

## **LAPORAN PRAKTIKUM 6**

**Mata Kuliah Pemograman Berorientasi Obyek**



Disusun Oleh :

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**PROGRAM STUDI D4 MANAJEMEN INFORMATIKA**

**FAKULTAS VOKASI**

**UNIVERSITAS NEGERI SURABAYA**

**2022**

1.

## Source Code



The screenshot shows the Visual Studio Code editor with the file 'nomor 1 php (prak 6).php' open. The code is as follows:

```
1 <!-- Nama : Asha Antania Anjani
2     NIM : 21091397068
3     Kelas : 2021 B-->
4
5 <?php
6
7 require_once 'No1 Abstract Prak6.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 }
```



The screenshot shows the Visual Studio Code editor with the file 'nomor 1 abstract (prak 6).php' open. The code is as follows:

```
1 <!-- Nama : Asha Antania Anjani
2     NIM : 21091397068
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 }
```

## Index PHP

```
1 <!-- Nama : Asha Antania Anjani
2 NIM : 21091397068
3 Kelas : 2021 B-->
4
5 <?php
6 require_once 'No1 Prak6.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="sha384-1BmE4kWBq78iYhF1dvKuhfTAU6auU8tT94WPHfjDbrCEXSU1oBoqyl2QvZ6jIW3" 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><?=$truk->getMaxLoad() . ' kg'; ?> <br></b>
29 <br>
30 <?=$truk->addBox(1000) . ' kg'; ?> <br>
31 <?=$truk->addBox(7000) . ' kg'; ?> <br>
```

## 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 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



## PHP

```
1 <!-- Asha Antania_21091397068 -->
2
3 <?php
4
5 require_once 'interface no2 prak6.php';
6
7 class Airplane implements Flyer {
8     public function takeOff() {
9         return 'Pesawat lepas landas..';
10    }
11
12    public function land() {
13        return 'Pesawat mendarat';
14    }
15
16    public function fly() {
17        return 'Pesawat dalam perjalanan';
18    }
19 }
20
21 class Bird implements Flyer {
22     public function takeOff() {
23         return 'Burung mencari makan';
24     }
25
26     public function land() {
27         return 'Burung kembali pulang';
28     }
29
30     public function fly() {
31         return 'Burung terbang';
32     }
33 }
```



## Interface PHP

```
1 <!-- Asha Antania_21091397068 -->
2
3 <?php
4
5 interface Flyer {
6     public function takeOff();
7     public function land();
8     public function fly();
9 }
10
11 interface Sailer {
12     public function dock();
13     public function cruise();
14 }
```

## Index PHP

```
1 <!-- Asha Antania_21091397068 -->
2
3 <?php
4     require_once 'no 2 prak6.php';
5 ?>
6
7 <!DOCTYPE html>
8 <html lang="en">
9
10 <head>
11     <!-- Bootstrap CSS -->
12     <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.3/dist/css/bootstrap.min.css" rel="stylesheet"
13         integrity="sha384-1BmE4kWBq781YhFIdvKuhfTAU6au08tT94WPHfjDbrCEXSU1oBoqy12QvZ6JIW3" crossorigin="anonymous">
14
15     <title>Praktikum 6</title>
16 </head>
17
18 <body>
19     <div class="container">
20         <br>
21         <div class="row">
22             <div class="col-5 mx-auto border p-3 mt-2">
23                 <h4 class="text-center"><strong><u>Soal 2</u></strong></h4>
24                 <br><br>
25                 <b><?php
26                     echo "Superman";
27                 ?></b><br>
28                 <?= $superman->land(); ?> <br>
29                 <?= $superman->takeOff(); ?> <br>
30                 <?= $superman->fly(); ?> <br>
31                 <?= $superman->leapBuilding(); ?> <br>
```

## Output

### Soal 2

#### **Superman**

Superman melawan Batman  
Superman mengejar Batman  
Superman melancarkan pukulan  
Batman terpelant 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.

## Source Code



## Interface PHP

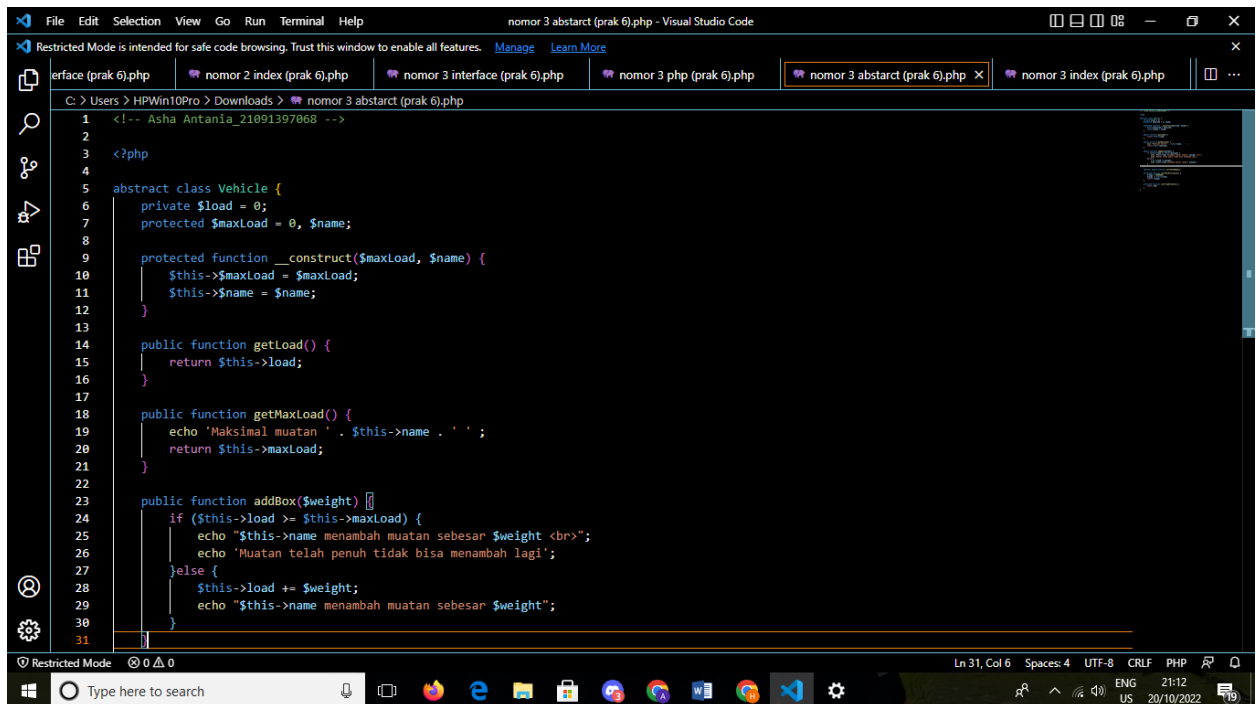
```
1 <!-- Asha Antania_21091397068 -->
2
3 <?php
4
5 interface Flyer {
6     public function takeOff();
7     public function land();
8     public function fly();
9 }
10
11 interface Sailer {
12     public function dock();
13     public function cruise();
14 }
```



## PHP

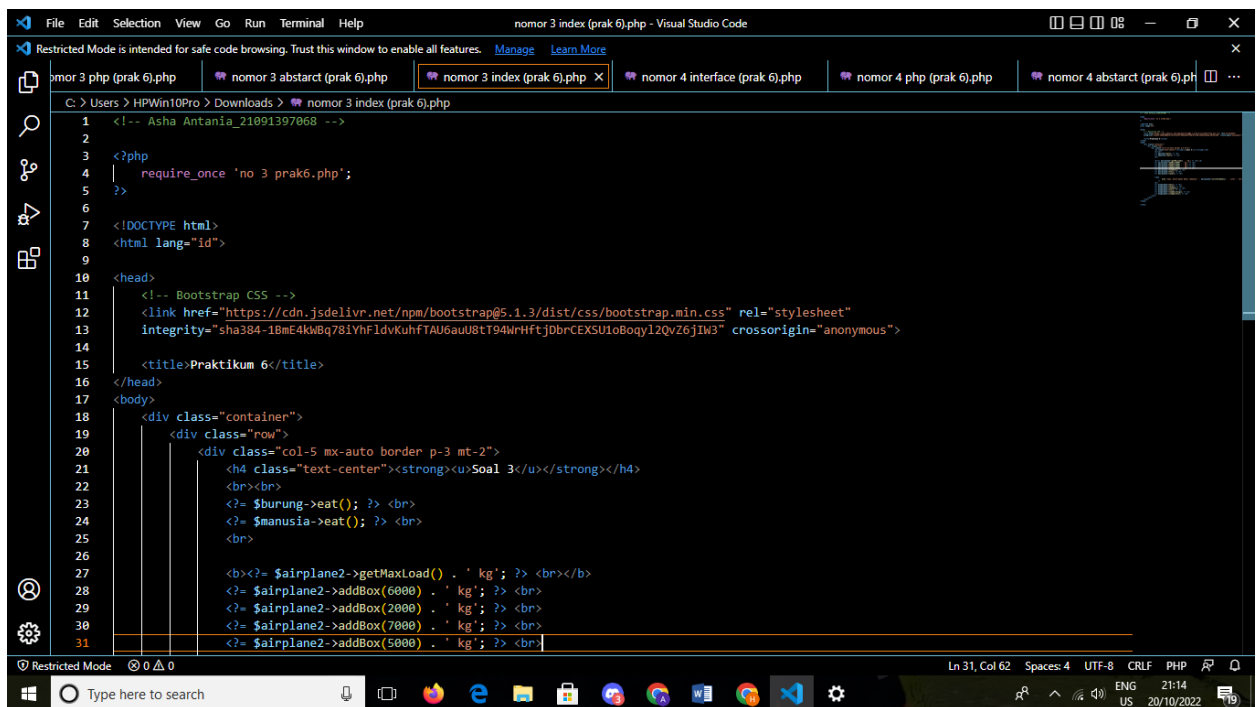
```
1 <!-- Asha Antania_21091397068 -->
2
3 <?php
4
5 require_once 'abstrac no 3 prak6.php';
6 require_once 'interface no 3 prak6.php';
7
8 class Animal
9 {
10     protected $name;
11
12     public function __construct($name)
13     {
14         $this->name = $name;
15     }
16
17     public function eat()
18     {
19         return $this->name . ' sedang makan';
20     }
21 }
22
23 class Homosapiens extends Animal {}
24
25 class Airplane2 extends Vehicle implements Flyer
26 {
27     public function __construct($maxLoad, $name)
28     {
29         $this->maxLoad = $maxLoad;
30         $this->name = $name;
31     }
32 }
```

## Abstract PHP



```
1 <!-- Asha Antania_21091397068 -->
2
3 <?php
4
5 abstract class Vehicle {
6     private $load = 0;
7     protected $maxLoad = 0, $name;
8
9     protected function __construct($maxLoad, $name) {
10         $this->$maxLoad = $maxLoad;
11         $this->$name = $name;
12     }
13
14     public function getLoad() {
15         return $this->load;
16     }
17
18     public function getMaxLoad() {
19         echo 'Maksimal muatan ' . $this->name . ' ';
20         return $this->maxLoad;
21     }
22
23     public function addBox($weight) {
24         if ($this->load >= $this->maxLoad) {
25             echo "This->name menambah muatan sebesar $weight <br>";
26             echo "Muatan telah penuh tidak bisa menambah lagi";
27         } else {
28             $this->load += $weight;
29             echo "This->name menambah muatan sebesar $weight";
30         }
31     }
32 }
```

## Index PHP



```
1 <!-- Asha Antania_21091397068 -->
2
3 <?php
4     require_once 'no 3 prak6.php';
5 >
6
7 <!DOCTYPE html>
8 <html lang="id">
9
10 <head>
11     <!-- Bootstrap CSS -->
12     <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.3/dist/css/bootstrap.min.css" rel="stylesheet"
13         integrity="sha384-1BmE4KwBq781YhF1dvKuhfTAU6auU8tt99wRHfJDbrCEXU10Boqy12QvZ6jIW3" crossorigin="anonymous">
14
15     <title>Praktikum 6</title>
16 </head>
17 <body>
18     <div class="container">
19         <div class="row">
20             <div class="col-5 mx-auto border p-3 mt-2">
21                 <h4 class="text-center"><strong><u>Soal 3</u></strong></h4>
22                 <br><br>
23                 <?=$burung->eat(); ?> <br>
24                 <?=$manusia->eat(); ?> <br>
25                 <br>
26
27                 <b><?=$airplane2->getMaxLoad() . ' kg'; ?> <br></b>
28                 <?=$airplane2->addBox(6000) . ' kg'; ?> <br>
29                 <?=$airplane2->addBox(2000) . ' kg'; ?> <br>
30                 <?=$airplane2->addBox(7000) . ' kg'; ?> <br>
31                 <?=$airplane2->addBox(5000) . ' kg'; ?> <br>
32             </div>
33         </div>
34     </div>
35 </body>
36 </html>
```

## Output

### 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

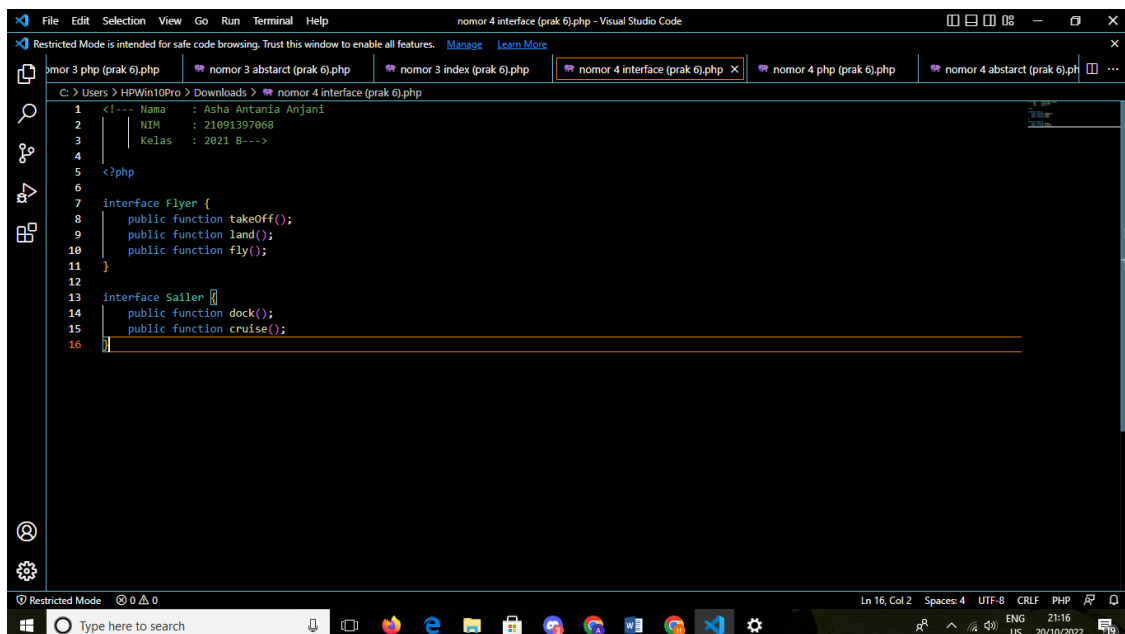
## Analisa

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.

## Source Code

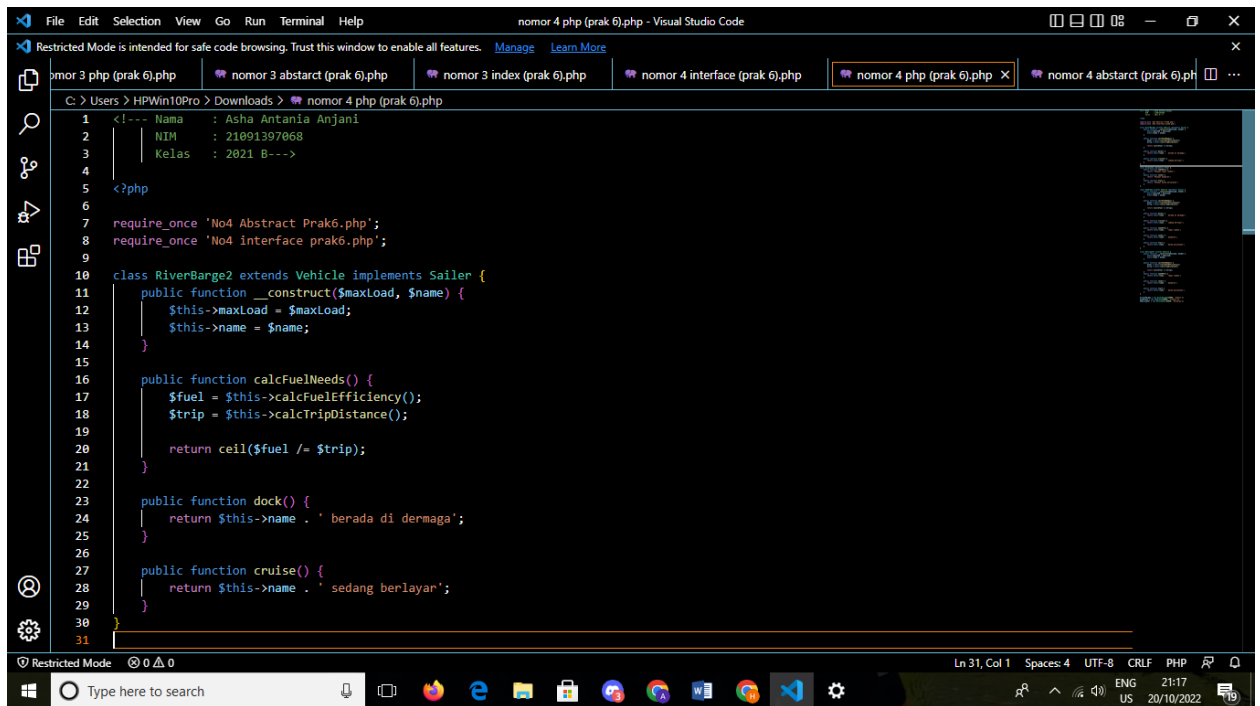
### Interface PHP



```
1 <!-- Nama : Asha Antania Anjani
2 NIM : 21091397068
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 }
```

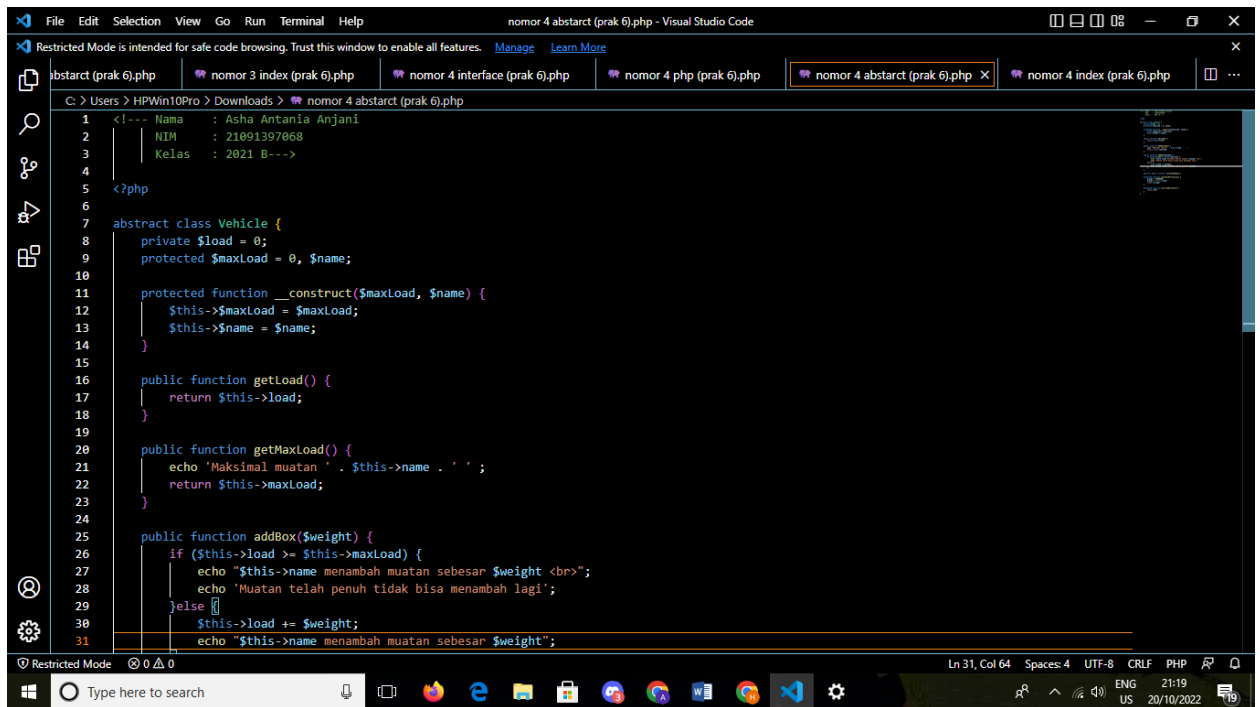


## PHP



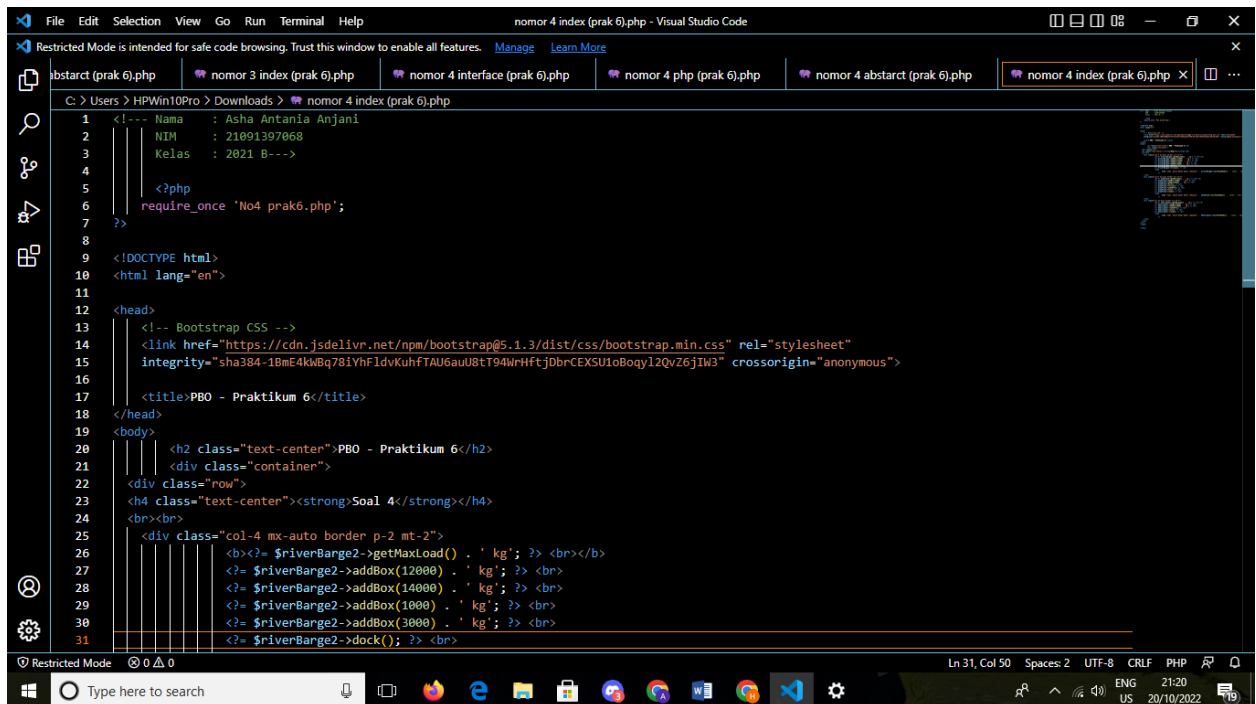
```
1 <!-- Nama : Asha Antania Anjani
2 NIM : 21091397068
3 Kelas : 2021 B-->
4
5 <?php
6
7 require_once 'No4 Abstract Prak6.php';
8 require_once 'No4 interface prak6.php';
9
10 class RiverBarge2 extends Vehicle implements Sailer {
11     public function __construct($maxLoad, $name) {
12         $this->maxLoad = $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
```

## Abstract PHP



```
1 <!-- Nama : Asha Antania Anjani
2 NIM : 21091397068
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
```

## Index PHP



```
1 <!-- Nama : Asha Antania Anjani
2 NIM : 21091397068
3 Kelas : 2021 B-->
4
5 <?php
6 require_once 'No4 prak6.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="sha384-1BmE4kWBq781YhF1dvKuhfTTAU6au0StT94WPHfjDbrCEXSU1oBoqy12QvZ6jIW3" 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>
```

## Output

### PBO - Praktikum 6 Soal 4

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