

## CHAPTER 5

### IMPLEMENTATION AND TESTING

#### 5.1 Implementation

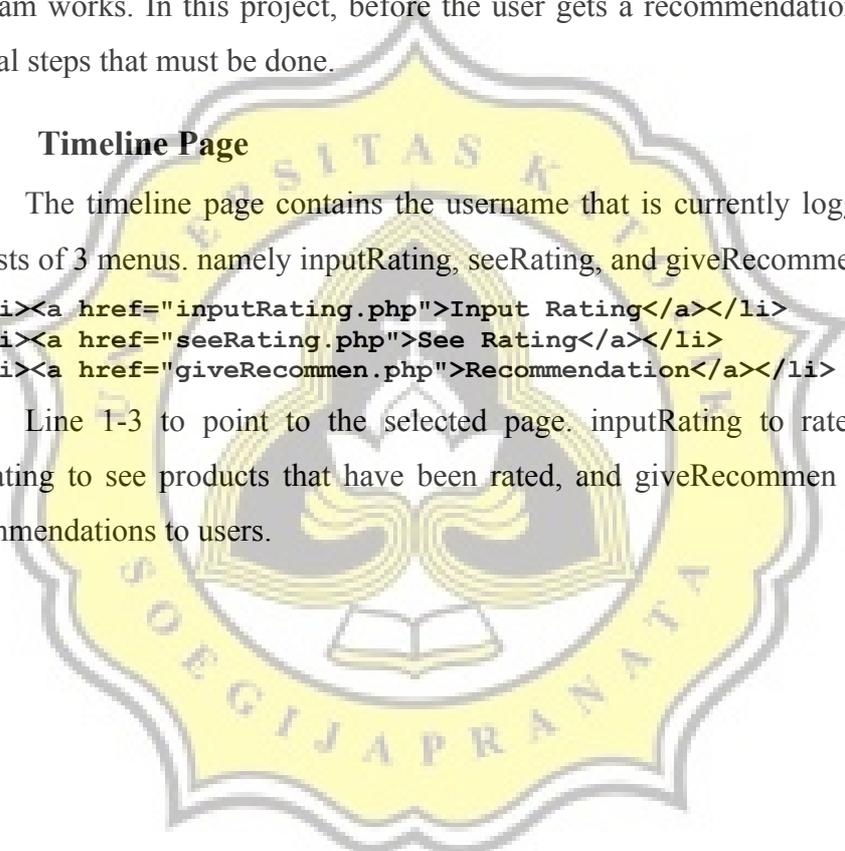
At this sub bab, it will be explained how to run the program and how the program works. In this project, before the user gets a recommendation there are several steps that must be done.

##### 5.1.1 Timeline Page

The timeline page contains the username that is currently logged in and consists of 3 menus. namely inputRating, seeRating, and giveRecommen.

1. `<li><a href="inputRating.php">Input Rating</a></li>`
2. `<li><a href="seeRating.php">See Rating</a></li>`
3. `<li><a href="giveRecommen.php">Recommendation</a></li>`

Line 1-3 to point to the selected page. inputRating to rate products. seeRating to see products that have been rated, and giveRecommen to provide recommendations to users.

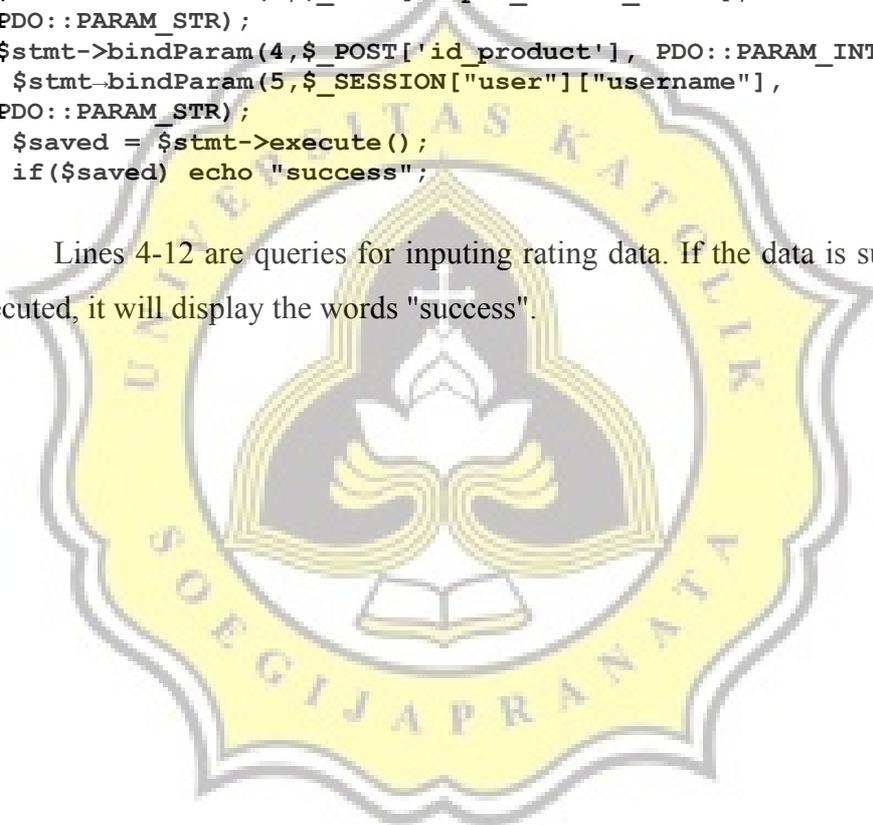


### 5.1.2 Input Rating

Like the previous explanation, inputRating is rating products.

```
4. if(isset($_POST['submit_rating'])){
5. $sql = "UPDATE tbluserrating set rating = ? , review = ? ,
   review_note =? where id_product =? and id_pelanggan=(select id
   from users where username = ?)";
6. $stmt->bindParam(1,$_POST['rating'], PDO::PARAM_INT);
7. $stmt->bindParam(2,$_POST['input_review'], PDO::PARAM_STR);
8. $stmt->bindParam(3,$_POST['input_review_note'],
   PDO::PARAM_STR);
9. $stmt->bindParam(4,$_POST['id_product'], PDO::PARAM_INT);
10. $stmt->bindParam(5,$_SESSION["user"]["username"],
   PDO::PARAM_STR);
11. $saved = $stmt->execute();
12. if($saved) echo "success";
```

Lines 4-12 are queries for inputting rating data. If the data is successfully executed, it will display the words "success".

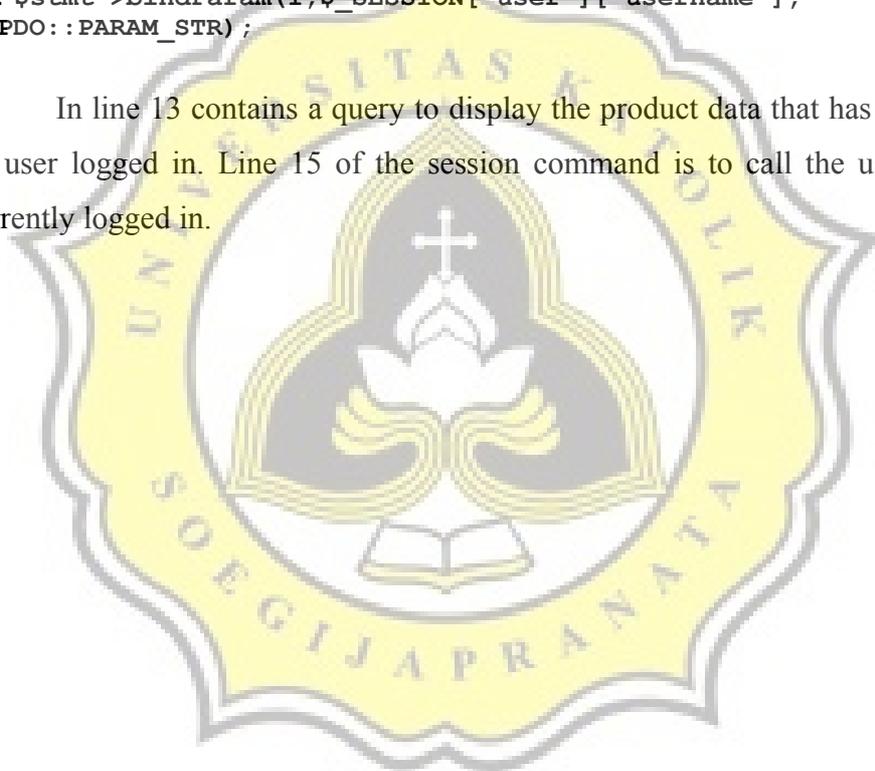


### 5.1.3 See Rating

On page seeRating, contains all products that have been rated before.

```
13. $ambil_data='SELECT
    tblproduct.id,tblproduct.nama_product,tblproduct.nama_brand,tbl
    product.harga,tbluserrating.rating,tbluserrating.review_note,tb
    luserrating.review from tblproduct join tbluserrating on
    tblproduct.id=tbluserrating.id_product join users on
    tbluserrating.id_pelanggan=users.id where tbluserrating.rating
    is not null and users.username= ? limit ?,?';
14. $stmt = $db->prepare($ambil_data);
15. $stmt->bindParam(1,$_SESSION["user"]["username"],
    PDO::PARAM_STR);
```

In line 13 contains a query to display the product data that has been rated by user logged in. Line 15 of the session command is to call the user who is currently logged in.



## 5.1.4 Recommendation

On the Recommendation page, contains the steps that must be done before getting the recommendations. Namely User Reference, Reference Products, and Product Options.

### 5.1.4.1 User Referensi

The User Reference page will display all users in the database unless the user is logged in. User references are used as a consideration for the login user to determine recommendations based on the user rating that has been chosen.

```

16. $stmt = $db->prepare('SELECT * FROM users where username !=?
    ');
17. $stmt->bindParam(1,$_SESSION["user"]["username"],
    PDO::PARAM_STR);
18. <?php while($row = $stmt->fetch(PDO::FETCH_ASSOC)): ?>
19. <?php extract($row); ?>
20. <div class="checkbox">
21. <label><input      name="userReferensi[]"      class="user-check"
    type="checkbox"      value="<?php echo $id; ?>"><?php echo
    $username; ?></label>
22. </div>
23. ?php endwhile; ?>

```

Line 16 contain commands a query to select data username in database except login username. Lines 19-22 contains commands to make the execution result a checkbox.

### 5.1.4.2 Produk Referensi

Reference Products are all products that have been rated by the user login and reference user. Reference products can also be referred to as comparison products that will be used as a fixed value when calculating the difference in the slope one algorithm.

```

24. $userReferensi = json_decode($_POST['id']);
25. $userReferensi[] = $_SESSION["user"]["id"];
26. $sql = 'SELECT DISTINCT(nama_product), tblproduct.id FROM
tblproduct JOIN tbluserrating T1 ON tblproduct.id =
T1.id_product WHERE T1.rating is not null AND T1.id_pelanggan
IN ('.join($userReferensi,',') . ') GROUP BY id_product HAVING
COUNT(id_product) = ' . count($userReferensi);
27. $stmt = $db->prepare($sql);
28. $stmt->execute();
29. while($row = $stmt->fetch(PDO::FETCH_ASSOC)):
30. extract($row);
31. echo '<div class="checkbox">
32. <label><input name="produkReferensi[]" class="produk-check"
type="checkbox" value="'. $id. '">'. $nama_product. '</label>
33. </div>';
34. endwhile;

```

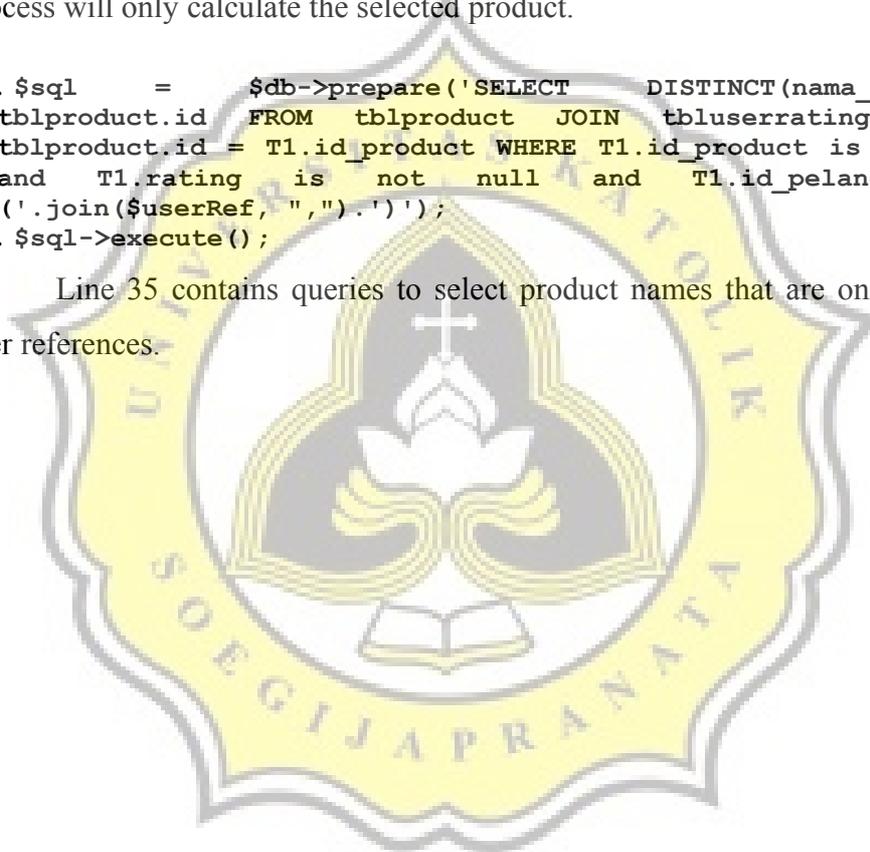
Line 24 is the command to decode json to the php array. A php array located on line 25. Line 26 contains a query to select references product that have been rated by the user login and selected user reference. Line 30-33 contains commands to make the execution result a checkbox.

### 5.1.4.3 Option Product

Option Products are the choice for the user in determining the slope one algorithm calculation process. There are 2 choices including all specific products and products. If you choose all products, the calculation process will calculate based on all available products. If you choose a particular product, the calculation process will only calculate the selected product.

```
35. $sql = $db->prepare('SELECT DISTINCT(nama_product),  
tblproduct.id FROM tblproduct JOIN tbluserrating T1 ON  
tblproduct.id = T1.id_product WHERE T1.id_product is not null  
and T1.rating is not null and T1.id_pelanggan in  
(.join($userRef, ",").')');  
36. $sql->execute();
```

Line 35 contains queries to select product names that are only rated by user references.



### 5.1.5 See Recommendation

See Recommendation is a page that will provide recommendations. Before getting a recommendation, the user must fill in the required conditions. Like, user references, product references, and choosing product options.

```
37. $sqlLoginRate = $db->prepare("SELECT * FROM `tbluserrating`
  WHERE id_pelanggan = ". $_SESSION["user"]["id"] . " and rating
  is NOT null");
38. $sqlLoginRate->execute();
39. $userLoggedInRate = $sqlLoginRate->fetch(PDO::FETCH_ASSOC)
  ['rating']
```

Line 37 contains a query to retrieve the initial user login rating.

```
40. $sqlProdukRate = $db->prepare("SELECT * FROM `tbluserrating`
  WHERE id_product = ". $produk['id'] . " and id_pelanggan = " .
  $idUserRef);
41. $sqlProdukRate->execute();
42. $produkRatedUser = $sqlProdukRate->fetch(PDO::FETCH_ASSOC);
```

Line 40 contains a query to retrieve ratings from user references on product options.

```
43. $sqlBandingRate = $db->prepare("SELECT * FROM `tbluserrating`
  WHERE id_product = ". $row['id_product'] . " and id_pelanggan =
  " . $idUserRef); //untuk mengambil rating user ref pada produk
  ref yang dipilih
44. $sqlBandingRate->execute();
45. $bandingRatedUser = $sqlBandingRate->fetch(PDO::FETCH_ASSOC);
```

Line 43 program code to retrieve rating user references on selected reference products.

```
46. $jumlahRate = $db->prepare("SELECT r.* FROM tblproduct p join
  tbluserrating r on r.id_product = p.id where p.id in (".
  $produk['id'] . "," . $row['id_product'] . ") and r.rating is not
  null GROUP by r.id_pelanggan HAVING COUNT(r.id_pelanggan) =
  2");
47. $jumlahRate->execute();
```

Line 46 contain a query to calculate the number of users who rated the selected product in ref products and product options.

```

48. $sqlZ = $db->prepare("SELECT COUNT(rating) as rating FROM
    tbluserrating JOIN users on tbluserrating.id_pelanggan=users.id
    WHERE id_pelanggan=28 GROUP BY id_pelanggan DESC limit 1");//
49. $sqlZ->execute();
50. $nilaiZ = $sqlZ->fetch(PDO::FETCH_ASSOC);

```

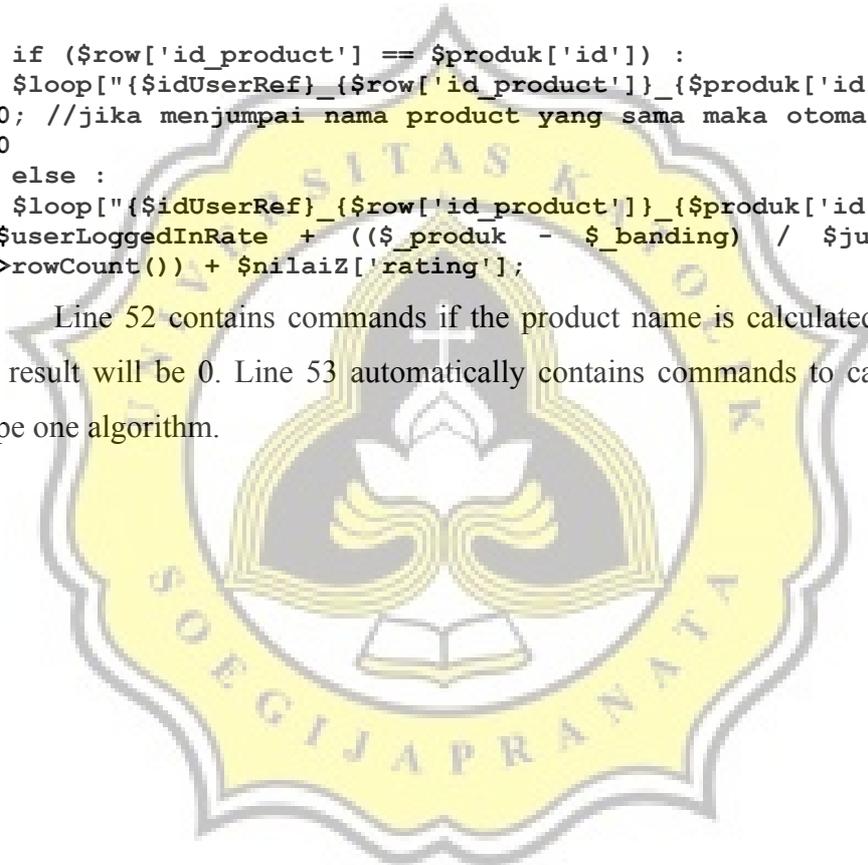
Line 48 program code to retrieve the highest number of products, user ID 28 is the user who rates the most products.

```

51. if ($row['id_product'] == $produk['id']) :
52. $loop["{$idUserRef}_{$row['id_product']}_{$produk['id']}"] =
    0; //jika menjumpai nama product yang sama maka otomatis nilai
    0
53. else :
54. $loop["{$idUserRef}_{$row['id_product']}_{$produk['id']}"] =
    $userLoggedInRate + (($produk - $_banding) / $jumlahRate-
    >rowCount()) + $nilaiZ['rating'];

```

Line 52 contains commands if the product name is calculated the same, the result will be 0. Line 53 automatically contains commands to calculate the slope one algorithm.



## 5.2 Testing

### 5.2.1 First Testing

On first testing, writer try to implement Slope One and Modified Slope One with one data user reference. The result of testing data are showed on below.

Data User Reference : 1 (ganis)

Data Product Reference : Apple iPhone 4S 32GB (Black) - AT&T

Data Option Product : all product and specific product

Table 5.1: First Testing

Data Option Product	User Ref	Product Name	Slope One $y=x+b$	Run Time	Modif Slope One $y=x+b+z$	Run Time
All products	ganis	(LANDVO) 5.0 Capacitive Touch MTK6582 Quad Core Android 4.2.2 3G Phone 512MB RAM 4GB ROM 2MP CAM WiFi GPS - Black	4.5	0.41 sec	88.5	0.46 sec
	ganis	Android 5.1 Smartphone Unlocked 5.5 Android 5.1 MTK6580 Quad Core Dual Sim Quadband-JUNING GSM/3G Cellphone Black	4.33		88.3	
	ganis	5200mAh Long Standby Rugged Mobile Phone with Waterproof Shockproof Dustproof Unlocked Phone for Elderly People Adventurers Army Cellphone(Green)	4.33		88.3	
	ganis	Apple iPhone 4 32GB (Black) - Verizon	4.33		88.3	
	ganis	5.0 Phones Unlocked	4.25		88.25	

		Android 5.1 MTK6580 Quad Core ROM 4GB 5.0MP Camera Dual Sim Quadband-JUNING GSM/3G Cellphone Gold				
Specific Product (5Product)	ganis	Apple iPhone 2G 8GB (Black)	4.1	0.02 sec	88.1	0.03 sec
	ganis	Apple iPhone 4S 16GB (Black) - Verizon	3.8		87.8	
	ganis	Nokia Asha 302 Unlocked GSM Phone with 3.2MP Camera, Video, QWERTY Keyboard, Wi-Fi, Bluetooth, FM Radio, SNS Integration, MP3/MP4 Player and microSD Slot - White International Version/Warranty	3.57		87.57	
	ganis	[XMAS DEAL] [New Edition] Jethro [SC213V2] Flip Quad- band Unlocked GSM Senior & Kids Cell Phone, SOS Emergency Button, 2.4 Large LCD with Large Keypad.	3.5		87.5	
	ganis	5530 XpressMusic Cell Phone w/ Games	3.5		87.5	

Based on the results of the first testing above using the selected data, namely 1 user reference (ganis), 1 reference product (Apple iPhone 4S 32GB (Black) - AT & T) and Product Option (all and specific) it can be concluded that the more products selected then the execution time will be longer. Which affects the difference in recommendation results for the option all product and the specific product is if all products then when calculating the slope one algorithm

based on all products, if the specific product, the slope one calculation is only done on the selected product.

### 5.2.2 Second Testing

On second testing, writer try to implement Slope One and Modified Slope One with one product reference. The result of testing data are showed on below.

Data User Reference : 2 ( ganis dan bayu )

Data Product Reference : Apple iPhone 4S 32GB (Black) - AT&T

Data Option Product : 1 specific product (Apple - Iphone 5c A1532 Verizon 16 GB Cell Phone - Green)

Table 5.2: Second Testing

Data User Ref	User Ref	Product Name	Slope One $y=x+b$	Run Time	Modif Slope One $y=x+b+z$	Run Time
ganis	ganis	Apple - Iphone 5c A1532 Verizon 16 GB Cell Phone - Green	3.5	0.006 sec	87.5	0.009 sec
bayu	bayu	Apple - Iphone 5c A1532 Verizon 16 GB Cell Phone - Green	3.83	0.006 sec	87.83	0.008 sec
ganis dan bayu	bayu	Apple - Iphone 5c A1532 Verizon 16 GB Cell Phone - Green	3.83	0.011 sec	87.83	0.020 sec
	ganis	Apple - Iphone 5c A1532 Verizon 16 GB Cell Phone - Green	3.5		87.5	

On the second testing above, the same recommendation value is generated, either selecting 1 user individually or directly selecting 2 users, with the selected data, 2 reference users (ganis and bayu), 1 reference product (Apple iPhone 4S 32GB (Black) - AT & T) and 1 specific product on Option Product (Apple - Verizon 16 GB Iphone 5c A1532 Cell Phone - Green).

From all testing results it can be concluded that what causes a product to get the highest or lowest value is the rating given by another user and how often the user gives a rating.

