

Final Project OOP - Documentation

LO-01

- Austin Andika Tanujaya / 2301860261**
- Bani Adil Insan / 2001551681**
- Michael Ken / 2301915531**
- Patrick / 2301924984**
- Bobby Ravel Moreno /2301924933**
- Jason Tanuwidjaja / 2301850235**

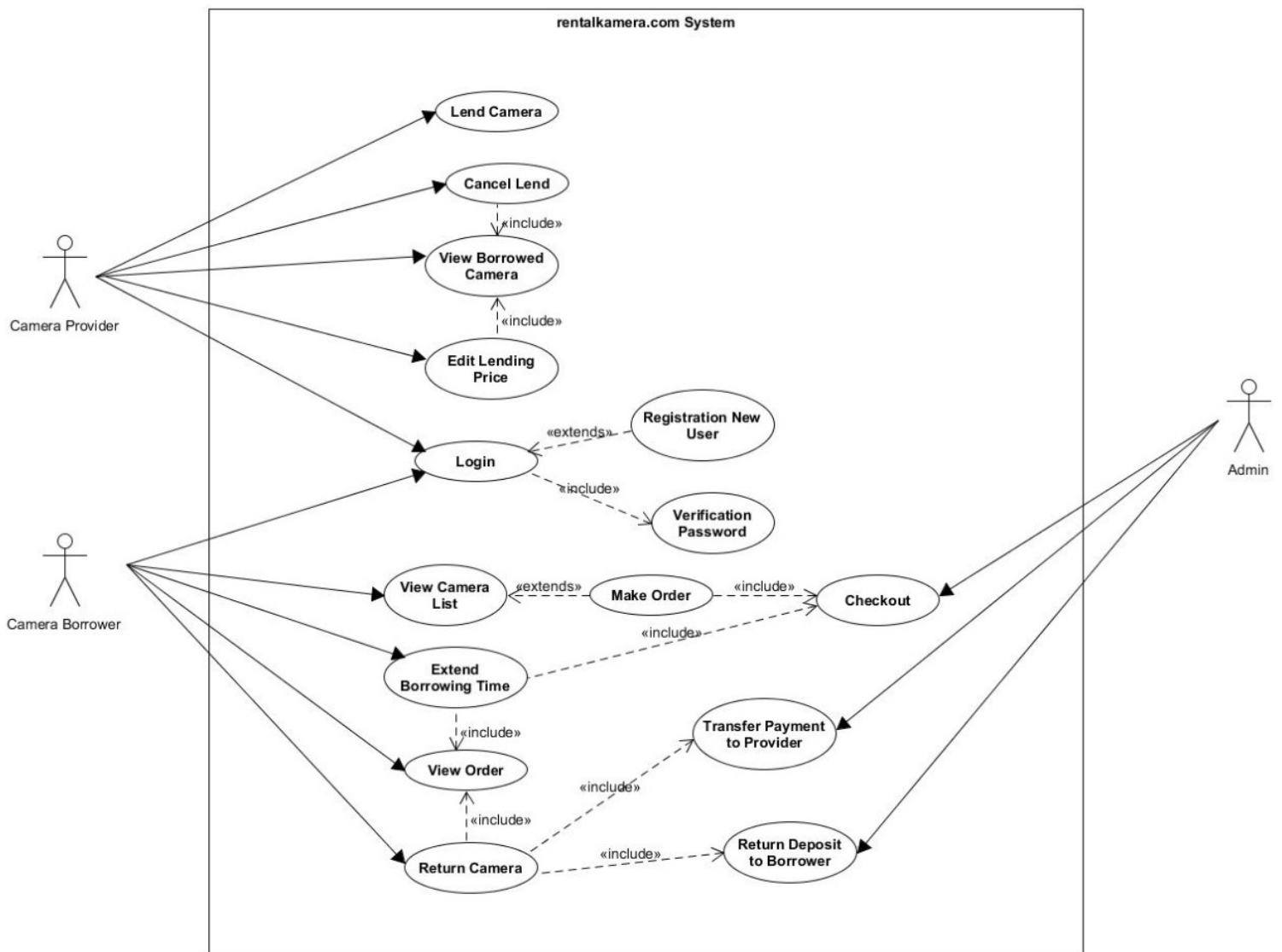
I. Introduction

For the final project of our semester, we are asked to team up and build a complete Java application which encompass everything that we have learned previously. Those things include Interface, Abstract Class, and also Multithreading programming. The program will need to be documented and we are required to do a presentation about the program.

Nowadays, the photography field is very popular. A lot of people are highly interested in this field because of the possible high income. But a lot of people are still indecisive about their choices and afraid to spend too much on their first camera. So, most of them will choose to rent a camera instead of buying a new one. Based on the facts stated above, our team decided to make a simple yet efficient application to handle a camera renting business which we call "rentalkamera.com." This app was made to aid and simplify a camera renting transaction. Our users will be asked to sign up and login so their data can be stored. Once logged in, they can choose whether to be the camera provider or the borrower. By now, the user will have a lot of options and features to choose from.

Being the camera provider brings us the ability to add a camera to the Lended Camera list. All the prices will be decided by our own users and can be changed any time. The Lended Camera list can then be viewed by our interested customers who chose to be the borrower. Once they choose a camera they desire, they will need to pick a due date to return the camera. After that, our user will be provided with an order detail consisting of all the camera's information and total price. All transactions will be done through us to offer the safest way possible and avoiding scams.

II. Analysis & Design



Use Case Description

1. Use case : Login

Actors : Camera provider, Camera borrower

Goal : to access application

Description:

Before user can access the application, user needs to input username and password. If new user, then continue to "Registration New User". Then verified account.

2. Use case : Registration New User

Actors : Camera provider, Camera borrower

Goal : to register a new user

Description:

User input name, phone number, address, e-mail, and password. Then username will be automatically generated and user data will be stored to the system.

3. Use case : Verification Password

Actors : Camera provider, Camera borrower

Goal : to verified account

Description:

If user's email and password does not match, then loop back to "login" page. If email and password match, then continue to application.

4. Use Case : Lend Camera

Actors : Camera provider

Goal : add camera to borrowed camera list

Description:

User input camera's brand, camera's type (DSLR/Mirror-less, pocket camera), camera's name, camera's price, lend price (per-day), and maximum lend date.

5. Use case : View Borrowed Camera

Actors : Camera provider

Goal : to view the borrowed camera list

Description:

Application shows list of camera that has been added by that user. It shows camera's brand, camera's type (DSLR/Mirror-less, pocket camera), camera's name, camera's price, lend price (per-day), maximum lend duration, and borrowed status.

6. Use case : Cancel Lend

Actors : Camera provider

Goal : to cancel camera that has been added

Description:

If user wants to cancel a camera that has been added, simply input order number from the given camera list.

7. Use case : Edit Lending Price

Actors : Camera provider

Goal : to edit the lending price of camera per day

Description:

If user wants to edit the price of an added camera. Simply input order number from the given camera list and new price.

8. Use case : Lend Camera

Actors : Camera provider

Goal : add camera to borrowed camera list

Description:

User input camera's brand, camera's type (DSLR, Mirror-less), camera's name, camera's price, lend price (per-day), and maximum lend duration.

9. Use case : View Camera List

Actors : Camera borrower

Goal : to view all available camera list

Description:

Application shows list of cameras that are available. It shows camera's brand, camera's type (DSLR, Mirror-less), camera's name, camera's price, lend price (per-day), and maximum lend duration.

10. Use case : Make Order

Actors : Camera borrower

Goal : to make order

Description:

User input the order number of chosen camera and lend duration.

11. Use case : Checkout

Actors : Camera borrower, Admin

Goal : to confirm order

Description:

Application shows the summary of order (camera's order number, price, deposit, and duration). Then send camera from provider to borrower.

12. Use case : Extend Borrowing Time

Actors : Camera borrower

Goal : to extend the duration of borrowing camera.

Description:

User view order, then input the new duration for the extended time. Then continue to "checkout".

13. Use case : View Order

Actors : Camera borrower

Goal : to view user's order

Description:

Application shows the list of all cameras that's currently borrowed (camera's order number, price, deposit, and duration).

14. Use case : Return Camera

Actors : Camera borrower

Goal : to return camera from order list

Description:

Once user choose to return camera, remove all camera from order list. Borrower then send camera back to provider. Continue to transfer payment and receive deposit process.

15. Use case : Transfer Payment to Provider

Actors : Admin

Goal : Sending payment from borrower to provider

Description:

Sending payment after provider has received the camera, then transfer borrower's payment excluding admin fee to provider.

16. Use case : Return Deposit to Borrower

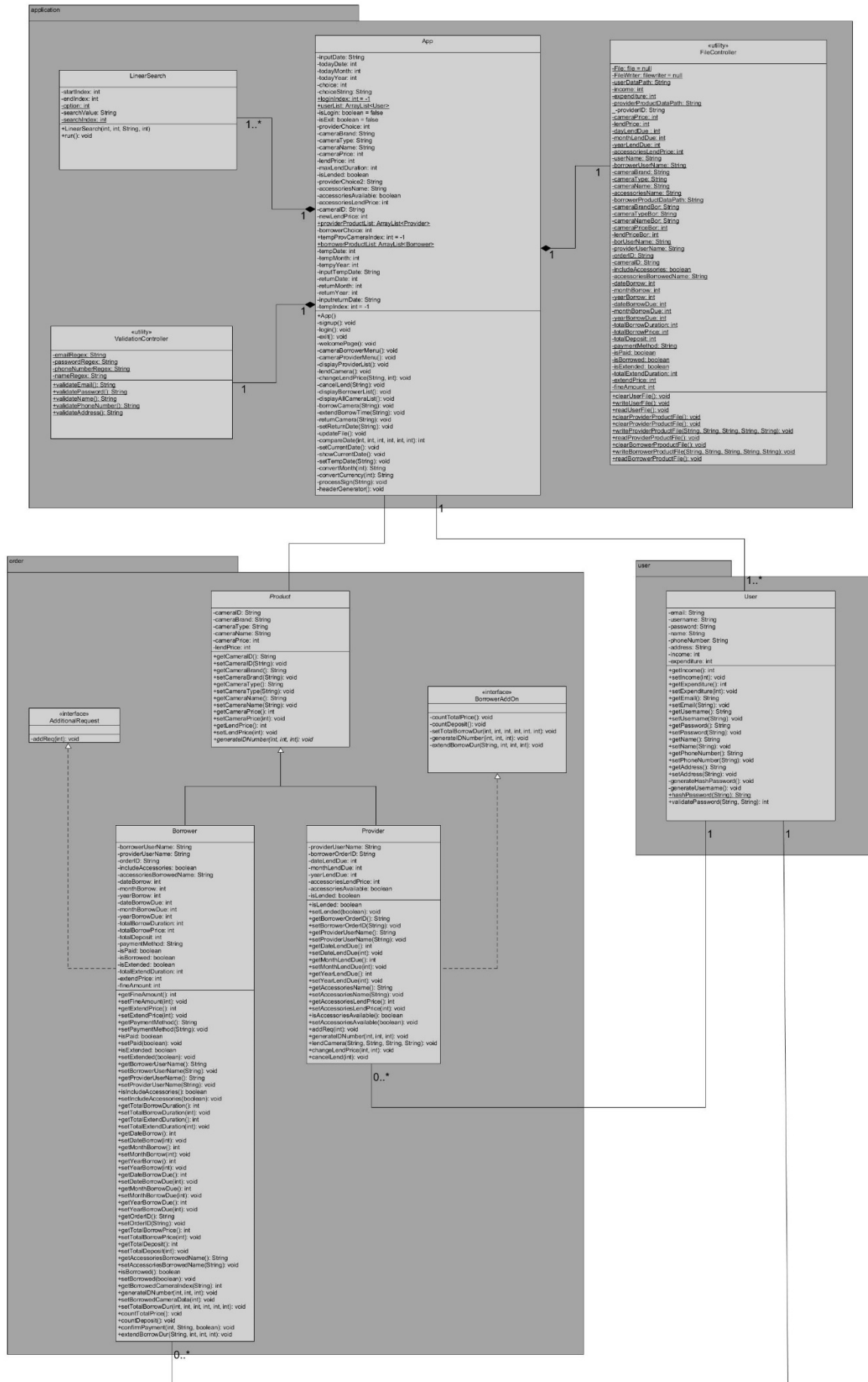
Actors : Admin

Goal : Returning deposit to borrower

Description:

After provider has received the camera and has verified the condition, then return the deposit to borrower.

Class Diagram



III. Implementation

1. User Login / User SignUp

```
RentalKamera.com
1. Login
2. Create a New Account
3. Exit
Choose >>
```

This is “RentalKamera.com”'s Login and Signup menu, and it has 3 option to choose.

- If you already have an account you can choose login,
- if you're a new user you can choose create a new account menu, and if you want to exit you can choose exit.

1.1. Create New Account

```
RentalKamera.com
1. Login
2. Create a New Account
3. Exit
Choose >> 2
[SIGN UP]
Email: dixla@gmail.com
Password [minimum 8 characters] [at least one numeric, lowercase, uppercase character]: Dixlala21
Name [7 - 25 characters]: Dixla Cam
Phone Number [start with 0 or +62]: 08889877663
Address [10 - 100 characters]: Jln. Jeruk No. 3
You have registered, please login!
```

Since we don't have an account yet, we need to choose number 2 and create a new account.

- All you need to input are your Email, Password, Username, Phone Number, Address and you good to go.
- After user create an account, user's username will be auto generated with 5 first letter from use's name + 3 random number.

1.2. Login

```
Rentalkamere.com

1. Login
2. Create a New Account
3. Exit
Choose >> 1
[LOG IN]
Email: dixla@gmail.com
Password [minimum 8 characters] [at least one numeric, lowercase, uppercase character]: Dixla21

You are logging in..
```

When you have an account, you can login with your email and password. After logging in you'll be inside Main menu.

2. Main Menu

```
Rentalkamere.com

Hello Mr/Mrs Dixla Cam.

[MAIN MENU]
Please select the menus:
1. See my profile
2. Login as camera provider
3. Login as camera borrower
4. Log out
Choice >>
```

In this Main menu there are 4 option that you can choose, See my profile, Login as Camera Provider, Login as Camera Borrower, and Log out.

2.1. See My Profile

```
Rentalkamera.id.idn

[MAIN MENU -> MY PROFILE]
Your Profile
=====
Name: Dixla Cam
Email: dixla@gmail.com
Username: DIXLA968
Phone Number: 08889877663
Address: Jln. Jeruk No. 3
=====

My Finished Order Income      : Rp. 0,00
My Finished Order Expenditure: Rp. 0,00

Press enter to continue...
```

In here you can see all your information including:

- Name, email, username, phone number, address,
- Finished Order income and Expenditure. If borrower has returned the camera, the income will go to income provider camera, and if borrower has returned the camera, all income and deposit (if there's any late return) will go to expenditure of the borrower.

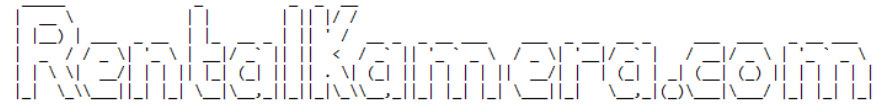
2.2. Login as Camera Provider

```
Rentalkamera.id.idn

[MAIN MENU -> CAMERA PROVIDER PAGE]
Please select the menus:
1. Lend Camera
2. View Lended Camera
3. Cancel Lend
4. Edit Total Lend Price
5. Back to Main Menu
Choice >>
```

There are 5 menu option that you can choose such as, lend camera, view lended camera, cancel lend, edit total lend price, and back to menu.

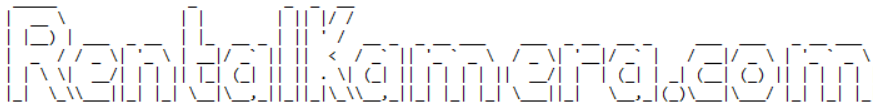
2.2.1. Lend Camera



```
[MAIN MENU -> CAMERA PROVIDER PAGE -> LEND CAMERA]
Enter camera's brand: Sony
Enter camera's type [DSLR / Pocket]: Pocket
Enter camera's name: G7x
Enter camera's price: Rp 500000
Enter lend price [per day]: Rp 50000
Input Lend Due Date [dd/mm/yyyy]: 21/05/2020
New camera added!

Press enter to continue...
```

if you choose **Lend Camera**, that means you need to input your camera's brand, type, name, price, lend price/day, and lend due date that you want to lend.



```
[MAIN MENU -> CAMERA PROVIDER PAGE -> LEND CAMERA]
Enter camera's brand: Sony
Enter camera's type [DSLR / Pocket]: DSLR
Enter camera's name: A6400
Enter camera's price: Rp 200000
Enter lend price [per day]: Rp 50000
Input Lend Due Date [dd/mm/yyyy]: 21/08/2020
Any accessories available to be lend [yes / no]: yes
Enter accessories name: 35 mm Lens
Enter accessories lend price: Rp 30000
New camera added!

Press enter to continue...|
```

And if you specifically choose DSLR on camera's type, there is an option if there is any accessories included on that camera.

After all of the process, camera's ID will be automatically generated with the format PRO/(ddmmyyyy lend due)/(random number)

2.2.2. View Lended Camera

RentalKamera.com

[MAIN MENU -> CAMERA PROVIDER PAGE -> VIEW LENDED CAMERA]

Camera's ID	Brand	Type	Name	Camera's Price	Camera's Lend Price / Day	Accessories Name	Accessories Price	Total Lend Price / Day	Lend Due Date	Borrowed Status
PRO/21052020/5847	Sony	Pocket	G7x	Rp. 500.000,00	Rp. 56.000,00	-	-	Rp. 56.000,00	21 May 2020	Available

Press enter to continue...

If you choose View Lended Camera, there will be a list of your camera info that you inputted, including : camera's ID , brand, type, name, price, lend price, accessories name, accessories price, total lend price/day, lend due date, borrowed status.

* total lend price per day = lend price per day + accessories price

2.2.3. Cancel Lend

RentalKamera.com

[MAIN MENU -> CAMERA PROVIDER PAGE -> CANCEL LEND]

Camera's ID	Brand	Type	Name	Camera's Price	Camera's Lend Price / Day	Accessories Name	Accessories Price	Total Lend Price / Day	Lend Due Date	Borrowed Status
PRO/21052020/5847	Sony	Pocket	G7x	Rp. 500.000,00	Rp. 56.000,00	-	-	Rp. 56.000,00	21 May 2020	Available

Enter Camera's ID: PRO/21052020/5847

Item has been cancelled.

Press enter to continue...

If you choose Cancel Lend, there will be a list of your camera info that you inputted and you can cancel your item from being lend by entering Camera's ID.

You can only cancel the one that available, if it's borrowed you can't cancel the item.

2.2.4. Edit Lend Price

RentalKamera.com

[MAIN MENU -> CAMERA PROVIDER PAGE -> EDIT LEND PRICE]

Camera's ID	Brand	Type	Name	Camera's Price	Camera's Lend Price / Day	Accessories Name	Accessories Price	Total Lend Price / Day	Lend Due Date	Borrowed Status
PRO/21052020/3206	Sony	DSLR	67x	Rp. 500.000,00	Rp. 100.000,00	Tripod	Rp. 20.000,00	Rp. 120.000,00	21 May 2020	Available
PRO/21092020/3179	Canon	Pocket	A75	Rp. 300.000,00	Rp. 200.000,00	-	-	Rp. 200.000,00	21 September 2020	Available
PRO/21052020/3189	Sony	DSLR	46400	Rp. 200.000,00	Rp. 50.000,00	35 mm Lens	Rp. 30.000,00	Rp. 80.000,00	21 August 2020	Available

Enter Camera's ID: PRO/21052020/3206
Enter new lend price [per day]: 200000
[The price has been updated.]

Press enter to continue...

If you choose Edit Lend Price, there will be a list of your camera info that you inputted and you can edit your lend time price by entering Camera's ID that you want to edit.

You can only cancel the one that available, if it's borrowed you can't edit the item. Then if you choose Back to Main Menu it will take you back to Main Menu.

*Edit lend price will change the Total Lend Price/day's tab

2.3. Login as Camera Borrower

RentalKamera.com

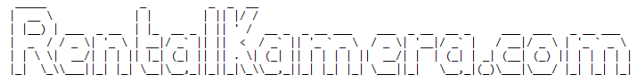
[MAIN MENU -> CAMERA BORROWER PAGE]

Please select the menus:

1. Borrow Camera
 2. View Borrowed Camera
 3. Extend Borrowing Time
 4. Return Camera
 5. Back to Main Menu
- >>

There are 5 menu option that you can choose such as, Borrow camera, view borrowed camera, extend borrowing time, return, and back to menu.

2.3.1. Borrow Camera



* For simulation only
Input today's date [dd/mm/yyyy]: 12/01/2020
[MAIN MENU -> CAMERA BORROWER PAGE -> BORROW CAMERA]

Camera's ID	Brand	Type	Name	Camera's Price	Include Accessories	Accessories Name	Lend Price / Day	Lended Until	Borrowed Status
PRO/15052020/2431	Canon	Pocket	Canon aje	Rp. 150.000,00	No	-	Rp. 12,00	15 May 2020	Available

Enter Camera's ID: PRO/15052020/2431
Enter the camera return date [dd/mm/yyyy]: 2101/2020
Enter a valid date's format!

Enter the camera return date [dd/mm/yyyy]: 21/01/2020
Order Detail

=====

Order ID : BOR/12012020/5975
Camera's ID : PRO/15052020/2431
Camera's Brand : Canon
Camera's Type : Pocket
Camera's Name : Canon aje
Camera's Price : Rp. 150.000,00
Including Accessories : No
Borrow time : 12 January 2020 - 21 January 2020
Borrow Price / Day : Rp. 12,00
Borrow Duration : 9 day(s)
Total Borrow Price : Rp. 108,00
Deposit (25 percents of camera's price) : Rp. 37.500,00

TOTAL PAYMENT : Rp. 37.608,00
=====

Please transfer to BCA 292.520.158.8 a.n. PT Rentalcamera.com
1. Confirm Payment
2. Cancel Order
Choice >> 1
|
Processing your order...
Press enter to continue...

if you choose Borrow Camera, that means you need to input camera ID that you want to borrow and the return date, and after that you can confirm your payment. You can only borrow the one that available, if it's borrowed you can't borrow the item.

- You cannot input the camera return date that more and less than lend period time that provider has inputted or less than "Today" date.
- The system will automatically show the detail of the camera and count the total lend price and deposit that you need to pay.
- Deposit = camera's price * 25%

2.3.2. View Borrowed Camera

RentalKamera.com

[MAIN MENU -> CAMERA BORROWER PAGE -> VIEW BORROWED CAMERA]

Order ID	Camera's ID	Brand	Type	Name	Camera's Price	Include Accessories	Accessories Name	Lend Price / Day	Borrow Period
BOR/12012020/5975	PRO/15052020/2431	Canon	Pocket	Canon aje	Rp. 150.000,00	No	-	Rp. 12,00	12 January 2020 - 21 January 2020

Press enter to continue...

if you choose View Borrowed Camera, you can see camera you currently borrow. You can only see the camera that you borrowed and cannot see the other user borrowed list

2.3.3. Extend Borrowing Time

RentalKamera.com

* For simulation only

Input today's date [dd/mm/yyyy]: 12/01/2020

[MAIN MENU -> CAMERA BORROWER PAGE -> EXTEND BORROWING TIME]

Order ID	Camera's ID	Brand	Type	Name	Camera's Price	Include Accessories	Accessories Name	Lend Price / Day	Borrow Period
BOR/12012020/5975	PRO/15052020/2431	Canon	Pocket	Canon aje	Rp. 150.000,00	No	-	Rp. 12,00	12 January 2020 - 21 January 2020

Enter orderID : BOR/12012020/5975

Maximum borrow date : 15 May 2020

Enter the extended date [dd/mm/yyyy]: 21/02/2020

Order Detail

=====

Order ID : BOR/12012020/5975

Camera's ID : PRO/15052020/2431

Camera's Brand : Canon

Camera's Type : Pocket

Camera's Name : Canon aje

Adjusted Borrow Time : 21 January 2020 - 21 February 2020

Extend Borrow Duration : 31 day(s)

Borrow Price / Day : Rp. 12,00

Total Extend Borrow Price : Rp. 372,00

TOTAL : Rp. 372,00

=====

Please transfer to BCA 292.520.158.8 a.n. PT Rentalcamera.com

---Press enter to confirm your payment---

|

Processing your order...

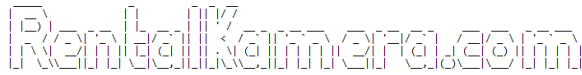
Order has been extended.

Press enter to continue...

if you choose Extend Borrowing Camera, you can extend your borrowing time by inputting orderID and date that you want to extend, then you can confirm you extend.

- Extend time can't be more and less than lend period time that provider has inputted, or less than "Today" date.

2.3.4. Return Camera



[MAIN MENU -> CAMERA BORROWER PAGE -> RETURN CAMERA]
* For simulation only
Input today's date [dd/mm/yyyy]: 12/01/2020

Order ID	Camera's ID	Brand	Type	Name	Camera's Price	Include Accessories	Accessories Name	Lend Price / Day	Borrow Period
BOR/12012020/5975	PRO/15052020/2431	Canon	Pocket	Canon aje	Rp. 150.000,00	No	-	Rp. 12,00	12 January 2020 - 21 February 2020

enter orderID : BOR/12012020/5975
Deposit to be returned: Rp. 37.500,00

Returning Camera.....
Camera has been returned.

Press enter to continue...

if you choose return camera, you can return your camera by inputting the order ID of the camera that you want to return and get your deposit back, and you can go back to main menu by choosing number 5.

- If you return the camera less than the return date that has been recorded in the system, you cannot get the excess money back.
- If you return the camera more than the return date that has been recorded in the system (late return), you get the amount of charge that will cut your amount of deposit.

Amount of charge = lend price per day * 120% * late duration (day)

NOTES:

1. **Multithreading** -> All camera's list searching process in this application, applicate the linear search and multithreading concept. Where the search is divided into 2 process that run in the same time.

* for example : searching 12 borrowed camera. The searching method will divided into 2 process

- 1st process is searching for the index 0 – 6
- 2nd process is searching for the index 7 – 11

All the process will run simultaneously, so we can get more efficient searching.

2. **File Processing** -> All data will be saved as txt file, where:

- UserList: to save login data and user profile.
- CameraProviderList: to save all lended camera data from all users
- CameraBorrowerList: to save all borrowed camera data from all users

After you open the app, all the data will be imported to arraylist, dan after data update finished, all of it will be updated as txt file in the "Database" folder.

3. **MD5 Password Hash** -> Every time user input the password, the password will be hashed with MD5 hash. So the password in the file UserList will show the MD5 hashing password format.
4. Input today's date is for simulation only. The reality is following the real today's date