

LAPORAN PRAKTIKUM 6
PEMROGAMAN BERORIENTASI OBJEK



Disusun oleh :

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D4 MANAJEMEN INFORMATIKA
UNIVERSITAS NEGERI SURABAYA

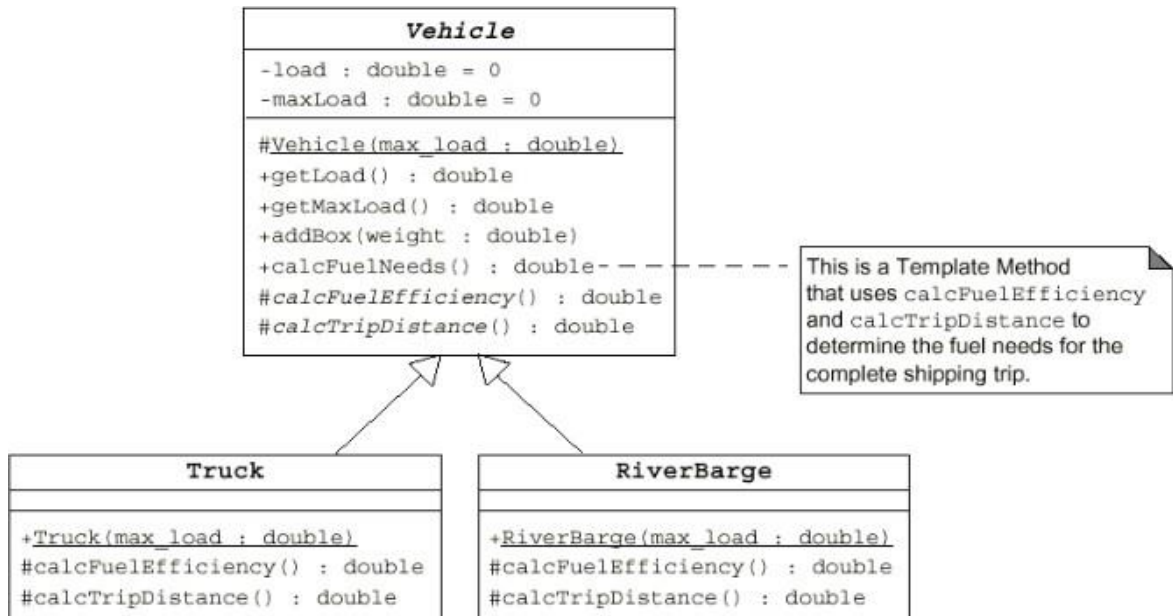
2022

PRAKTIKUM 6

ABSTRACT DAN INTERFACE

TUGAS PRAKTIKUM

1. Buat program berdasarkan UML berikut



- Codingan

```
File Edit Selection View Go Run Terminal Help No1 C.php - kecerdasan buatan - Visual Studio Code
no 3.php interface no 3.php index no 3.php abstrac no 3.php No1 A.php No1 B.php No1 C.php X
C:\> XMAP pemrograman web >htdocs > PBOPraktikum > No1 C.php
1 <!-- Nama : Ananda putri rahmadani
2 NIM : 21091397046
3 Kelas : 2021 B-->
4
5 <?php
6
7 require_once 'No1 A.php';
8
9 class Truck extends Vehicle {
10     public function __construct($maxLoad, $name)
11     {
12         $this->maxLoad = $maxLoad;
13         $this->name = $name;
14     }
15
16     public function calcFuelNeeds()
17     {
18         $fuel = $this->calcFuelEfficiency();
19         $trip = $this->calcTripDistance();
20
21         return ceil($fuel / $trip);
22     }
23 }
24
25 class RiverBarge extends Vehicle {
26     public function __construct($maxLoad, $name)
27     {
28         $this->maxLoad = $maxLoad;
29         $this->name = $name;
30     }
31
32     public function calcFuelNeeds()
33     {
34         $fuel = $this->calcFuelEfficiency();
35     }
36 }
```

Activate Windows
Go to Settings to activate Windows.

Ln 7, Col 15 Spaces: 4 UTF-8 CRLF PHP Go Live

```

32     public function calcFuelNeeds()
33     {
34         $fuel = $this->calcFuelEfficiency();
35         $trip = $this->calcTripDistance();
36
37         return ceil($fuel / $trip);
38     }
39 }
40 $truck = new Truck(16000, 'Truk');
41 $riverBarge = new RiverBarge(15000, 'Perahu');

```

Abstrak nomer 1

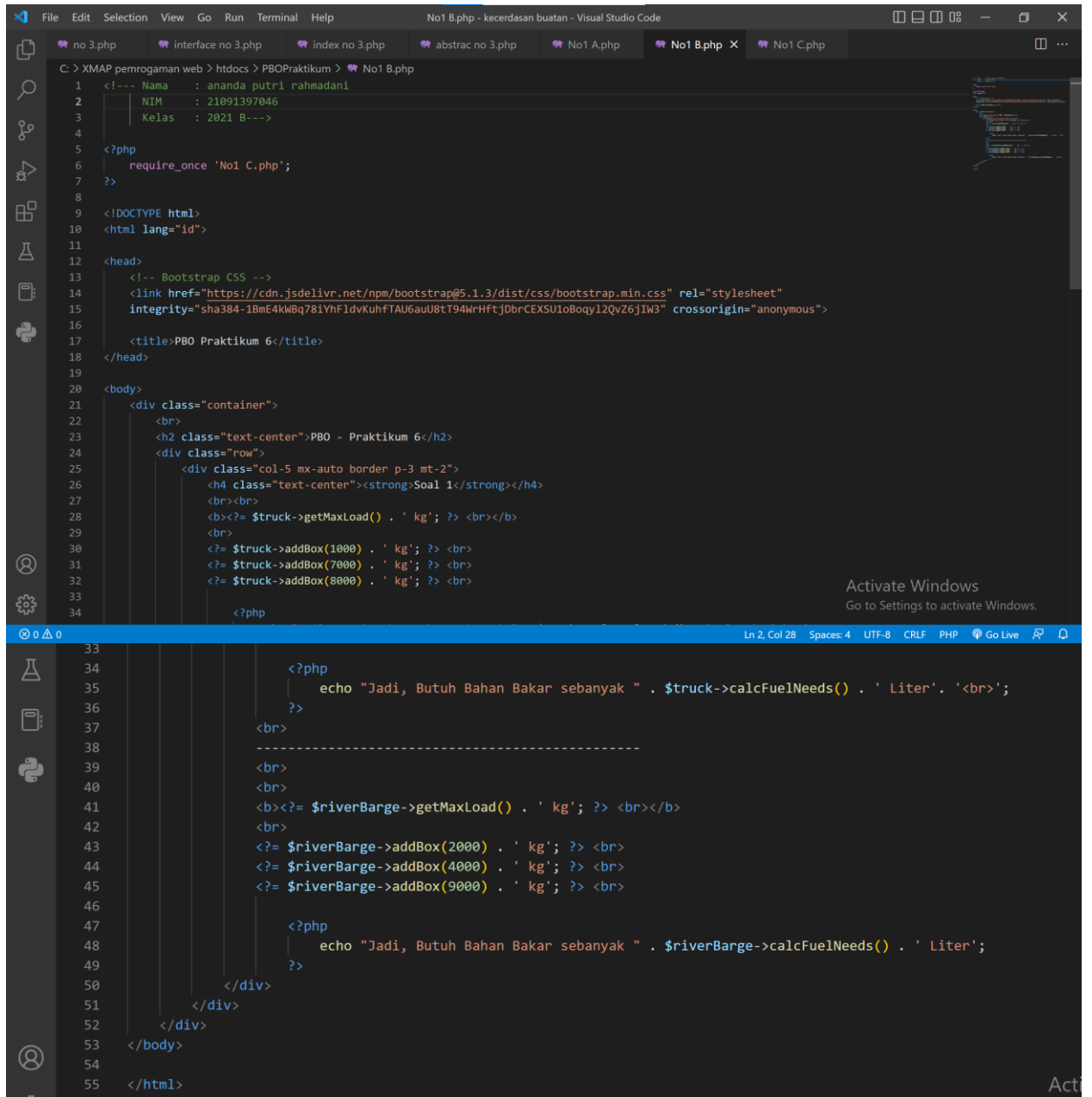
The screenshot shows the Visual Studio Code editor with a file named 'No1 A.php'. The code defines an abstract class 'Vehicle' with several methods. The methods include a constructor, 'getLoad()', 'getMaxLoad()', 'addBox()', 'calcFuelNeeds()', 'calcFuelEfficiency()', and 'calcTripDistance()'. The 'addBox()' method checks if the current load exceeds the maximum load and provides feedback. The 'calcFuelNeeds()' method calculates the fuel needed based on the fuel efficiency and trip distance. The 'calcFuelEfficiency()' method calculates the fuel efficiency based on a range and the current load. The 'calcTripDistance()' method returns a constant value of 500.

```

1  <!-- Nama : ananda putri rahmadani
2      NIM : 21091397046
3      Kelas : 2021 <!-->
4
5  <?php
6
7  abstract class Vehicle {
8      private $load = 0;
9      protected $maxLoad = 0, $name;
10
11     protected function __construct($maxLoad, $name) {
12         $this->$maxLoad = $maxLoad;
13         $this->$name = $name;
14     }
15
16     public function getLoad() {
17         return $this->load;
18     }
19
20     public function getMaxLoad() {
21         echo 'Maksimal muatan ' . $this->name . ' ' ;
22         return $this->maxLoad;
23     }
24
25     public function addBox($weight) {
26         if ($this->load >= $this->maxLoad) {
27             echo "$this->name menambah muatan sebesar $weight <br>";
28             echo 'Muatan telah penuh tidak bisa menambah lagi';
29         } else {
30             $this->load += $weight;
31             echo "$this->name menambah muatan sebesar $weight";
32         }
33     }
34
35     abstract public function calcFuelNeeds();
36
37     protected function calcFuelEfficiency() {
38         $range = 50000000;
39         $range /= $this->load;
40         return $range;
41     }
42
43     protected function calcTripDistance() {
44         return 500;
45     }
46 }

```

Index nomer 1



```
C:\> XMAP pemrograman web > htdocs > PBOPraktikum > No1 B.php
1  <!-- Nama      : ananda putri rahmadani
2      NIM      : 21091397046
3      Kelas    : 2021 B-->
4
5  <?php
6      require_once 'No1 C.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="sha384-1BmE4kWBq78iYhF1dvKuhF7AU6auU8tT94WrHftjDbrCEXSU1oBoqyl2QvZ6jIW3" 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 1</strong></h4>
27                 <br><br>
28                 <b><?=> $truck->getMaxLoad() . ' kg'; ?> <br></b>
29                 <br>
30                 <?=> $truck->addBox(1000) . ' kg'; ?> <br>
31                 <?=> $truck->addBox(7000) . ' kg'; ?> <br>
32                 <?=> $truck->addBox(8000) . ' kg'; ?> <br>
33             </div>
34             <div class="col-5 mx-auto border p-3 mt-2">
35                 <?php
36                     echo "Jadi, Butuh Bahan Bakar sebanyak " . $truck->calcFuelNeeds() . ' Liter'. '<br>';
37                 ?>
38                 <br>
39                 -----
40                 <br>
41                 <b><?=> $riverBarge->getMaxLoad() . ' kg'; ?> <br></b>
42                 <br>
43                 <?=> $riverBarge->addBox(2000) . ' kg'; ?> <br>
44                 <?=> $riverBarge->addBox(4000) . ' kg'; ?> <br>
45                 <?=> $riverBarge->addBox(9000) . ' kg'; ?> <br>
46             </div>
47         </div>
48         <?php
49             echo "Jadi, Butuh Bahan Bakar sebanyak " . $riverBarge->calcFuelNeeds() . ' Liter';
50         ?>
51     </div>
52 </body>
53 </html>
```

- **Output**

localhost/PBOPraktikum/No1%20B.php

🔍 📄 ☆

PBO - Praktikum 6

Soal 1

Maksimal muatan Truk 16000 kg

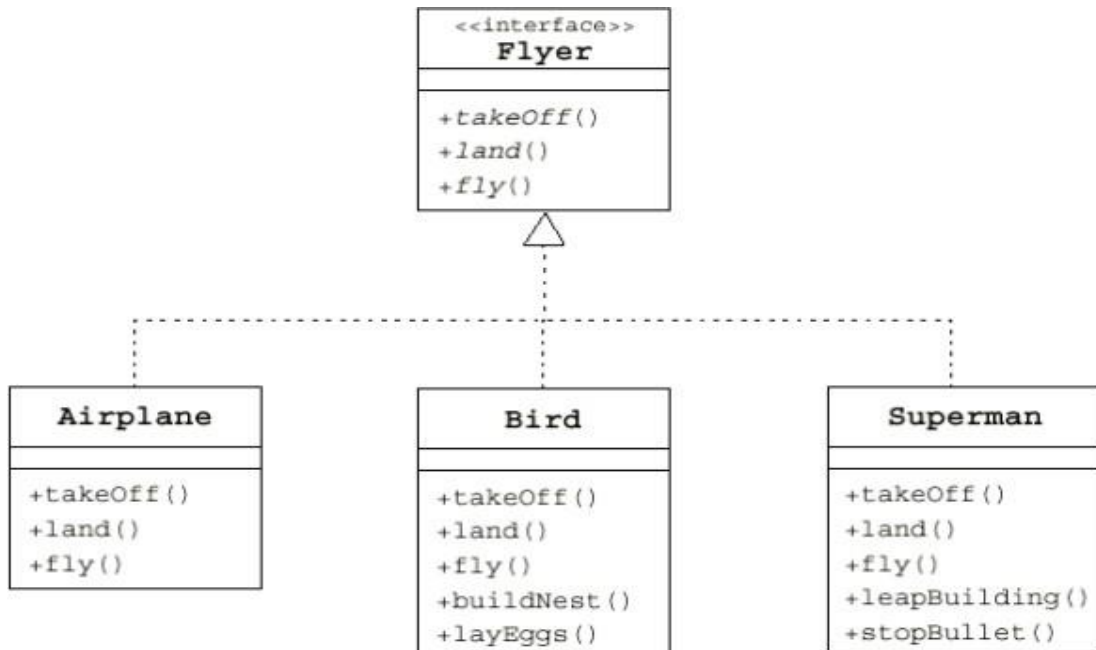
Truk menambah muatan sebesar 1000 kg
 Truk menambah muatan sebesar 7000 kg
 Truk menambah muatan sebesar 8000 kg
 Jadi, Butuh Bahan Bakar sebanyak 7 Liter

Maksimal muatan Perahu 15000 kg

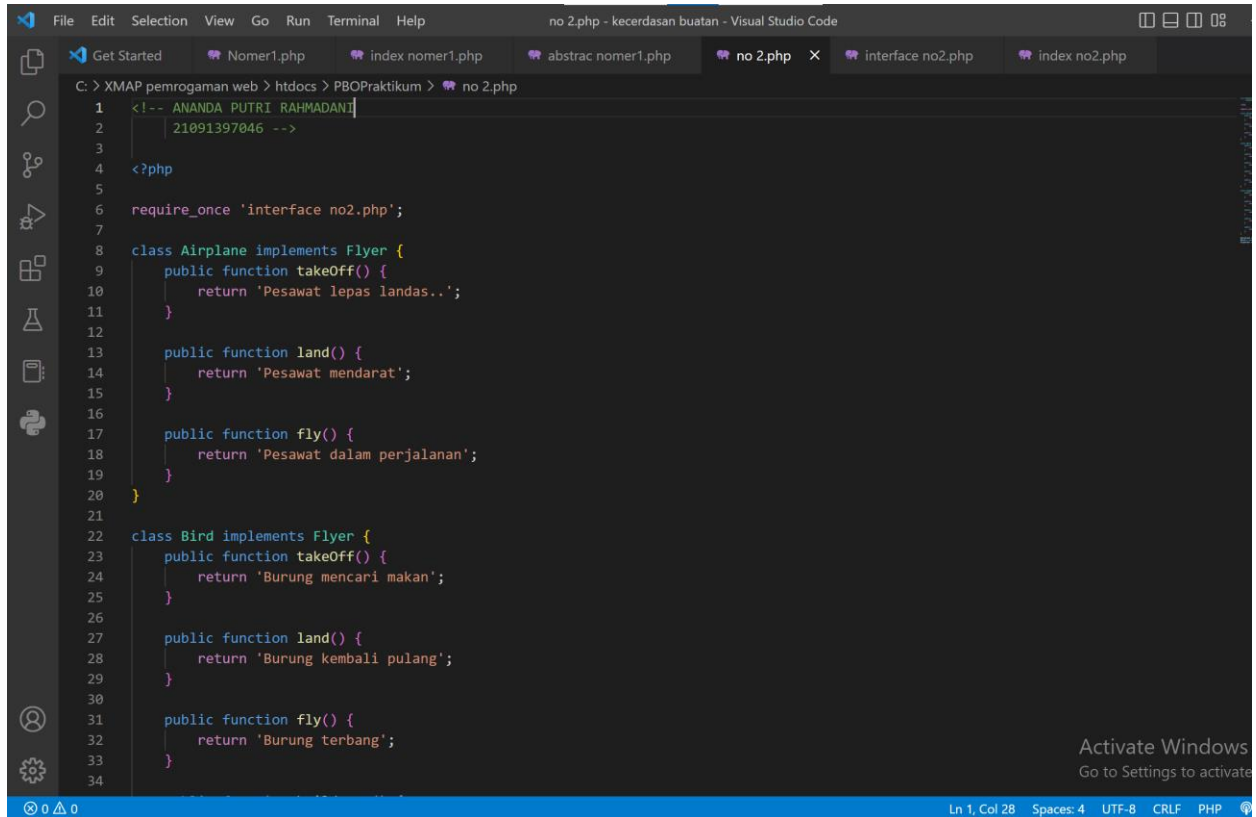
Perahu menambah muatan sebesar 2000 kg
 Perahu menambah muatan sebesar 4000 kg
 Perahu menambah muatan sebesar 9000 kg
 Jadi, Butuh Bahan Bakar sebanyak 7 Liter

- **Analisa** : Implementasi dari abstract class pada class Vehicle, method calcFuelNeeds dipakai untuk menghitung bahan bakar yang digunakan. Abstract method diletakkan 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

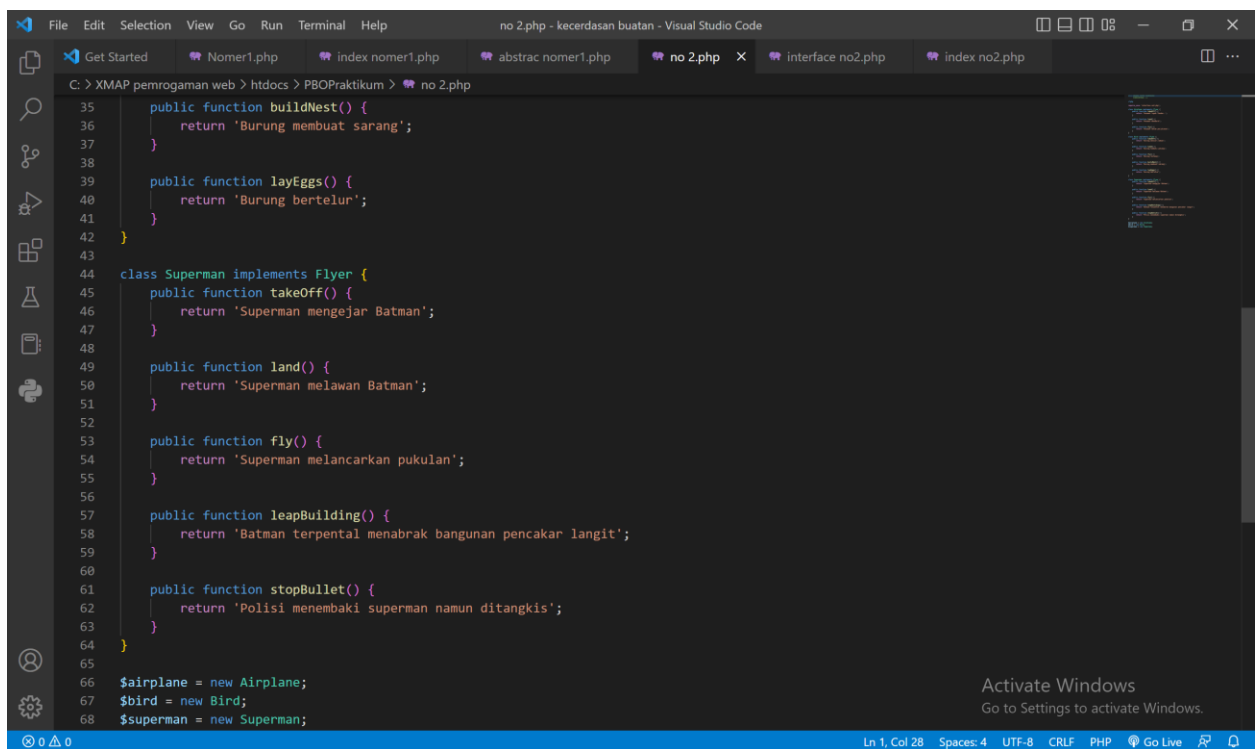
2. Buat program berdasarkan UML berikut



- ## Codingan

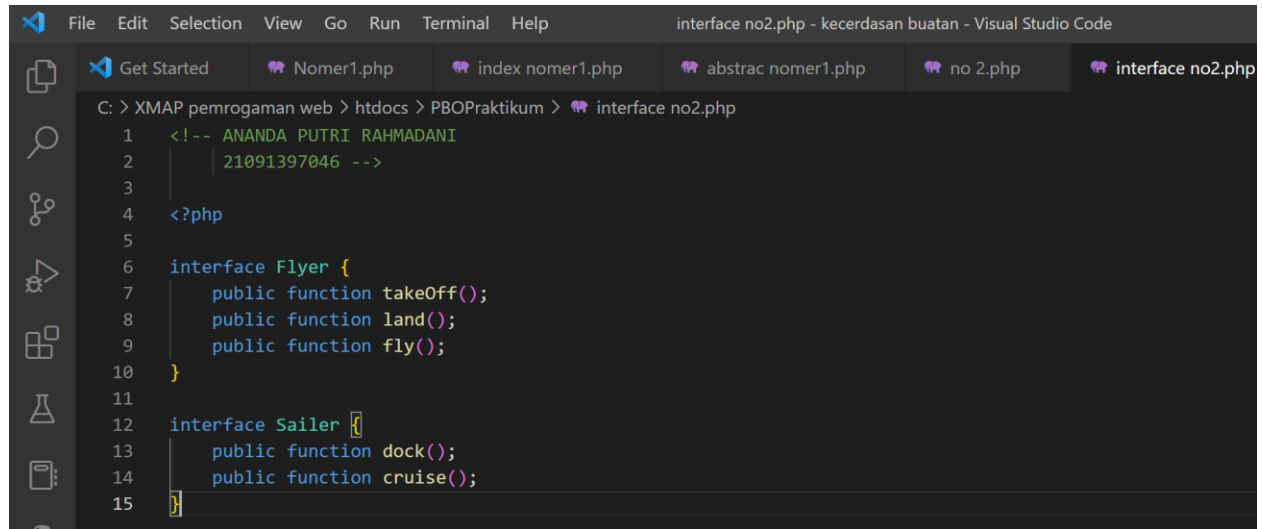


```
1 <!-- ANANDA PUTRI RAHMADAN -->
2 21091397046 -->
3
4 <?php
5
6 require_once 'interface no2.php';
7
8 class Airplane implements Flyer {
9     public function takeOff() {
10         return 'Pesawat lepas landas..';
11     }
12
13     public function land() {
14         return 'Pesawat mendarat';
15     }
16
17     public function fly() {
18         return 'Pesawat dalam perjalanan';
19     }
20 }
21
22 class Bird implements Flyer {
23     public function takeOff() {
24         return 'Burung mencari makan';
25     }
26
27     public function land() {
28         return 'Burung kembali pulang';
29     }
30
31     public function fly() {
32         return 'Burung terbang';
33     }
34 }
```



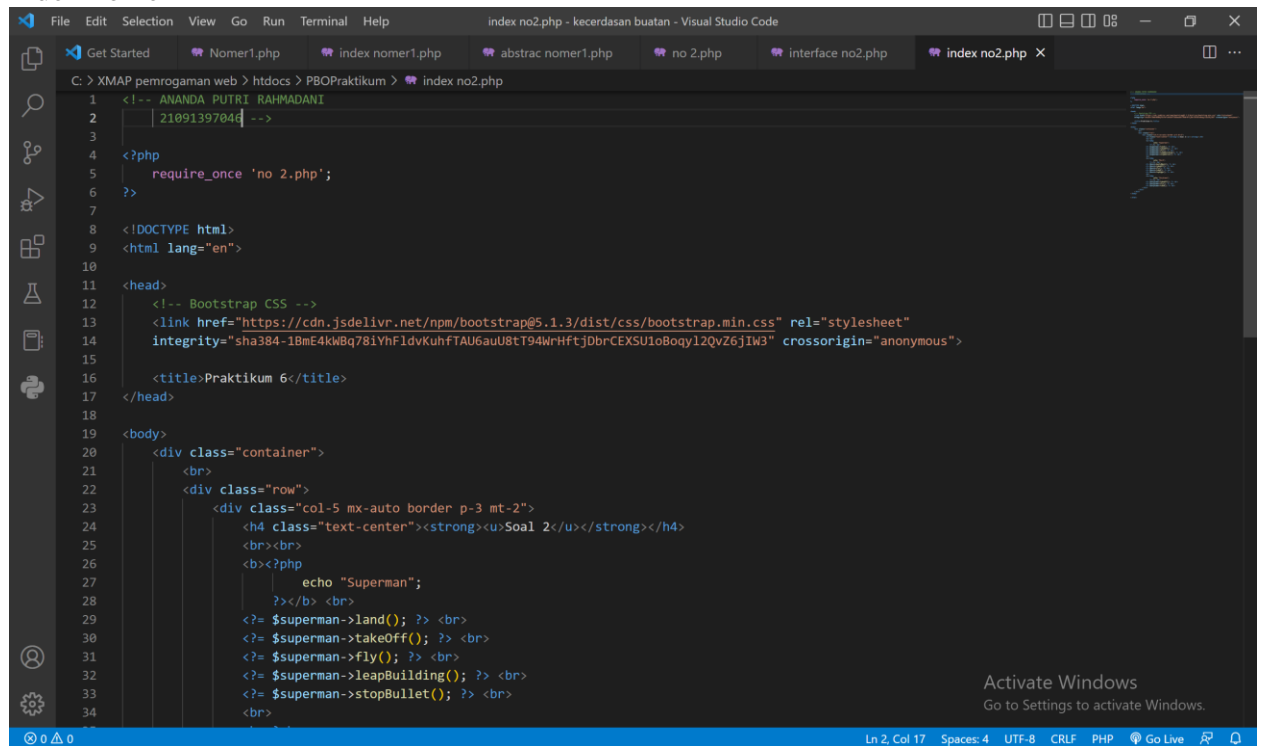
```
35     public function buildNest() {
36         return 'Burung membuat sarang';
37     }
38
39     public function layEggs() {
40         return 'Burung bertelur';
41     }
42 }
43
44 class Superman implements Flyer {
45     public function takeOff() {
46         return 'Superman mengejar Batman';
47     }
48
49     public function land() {
50         return 'Superman melawan Batman';
51     }
52
53     public function fly() {
54         return 'Superman melancarkan pukulan';
55     }
56
57     public function leapBuilding() {
58         return 'Batman terpelant menabrak bangunan pencakar langit';
59     }
60
61     public function stopBullet() {
62         return 'Polisi menembaki superman namun ditangkis';
63     }
64 }
65
66 $airplane = new Airplane;
67 $bird = new Bird;
68 $superman = new Superman;
```

Interface nomer2



```
1 <!-- ANANDA PUTRI RAHMADANI
2 | 21091397046 -->
3
4 <?php
5
6 interface Flyer {
7     public function takeOff();
8     public function land();
9     public function fly();
10 }
11
12 interface Sailer {
13     public function dock();
14     public function cruise();
15 }
```

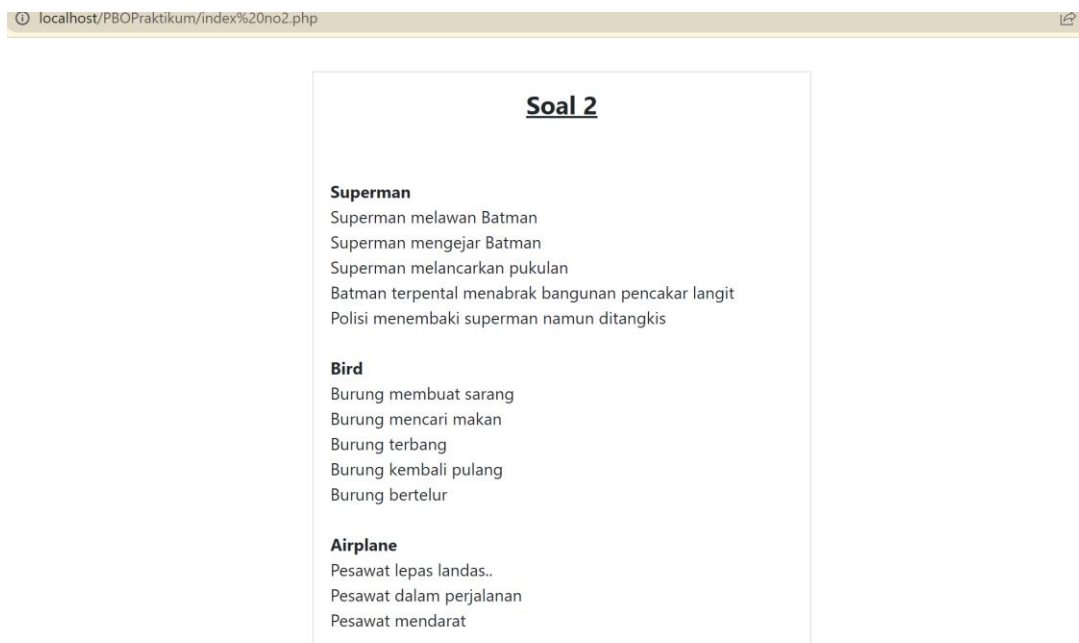
Index nomer 2



```
1 <!-- ANANDA PUTRI RAHMADANI
2 | 21091397046 -->
3
4 <?php
5     require_once 'no 2.php';
6 >
7
8 <!DOCTYPE html>
9 <html lang="en">
10
11 <head>
12     <!-- Bootstrap CSS -->
13     <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.3/dist/css/bootstrap.min.css" rel="stylesheet"
14         integrity="sha384-18mE4kWbQ78iYhF1dvKuhfTAU6auU8tT94WrHftjDbrCEXSU1oBoqy12QvZ6jIW3" crossorigin="anonymous">
15
16     <title>Praktikum 6</title>
17 </head>
18
19 <body>
20     <div class="container">
21         <br>
22         <div class="row">
23             <div class="col-5 mx-auto border p-3 mt-2">
24                 <h4 class="text-center"><strong><u>Soal 2</u></strong></h4>
25                 <br><br>
26                 <b><?php
27                     echo "Superman";
28                     ?></b> <br>
29                     <?= $superman->land(); ?> <br>
30                     <?= $superman->takeOff(); ?> <br>
31                     <?= $superman->fly(); ?> <br>
32                     <?= $superman->leapBuilding(); ?> <br>
33                     <?= $superman->stopBullet(); ?> <br>
34                 </b>
35             </div>
36         </div>
37     </div>
38 </body>
39 </html>
```

```
File Edit Selection View Go Run Terminal Help index no2.php - kecerdasan buatan - Visual Studio Code
Get Started Nomer1.php index nomer1.php abstrac nomer1.php no 2.php interface no2.php index no2.php
C: > XMAP pemrograman web > htdocs > PBOPraktikum > index no2.php
28      ?></b> <br>
29      <?= $superman->land(); ?> <br>
30      <?= $superman->takeOff(); ?> <br>
31      <?= $superman->fly(); ?> <br>
32      <?= $superman->leapBuilding(); ?> <br>
33      <?= $superman->stopBullet(); ?> <br>
34      <br>
35      <b><?php
36          echo "Bird";
37      ?></b> <br>
38      <?= $bird->buildNest(); ?> <br>
39      <?= $bird->takeOff(); ?> <br>
40      <?= $bird->fly(); ?> <br>
41      <?= $bird->land(); ?> <br>
42      <?= $bird->layEggs(); ?> <br>
43      <br>
44      <b><?php
45          echo "Airplane";
46      ?></b> <br>
47      <?= $airplane->takeOff(); ?> <br>
48      <?= $airplane->fly(); ?> <br>
49      <?= $airplane->land(); ?> <br>
50  </div>
51  </div>
52  </div>
53  </body>
54
55  </html>
```

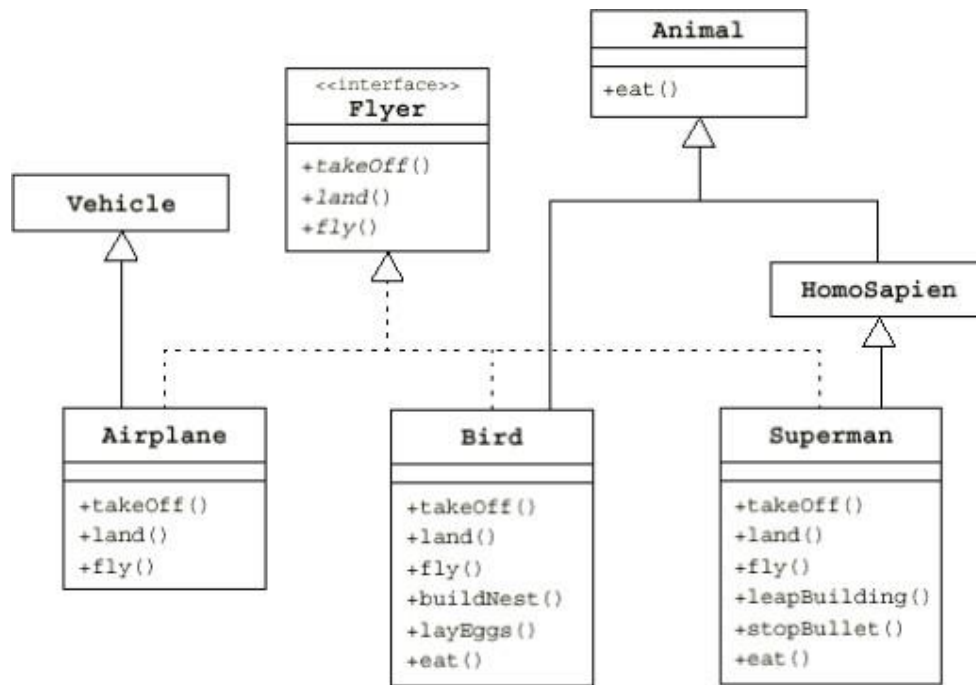
- **Output**



Analisa :

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

3. Buat program berdasarkan UML berikut



• Codingan

```
File Edit Selection View Go Run Terminal Help
no 3.php - kecerdasan buatan - Visual Studio Code
no 2.php interface no2.php index no2.php no 3.php X interface no 3.php index no 3.php abstrac no 3.php
C: > XMAP pemrograman web > htdocs > PBOPraktikum > no 3.php
1 <!-- ANANDA PUTRI RAHMADANI
2 21091397046 -->
3
4 <?php
5
6 require_once 'abstrac no 3.php';
7 require_once 'interface no 3.php';
8
9 class Animal
10 {
11     protected $name;
12
13     public function __construct($name)
14     {
15         $this->name = $name;
16     }
17
18     public function eat()
19     {
20         return $this->name . ' sedang makan';
21     }
22 }
23
24 class Homosapiens extends Animal {}
25
26 class Airplane2 extends Vehicle implements Flyer
27 {
28     public function __construct($maxLoad, $name)
29     {
30         $this->maxLoad = $maxLoad;
31         $this->name = $name;
32     }
33
34     public function takeOff()
```

```
File Edit Selection View Go Run Terminal Help no 3.php - kecerdasan buatan - Visual Studio Code
no 2.php interface no 2.php index no 2.php no 3.php X interface no 3.php index no 3.php abstrac no 3.php
C:\XMAP pemrograman web > htdocs > PBOPraktikum > no 3.php
35
36 {
37     return "$this->name lepas landas";
38 }
39
40 public function land()
41 {
42     return "$this->name mendarat";
43 }
44
45 public function fly()
46 {
47     return "$this->name dalam perjalanan";
48 }
49
50 public function calcFuelNeeds()
51 {
52     $fuel = $this->calcFuelEfficiency();
53     $trip = $this->calcTripDistance();
54
55     return ceil($fuel / $trip);
56 }
57
58 }
59
60 class Superman2 extends Homosapiens implements Flyer
61 {
62     public function takeOff()
63     {
64         return "$this->name mengejar Batman";
65     }
66
67     public function land()
68     {
69         return "$this->name melawan Batman";
70     }
71
72     public function fly()
73     {
74         return "$this->name melancarkan pukulan";
75     }
76
77     public function leapBuilding()
78     {
79         return "Batman terpenjal menabrak bangunan pencakar langit";
80     }
81
82     public function stopBullet()
83     {
84         return "Polisi menembaki $this->name namun ditangkis";
85     }
86 }
87
88 $burung = new Animal('Burung');
89 $manusia = new Homosapiens('Aransha');
90 $airplane2 = new Airplane2(25000, 'Batik Air');
91 $superman2 = new Superman2('Superman');
```

Interface nomer 3

```
C: > XMAP pemrograman web > htdocs > PBOPraktikum > interface no 3.php

1  <!-- ANANDA PUTRI RAHMADANI
2      21091397046 -->
3
4  <?php
5
6  interface Flyer {
7      public function takeOff();
8      public function land();
9      public function fly();
10 }
11
12 interface Sailer {
13     public function dock();
14     public function cruise();
15 }
```

Index nomer 3

```
File Edit Selection View Go Run Terminal Help index no 3.php - kecerdasan buatan - Visual Studio Code
no 2.php interface no2.php index no2.php no 3.php interface no 3.php index no 3.php X abstrac no 3.php
C: > XMAP pemrograman web > htdocs > PBOPraktikum > index no 3.php

1  <!-- Ananda Putri Rahmadani
2      21091397046 -->
3
4  <?php
5      require_once 'no 3.php';
6  ?>
7
8  <!DOCTYPE html>
9  <html lang="id">
10
11 <head>
12     <!-- Bootstrap CSS -->
13     <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.3/dist/css/bootstrap.min.css" rel="stylesheet"
14         integrity="sha384-1BmE4kWbQ78iYhF1dvKuhfTAU6auU8tT94WrHftjDbrCEXSU1oBoqy12Qv26jIW3" crossorigin="anonymous">
15
16     <title>Praktikum 6</title>
17 </head>
18 <body>
19     <div class="container">
20         <div class="row">
21             <div class="col-5 mx-auto border p-3 mt-2">
22                 <h4 class="text-center"><strong><u>Soal 3</u></strong></h4>
23                 <br><br>
24                 <?=$burung->eat(); ?> <br>
25                 <?=$manusia->eat(); ?> <br>
26                 <br>
27
28                 <b><?=$airplane2->getMaxLoad() . ' kg'; ?> <br></b>
29                 <?=$airplane2->addBox(6000) . ' kg'; ?> <br>
30                 <?=$airplane2->addBox(2000) . ' kg'; ?> <br>
31                 <?=$airplane2->addBox(7000) . ' kg'; ?> <br>
32                 <?=$airplane2->addBox(5000) . ' kg'; ?> <br>
33                 <?=$airplane2->takeOff(); ?> <br>
34                 <?=$airplane2->fly(); ?> <br>

```

```
33         <?= $airplane2->takeOff(); ?> <br>
34         <?= $airplane2->fly(); ?> <br>
35         <?= $airplane2->land(); ?> <br>
36
37         <?php
38             echo "Jadi, Butuh Bahan Bakar sebanyak " . $airplane2->calcFuelNeeds() . ' Liter'. '<br>';
39             ?>
40         <br>
41         <?= $superman2->eat(); ?> <br>
42         <?= $superman2->land(); ?> <br>
43         <?= $superman2->takeOff(); ?> <br>
44         <?= $superman2->fly(); ?> <br>
45         <?= $superman2->leapBuilding(); ?> <br>
46         <?= $superman2->stopBullet(); ?> <br>
47     </div>
48 </div>
49 </div>
50 </body>
51
52 </html>
```

Abstrac nomer 3

```
File Edit Selection View Go Run Terminal Help  abstrac no 3.php - kecerdasan buatan - Visual Studio Code
no 2.php interface no2.php index no2.php no 3.php interface no 3.php index no 3.php abstrac no 3.php X
C: > XMAP pemrograman web > htdocs > PBOPraktikum > abstrac no 3.php
1  <!-- Ananda Putri Rahmadani |
2  | 21091397046 -->
3
4  <?php
5
6  abstract class Vehicle {
7      private $load = 0;
8      protected $maxLoad = 0, $name;
9
10     protected function __construct($maxLoad, $name) {
11         $this->$maxLoad = $maxLoad;
12         $this->$name = $name;
13     }
14
15     public function getLoad() {
16         return $this->load;
17     }
18
19     public function getMaxLoad() {
20         echo 'Maksimal muatan ' . $this->name . ' ' ;
21         return $this->maxLoad;
22     }
23
24     public function addBox($weight) {
25         if ($this->load >= $this->maxLoad) {
26             echo "$this->name menambah muatan sebesar $weight <br>";
27             echo 'Muatan telah penuh tidak bisa menambah lagi';
28         } else {
29             $this->load += $weight;
30             echo "$this->name menambah muatan sebesar $weight";
31         }
32     }
33
34     abstract public function calcFuelNeeds();
35
36     protected function calcFuelEfficiency() {
37         $range = 50000000;
38         $range /= $this->load;
39         return $range;
40     }
41
42     protected function calcTripDistance() {
43         return 500;
44     }
45 }
```

- **Output**

OPraktikum/index%20no%203.php

Soal 3

Burung sedang makan
Aransha sedang makan

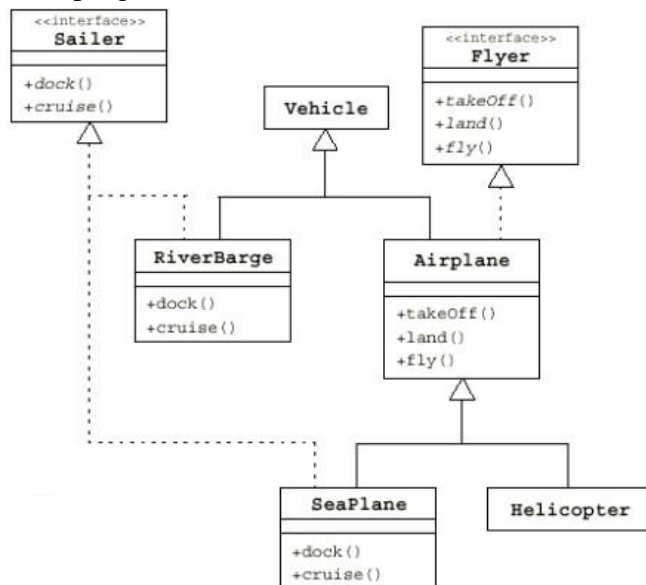
Maksimal muatan Batik Air 25000 kg

Batik Air menambah muatan sebesar 6000 kg
Batik Air menambah muatan sebesar 2000 kg
Batik Air menambah muatan sebesar 7000 kg
Batik Air menambah muatan sebesar 5000 kg
Batik Air lepas landas
Batik Air dalam perjalanan
Batik Air mendarat
Jadi, Butuh Bahan Bakar sebanyak 5 Liter

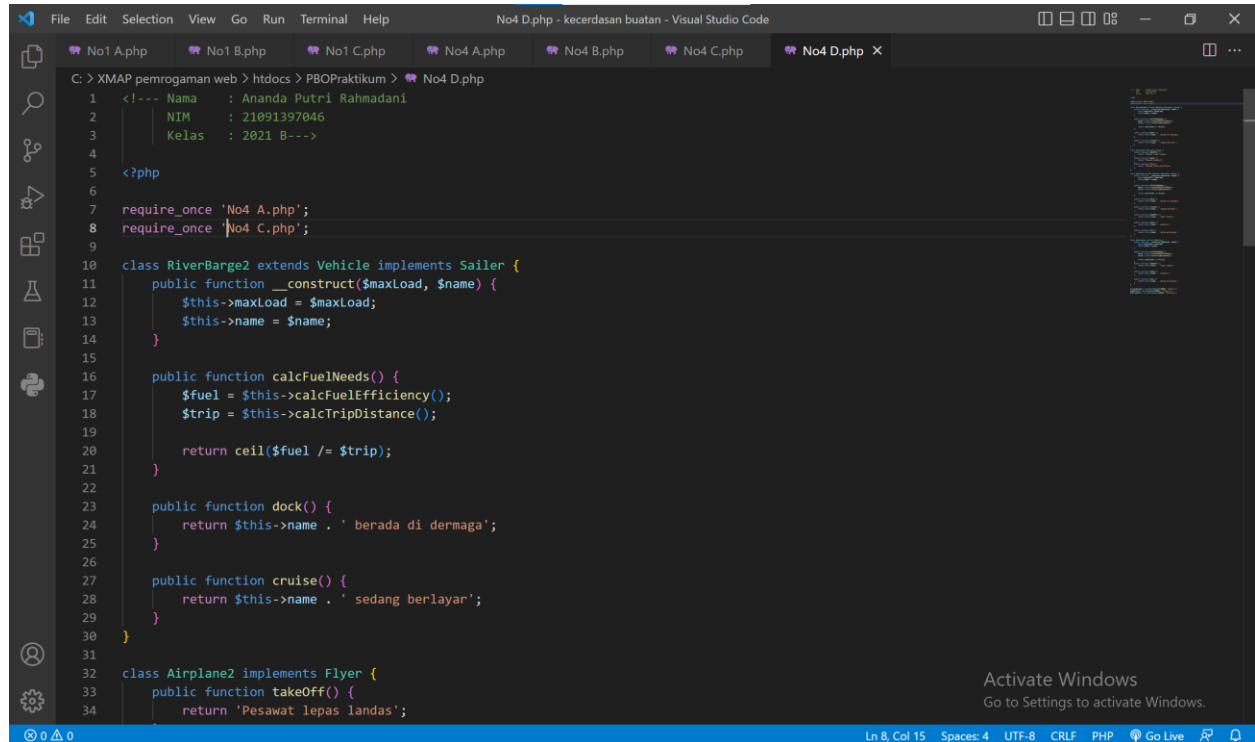
Superman sedang makan
Superman melawan Batman
Superman mengejar Batman
Superman melancarkan pukulan
Batman terpental menabrak bangunan pencakar langit
Polisi menembaki Superman namun ditangkis

- **Analisa :** Terdapat interface Flyer dan abstract class Vehicle. Class airplane implementasi dari interface Flyer 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 juga turunan dari Animal, serta implementasi dari interface Flyer. Maka class Superman memiliki method eat, takeoff, land, fly

4. Buat program berdasarkan UML berikut



- Codingan

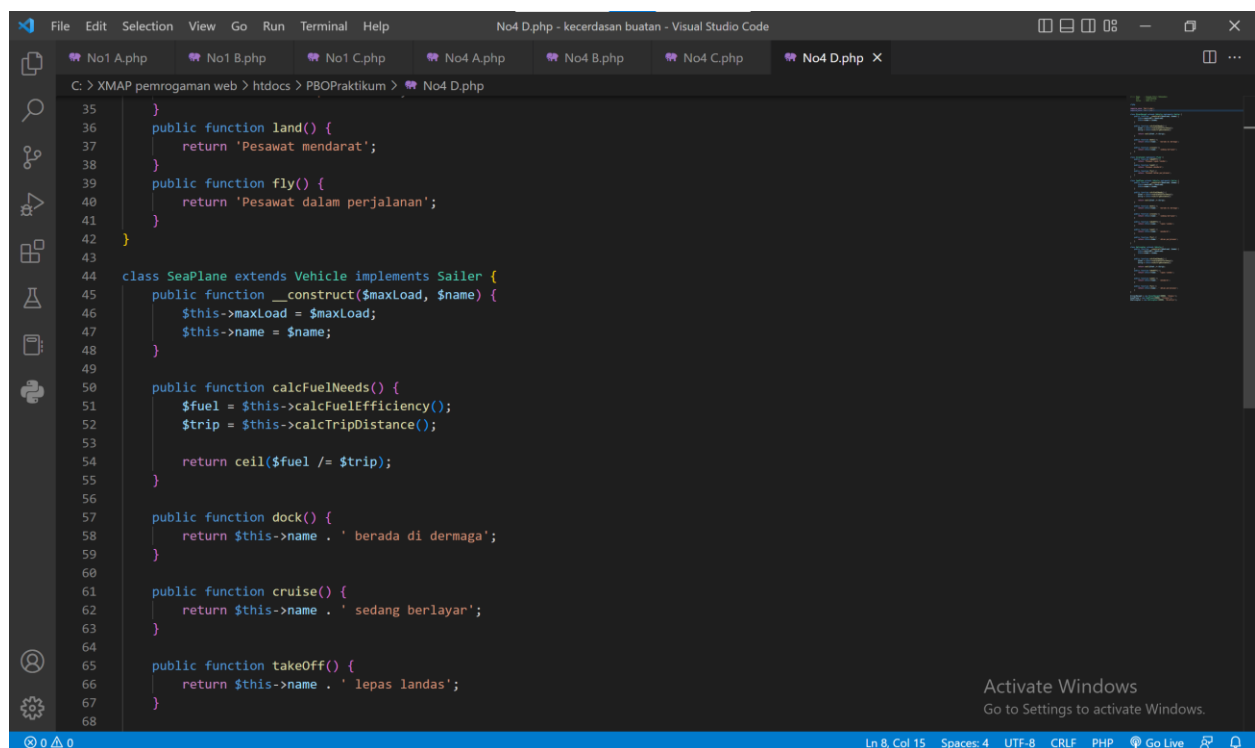


```
File Edit Selection View Go Run Terminal Help No4 D.php - kecerdasan buatan - Visual Studio Code

C: > XMAP pemrograman web > htdocs > PBOPraktikum > No4 D.php
1 <!-- Nama : Ananda Putri Rahmadani
2 NIM : 21091397046
3 Kelas : 2021 B-->
4
5 <?php
6
7 require_once 'No4 A.php';
8 require_once 'No4 C.php';
9
10 class RiverBarge2 extends Vehicle implements Sailer {
11     public function __construct($maxLoad, $name) {
12         $this->maxLoad = $maxLoad;
13         $this->name = $name;
14     }
15
16     public function calcFuelNeeds() {
17         $fuel = $this->calcFuelEfficiency();
18         $trip = $this->calcTripDistance();
19
20         return ceil($fuel / $trip);
21     }
22
23     public function dock() {
24         return $this->name . ' berada di dermaga';
25     }
26
27     public function cruise() {
28         return $this->name . ' sedang berlayar';
29     }
30 }
31
32 class Airplane2 implements Flyer {
33     public function takeOff() {
34         return 'Pesawat lepas landas';
35     }
36 }
37
38 public function land() {
39     return 'Pesawat mendarat';
40 }
41
42 public function fly() {
43     return 'Pesawat dalam perjalanan';
44 }
45
46 class SeaPlane extends Vehicle implements Sailer {
47     public function __construct($maxLoad, $name) {
48         $this->maxLoad = $maxLoad;
49         $this->name = $name;
50     }
51
52     public function calcFuelNeeds() {
53         $fuel = $this->calcFuelEfficiency();
54         $trip = $this->calcTripDistance();
55
56         return ceil($fuel / $trip);
57     }
58
59     public function dock() {
60         return $this->name . ' berada di dermaga';
61     }
62
63     public function cruise() {
64         return $this->name . ' sedang berlayar';
65     }
66
67     public function takeOff() {
68         return $this->name . ' lepas landas';
69     }
70 }
```

Activate Windows
Go to Settings to activate Windows.

Ln 8, Col 15 Spaces: 4 UTF-8 CRLF PHP Go Live



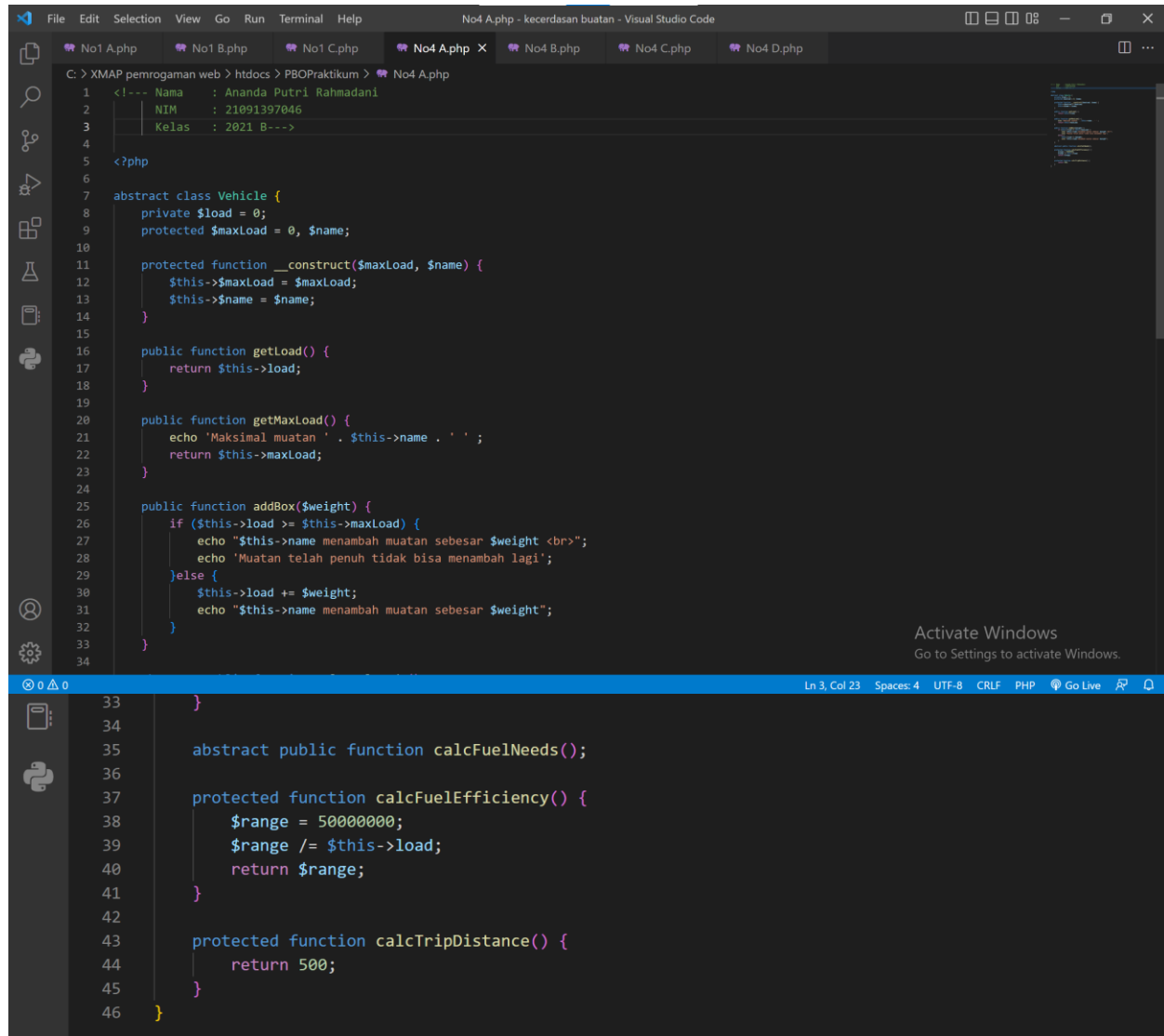
```
File Edit Selection View Go Run Terminal Help No4 D.php - kecerdasan buatan - Visual Studio Code

C: > XMAP pemrograman web > htdocs > PBOPraktikum > No4 D.php
35 }
36 public function land() {
37     return 'Pesawat mendarat';
38 }
39 public function fly() {
40     return 'Pesawat dalam perjalanan';
41 }
42 }
43
44 class SeaPlane extends Vehicle implements Sailer {
45     public function __construct($maxLoad, $name) {
46         $this->maxLoad = $maxLoad;
47         $this->name = $name;
48     }
49
50     public function calcFuelNeeds() {
51         $fuel = $this->calcFuelEfficiency();
52         $trip = $this->calcTripDistance();
53
54         return ceil($fuel / $trip);
55     }
56
57     public function dock() {
58         return $this->name . ' berada di dermaga';
59     }
60
61     public function cruise() {
62         return $this->name . ' sedang berlayar';
63     }
64
65     public function takeOff() {
66         return $this->name . ' lepas landas';
67     }
68 }
```

Activate Windows
Go to Settings to activate Windows.

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Abstrak nomer4



```
1 <!-- Nama : Ananda Putri Rahmadani
2      NIM : 21091397046
3      Kelas : 2021 B-->
4
5 <?php
6
7 abstract class Vehicle {
8     private $load = 0;
9     protected $maxLoad = 0, $name;
10
11     protected function __construct($maxLoad, $name) {
12         $this->$maxLoad = $maxLoad;
13         $this->$name = $name;
14     }
15
16     public function getLoad() {
17         return $this->load;
18     }
19
20     public function getMaxLoad() {
21         echo 'Maksimal muatan ' . $this->name . ' ' ;
22         return $this->maxLoad;
23     }
24
25     public function addBox($weight) {
26         if ($this->load >= $this->maxLoad) {
27             echo "$this->name menambah muatan sebesar $weight <br>";
28             echo 'Muatan telah penuh tidak bisa menambah lagi';
29         } else {
30             $this->load += $weight;
31             echo "$this->name menambah muatan sebesar $weight";
32         }
33     }
34
35     abstract public function calcFuelNeeds();
36
37     protected function calcFuelEfficiency() {
38         $range = 50000000;
39         $range /= $this->load;
40         return $range;
41     }
42
43     protected function calcTripDistance() {
44         return 500;
45     }
46 }
```

Interface nomer4

```
C: > XMAP pemrograman web > htdocs > PBOPraktikum > No4 C.php
1  <!-- Nama      : ananda putri rahmadani
2      NIM       : 21091397046
3      Kelas    : 2021 b-->
4
5  <?php
6
7      interface Flyer {
8          public function takeOff();
9          public function land();
10         public function fly();
11     }
12
13     interface Sailer {
14         public function dock();
15         public function cruise();
16     }
```

Index nomer 4

```
File Edit Selection View Go Run Terminal Help
No4 B.php - kecerdasan buatan - Visual Studio Code

No1 A.php No1 B.php No1 C.php No4 A.php No4 B.php x No4 C.php No4 D.php
C: > XMAP pemrograman web > htdocs > PBOPraktikum > No4 B.php
1  <!-- Nama      : Ananda Putri Rahmadani
2      NIM       : 21091397046
3      Kelas    : 2021 B-->
4
5  <?php
6      require_once 'No4 D.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="sha384-1BmE4KWBq78iYhF1dvKuhfTAU6auU8tT94WfhTjDbrCEXSU1oBoqy12Qv26jIW3" 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 4</strong></h4>
24             <br><br>
25             <div class="col-4 mx-auto border p-2 mt-2">
26                 <b><?=$riverBarge2->getMaxLoad() . ' kg'; ?> <br></b>
27                 <?=$riverBarge2->addBox(12000) . ' kg'; ?> <br>
28                 <?=$riverBarge2->addBox(14000) . ' kg'; ?> <br>
29                 <?=$riverBarge2->addBox(1000) . ' kg'; ?> <br>
30                 <?=$riverBarge2->addBox(3000) . ' kg'; ?> <br>
31                 <?=$riverBarge2->dock(); ?> <br>
32                 <?=$riverBarge2->cruise(); ?> <br>
33                 <?php
34                     echo "Jadi, Butuh Bahan Bakar sebanyak " . $riverBarge2->calcFuelNeeds() . ' Liter'. ' <br>";
35             </div>
26         </div>
27     </div>
28 </body>
29 </html>
30
31 0 0
Ln 3, Col 23 Spaces: 4 UTF-8 CRLF PHP Go Live
```



```

33
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```

• **Output**

<div> <div>localhost/PBOPraktikum/No4%20B.php</div> <div> <div>PBO - Praktikum 6</div> <div>Soal 4</div> </div> </div>		
<div> <div>Maksimal muatan Atomic 30000 kg</div> <div>Atomic menambah muatan sebesar 12000 kg</div> <div>Atomic menambah muatan sebesar 14000 kg</div> <div>Atomic menambah muatan sebesar 1000 kg</div> <div>Atomic menambah muatan sebesar 3000 kg</div> <div>Atomic berada di dermaga</div> <div>Atomic sedang berlayar</div> <div>Jadi, Butuh Bahan Bakar sebanyak 4 Liter</div> </div>	<div> <div>Maksimal muatan Titanic 20000 kg</div> <div>Titanic menambah muatan sebesar 12000 kg</div> <div>Titanic menambah muatan sebesar 8000 kg</div> <div>Titanic berada di dermaga</div> <div>Titanic sedang berlayar</div> <div>Titanic lepas landas</div> <div>Titanic dalam perjalanan</div> <div>Titanic mendarat</div> <div>Jadi, Butuh Bahan Bakar sebanyak 5 Liter</div> </div>	<div> <div>Maksimal muatan Brooklyn 10000 kg</div> <div>Brooklyn menambah muatan sebesar 8000 kg</div> <div>Brooklyn menambah muatan sebesar 2000 kg</div> <div>Brooklyn lepas landas</div> <div>Brooklyn dalam perjalanan</div> <div>Brooklyn mendarat</div> <div>Jadi, Butuh Bahan Bakar sebanyak 10 Liter</div> </div>

- Analisa :** Implementasi polymorphism dengan interface dan abstact class detunjukkan 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

