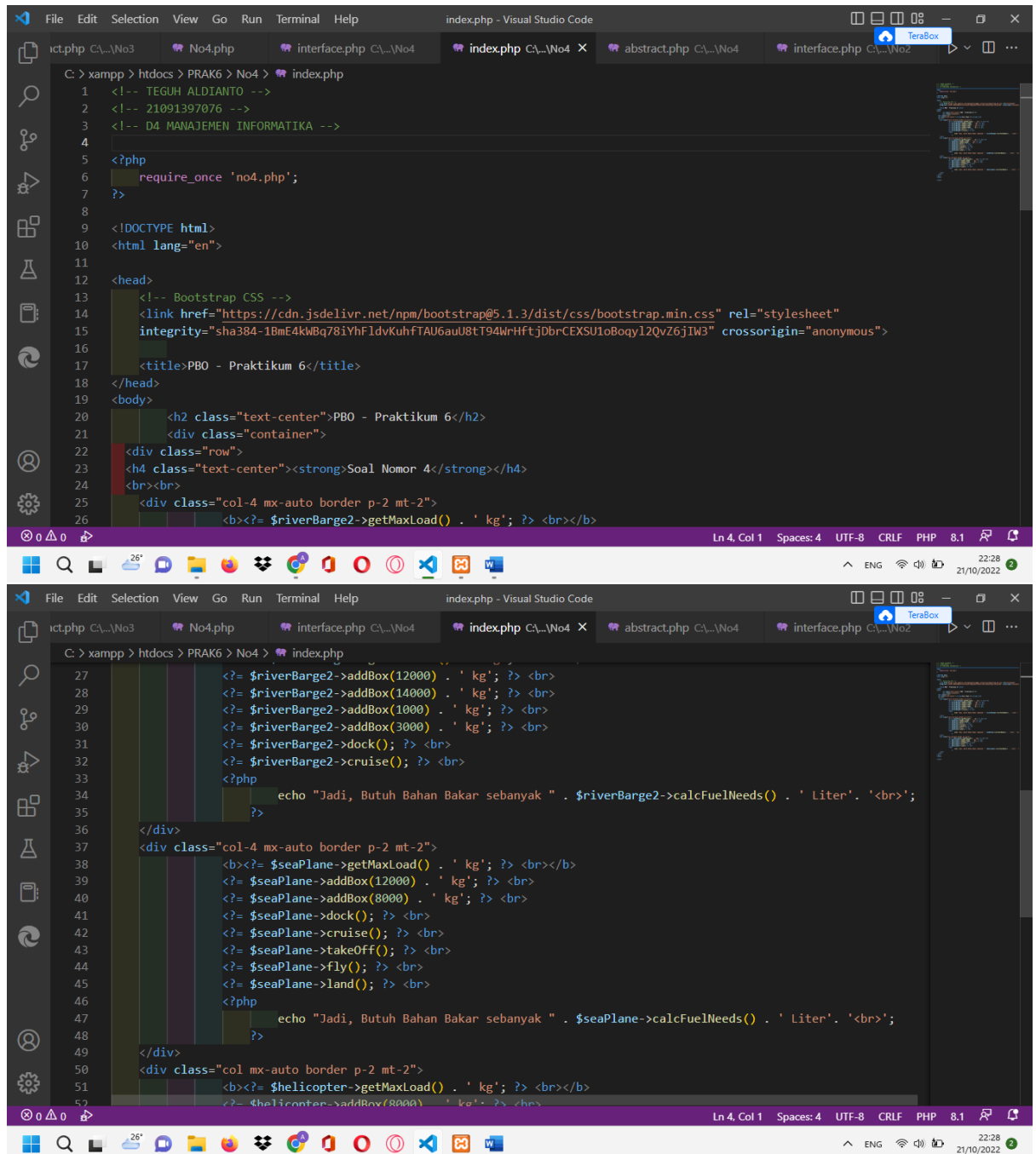
Superman sedang makan
Superman melawan Batman
Superman mengejar Batman
Superman melancarkan pukulan
Batman terpental menabrak bangunan pencakar langit
Polisi menembaki Superman namun ditangkis

26° ENG 22:24 21/10/2022

Analisis :

Terdapat interface Flyer dan abstract class Vehicle. Class airplane implementasi dari interfaceFlyer dan turunan dari Vehicle sehingga class Airplane harus memiliki method calcFuelNeeds, takeoff, land, dan fly. Class Bird implementasi dari Flyer dan turunan dari Animal sehingga memiliki method takeoff, land, fly, dan eat. Class Superman turunan dari homosapiens yang jugaturunan dari Animal, serta implementasi dari interface Flyer. Maka class Superman memiliki method eat, takeoff, land, fly.

4. Source code :



```
index.php - Visual Studio Code
C:\xampp\htdocs> PRAK6 > No4 > index.php
1 <!-- TEGUH ALDIANTO -->
2 <!-- 21091397076 -->
3 <!-- D4 MANAJEMEN INFORMATIKA -->
4
5 <?php
6     require_once 'no4.php';
7 ?>
8
9 <!DOCTYPE html>
10 <html lang="en">
11
12 <head>
13     <!-- Bootstrap CSS -->
14     <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.3/dist/css/bootstrap.min.css" rel="stylesheet"
15         integrity="sha384-1BmE4kWBq78iYhF1dvKuhfTAU6auU8tT94WrHffjDbrCEXSU1oBoqy12QvZ6jIW3" crossorigin="anonymous">
16
17     <title>PBO - Praktikum 6</title>
18 </head>
19 <body>
20     <h2 class="text-center">PBO - Praktikum 6</h2>
21     <div class="container">
22         <div class="row">
23             <h4 class="text-center"><strong>Soal Nomor 4</strong></h4>
24             <br><br>
25             <div class="col-4 mx-auto border p-2 mt-2">
26                 <b><?=$riverBarge2->getMaxLoad() . ' kg'; ?> <br></b>
27
28                 <?=$riverBarge2->addBox(12000) . ' kg'; ?> <br>
29                 <?=$riverBarge2->addBox(14000) . ' kg'; ?> <br>
30                 <?=$riverBarge2->addBox(1000) . ' kg'; ?> <br>
31                 <?=$riverBarge2->addBox(3000) . ' kg'; ?> <br>
32                 <?=$riverBarge2->dock(); ?> <br>
33                 <?=$riverBarge2->cruise(); ?> <br>
34                 <?php
35                     echo "Jadi, Butuh Bahan Bakar sebanyak " . $riverBarge2->calcFuelNeeds() . ' Liter'. '<br>';
36                 ?>
37             </div>
38             <div class="col-4 mx-auto border p-2 mt-2">
39                 <b><?=$seaPlane->getMaxLoad() . ' kg'; ?> <br></b>
40                 <?=$seaPlane->addBox(12000) . ' kg'; ?> <br>
41                 <?=$seaPlane->addBox(8000) . ' kg'; ?> <br>
42                 <?=$seaPlane->dock(); ?> <br>
43                 <?=$seaPlane->cruise(); ?> <br>
44                 <?=$seaPlane->takeOff(); ?> <br>
45                 <?=$seaPlane->fly(); ?> <br>
46                 <?=$seaPlane->land(); ?> <br>
47                 <?php
48                     echo "Jadi, Butuh Bahan Bakar sebanyak " . $seaPlane->calcFuelNeeds() . ' Liter'. '<br>';
49                 ?>
50             </div>
51             <div class="col mx-auto border p-2 mt-2">
52                 <b><?=$helicopter->getMaxLoad() . ' kg'; ?> <br></b>
53                 <?=$helicopter->addBox(8000) . ' kg'; ?> <br>
```



```
File Edit Selection View Go Run Terminal Help index.php - Visual Studio Code
ict.php C:\...No3 No4.php interface.php C:\...No4 index.php C:\...No4 X abstract.php C:\...No4 interface.php C:\...No2 TeraBox

C: > xampp > httdocs > PRAK6 > No4 > index.php
42 <!-- $seaPlane->cruise(); --> <br>
43 <?=$seaPlane->takeOff(); ?> <br>
44 <?=$seaPlane->fly(); ?> <br>
45 <?=$seaPlane->land(); ?> <br>
46 <?php
47     echo "Jadi, Butuh Bahan Bakar sebanyak " . $seaPlane->calcFuelNeeds() . ' Liter'. '<br>';
48     ?>
49
50 </div>
51 <div class="col mx-auto border p-2 mt-2">
52     <b><?=$helicopter->getMaxLoad() . ' kg'; ?> <br></b>
53     <?=$helicopter->addBox(8000) . ' kg'; ?> <br>
54     <?=$helicopter->addBox(2000) . ' kg'; ?> <br>
55     <?=$helicopter->takeOff(); ?> <br>
56     <?=$helicopter->fly(); ?> <br>
57     <?=$helicopter->land(); ?> <br>
58     <?php
59         echo "Jadi, Butuh Bahan Bakar sebanyak " . $helicopter->calcFuelNeeds() . ' Liter'. '<br>';
60         ?>
61 </div>
62 </div>
63 </body>
64
65 </html>
```

```
File Edit Selection View Go Run Terminal Help No4.php - Visual Studio Code
ict.php C:\...No3 No4.php X interface.php C:\...No4 index.php C:\...No4 abstract.php C:\...No4 interface.php C:\...No2 TeraBox

C: > xampp > httdocs > PRAK6 > No4 > No4.php > ...
1 <!-- TEGUH ALDIANTO -->
2 <!-- 21091397076 -->
3 <!-- D4 MANAJEMEN INFORMATIKA -->
4
5 <?php
6
7     require_once '../No4/abstract.php';
8     require_once '../No4/interface.php';
9
10     1 reference | 0 implementations
11     class RiverBarge2 extends Vehicle implements Sailer {
12         1 reference | 0 overrides | prototype
13         public function __construct($maxLoad, $name) {
14             $this->maxLoad = $maxLoad;
15             $this->name = $name;
16         }
17
18         10 references | 0 overrides | prototype
19         public function calcFuelNeeds() {
20             $fuel = $this->calcFuelEfficiency();
21             $trip = $this->calcTripDistance();
22             return ceil($fuel / $trip);
23         }
24
25         2 references | 0 overrides
26         public function dock() {
```

```
File Edit Selection View Go Run Terminal Help No4.php - Visual Studio Code
ict.php C:\...\No3 No4.php X interface.php C:\...\No4 index.php C:\...\No4 abstract.php C:\...\No4 interface.php C:\...\No2 TeraBox

C: > xampp > htdocs > PRAK6 > No4 > No4.php > ...

24     return $this->name . ' berada di dermaga';
25 }
26
27     2 references | 0 overrides
28     public function cruise() {
29         return $this->name . ' sedang berlayar';
30     }
31
32     1 reference | 0 implementations
33     class Airplane2 implements Flyer {
34         5 references | 0 overrides
35         public function takeOff() {
36             return 'Pesawat lepas landas';
37         }
38         5 references | 0 overrides
39         public function land() {
40             return 'Pesawat mendarat';
41         }
42         5 references | 0 overrides
43         public function fly() {
44             return 'Pesawat dalam perjalanan';
45         }
46     }
47
48     1 reference | 0 implementations
49     class SeaPlane extends Vehicle implements Sailer {
```

```
File Edit Selection View Go Run Terminal Help No4.php - Visual Studio Code
ict.php C:\...\No3 No4.php X interface.php C:\...\No4 index.php C:\...\No4 abstract.php C:\...\No4 interface.php C:\...\No2 TeraBox

C: > xampp > htdocs > PRAK6 > No4 > No4.php > ...

43
44     1 reference | 0 implementations
45     class SeaPlane extends Vehicle implements Sailer {
46         1 reference | 0 overrides | prototype
47         public function __construct($maxLoad, $name) {
48             $this->maxLoad = $maxLoad;
49             $this->name = $name;
50         }
51
52         10 references | 0 overrides | prototype
53         public function calcFuelNeeds() {
54             $fuel = $this->calcFuelEfficiency();
55             $trip = $this->calcTripDistance();
56             return ceil($fuel / $trip);
57         }
58
59         2 references | 0 overrides
60         public function dock() {
61             return $this->name . ' berada di dermaga';
62         }
63
64         2 references | 0 overrides
65         public function cruise() {
66             return $this->name . ' sedang berlayar';
67         }
68     }
69 }
```

```
File Edit Selection View Go Run Terminal Help No4.php - Visual Studio Code
ict.php C:\...\No3 No4.php X interface.php C:\...\No4 index.php C:\...\No4 abstract.php C:\...\No4 interface.php C:\...\No2 TeraBox

C: > xampp > htdocs > PRAK6 > No4 > No4.php > ...

63     }
64
65     1 reference | 0 overrides
66     public function takeOff() {
67         return $this->name . ' lepas landas';
68     }
69
70     1 reference | 0 overrides
71     public function land() {
72         return $this->name . ' mendarat';
73     }
74
75     1 reference | 0 overrides
76     public function fly() {
77         return $this->name . ' dalam perjalanan';
78     }
79
80     1 reference | 0 implementations
81     class Helicopter extends Vehicle {
82         1 reference | 0 overrides | prototype
83         public function __construct($maxLoad, $name) {
84             $this->maxLoad = $maxLoad;
85             $this->name = $name;
86         }
87     }
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1 <!-- TEGUH ALDIANTO -->
2 <!-- 21091397076 -->
3 <!-- D4 MANAJEMEN INFORMATIKA -->
4
5 <?php
6
7 14 references | 15 implementations
  abstract class Vehicle {
8      24 references
9      private $load = 0;
10     protected $maxLoad = 0, $name;
11
12     0 references | 14 overrides
13     protected function __construct($maxLoad, $name) {
14         $this->$maxLoad = $maxLoad;
15         $this->$name = $name;
16     }
17
18     0 references | 0 overrides
19     public function getLoad() {
20         return $this->load;
21     }
22
23     10 references | 0 overrides
24     public function getMaxLoad() {
25         echo 'Maksimal muatan ' . $this->name . ' ';
26         return $this->maxLoad;
27     }
28 }
```

```
File Edit Selection View Go Run Terminal Help abstract.php - Visual Studio Code
ict.php C:\...\No3 No4.php interface.php C:\...\No4 index.php C:\...\No4 abstract.php C:\...\No4 x interface.php C:\...\No2 TeraBox

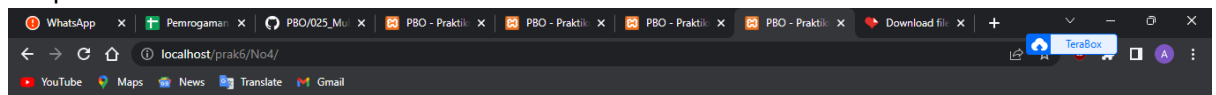
C: > xampp > htdocs > PRAK6 > No4 > abstract.php > ...
22     return $this->maxLoad;
23 }
24
25 30 references | 0 overrides
26 public function addBox($weight) {
27     if ($this->load >= $this->maxLoad) {
28         echo "$this->name menambah muatan sebesar $weight <br>";
29         echo 'Muatan telah penuh tidak bisa menambah lagi';
30     } else {
31         $this->load += $weight;
32         echo "$this->name menambah muatan sebesar $weight";
33     }
34 }
35
36 10 references | 14 overrides
37 abstract public function calcFuelNeeds();
38
39 14 references | 0 overrides
40 protected function calcFuelEfficiency() {
41     $range = 50000000;
42     $range /= $this->load;
43     return $range;
44 }
45
46 14 references | 0 overrides
47 protected function calcTripDistance() {
48 }
```

```

1 <!-- TEGUH ALDIANTO -->
2 <!-- 21091397076 -->
3 <!-- D4 MANAJEMEN INFORMATIKA -->
4
5 <?php
6
7 6 references | 6 implementations
8 interface Flyer {
9     5 references | 6 overrides
10     public function takeOff();
11     5 references | 6 overrides
12     public function land();
13     5 references | 6 overrides
14     public function fly();
15 }
16
17 2 references | 2 implementations
18 interface Sailer {
19     2 references | 2 overrides
20     public function dock();
21     2 references | 2 overrides
22     public function cruise();
23 }

```

Output :



PBO - Praktikum 6

Soal Nomor 4

Maksimal muatan Atomic 30000 kg Atomic menambah muatan sebesar 12000 kg Atomic menambah muatan sebesar 14000 kg Atomic menambah muatan sebesar 1000 kg Atomic menambah muatan sebesar 3000 kg Atomic berada di dermaga Atomic sedang berlayar Atomic sedang berlayar Jadi, Butuh Bahan Bakar sebanyak 4 Liter	Maksimal muatan Titanic 20000 kg Titanic menambah muatan sebesar 12000 kg Titanic menambah muatan sebesar 8000 kg Titanic berada di dermaga Titanic sedang berlayar Titanic lepas landas Titanic dalam perjalanan Titanic mendarat Jadi, Butuh Bahan Bakar sebanyak 5 Liter	Maksimal muatan Brooklyn 10000 kg Brooklyn menambah muatan sebesar 8000 kg Brooklyn menambah muatan sebesar 2000 kg Brooklyn lepas landas Brooklyn dalam perjalanan Brooklyn mendarat Jadi, Butuh Bahan Bakar sebanyak 10 Liter
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Analisis :

Implementasi polymorphism dengan interface dan abstract class ditunjukkan pada class SeaPlane yang implements interface Sailer, turunan dari class Airplane yang implements Flyer dan child dari Vehicle sehingga class SeaPlane memiliki method dock, cruise, takeoff, land, fly, dan calcFuelNeeds.