977-110: Web Programming 2nd Semester 2022

Term Project (50 points)

Lecturer: Amonrat Prasitsupparote Prince of Songkla University

Instruction:

• This project is a co-project with a Database class, but the grading is separate.

- This work is a group of at most 2 persons per group for creating a web application.
- Each group must choose the topic from the following list on page 3, there are 14 topics available in total. NOT allow choosing duplicate.
- In case of a duplicate topic, allow only one group to get the point.
- For more details on your chosen topic, make an appointment with me or Teacher Panisa in advance 2-3 days.
- This project has been divided into two phases below.

1) Phase I (Progress Presentation) 20 points

In this phase, you should present your frontend application. Each member must present your responsible module/task by yourself, otherwise, you will not get any points.

1.1) The rubric for getting the point is the following:

Point	Level	Description					
5	A-E	UX/UI of your frontend application					
	А	• There is a UX/UI of your frontend application that meets all of the descriptions in your selected project (100%).					
	В	• There is a UX/UI of your frontend application that meets most of the descriptions in your selected project (75%).					
	С	• There is a UX/UI of your frontend application that meets half of the descriptions in your selected project (50%).					
	D	• There is a UX/UI of your frontend application that meets some of the descriptions in your selected project (25%).					
	E	• There is a UX/UI of your frontend application that meets none of the descriptions in your selected project (0%).					

10	A-E	The Modules of your frontend application (Each member must present your responsible module by					
		yourself					
	A	All modules of your application meet all of the descriptions in your selected project (100%).					
	В	• Most modules of your application meet all of the descriptions in your selected project (75%).					
	С	• Half modules of your application meet all of the descriptions in your selected project (50%).					
	D	• Some modules of your application meet all of the descriptions in your selected project (25%).					
	E	• None modules of your application meet all of the descriptions in your selected project (0%).					
		Presentation and Understanding					
		(ready for presentation, equipment, sample data and files, understanding of project, techniques and tools used)					
5	A-E	files, understanding of project, techniques and tools					
5	A-E A	files, understanding of project, techniques and tools					
5		files, understanding of project, techniques and tools used)					
5	A	files, understanding of project, techniques and tools used) • Excellent					
5	A B	files, understanding of project, techniques and tools used) • Excellent • Good					

- 1.2) Two extra points for deploying to the server and can access via the internet.
- 1.3) Date to presentation

Monday, September 26, 2022, 10:30 AM - 12:30 PM

Friday, September 30, 2022, 10:30 AM - 12:30 PM

2) Phase II (Final Presentation) 30 points

In this phase, you should present your final project including frontend and backend applications. Each member must present your responsible module/task by yourself, otherwise, you will not get any points.

2.1) The rubric for getting the point is the following:

Point	Level	Description							
15	A-E	The Modules of your backend application (Each member must present your responsible module by yourself							
	А	• All modules of your application meet all of the descriptions in your selected project (100%).							
	В	Most modules of your application meet all of the descriptions in your selected project (75%).							
	С	Half modules of your application meet all of the descriptions in your selected project (50%).							
	D	Some modules of your application meet all of the descriptions in your selected project (25%).							
	E	• None modules of your application meet all of the descriptions in your selected project (0%).							
10	A-E	The completion of your application (frontend and backend applications work well together, NO error, manipulate a database, publish on a public server)							
	А	• Excellent							
	В	• Good							
	С	• Satisfactory							
	D	Below expectation							
	E	• Not show							
5	A-E	Presentation and Understanding (ready for presentation, equipment, sample data and files, understanding of project, techniques and tools used)							
	A	• Excellent							
	В	• Good							
	С	• Satisfactory							
	D	Below expectation							
	E	• Not show							

2.2) Extra points.

- One point for your presentation is a production version of SPA or PWA, etc.
- Two points for deploying to the server and can access via the internet.

2.3) Date to presentation

Monday, November 21, 2021, 10:30 AM - 12:30 PM

Tuesday

Wednesday, November 23, 2021, 10:30 AM - 12:30 PM

Friday

Topic 1. Currency Exchange Shop

1. Admin

- 1.1 Dashboard: this section summarizes the amount of buying and selling in total and today, the amount of pending and rejected transactions.
- 1.2 Currency, Currency Rate, Denomination: admin can manage the currency rate (add/update/delete) including setting the specific currency to visible or invisible, see an example in Figure 1.
- 1.3 Transaction Management: there are three statuses (pending, completed, and rejected). Admin can modify the status to completed or rejected only.

- 2.1 Buy or Sell: make a transaction to buy or sell the currency. This transaction will be set to a pending transaction at first.
 - Sell rate for THB => others
 - Buy rate for others => THB
- 2.2 Registered User: see the history of transactions.

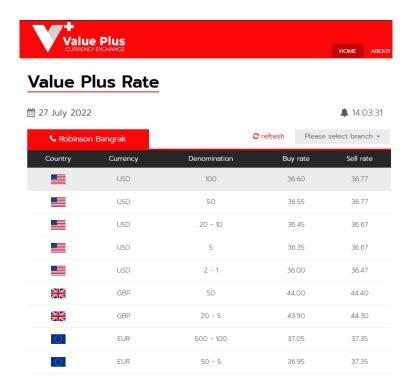


Figure 1. An example of the currency rate & denomination

Topic 2. Top-up Online Game

1. Admin

- 1.1 Dashboard: this section summarizes the amount of top-up in total and today, the amount of pending and rejected transactions.
- 1.2 Games, Payment methods, Packages: admin can manage the games, payment methods, and packages in this system (add/update/delete) including setting the status to visible or invisible, see an example in Figure 2.
- 1.3 Transaction Management: there are three statuses (pending, completed, and rejected). Admin can modify the status to completed or rejected only.

- 2.1 Top up: user must do the following steps:
 - Choose the available game
 - Fill the UID
 - Choose the package
- 2.2 Cart: user can manage (add/update/delete) the top up packages in the cart.
- 2.3 Payment: user confirms all packages in the cart, then chooses the payment method. The transaction will be created and the status is pending.
- 2.4 Registered User: see the history of transactions.

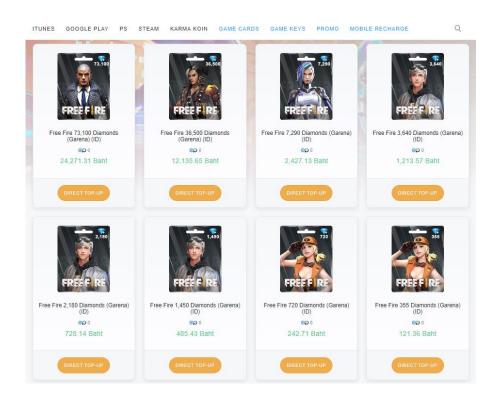


Figure 2. An example of the packages

Topic 3. Drinking Ordering System

1. Admin

- 1.1 Dashboard: this section summarizes the number of orders in total and today, the amount of pending and rejected transactions.
- 1.2 Category, Size, Topping, Sugar level, Ice level: admin can manage the category, size, topping, sugar level, and ice level (add/update/delete), see an example in Figure 3.
- 1.3 Drinking menu: admin can manage the drinking menu in this system (add/update/delete) including setting the status to visible or invisible, see an example in Figure 3.
- 1.4 Transaction Management: there are three statuses (pending, completed, and rejected). Admin can modify the status to completed or rejected only.

- 2.1 Order: user chooses the available drinking menu and does the
 following steps:
 - Choose the size
 - Choose the topping, allow choosing more than one.
 - Choose the sugar level
 - No sugar (0%)
 - Quarter sugar (25%)
 - Half sugar (50%)
 - Less sugar (75%)
 - Full sugar (100%)
 - More sugar (120%)
 - Choose the ice level
 - Hot drink
 - No ice
 - Less ice
 - Normal ice
- 2.2 Cart: user can manage (add/update/delete) the order in the cart.
- 2.3 Payment: user confirms all orders in the cart, then chooses the payment method. The transaction will be created and the status is pending.
- 2.4 Registered User: see the history of transactions.



Figure 3. An example of the drinking menu

Topic 4. Car Parking System

1. Admin

- 1.1 Dashboard: this section summarizes the amount of parking fee in total and today, the amount of pending and rejected transactions.
- 1.2 Parking fees, Payment methods: admin can manage the parking fees, payment methods in this system (add/update/delete) including setting the status to visible or invisible, see an example in Figure 4.
- 1.3 Transaction Management: there are three statuses (pending, completed, and rejected). Admin can modify the status to completed or rejected only.

- 2.1 Parking: user fills the enter and out DateTime then the fee will be summarized.
- 2.2 Payment: user chooses the payment method. The transaction will be created and the status is pending.
- 2.3 Registered User: see the history of transactions.



Figure 4. An example of the parking fee

Topic 5. Fixed-rate Loan System

1. Admin

- 1.1 Dashboard: this section summarizes the amount of loan in total and today, the amount of pending and rejected transactions.
- 1.2 Loan tenure, Yearly interest rate: admin can manage the loan tenure, yearly interest rate in this system (add/update/delete) including setting the status to visible or invisible, see an example in Figure 5.
- 1.3 Transaction Management: there are three statuses (pending, completed, and rejected). Admin can modify the status to completed or rejected only.

- 2.1 Loan Simulation: user fills loan amount, chooses loan tenure (in years or months), chooses the yearly interest rate, then the payment in each installment will be summarized, see an example in Figure 5.
 - Total Interest Paid = Loan Amount * Loan Tenure (in years)
 * Yearly Interest Rate
 - Monthly Payments = (Loan Amount + Total Interest Paid) / Loan Tenure (in months)
- 2.2 Get a loan: Only the registered user can get a loan through the button (Get a Loan) in the simulation. The transaction will be created and the status is pending.
- 2.3 Registered User: see the history of loan transactions.

Loan Amount = 100,000.00		Total Interest Paid = 8,040.	00 Total Payme	Total Payments = 108,040.00		
No. of Instalment	Principal Payment	Interest Payment	Total Payment	Outstanding Balance	T	
1	2,777.78	223.33	3,001.11	105,038.89	A	
2	2,777.78	223.33	3,001.11	102,037.78		
3	2,777.78	223.33	3,001.11	99,036.67		
4	2,777.78	223.33	3,001.11	96,035.56		
5	2,777.78	223.33	3,001.11	93,034.44		
6	2,777.78	223.33	3,001.11	90,033.33		
7	2,777.78	223.33	3,001.11	87,032.22		
8	2,777.78	223.33	3,001.11	84,031.11		
9	2,777.78	223.33	3,001.11	81,030.00		
10	2,777.78	223.33	3,001.11	78,028.89		
11	2,777.78	223.33	3,001.11	75,027.78		
12	2,777.78	223.33	3,001.11	72,026.67		
13	2,777.78	223.33	3,001.11	69,025.56	ı,	
14	2,777.78	223.33	3,001.11	66,024.44		
15	2,777.78	223.33	3,001.11	63,023.33	ш	
16	2,777.78	223.33	3,001.11	60,022.22		
17	2,777.78	223.33	3,001.11	57,021.11	ш	
18	2,777.78	223.33	3,001.11	54,020.00		
19	2,777.78	223.33	3,001.11	51,018.89		
20	2,777.78	223.33	3,001.11	48,017.78		
21	2,777.78	223.33	3,001.11	45,016.67		
22	2,777.78	223.33	3,001.11	42,015.56	V	

Figure 5. An example of the loan simulation with a loan tenure of 3 years and a yearly interest rate is 2.68

Topic 6. OT Request System

1. Admin

- 1.1 Dashboard: this section summarizes the amount of approved OT requests in total and today, the amount of pending and rejected requests.
- 1.2 Employee information: admin can manage the employee information (add/update/delete), including salary, and working hours.
- 1.3 OT rate: admin can manage the OT rate in this system (add/update/delete) including setting the status to visible or invisible. See an example in the below table.
 - Hourly wage = salary / 30 / working hour

The number of OT hours in total (defined as X)	OT rate
X ≥ 10 hours	1.3 times of hourly wage
5 hours ≤ X < 10 hours	1.8 times of hourly wage
X < 5 hours	2.0 times of hourly wage

1.4 Request Management: there are three statuses (pending, approved, and rejected). Admin can modify the status to completed or rejected only.

2. Employee

- 2.1 OT request: employee fills the enter and out DateTime in each day that requests OT. Each request will be created and the status is pending.
- 2.2 Checking status: employee can check the status of his/her request. For the approved request, there is a summary of OT in total.

Topic 7. Laundry Management System

1. Admin

- 1.1 Dashboard: this section summarizes the number of laundry requests in total and today, and the amount of pending, accepted, inprocess, and finished requests, see an example in Figure 7-1.
- 1.2 Manage Laundry Price, Service Types, Payment methods: admin can manage the laundry price, the service types, and the payment methods in this system (add/update/delete) including setting the status to visible or invisible, see an example in Figure 7-2.
 - Service Types such as Pickup, Wash and Dry, Dry Cleaning, Fluff, and Fold Laundry, etc.
- 1.3 Manage Laundry Request: admin can update the request status from pending to others (accepted, in-process, and finished).

- 2.1 Laundry request: user fills in the laundry detail form, see an example in Figure 7-3. After submitting the form, the laundry detail will be summarized including the total charges.
- 2.2 Payment: user chooses the payment method. The request will be created and the status is pending.
- 2.3 Registered User: the registered user can check the request status.

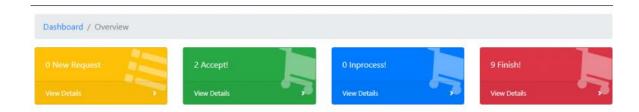


Figure 7-1. An example of an admin dashboard

Laundry Price(Per Unit)						
Top Wear Laundry Price	12					
Bootom Wear Laundry Price	22					
Woolen Cloth Laundry Price	20					

Figure 7-2. An example of a laundry price

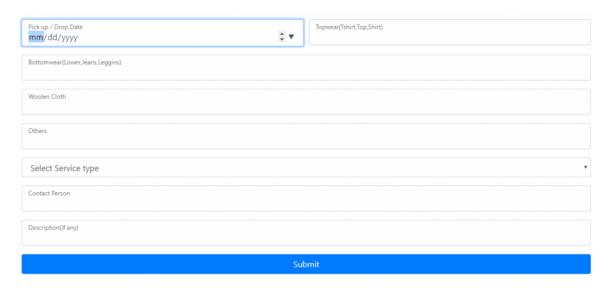


Figure 7-3. An example of a laundry request form

Topic 8. Laptop Rental System

1. Admin

- 1.1 Dashboard: this section summarizes the number of rental requests in total and today, and the amount of pending, approved, and rejected requests, see an example in Figure 8.
- 1.2 Manage Rental Price, Laptop, Payment methods: admin can manage the rental price (per day, month, year), the laptop detail, and the payment methods in this system (add/update/delete) including setting the status to visible or invisible.
- 1.3 Manage Rental Request: admin can update the request status from pending to approved or rejected.

- 2.1 Rental request: user chooses the desired laptop and fills in the rental detail. After submitting the form, the rental detail will be summarized including the total charges.
- 2.2 Payment: user chooses the payment method. The request will be created and the status is pending.
- 2.3 Registered User: the registered user can check the rental status.



Figure 8. An example of an admin dashboard

Topic 9. Car Wash Service System

1. Admin

- 1.1 Dashboard: this section summarizes the number of car wash requests in total and today, and the amount of pending, in-process, and finished requests.
- 1.2 Manage Services, Additional Services, Payment methods: admin can manage the services, the additional services, and the payment methods in this system (add/update/delete) including setting the status to visible or invisible, see an example in Figure 9.
 - Additional Services such as Hard Wax, Scratch Removal, Carpet Shampooing, Water Spot Removal, Paint Restoration, etc.
- 1.3 Manage Car Wash Request: admin can update the request status from pending to in-process or finished.

- 2.1 Car Wash request: user fills in the car wash detail form. After submitting the form, the car wash detail will be summarized including the total charges.
- 2.2 Payment: user chooses the payment method. The request will be created and the status is pending.
- 2.3 Registered User: the registered user can check the request status.

SERVICES & PRICES				
VEHICLE	OUTSIDE ONLY	INSIDE & OUT		
CAR	\$12	\$20		
SUV (AVERAGE)	\$15	\$25		
SUV (LARGE)	\$20	\$30		
PICKUP TRUCK (SMALL)	\$15	\$25		
PICKUP TRUCK (LARGE)	\$20	\$30		
PICKUP TRUCK (XL)	\$25	\$35		
TAXI VAN	\$20	\$30		

Figure 9. An example of a service price.

Topic 10. Daily Expense Tracker System

1. Admin

- 1.1 Category and Sub-Category: admin can manage the category and sub-category in this system (add/update/delete) including setting the status to visible or invisible, see an example in Figure 10-1.
- 1.2 Manage Users: admin can modify the status of each user to active or inactive. An inactive user can not use the system.

- 2.1 Expenses: only the registered user fills in the expense form. This form accepts more than one expense detail in a form. There is a total expense at the end of this form.
- 2.2 Dashboard: user can view the amount of expense in total, today, yesterday, last 7 days, last 30 days, and specify the period see an example in Figure 10-2.
- 2.3 Register: user fills in the register form, then his/her account was created with active status.

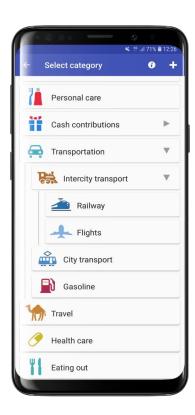


Figure 10-1. An example of a category and sub-category.

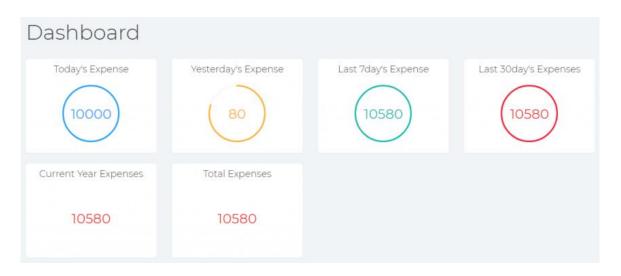


Figure 10-2. An example of a dashboard.

Topic 11. Electronic Device Repair System

1. Admin

- 1.1 Dashboard: this section summarizes the number of requests in total and today, and the amount of pending, in-process, and finished requests.
- 1.2 Technicians, Device Brand, Device Types: admin can manage the technicians, the device brand, and the device types in this system (add/update/delete) including setting the status to visible or invisible.
 - Device Types such as television, microwave, rice cooker, clothes iron, refrigerator, washing machine, vacuum cleaner, etc.
- 1.3 Manage Requests: admin assigns a technician to the pending request. This request will change to an in-process request.

2. User

- 2.1 Repair request: user fills in the request form. After submitting the form, the request will be created and the status is pending.
- 2.2 Registered User: the registered user can check the request status.

3. Technicians

- **3.1 Dashboard:** this section summarizes the number of in-process and finished requests in total and today.
- 3.2 Manage Requests: technician fills in the charges, then this request will be changed to finished status.

Topic 12. Swensen's Ordering System

1. Admin

- 1.1 Dashboard: this section summarizes the number of orders in total and today, the amount of pending and rejected transactions.
- 1.2 Category, Toppings, Scoops: admin can manage the category, toppings, and scoops (add/update/delete), see an example in Figure 12.
 - Category such as signature sundaes, chocolate fantasy, beautiful sundaes, etc.
- 1.3 Ice-cream menu: admin can manage the ice-cream menu in this system (add/update/delete) including setting the status to visible or invisible, see an example in Figure 12. Each menu has the default flavor of ice-cream and toppings. For example, Coffee Mocha Almond consists of:
 - Mocha Almond Fudge 1 scoop
 - Turkish Coffee 1 scoop
 - Vanilla 1 scoop
 - Toppings: Caramel, Fan Wafer, Cherry Dipped, Almonds, Chocolate Fudge, and Whipped Cream.
- 1.4 Transaction Management: there are three statuses (pending, completed, and rejected). Admin can modify the status to completed or rejected only.

- 2.1 Order: user chooses the available ice-cream menu and does the following steps:
 - Change the flavor of ice-cream
 - Change the toppings
 - Addon the toppings
- 2.2 Cart: user can manage (add/update/delete) the order in the cart.
- 2.3 Payment: user confirms all orders in the cart, then chooses the payment method. The transaction will be created and the status is pending.
- 2.4 Registered User: see the history of transactions.



















Figure 12. An example of the ice-cream menu

Topic 13. Garbage Recycling Online Shop System

1. Admin

- 1.1 Dashboard: this section summarizes the number of transactions in total and today, the amount of pending, in-progress and rejected transactions.
- 1.2 Category, Products, Staffs: admin can manage the category, products and staffs (add/update/delete), see an example in Figure 13. Especially, the products can be set the status to visible or invisible.
 - Category such as Steel, Paper, Glass, Plastic, etc.
- 1.3 Transaction Management: there are four statuses (pending, in-progress, completed, and rejected). Admin can modify the status to in-progress or rejected only.
 - The in-progress status means the staff was assigned for this transaction by the admin.
 - The rejected status means the admin canceled this transaction.

2. Staff

2.1 Transaction Management: Staff can modify the in-progress status to completed status when finishing pick-up the garbage.

- 3.1 Request Pick-up Grabage: only non-registered users must fill in the contact information. After that fill in the garbage information such as type (newspaper, zinc can, etc.) and choose the date-time for pick-up the garbage. The transaction will be created and the status is pending.
- 3.2 Registered User: see the history of transactions.



Price Monday 15 August 2022 (Retail Price)

Frice Monday 15 August 2022 (Retail Price)								
ประเภาแทนเหลืก / Steel								
Product Type	Price / Unit	Product Type	Price / Unit	Product Type	Price / Unit	Product Type	Price / Unit	
Sliced Steel -not cut	5.70	Steel Bar 1 inch,more than 1 m. long	9.50	Steel Nail	8.70	Thick Steel (cut in short pieces not exceed 80 cm.)	9.50]
Round Bar	6.00	T-BAR,Metal Sheet	4.00	No.2 Big Cast Iron	6.80	Shock Absorber Steel	4.00]
Zinc Can	5.00	Thick Steel (cut in short pieces not exceed 50 cm.)	8.70	Thick Steel - not cut	6.00	Steel Bar 6 hun, 2.50 m. long ,end tied	9.20]
No.3 Big Cast Iron	5.60	Sling	7.00	Steel from the whole car / pick-up	5.70	Sliced Steel (cut in shotr pieces not exceed 50 cm.)	8.70]
Zinc	4.00	No.4 Engine Steel	6.40	Sling	5.00	Extra thick steel (cut in short)	9.50]
Thin Steel - not cut	2.50	Metal Swarf (black,fluffy,notdirty)	2.50	No.1 Small Cast Iron	9.00			T
			ประเภา	ทเสษกระดาษ / Paper				
Product Type	Price / Uni	it Product Type	Price / Uni	it Product Type	Price / U	nit Product Type	Price / U	ait
Newspaper	3.40	Book Paper - Newsprint	3.40	Office Paper(A)	7.20	Milk / Fruit Juice Box	0.00	
Mixed Paper	3.40	Old Corrugated Cardboard B(OCC)	3.80	Office Paper(D)	4.20	Office Paper(B)	6.20	
Old Corrugated Cardboard A(OCC)	4.10	Cup sleeve	0.00	Magazines / Gloss Coated Paper	3.40	Office Paper(C)	5.20	
Color Paper / Shoe Box	3.40	Cement Bag	3.40					
			ประเภทขว	คิแก้ว / Glass	•			
Product Type	Price / Unit	Product Type	Price / Unit	Product Type	Price / Unit	Product Type	Price / Unit	
Medicine Bottle-kg.(pound bottle) / (small)	2.10	Rice whiskey Bottle : Box(24)	15.00	Green Broken	1.95	BLEND 258 Bottle (700 cc.) : box	7.00	
LEO Beer 1 bottle	0.30	Clear Broken Glass	2.05	heineken	19.00	Dek Somboon Sauce Bottle - 12 bottles / box	0.00	
Fish Sauce Bottle : 1 Bottle	1.00	Chang Beer Bottle (green) / Box / clean	14.00	Glass of beer (Broken)			18.00	
Dek Somboon Sauce Bottle - 24 bottles / box	0.00	Fish Sauce Bottle : 1 Box	17.00	LEO Beer bottle / Box / clean	10.00	Red Broken Glass	2.05	
Glass-Mixed Colored Broken Glass	1.30	Hong Thong Bottle(700 cc.) : box	16.00	Chang Beer 1 Bottle (green / clean)	0.50			
		'	ประเภทพ	ia ावजेंग / Plastic		<u>'</u>		ĺ
Product Type	Price / Unit	Product Type	Price / Unit	Product Type	Price / Unit	Product Type	Price / Unit	
Hard Water Hose	0.00	No.2 PET Bottle (green)	1.00	Large PVC Electrical Wire Skin-Black	3.50	PE Bag - Large size	1.30	
Plastic Band-floated	Plastic Band-floated 1.50		3.00	Black plastic	1.00	PVC Boots	11.50	
PP Board (black)	1.00	Fertilizer Sack Scrap-dry & clean	1.00	Normal Saline Bottle cap removed / with cap		Green Water Hose	1.20	
No.3 PET Bottle (Screen bottle)	0.50	Small PVC Electrical Wire-SkinBlack	2.50	HDPE Bag - Large size	1.00	Plastic CD	12.00	
Fish Sauce Bottle Caps	3.00	Pepsi,Miranda,Aquaves (bottle)	7.50	Plastic headlights,tail lights car.	2.00	PVC Pipe (blue)	5.50	
PP.TD10,20	0.00	PS (large piece)	0.50	Clear PS Plastic-CD Case	1.00	(HDPE White) Drinking Water Plastic Bottle	5.00	
PVC Electrical Wire Skin-(mixed color)	1.50	Big Black Trash Bag (dry)	0.70	Plastic DVD	6.00	Plastic Acrylic Billboard	4.00	
Soft Water Hose	Soft Water Hose 4.50 No.1 PET Bottle (clear) 6.50 PVC I		PVC Pipe (yellow)	2.00	PVC Pipe (grey)	0.50		
Mountain Dew	2.00	Plastic Band (PET green)	1.00	EPS Foam	1.50	(HDPE White) Drinking Water Tank 20 litre	1.50	

Figure 13. An example of the category and products

PVC Bottle (clear / color)

PP Board (color)

PVC Slippers

(see more at http://www.wongpanit.com/list history price)

Normal Saline Bottle cap

Topic 14. School Bank Saving System

1. Admin

- 1.1 Deposit Types: admin can manage the deposit types (add/update/delete) including setting the status to visible or invisible. The deposit types consist of name, interest rate, the minimum deposit to open an account, and the pay interest periods), see an example in Figure 14-1.
 - Pay interest periods such as every month, every 3 months, every 4 months, every 6 months, and every year.
- 1.2 Account Management: there are three operations that the admin can do in the following:
 - Create an account: admin can create a new account for the selected deposit type. Each student has more than one account, see an example in Figure 14-2.
 - Close an account: admin can remove the account for the selected deposit type.
 - View an account: admin can view the account for the selected deposit type.

2. Students

- 2.1 Deposit: Students must choose the account first and then fill in the deposit form.
- 2.2 Withdraw: Students must choose the account first and then fill in the withdraw form.
- 2.3 History Transactions: Students can see all history transactions of the selected account, see an example in Figure 14-3.

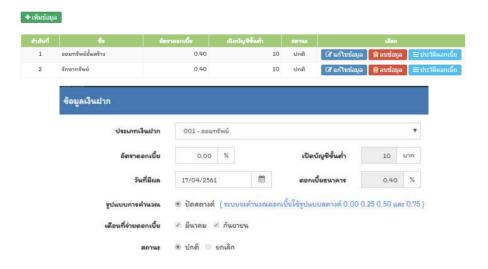


Figure 14-1. An example of Deposit Types.

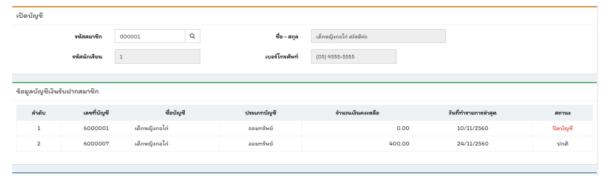


Figure 14-2. An example of the account for each student.

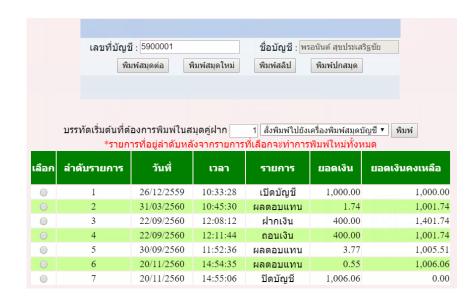


Figure 14-3. An example of the history transactions.