

LAPORAN PRAKTIKUM 6



Oleh:

Nur Haslinda (21091397035)

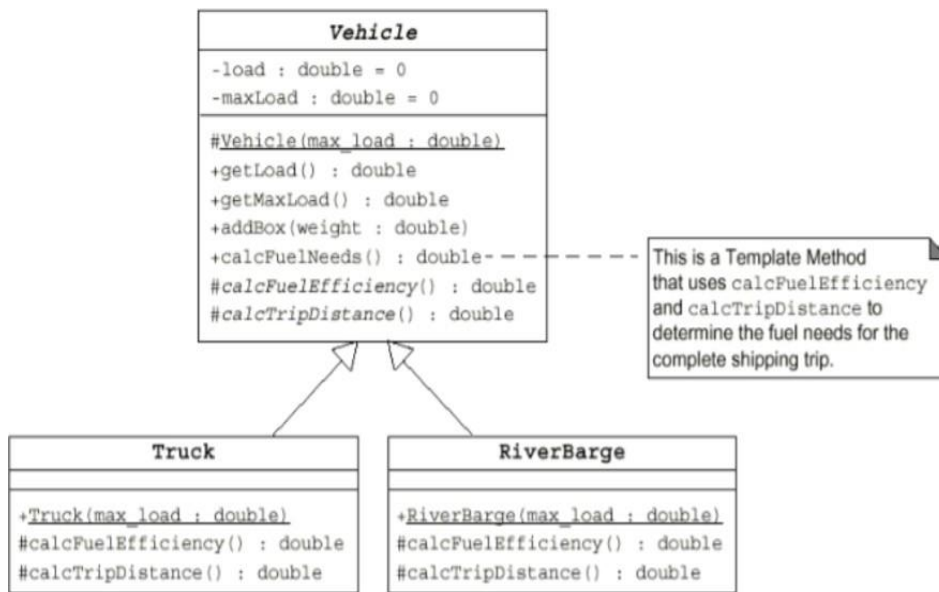
PROGRAM STUDI D4 MANAJEMEN INFORMATIKA

FAKULTAS VOKASI

UNIVERSITAS NEGERI SURABAYA

2022

1. Buatlah Program berdasarkan UML dibawah ini



Codingan

- PHP

```
File Edit Selection View Go Run Terminal Help No1 A.php - Visual Studio Code
Restricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More
No1 A.php X No1 B.php No1 C.php No3 A.php No3 B.php No3 C.php No3 D.p
C: > Xampp > htdocs > PBO > Prak 6 > Nomor 1 > No1 A.php
1 <!-- Nama : Nur Haslinda
2 NIM : 21091397035
3 Kelas : 2021 A-->
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 }
```

```
File Edit Selection View Go Run Terminal Help No1 A.php - Visual S
stricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More
No1 A.php X No1 B.php No1 C.php No3 A.php No3 B.php No3 C.php
C: > Xampp > htdocs > PBO > Prak 6 > Nomor 1 > No1 A.php
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 }
```

```
File Edit Selection View Go Run Terminal Help No1 B.php - Visual Studio Code
stricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More
No1 A.php No1 B.php X No1 C.php No3 A.php No3 B.php No3 C.php No3 D.php
C: > Xampp > htdocs > PBO > Prak 6 > Nomor 1 > No1 B.php
1 <!-- Nama      : Nur Haslinda
2      NIM       : 21091397035
3      Kelas    : 2021 A-->
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="sha384-1BmE4KWBq78iYhFtdvkuhFtAUGAU8tT94WrfHftjDbrCEXSU1oBoqyl2QvZ6jIW3" crossorigin="anonymous">
16
17     <title>PBO Praktikum 6</title>
18 </head>
19
```

```
File Edit Selection View Go Run Terminal Help No1 B.php - Visual Studio Code
stricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More
No1 A.php No1 B.php X No1 C.php No3 A.php No3 B.php No3 C.php No3 D.php
C: > Xampp > htdocs > PBO > Prak 6 > Nomor 1 > No1 B.php
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
34                 <?php
35                 |     echo "Jadi, Butuh Bahan Bakar sebanyak " . $truck->calcFuelNeeds() . ' Liter'. '<br>';
36                 ?>
37                 <br>
38                 -----
39                 <br>
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
47                 <?php
48                 |     echo "Jadi, Butuh Bahan Bakar sebanyak " . $riverBarge->calcFuelNeeds() . ' Liter';
49                 ?>
50             </div>
51         </div>
52     </div>
53 </body>
54
```

```

54
55     </html>

```

```

File Edit Selection View Go Run Terminal Help No1 C.php - Visual Studio Code
stricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More
No1 A.php No1 B.php No1 C.php X No3 A.php No3 B.php No3 C.php No3 D.php
C: > Xampp > htdocs > PBO > Prak 6 > Nomor 1 > No1 C.php
1 <!-- Nama : Nur Haslinda
2 NIM : 21091397035
3 Kelas : 2021 A-->
4
5 <?php
6
7 require_once '../Nomor 1/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

```

```

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         $trip = $this->calcTripDistance();
36
37         return ceil($fuel / $trip);
38     }
39 }
40 $truck = new Truck(16000, 'Truk');
41 $riverBarge = new RiverBarge(15000, 'Perahu');

```

- Output

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

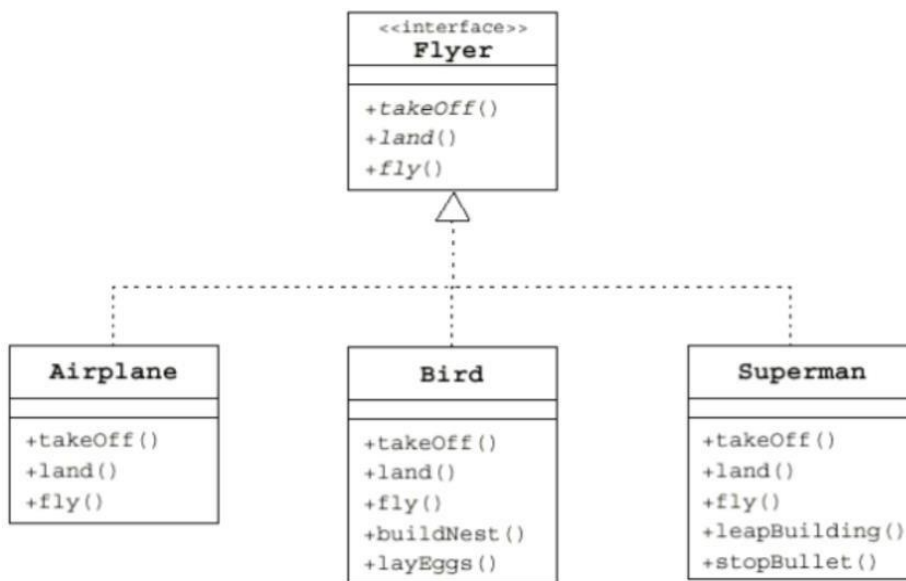
Maksimal muatan Perahu 15000 kg

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 digunakan 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. Buatlah Program berdasarkan UML dibawah ini



Codingan

- PHP

```

terminal  Help      No2 A.php - Prak 6 - Visual Studio Code

No2 A.php x
Nomor 2 > No2 A.php
1  <!-- Nama      : Nur Haslinda
2     NIM       : 21091397035
3     Kelas    : 2021 A-->
4
5  <?php
6     require_once 'No2 C.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="sha384-1BmE4kWBq78iYhFldvKuhfTAU6auU8tT94WrfjDbrcEXSU1oBoqyl2QvZ6jIW3" crossorigin="anonymous">
16
17     <title>PBO - Praktikum 6</title>
18 </head>
19
20 <body>
  
```

```
terminal Help • No2 A.php - Prak 6 - Visual Studio Code
No2 A.php
Nomor 2 > No2 A.php
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 2</strong></h4>
27                 <br><br>
28                 <b><?php
29                     | echo "Superman";
30                     ?></b> <br>
31                 <?=> $superman->land(); ?> <br>
32                 <?=> $superman->takeOff(); ?> <br>
33                 <?=> $superman->fly(); ?> <br>
34                 <?=> $superman->leapBuilding(); ?> <br>
35                 <?=> $superman->stopBullet(); ?> <br>
36                 <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                 <br>
46                 <b><?php
47                     | echo "Airplane";
48                     ?></b> <br>
49                 <?=> $airplane->takeOff(); ?> <br>
50                 <?=> $airplane->fly(); ?> <br>
51                 <?=> $airplane->land(); ?> <br>
52                 </div>
53             </div>
54         </div>
55     </body>
56 </html>
```

```
terminal Help No2 B.php - Prak 6 - Visual Studio Code
No2 A.php • No2 B.php X
Nomor 2 > No2 B.php
1 <!-- Nama : Nur Haslinda
2     NIM : 21091397035
3     Kelas : 2021 A-->
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 }
```

```
Terminal Help No2 C.php - Prak 6 - Visual Studio Code
No2 A.php • No2 B.php No2 C.php X
Nomor 2 > No2 C.php
1 <!-- Nama : Nur Haslinda
2     NIM : 21091397035
3     Kelas : 2021 A-->
4
5
6 <?php
7
8 require_once '../Nomor 2/No2 B.php';
9
10 class Airplane implements Flyer {
11     public function takeOff() {
12         return 'Pesawat lepas landas..';
13     }
14
15     public function land() {
16         return 'Pesawat mendarat';
17     }
18
19     public function fly() {
20         return 'Pesawat dalam perjalanan';
21     }
22 }
```

```
rminal  Help  No2 C.php - Prak 6 - Visual Studio Code
No2 A.php  No2 B.php  No2 C.php X
Nomor 2 > No2 C.php
23
24 class Bird implements Flyer {
25     public function takeOff() {
26         | return 'Burung mencari makan';
27     }
28
29     public function land() {
30         | return 'Burung kembali pulang';
31     }
32
33     public function fly() {
34         | return 'Burung terbang';
35     }
36
37     public function buildNest() {
38         | return 'Burung membuat sarang';
39     }
40
41     public function layEggs() {
42         | return 'Burung bertelur';
43     }
44 }
45
```

```
rminal  Help  No2 C.php - Prak 6 - Visual Studio Code
No2 A.php  No2 B.php  No2 C.php X
Nomor 2 > No2 C.php
45
46 class Superman implements Flyer {
47     public function takeOff() {
48         | return 'Superman mengejar Batman';
49     }
50
51     public function land() {
52         | return 'Superman melawan Batman';
53     }
54
55     public function fly() {
56         | return 'Superman melancarkan pukulan';
57     }
58
59     public function leapBuilding() {
60         | return 'Batman terpentak menabrak bangunan pencakar langit';
61     }
62
63     public function stopBullet() {
64         | return 'Polisi menembaki superman namun ditangkis';
65     }
66 }
67
68 $airplane = new Airplane;
69 $bird = new Bird;
70 $superman = new Superman;
```

- Output

PBO - Praktikum 6

Soal 2

Superman

Superman melawan Batman

Superman mengejar Batman

Superman melancarkan pukulan

Batman terpental 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..

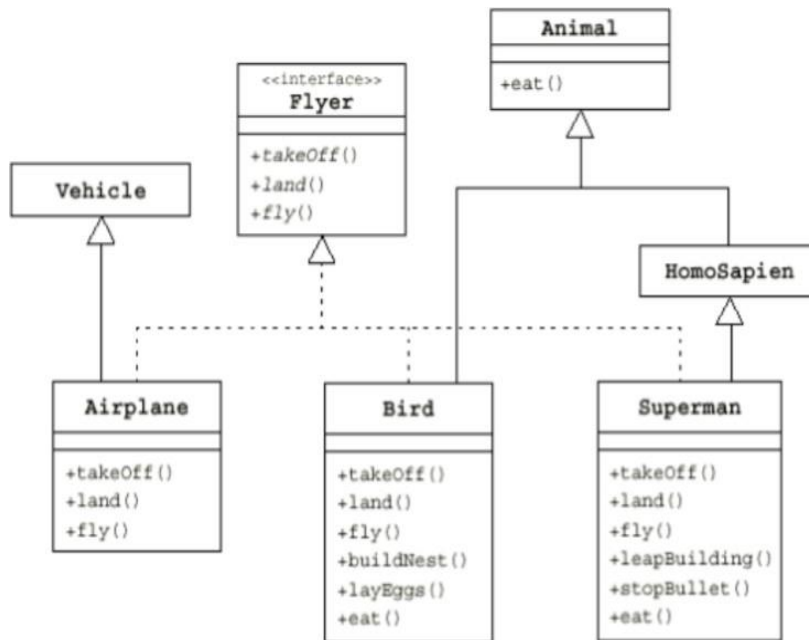
Pesawat dalam perjalanan

Pesawat mendarat

- Analisa

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

3. Buatlah program berdasarkan UML berikut



Codingan

- PHP

```
File Edit Selection View Go Run Terminal Help No3 A.php - Visual Studio Code
stricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More
No1 A.php No1 B.php No1 C.php No3 A.php X No3 B.php No3 C.php No3 D.php
C: > Xampp > htdocs > PBO > Prak 6 > Nomor 3 > No3 A.php
1 <!-- Nama : Nur Haslinda
2 NIM : 21091397035
3 Kelas : 2021 A-->
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 }
```

```

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 }

```

File Edit Selection View Go Run Terminal Help No3 B.php - Visual Studio Code

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No1 A.php No1 B.php No1 C.php No3 A.php No3 B.php X No3 C.php No3 D.php

C: > Xampp > htdocs > PBO > Prak 6 > Nomor 3 > No3 B.php

```

1 <!-- Nama      : Nur Haslinda
2      NIM       : 21091397035
3      Kelas    : 2021 A-->
4
5 <?php
6     require_once 'No3 D.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="sha384-1BmE4Kkq78iYhF1dVkuhF1AU6auu8T194MrHFTj0brCEXSU1oBoqyl2QvZ6jIW3" crossorigin="anonymous">
16
17     <title>PBO - Praktikum 6</title>
18 </head>

```

File Edit Selection View Go Run Terminal Help No3 B.php - Visual Studio Code

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No1 A.php No1 B.php No1 C.php No3 A.php No3 B.php X No3 C.php No3 D.php

C: > Xampp > htdocs > PBO > Prak 6 > Nomor 3 > No3 B.php

```

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 3</strong></h4>
25                 <br><br>
26                 <?= $singa->eat(); ?> <br>
27                 <?= $manusia->eat(); ?> <br>
28                 <br>
29
30                 <b><?= $airplane2->getMaxLoad() . ' kg'; ?> <br></b>
31                 <?= $airplane2->addBox(2000) . ' kg'; ?> <br>
32                 <?= $airplane2->addBox(4000) . ' kg'; ?> <br>
33                 <?= $airplane2->addBox(2000) . ' kg'; ?> <br>
34                 <?= $airplane2->addBox(9000) . ' 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>
53
54 </html>

```

```
C: > Xampp > htdocs > PBO > Prak 6 > Nomor 3 > No3 C.php

1 <!-- Nama : Nur Haslinda
2     NIM : 21091397035
3     Kelas : 2021 A--->
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 }
```

```
File Edit Selection View Go Run Terminal Help No3 D.php - Visual Studio Code
stricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More
No1 A.php No1 B.php No1 C.php No3 A.php No3 B.php No3 C.php No3 D.php X
C: > Xampp > htdocs > PBO > Prak 6 > Nomor 3 > No3 D.php

1 <!-- Nama : Nur Haslinda
2     NIM : 21091397035
3     Kelas : 2021 A--->
4
5 <?php
6
7 require_once '../Nomor 3/No3 A.php';
8 require_once '../Nomor 3/No3 C.php';
9
10 class Animal
11 {
12     protected $name;
13
14     public function __construct($name)
15     {
16         $this->name = $name;
17     }
18
19     public function eat()
20     {
21         return $this->name . ' sedang makan';
22     }
23 }
24
25 class Homosapiens extends Animal {}
26
```


- Output

PBO - Praktikum 6

Soal 3

Singa sedang makan

Andi sedang makan

Maksimal muatan Garuda Air 17000 kg

Garuda Air menambah muatan sebesar 2000 kg

Garuda Air menambah muatan sebesar 4000 kg

Garuda Air menambah muatan sebesar 2000 kg

Garuda Air menambah muatan sebesar 9000 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

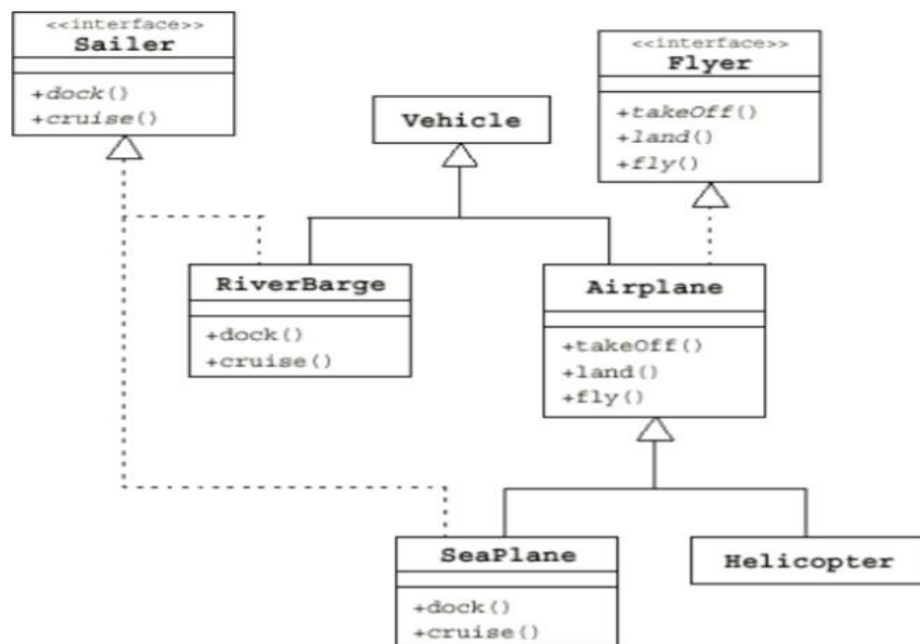
Batman terpental menabrak bangunan pencakar langit

Polisi menembaki Superman namun ditangkis

- 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. Buatlah Program UML berikut



Codingan

- PHP

```
terminal Help No4 A.php - Prak 6 - Visual Studio Code
No2 A.php No2 B.php No2 C.php No4 A.php X
Nomor 4 > No4 A.php
1 <!-- Nama : Nur Haslinda
2 NIM : 21091397035
3 Kelas : 2021 A-->
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 }
```

```

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 }

```

```

terminal  Help      No4 B.php - Prak 6 - Visual Studio Code
No2 A.php  No2 B.php  No2 C.php  No4 A.php  No4 B.php X
Nomor 4 > No4 B.php
1  <!-- Nama      : Nur Haslinda
2      NIM       : 21091397035
3      Kelas    : 2021 A-->
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="sha384-1BmE4KwBq78iYhF1dvKuhfTAU6auU8tT94WrHftjDbrCEXSU1oBoqyl2QvZ6jIW3" 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                 | | | ?>
36             </div>

```

```

37     <div class="col-4 mx-auto border p-2 mt-2">
38         <b><?= $seaPlane->getMaxLoad() . ' kg'; ?> <br></b>
39         <?= $seaPlane->addBox(12000) . ' kg'; ?> <br>
40         <?= $seaPlane->addBox(8000) . ' kg'; ?> <br>
41         <?= $seaPlane->dock(); ?> <br>
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     </div>

```

```

50     <div class="col mx-auto border p-2 mt-2">
51         <b><?= $helicopter->getMaxLoad() . ' kg'; ?> <br></b>
52         <?= $helicopter->addBox(8000) . ' kg'; ?> <br>
53         <?= $helicopter->addBox(2000) . ' kg'; ?> <br>
54         <?= $helicopter->takeOff(); ?> <br>
55         <?= $helicopter->fly(); ?> <br>
56         <?= $helicopter->land(); ?> <br>
57         <?php
58         | | | echo "Jadi, Butuh Bahan Bakar sebanyak " . $helicopter->calcFuelNeeds() . ' Liter'. '<br>';
59         | | | ?>
60     </div>
61 </div>
62 </div>
63 </body>
64
65 </html>

```

```
terminal  Help  No4 C.php - Prak 6 - Visual Studio Code

No2 A.php  No2 B.php  No2 C.php  No4 A.php  No4 B.php  No4 C.php X

Nomor 4 > No4 C.php
1 <!-- Nama : Nur Haslinda
2     NIM : 21091397035
3     Kelas : 2021 A--->
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 }
```

```
terminal  Help  No4 D.php - Prak 6 - Visual Studio Code

No2 A.php  No2 B.php  No2 C.php  No4 A.php  No4 B.php  No4 C.php  No4 D.php

Nomor 4 > No4 D.php
1 <!-- Nama : Nur Haslinda
2     NIM : 21091397035
3     Kelas : 2021 A--->
4
5 <?php
6
7 require_once '../Nomor 4/No4 A.php';
8 require_once '../Nomor 4/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     public function land() {
37         return 'Pesawat mendarat';
38     }
39     public function fly() {
40         return 'Pesawat dalam perjalanan';
41     }
42 }
```



```

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 |
69 |     public function land() {
70 |         return $this->name . ' mendarat';
71 |     }
72 |
73 |     public function fly() {
74 |         return $this->name . ' dalam perjalanan';
75 |     }
76 | }

```

```

78 | class Helicopter extends Vehicle {
79 |     public function __construct($maxLoad, $name) {
80 |         $this->maxLoad = $maxLoad;
81 |         $this->name = $name;
82 |     }
83 |
84 |     public function calcFuelNeeds() {
85 |         $fuel = $this->calcFuelEfficiency();
86 |         $trip = $this->calcTripDistance();
87 |
88 |         return ceil($fuel / $trip);
89 |     }
90 |     public function takeOff() {
91 |         return $this->name . ' lepas landas';
92 |     }
93 |
94 |     public function land() {
95 |         return $this->name . ' mendarat';
96 |     }
97 |
98 |     public function fly() {
99 |         return $this->name . ' dalam perjalanan';
100 |     }
101 | }
102 |
103 | $riverBarge2 = new RiverBarge2(30000, 'Atomic');
104 | $seaPlane = new SeaPlane(20000, 'Titanic');
105 | $helicopter = new Helicopter(10000, 'Brocklyn');

```

- Output

PBO - Praktikum 6

Soal 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 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 Brocklyn 10000 kg Brocklyn menambah muatan sebesar 8000 kg Brocklyn menambah muatan sebesar 2000 kg Brocklyn lepas landas Brocklyn dalam perjalanan Brocklyn mendarat Jadi, Butuh Bahan Bakar sebanyak 10 Liter
--	--	--

- Analisa

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.