

Coventry University

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City University of Hong Kong

PROGRAMME - {173-19431}

BSc (Hons) Information Technology for Business (3-yr Full Degree)

2017-2020

Year 2 ALL Project 2

Group 9

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Introduction

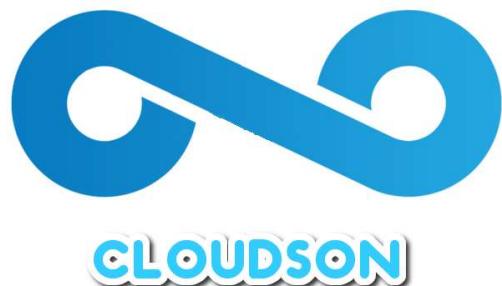
According to the ALL group project 1 in last trimester, our group agreed that using Point of Sale (POS) system is one of the trends that can improve the processing speed in the traditional retail store. That's why our group have made a POS system for our designed business named Cloudson which is selling IT products. And we used financial report to proved that the POS system will help the business to reduce the running cost of business.

However, our group found some implementations and limitations. In this trimester, our group is going to use the knowledge that we have learnt from '104KM Enterprise Information Systems', '118COM IT Infrastructure and Service Management' and '122COM Introduction to Algorithms' to make improvement to our project and the business.

In this ALL project 2, our group is going to make a database, online website system and improved POS system for our designed business. We believe that these new functions can improve the services and processing time for our designed business.

Background of business

Cloudson Limited (Cloudson), is a newly opened local small-scale electronic retailer, their targeted customers are those who didn't have their own electronic devices or they want to change to a new one. Cloudson aims to provide a friendly selling service which can let the customers easy to know the details of the products and have a short time selling process.



Cloudson has one physical store and an own online system.

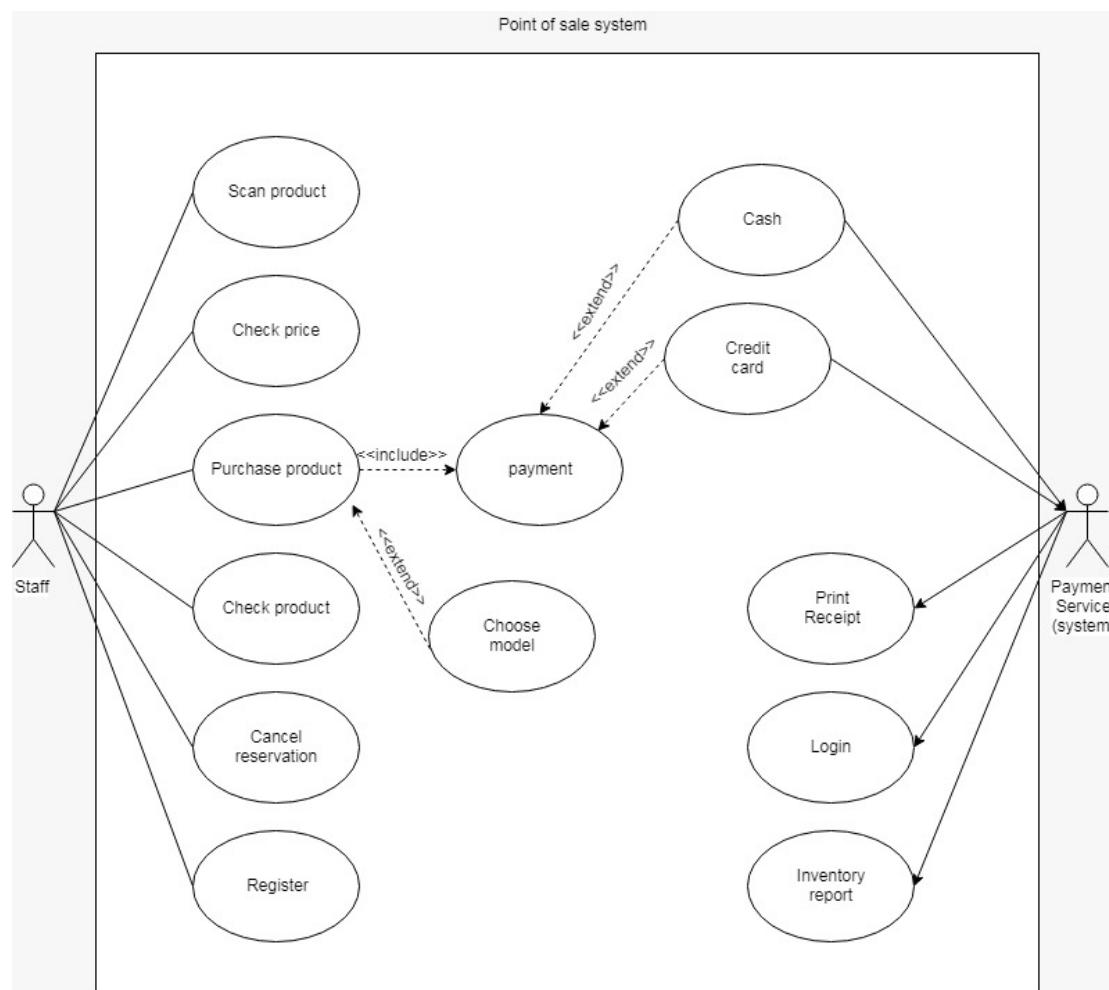
Products types: IT products (e.g. Smartphones, tablets or digital camera)

Planning

In this part, we are going to use some diagrams to show the ideas of what we want the POS system will help the business for selling process or the services.

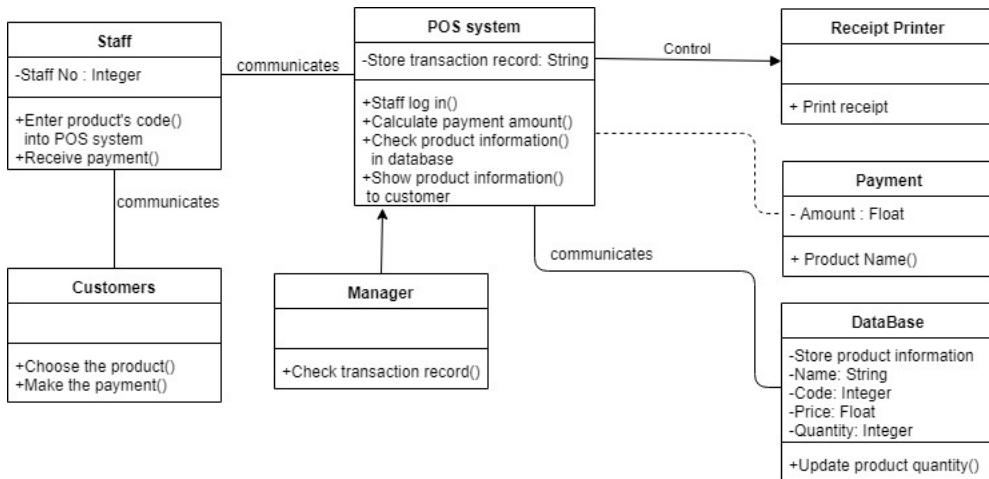
Use Case Diagram

For the staff, their job is to scan the product, check the product price, cancel reservation and register their own staff id. Also, when the customers want to buy the product, the staffs need to enter the product ID into POS system for finishing the transaction. For the system, it is used to control the cashier, print receipt, take cash record and store the information for the staff to log in.



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Class Diagram



For the POS system, it stores the transaction record as a String.

Then, it is used for the Staff to log in and help them to calculate the payment amount; it can also check the product information in the database and show the information of customer's product. Besides, it controls the receipt printer to print receipt when the transaction is done.

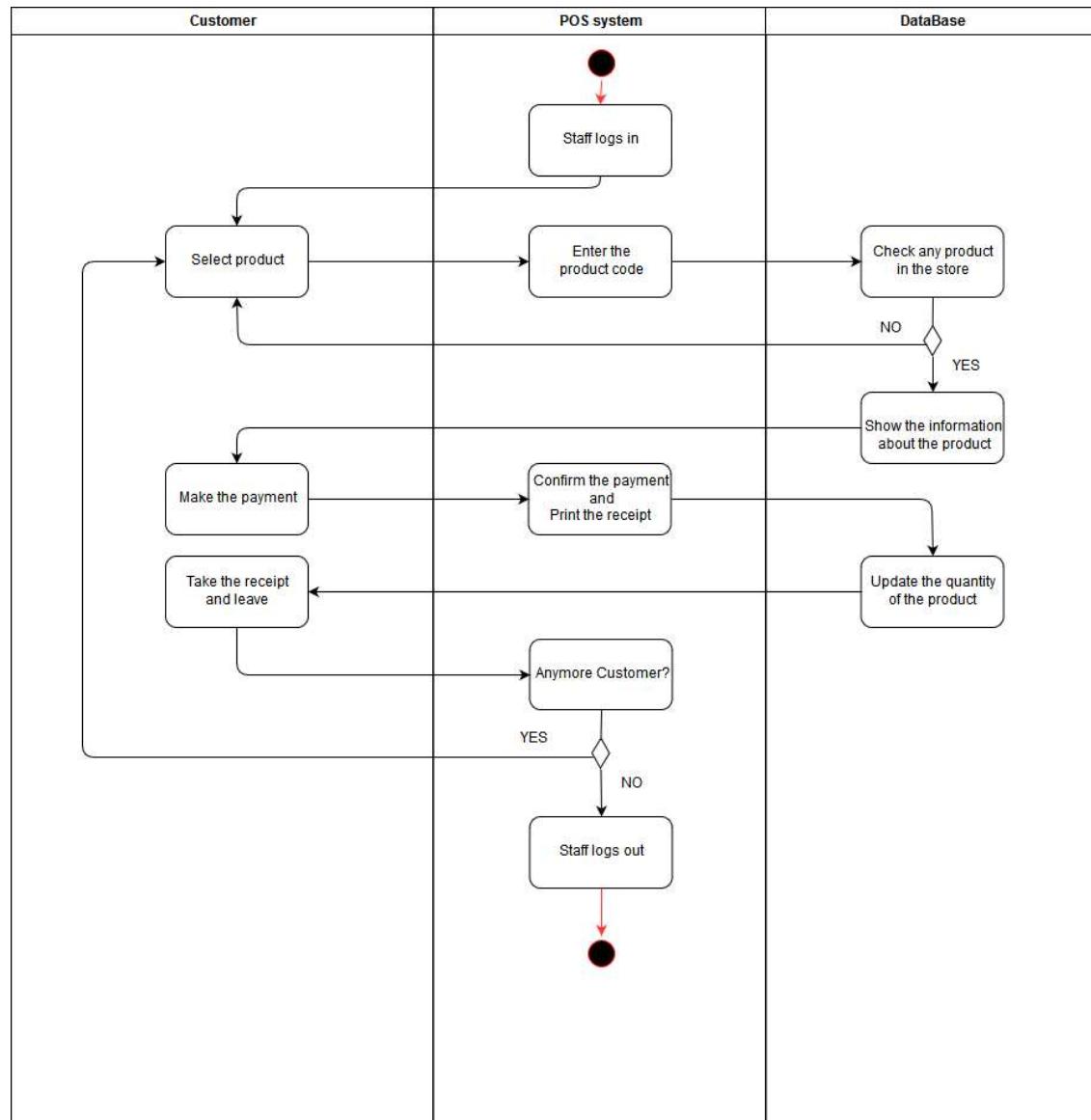
For the Staff which use the POS system, they need to register their own staff no. in POS system, which is stored as Integer. The job of the staff is to enter the customer's product ID into POS system and receive the payment from customer.

For the customers, they only need to choose the product they want and hand it in to the staff to make payment.

For the Database, it stores many things which make the POS system run successfully. First, it stores the product information in the shop, such as product name, product ID, product's price and product's quantity. This information can be modified by the POS system when there is a transaction. Besides, it also stores the staff information for them to log in the POS system.

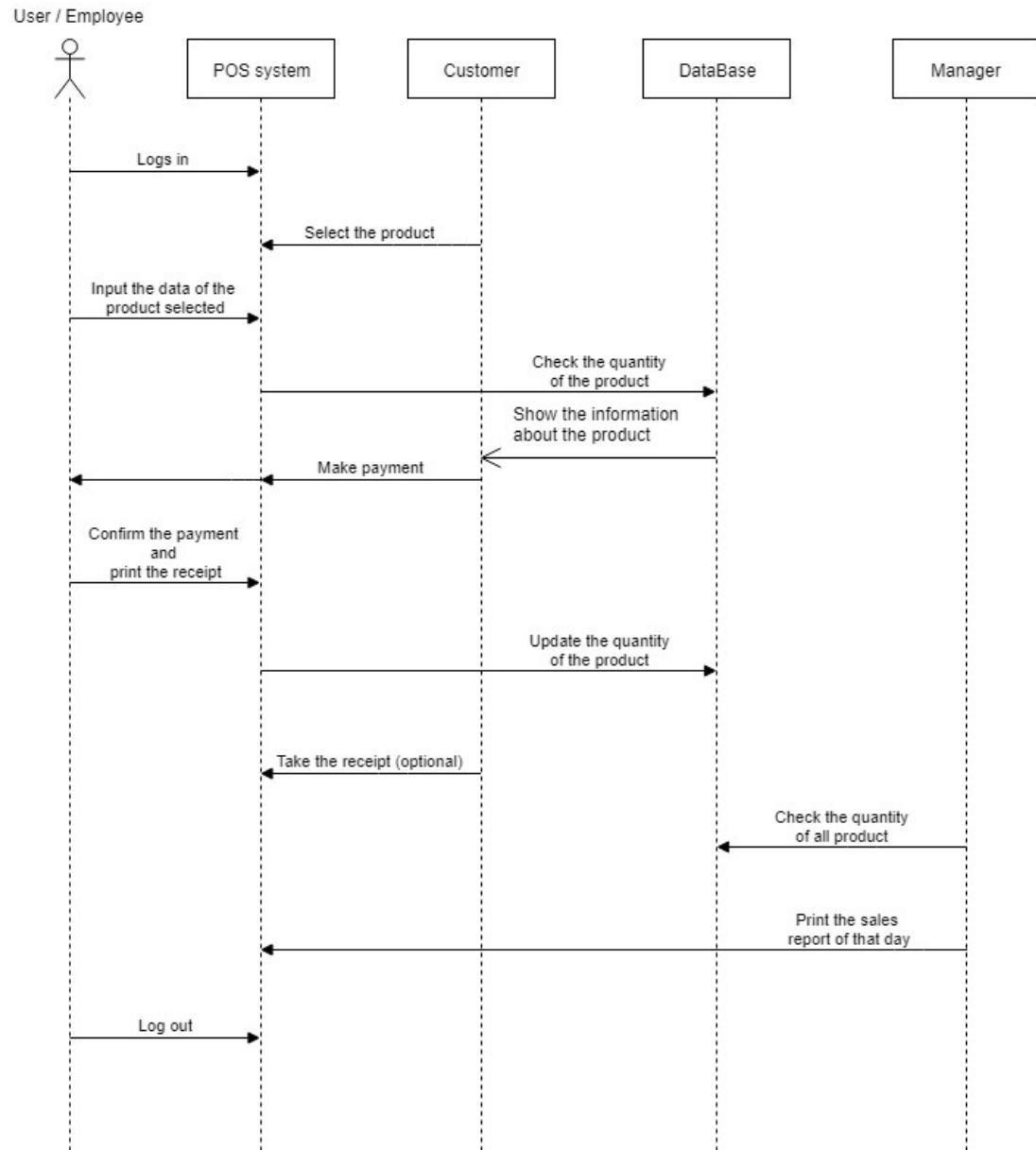
If the manager wants to check the transaction of that day, they can check it in the POS system anytime.

Activity Diagram



1. The staff need to log in to the POS system;
2. The customer wants to buy some product;
3. The staff enter the product's code into the POS system;
4. The Database will check the quantity of that product;
5. The Database will return the information of that product; e.g. Product Name, Price, model, etc;
6. The customer choose the method for the payment;
7. The staff receive the payment;
8. POS system will print out the receipt and send the record to the database;
9. The Database will update the quantity of the product;
10. Transaction complete;
11. Log out the POS system

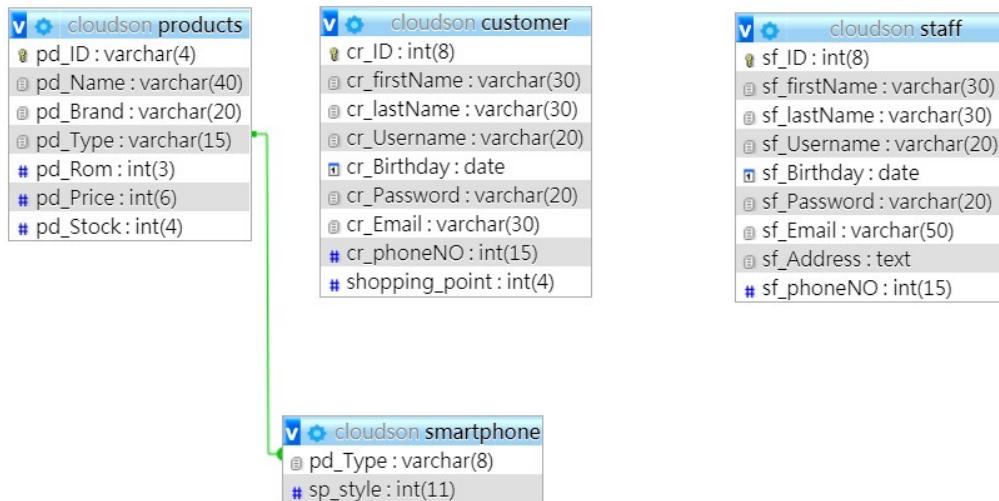
Sequence Diagram



1. The staff need to log in to the POS system;
2. The customer wants to buy some product;
3. The staff enter the product's code into the POS system;
4. The Database will check the quantity of that product;
5. The Database will return the information of that product; e.g. Product Name, Price, model, etc;
6. The customer choose the method for the payment;
7. The staff receive the payment;
8. POS system will print out the receipt and send the record to the database;
9. The Database will update the quantity of the product;
10. Transaction complete;
11. Log out the POS system

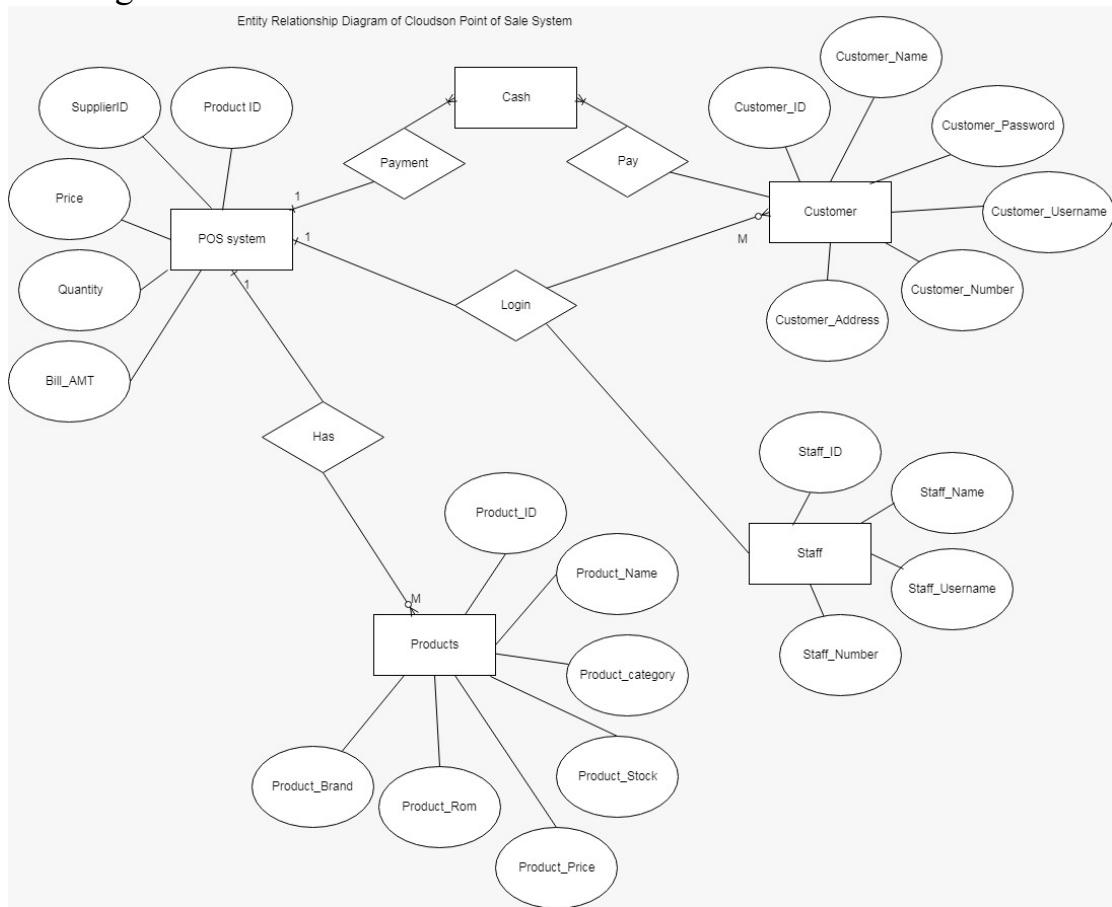
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Database Diagram



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ER Diagram



The attribute of POS system:

Product ID, Price, Quantity and Balance's check(Bill ATM)

The attribute of Product:

product name, product ID, product category, product stock, product brand, product's price and product's quantity.

The attribute of Customers:

customer ID, customer name, customer password, customer user name, customer name and customer address.

The attribute of Staff:

staff ID, staff name, staff user name and staff number.

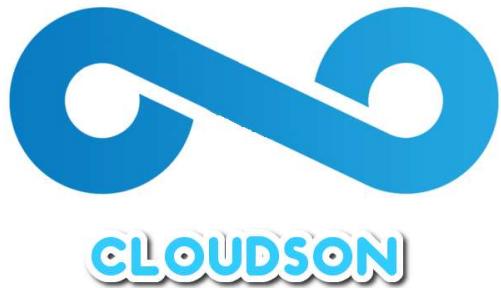
In this diagram, customer and the staff can log in the POS system to have check or purchase the product. if there is a transaction, the POS system will use the cashier to get the payment.

Business Services

1. Company Overview or Target Customers Overview

Background of the business:

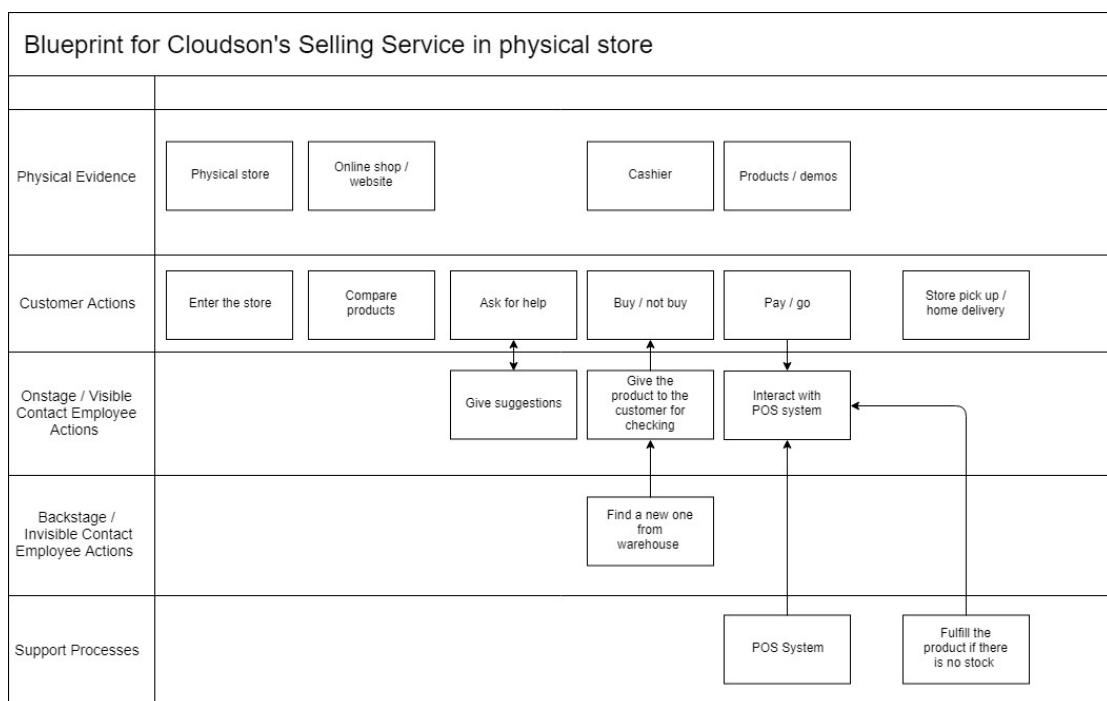
Cloudson Limited (Cloudson), is a newly opened local small-scale electronic retailer, their targeted customers are those who didn't have their own electronic devices or they want to change to a new one. Cloudson aims to provide a friendly selling service which can let the customers easily know the details of the products and have a short time selling process.



Cloudson has one physical store and an own online system.

Products types: IT products (e.g. Smartphones, tablets or digital camera)

2. Service Blueprint



3. Proposed application overview

Website System: (on the internet)

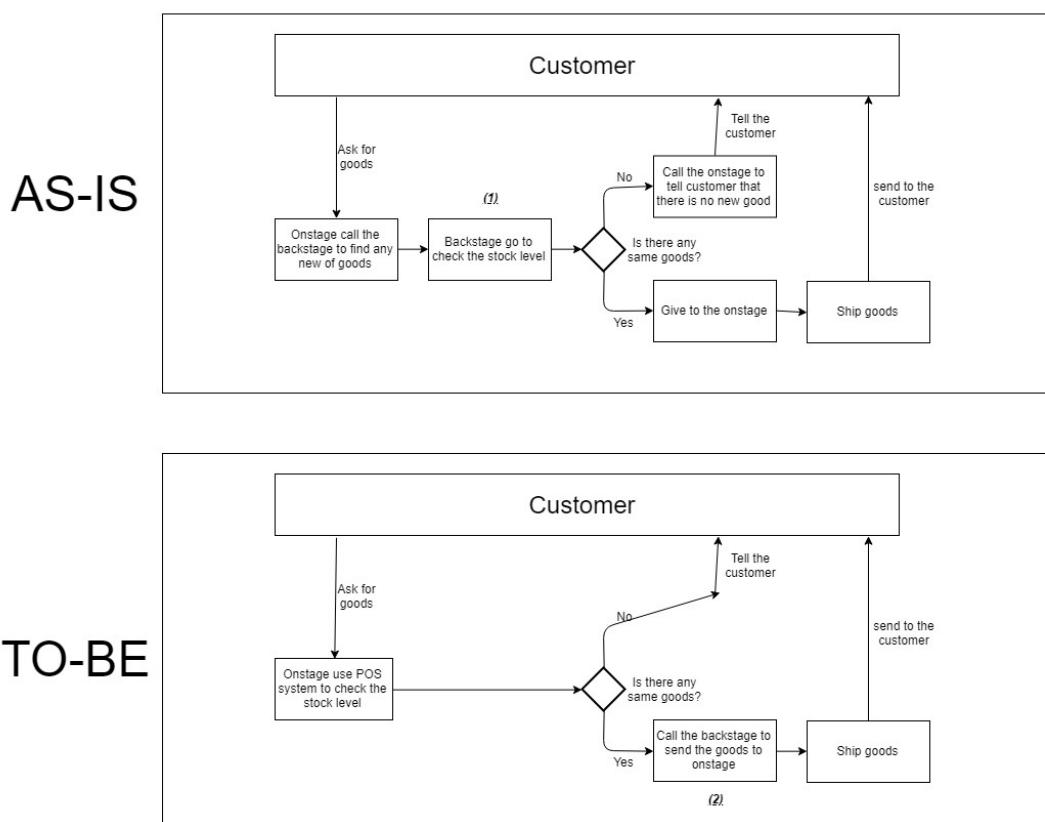
- Customer can login or sign up the system
- Can search the information of the products
- Information of the business

POS System: (in physical store)

- Login for staff
- Payment (calculate how much customer should pay)
- Can search the information of the products
- Can update the products details or delete them
- Refund & Print receipt or Z-report

4. Service Strategy – AS-IS versus TO-BE mapping and estimation of task time for each step

In physical store version:



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Service Strategy – Process Analysis

a) Process Analysis for Cloudson's AS-IS

	Step name	Processing time	Wait time	Remarks
1	Staffs need to confirm the number of stocks, take a record by using paper of notes and prepare for start to operate the store.	40 mins	10 mins	40 minutes will be taken for confirm the record in stock written by the end closing the store in the day before.
2	Customer decided to enter the store and looking around for the goods he/she want.	10 mins	5 mins	5 minutes may be taken for the customers waiting to get near the desk showing samples the goods they want.
3	Customer takes a look of the samples and asks the staff for help to know more information about the products or goods that they are looking for.	3 mins	3 mins	Staffs need to answer the questions asked by customers in 3 minutes.
4	Customer decided to buy the product and ask the staff to get a new one to them.	3 mins	15 mins <u>1</u>	Staffs have to ask the staffs in the warehouse to check if there is the product or not; the staffs in the stock need to give out the good to the staffs who are selling the products to customer.
5	After the customer confirms to buy the products, staffs need to help the customer to check the products and help them to pay.	5 mins	5 mins	The staffs need to calculate how much did the customer pay, put the money to the register and give the chance back to customer.
6	The staff's write the receipt and give the chance back to customer, then the customer leave.	3 mins	4 mins	Staffs need to take the record of how many products did they sold in first time.
7	Take all records of the products sold, fulfil the stock in the store and prepare the Z-report of that day.	40 mins <u>1</u>	5 mins	After the store closed, staffs need to take all records in the stock, make a Z-report for the store in that day and send the report to the office by email.

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b) Process Analysis for Cloudson's TO-BE by using POS system

	Step name	Processing time	Wait time	Remarks
1	Checking the status and test the connection of the server.	5 mins	5 mins	Staffs in office need to check the status of the server in the office that is running and can be connected by the computer holding in physical store.
2	Turn on the computers, run and test the POS system.	10 mins	5 mins	Staffs in physical store must confirm that the status of POS system is connected to the server.
3	Customer takes a look of the samples and asks the staff for help to know more information about the products or goods that they are looking for.	5 mins	20 seconds	Staffs need to answer the questions asked by customers in 20 seconds.
4	Customer decided to buy the product and ask the staff to get a new one to them.	40 seconds	4 mins <u>(2)</u>	Staffs can check the stock of products using POS system and ask the staff in warehouse to get the product to them.
5	After the customer confirms to buy the products, staffs need to help the customer to check the products and help them to pay.	5 mins	5 mins	The staffs need to calculate how much did the customer pay, input the number of payment into POS system, put the money to the register and give the chance back to customer.
6	The staffs print the receipt written by POS system and give the chance back to customer, then the customer leave.	1 mins	2 mins	POS system will take the record of selling after the receipt was printed.
7	The staffs print the Z-report and check the stock by POS system after the store closed.	3 mins	2 mins	Z-report and the records need to send to the office after the store closed for them to confirm and do checking.
8	The staffs in office check and confirm the data sent by the store.	5 mins <u>(2)</u>	5 mins	After the store closed, the staffs in office need to check the database in the server print the Z-report and check the stock by their server or POS system and help to fulfil the stock to the store.

Result of AS-IS versus TO-BE mapping and estimation of task time for each step

In (1), the store needs more than four staff in warehouse that to search and record the stock of products when closing the store everyday, find them and pass them to the staff who serving the customers.

However in (2), because using the function of checking the stock of products by POS system, the time for searching product in warehouse and checking stock of products can be reduced.

Compare with (1) and (2), more than 10 minutes for searching products in each selling process and 35 minutes for making records & z-report can be reduced by POS system. Because of the time in selling process and taking record have been reduced, the man hours is reduced and some external man hours can be cut. Therefore, only two staff is needed for passing the product from warehouse and checking the stock of products is same as recorded in the database regularly.

As the result, two staff in warehouse can be cut and make the cost saving in labor.

5. Service Strategy –Financial Management

Benefits

In past, there must be at least 4 staffs in the backstage of store. After using the POS system, there will be a step of selling process can be skipped.

There can be only 2 staffs in backstage which only help for sending the goods to onstage and fulfil the stock level of the store.

According to the data from government, it will reduce the cost of manpower: $\$14328 * 2 = \28656 per month.

Also, because of the skipped process, it will also increase the business responses to the customers.

The cost that can be reduced after set up the POS system: (per year)

$$= \$28656 * 12$$

$$= \$343872$$

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Cost

System configurations:

\$5980 *2 for two notebooks which installed the POS system having 8GB Ram, i5 CPU and 1000GB HDD-ROM

\$440 for printer to print receipt or Z-report and \$313 *2 for two color-print toners

\$3970 for one Cash Register

\$198 per month for business fibre broadband

\$3249 for one server and set up by Cloudson IT support team

POS system cost:

6 months for create and develop the program, \$24000*2 per month for two programmers, and rest days for maintain the program.

Running cost:

\$2000 per month include the electronic cost (eg: WIFI system, power) and maintenance the System configurations

Total cost for set up and run the POS system & website system in first year:

$$(\$24000*2*12 + \$5980*2 + \$440 + \$313*2 + \$3970 + \$198*12 + \$3249 + \$2000*12)$$

$$= 576000 + 26621$$

$$= \$602621$$

Payback period:

$$=\text{Cost} / \text{Benefit}$$

$$= 602621 / 343872$$

$$= 1.75 \text{ year} / 21 \text{ months}$$

Result

Using POS system in Cloudson will reduce the cost of operating the physical store.

6. Service Design -Service catalogue

Service Catalogue – Cloudson

Element	Description
Service	Provide and maintenance of Point of Sale(POS) system for Cloudson's staffs to control the selling process in the Cloudson's physical store
Status	PROPOSED
Description	<p>POS system is an important system when it is using to provide a high quality customer service. It allow user to take transactions and simplify key day-to-day business operations.</p> <p>This POS system is only provided to be used by Cloudson's staffs either in physical store or in office.</p>
Standard Service Features	<p>As per the SLA, the cashier can use the POS system to charge the customers more effectively, also enable a faster throughput of customers. Besides, the manager can trace the daily income from selling the product more easily by analyzing the inventory and sales trends.</p> <p>When the staffs have any problems about the POS system, they can have the phone call to our office and our staffs will help to solve the problem.</p> <p>Also, we will monitor and support the POS system everyday, to avoid any BUG will happen. When there are any problem we will have remote assistance using Remote Desktop and a Virtual Private Network where available</p>
Optional Service Features	<p>Planned or Emergency Onsite assistance (extra costs apply)</p> <p>Request a posted statement</p> <p>Request an on screen mini statement</p>
Delivery Scope	POS system will be installed in all the Cloudson's store progressively.
Delivery Channels	The Store will need a PC to run and use the POS system.
Service Hours	Depends on the Cloudson's store working hours
User Requirements	<p>Cloudson's business managers and staff in stores are only allowed to access the sales functions in the POS system.</p> <p>Only IT support managers and staff in IT programming team are authorised to edit and test the POS system.</p> <p>Only staff in warehouse are authorised to change the data in the database of product; staff in customer service team are authorised to check and change the data in the database of customers.</p>

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Service Initiation	Every staff need to create their own account before log in the POS system
Service Support	Cloudson Support Team
Standard Costs	<p>System configurations: \$5980 *2 for two notebooks to use POS system \$440 for a receipt printer \$3970 for Cash Register \$198 per month for business fibre broadband \$3249 for one server</p> <p>Running Cost: \$2000 per month (include the electronic cost and maintenance the System configurations)</p> <p>POS system cost: 6 months for create and develop the program, \$24000*2 per month for two programmers, and rest days for maintain the program</p> <p>Total cost in first year: \$602621</p> <p>Customer Costs: \$602621</p>
Optional Costs	None
Service Targets	<p>The server and the POS system must be available in 24/7 service.</p> <p>Remote support – within 30 minutes to have a quick support</p> <p>Provide on-site support – within 2 hours to arrive the store</p> <p>Update the information in database for new product – within 10 hours</p> <p>Update the customer's shopping point on website – within 48 hours</p> <p>Maintain regularly – every 3 months</p>
SPD Category	Service Qualifier

7. Service Design -Service level agreement

Service Level Agreement (SLA)

for *CloudsonPOS System*

by
Cloudson

Effective Date: 11-11-2018

Document Owner:	Cloudson
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Version

Version	Date	Description	Author
1.0	03-11-2018	Service Level Agreement	Ambrose
1.1	05-11-2018	Service Level Agreement Revised	Kenton

Approval

(By signing below, all Approvers agree to all terms and conditions outlined in this Agreement.)

Approvers	Role	Signed	Approval Date
IT Programming Development	Service Provider	Eric	07-11-2018
Cloudson	Director	Kenton	10-11-2018



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1. Agreement Overview

This Agreement represents a Service Level Agreement (“SLA” or “Agreement”) between *Cloudson* and *CloudsonPOS* for the provisioning of IT services required to support and sustain the Point of Sale system.

This Agreement remains valid until superseded by a revised agreement mutually endorsed by the stakeholders.

This Agreement outlines the parameters of all IT services covered as they are mutually understood by the primary stakeholders. This Agreement does not supersede current processes and procedures unless explicitly stated herein.

2. Goals & Objectives

The **purpose** of this Agreement is to ensure that the proper elements and commitments are in place to provide consistent IT service support and delivery to the *Cloudson* and *CloudsonPOS*.

The **goal** of this Agreement is to obtain mutual agreement for IT service provision between *Cloudson* and *CloudsonPOS*.

The **objectives** of this Agreement are to:

- Provide clear reference to service ownership, accountability, roles and/or responsibilities.
- Present a clear, concise and measurable description of service provision to the customer.
- Match perceptions of expected service provision with actual service support & delivery.

3. Stakeholders

The following Service Provider(s) and Customer(s) will be used as the basis of the Agreement and represent the **primary stakeholders** associated with this SLA:

IT Service Provider(s): *Cloudson* (“Provider”)

IT Customer(s): *CloudsonPOS* (“Customer”)



4. Periodic Review

This Agreement is valid from the **Effective Date** outlined herein and is valid until further notice. This Agreement should be reviewed at a minimum once per fiscal year; however, in lieu of a review during any period specified, the current Agreement will remain in effect.

The **Business Relationship Manager** (“Document Owner”) is responsible for facilitating regular reviews of this document. Contents of this document may be amended as required, provided mutual agreement is obtained from the primary stakeholders and communicated to all affected parties. The Document Owner will incorporate all subsequent revisions and obtain mutual agreements / approvals as required.

Business Relationship Manager: Cloudson

Review Period: 3 mouths

Previous Review Date: 01-11-2018

Next Review Date: 01-02-2019

5. Service Agreement

The following detailed service parameters are the responsibility of the Service Provider in the ongoing support of this Agreement.

5.1. Service Scope

The following Services are covered by this Agreement;

- Manned telephone support
- Monitored POS system support
- Remote assistance using Remote Desktop and a Virtual Private Network where available
- Planned or Emergency Onsite assistance (extra costs apply)
- Monthly system health check



5.2. Customer Requirements

CloudsonPOS responsibilities and/or requirements in support of this Agreement include:

- Payment for all support costs at the agreed interval.
- Reasonable availability of customer representative(s) when resolving a service related incident or request.

5.3. Service Provider Requirements

Cloudson responsibilities and/or requirements in support of this Agreement include:

- Meeting response times associated with service related incidents.
- Appropriate notification to Customer for all scheduled maintenance.

5.4. Service Assumptions

Assumptions related to in-scope services and/or components include:

- Changes to services will be communicated and documented to all stakeholders.



6. Service Management

Effective support of in-scope services is a result of maintaining consistent service levels. The following sections provide relevant details on service availability, monitoring of in-scope services and related components.

6.1. Service Availability

Coverage parameters specific to the service(s) covered in this Agreement are as follows:

- Telephone support : 9:00 A.M. to 5:00 P.M. Monday – Friday
9:00 P.M. to 1:00 P.M. Saturday
 - Calls received out of office hours will be forwarded to a mobile phone and best efforts will be made to answer / action the call, however there will be a backup answer phone service
- Email support: Monitored 9:00 A.M. to 5:00 P.M. Monday – Friday
9:00 P.M. to 1:00 P.M. Saturday
 - Emails received outside of office hours will be collected, however no action can be guaranteed until the next working day
- Onsite assistance guaranteed within 72 hours during the business week

6.2. Service Requests

In support of services outlined in this Agreement, the Service Provider will respond to service related incidents and/or requests submitted by the Customer within the following time frames:

- 0-8 hours (during business hours) for issues classified as **High** priority.
- Within 48 hours for issues classified as **Medium** priority.
- Within 5 working days for issues classified as **Low** priority.

Remote assistance will be provided in-line with the above timescales dependent on the priority of the support request.

API / APP

System Design

Our group want to provide user friendly services for the Cloudson's customers, that why we have designed a GUI POS system for the Cloudson's customers who enter the Cloudson's physical store and a website on the internet for the customer who can't enter the physical store but still want to buy the IT products or get help by Cloudson. Both POS and website will be linked to our database server organized by the business.

- A GUI POS system
- A website

Functions

Our group provide these functions here to let the customers or staffs use:

In GUI POS system, staff must login to use it, and can use it to pay the products, update the information of the products, delete the products and save a Z report.

In website system, customer can get the information of the company and login to check how many shopping points they got.

There are 6 functions in our POS system including:

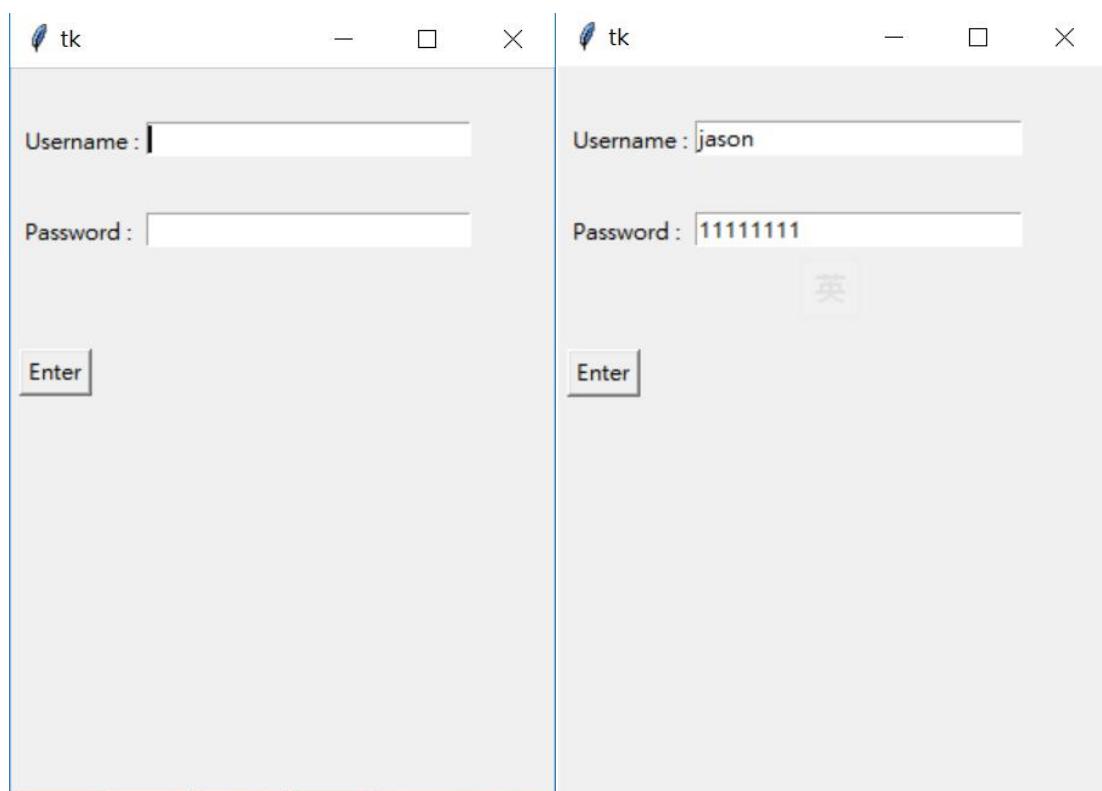
- Login function
- Payment function
- Check Products function
- Product update function
- Delete Products function
- Z-report function.

Program Test Result (For POS system)

Login function:

Every time when the staff turns on the computer and start running the POS system, he/she needs to login the POS system by using their username and password recorded in the database. If not, they cannot pass to the next step.

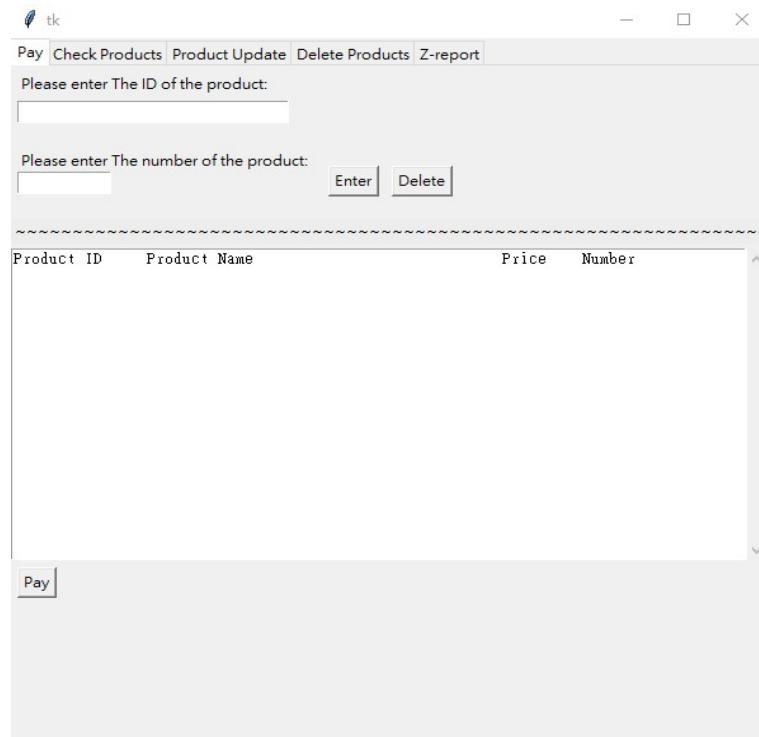
When type in the right username and password:
(For example, username is ‘jason’, password is ‘11111111’)



Then press ‘Enter’ button.

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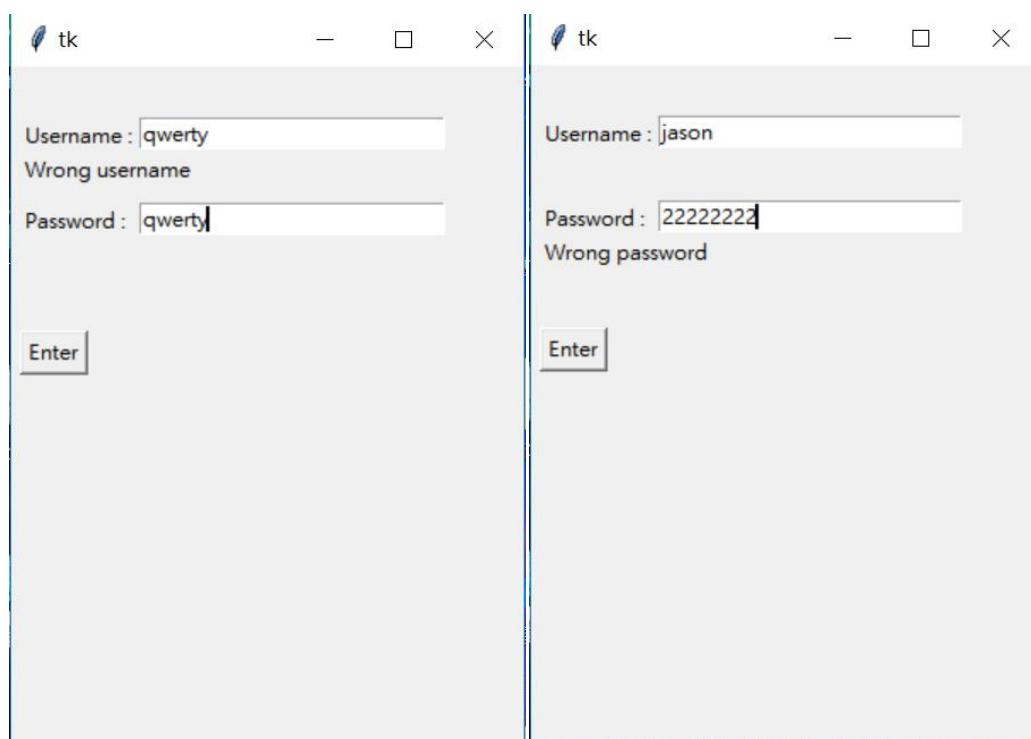
When login successful, login page will be closed and other 5 functions will be displayed:



Error handling:

When login fail by either wrong username or password:

An error message will be shown that wrong username or password.



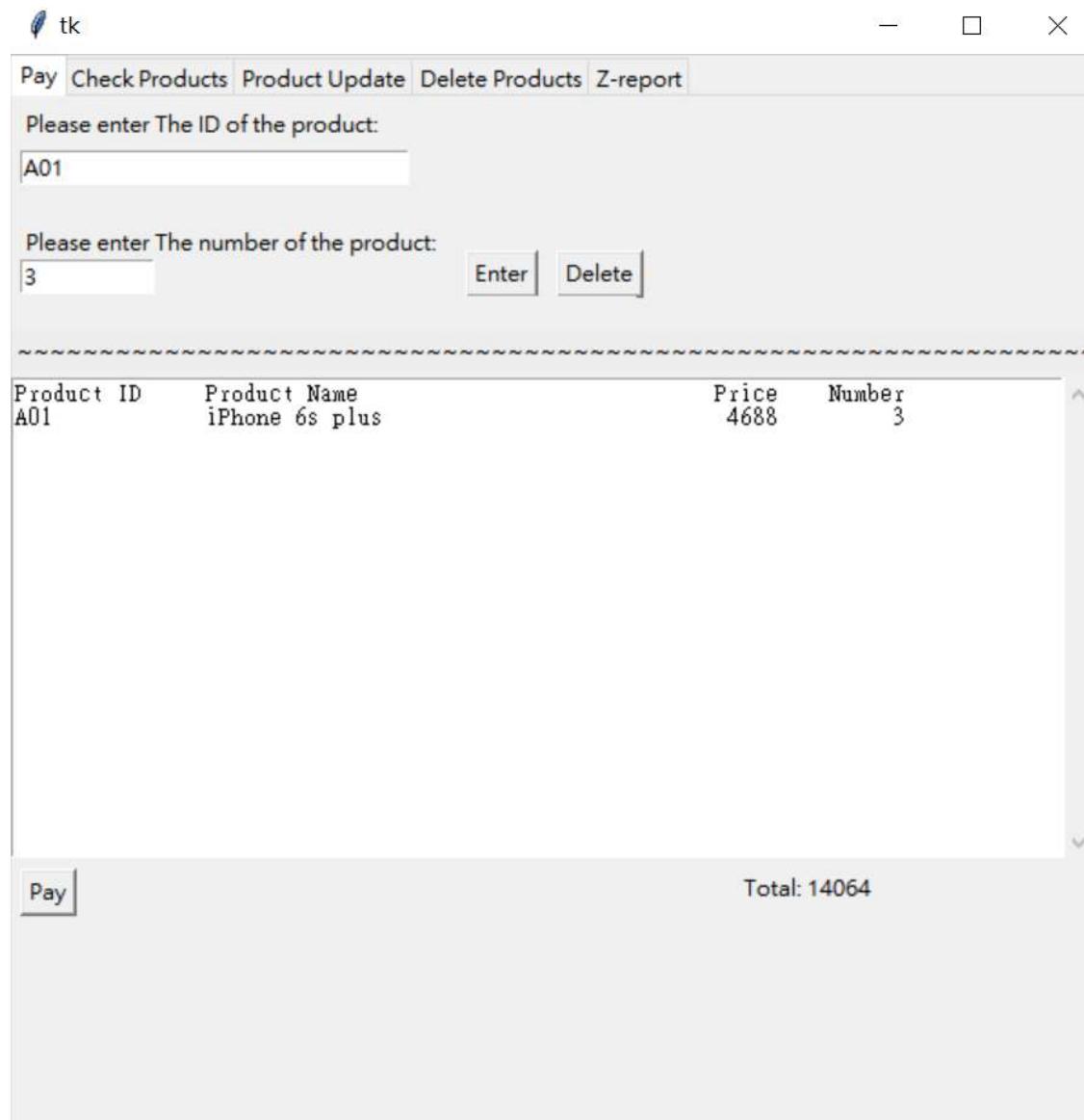
Payment function

When the customer wants to buy the product, staff needs to control the POS system and use the payment function to calculate how much does the customer pay and how much does the store get and how many products have been sold.

Enter the product ID and the number of product that the customer wants, it will show the product information.

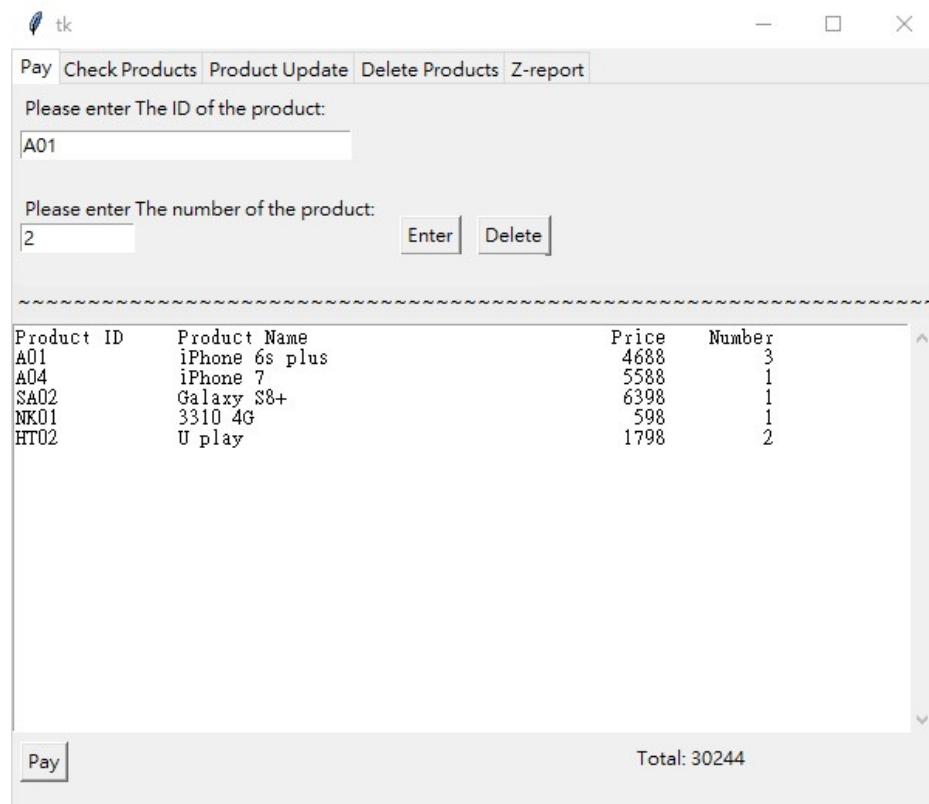
(For example, input the product ID ‘A01’ and the number of product ‘3’)

Then press ‘Enter’ button.

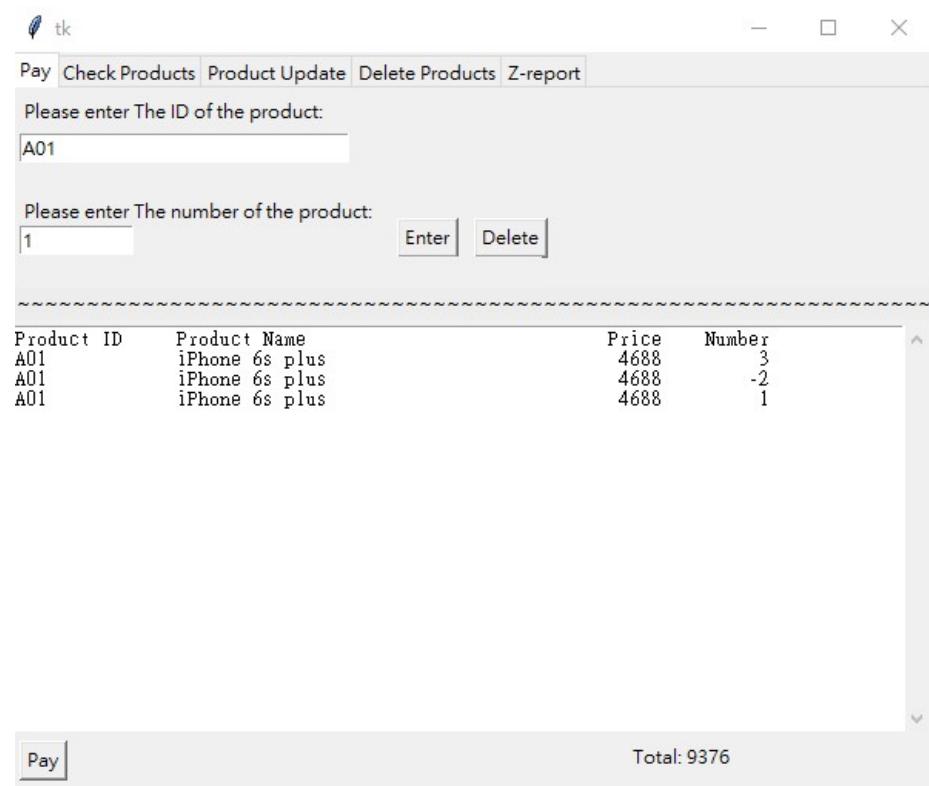


The information of the product ID, Product Name, Price and Number will be displayed.

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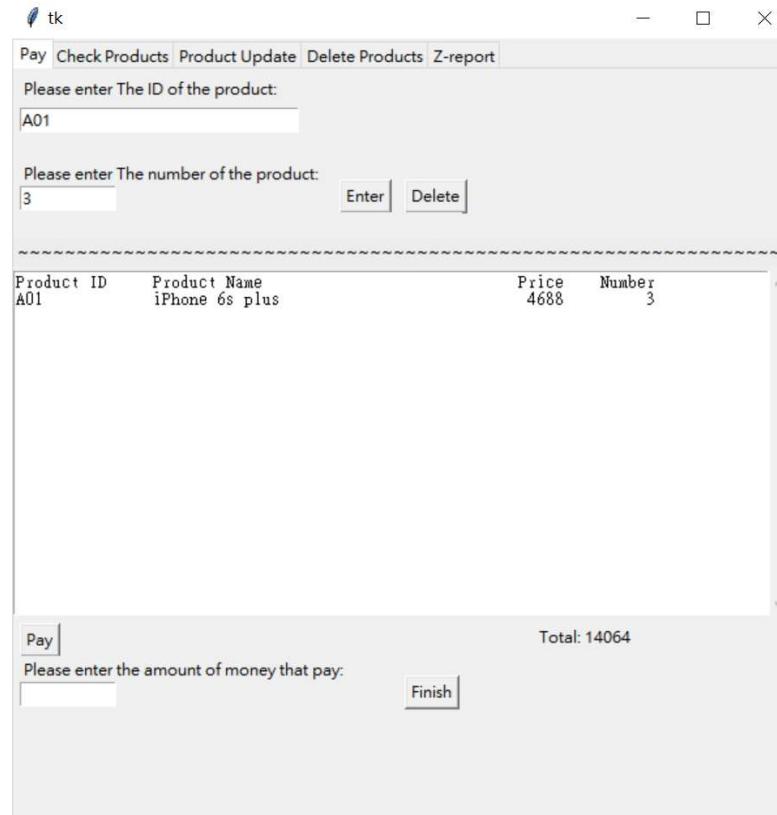
Multiple choices are also can be displayed.



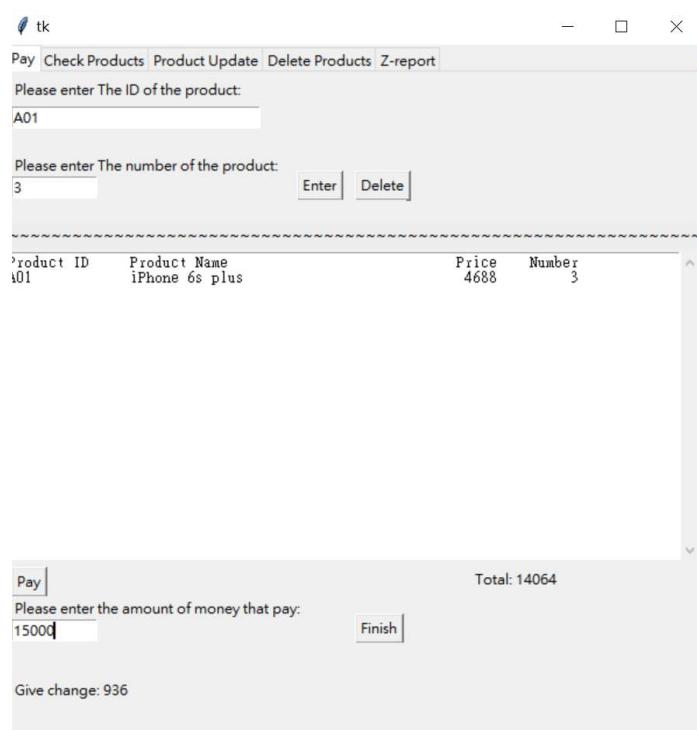
Product number can also be deleted by input number and press 'Delete'.

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Then press the 'Pay' button, a blank will be shown and asked the staff to input the amount of how much does the customer pay.



Next, enter the amount of money, it will tell the user how much should be change.

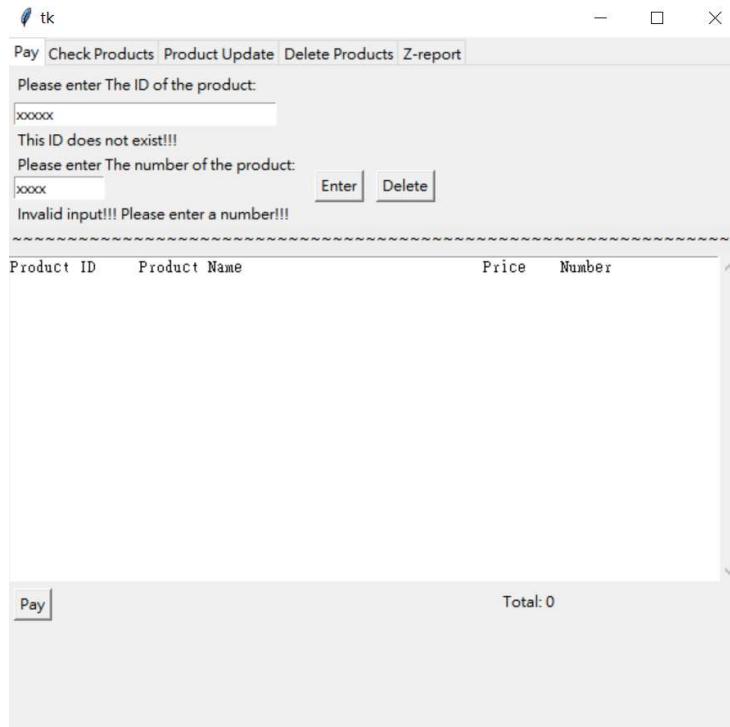


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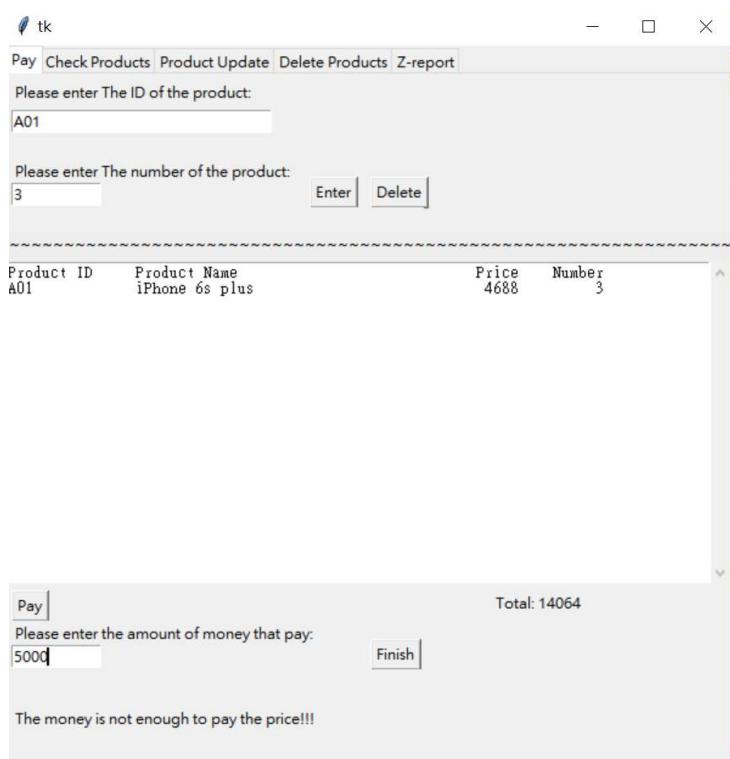
Error handling:

When enter a non recorded product ID or value that is not a number for number of product:

An error message will be shown and ask the user to input a correct product ID or number.



When enter less amount of money than the total money:

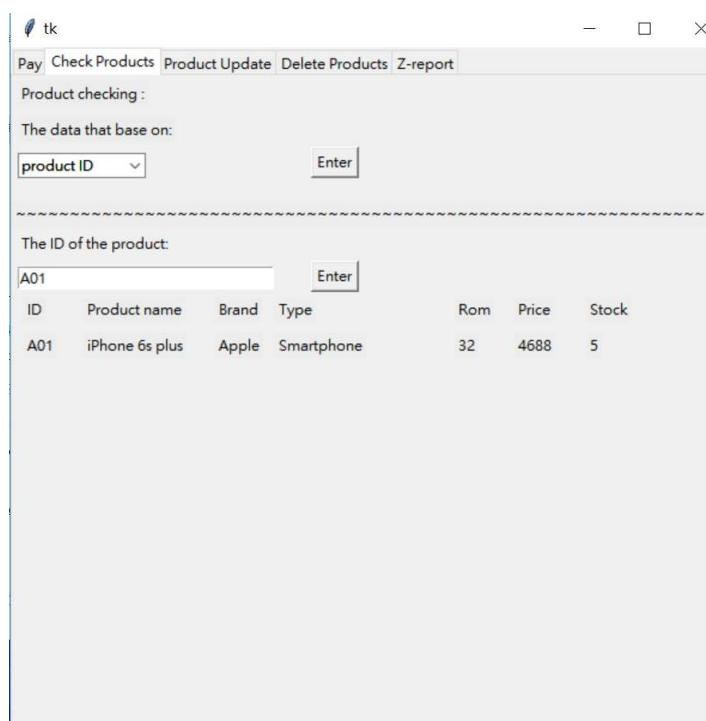
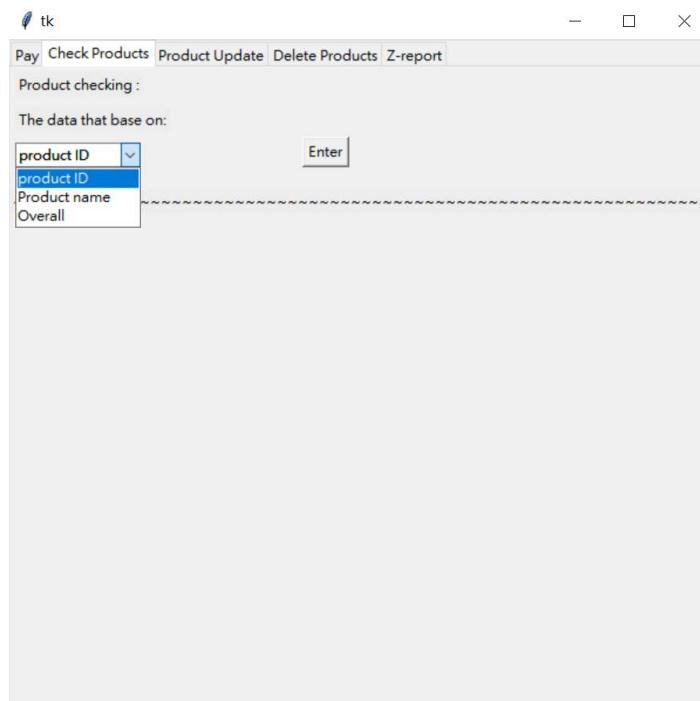


Check Products function:

Every time when the staff forgot the details of the product or asked by customer to help them check if there is any stock of that product in the warehouse of the store, staff can use the Check Product function to check.

Here are some examples using this function.

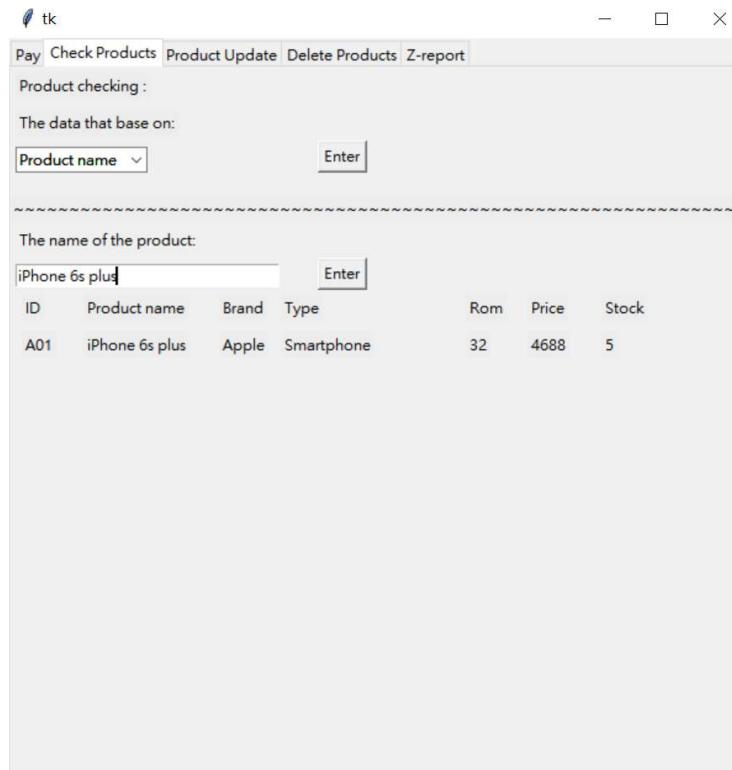
When choosing the ‘product ID’ and input ‘A01’, then press ‘Enter’ button:



Group 9

When choosing “Product Name” and input ‘iPhone 6s plus’:

must enter the exact name of the product for searching



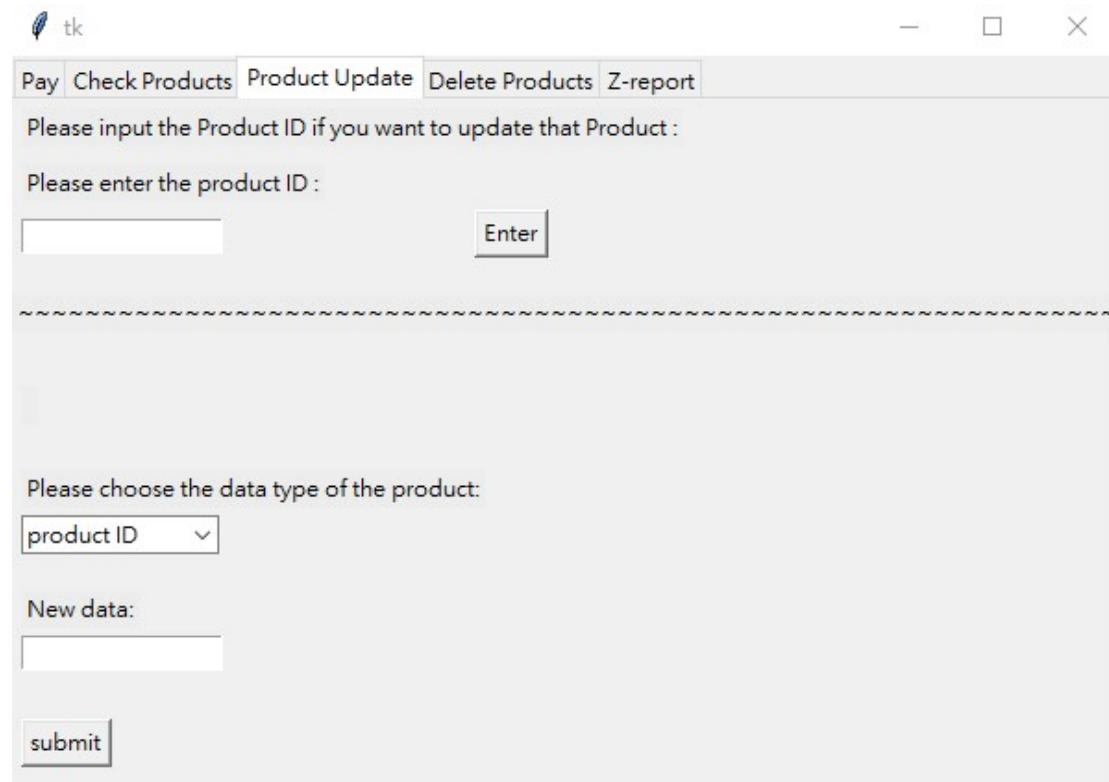
When choosing ‘overall’ for searching all details of all products:

Product ID	Product Name	Brand	Type	Rom	Price	Stock
A01	iPhone 6s plus	Apple	Smartphone	32	4688	5
A02	iPhone 6s plus	Apple	Smartphone	128	5588	4
A03	iPhone 7	Apple	Smartphone	32	4688	3
A04	iPhone 7	Apple	Smartphone	128	5588	2
A05	iPhone 7 plus	Apple	Smartphone	32	5788	2
A06	iPhone 7 plus	Apple	Smartphone	128	6688	3
A07	iPhone 8	Apple	Smartphone	64	5988	6
A08	iPhone 8	Apple	Smartphone	256	7288	5
A09	iPhone 8 plus	Apple	Smartphone	64	6888	6
A10	iPhone 8 plus	Apple	Smartphone	256	8188	6
A11	iPhone X	Apple	Smartphone	64	8588	10
A12	iPhone X	Apple	Smartphone	256	9888	14
AS01	zenfone 4	ASUS	Smartphone	128	3798	4
AS02	zenfone 4 Max Pro	ASUS	Smartphone	64	1798	2
HT01	U Ultra	HTC	Smartphone	64	4988	4
HT02	U play	HTC	Smartphone	32	1798	2
L001	V30+	LG	Smartphone	64	5698	4
NK01	3310 4G	Nokia	Phone	4	598	20

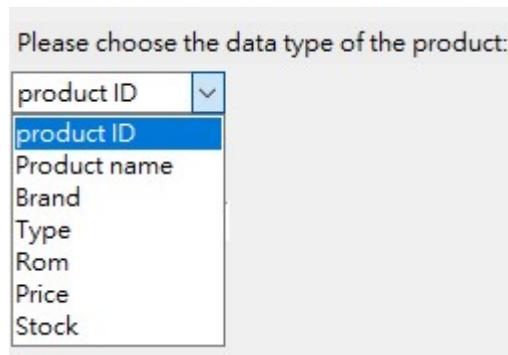
Product Update function:

Sometimes there may have some needs to update or change the information of the products. This function provides a way to change the data of the database. However, only listed user like manager of the store, the business manager or the staff in IT support team, has the permission to use this function in the POS system.

Main page of the function:



The list of choosing 'data type':



Group 9

The data in the database before update:

A01	iPhone 6s plus	Apple	Smartphone	32	4688	5
A02	iPhone 6s plus	Apple	Smartphone	128	5588	4
A03	iPhone 7	Apple	Smartphone	32	4688	3
A04	iPhone 7	Apple	Smartphone	128	5588	2
A05	iPhone 7 plus	Apple	Smartphone	32	5788	2
A06	iPhone 7 plus	Apple	Smartphone	128	6688	3
A07	iPhone 8	Apple	Smartphone	64	5988	6
A08	iPhone 8	Apple	Smartphone	256	7288	5
A09	iPhone 8 plus	Apple	Smartphone	64	6888	6
A10	iPhone 8 plus	Apple	Smartphone	256	8188	6
A11	iPhone X	Apple	Smartphone	64	8588	10
A12	iPhone X	Apple	Smartphone	256	9888	14
AS01	zenfone 4	ASUS	Smartphone	128	3798	4
AS02	zenfone 4 Max Pro	ASUS	Smartphone	64	1798	2
HT01	U Ultra	HTC	Smartphone	64	4988	4
HT02	U play	HTC	Smartphone	32	1798	2
LG01	V30+	LG	Smartphone	64	5698	4
NK01	3310 4G	Nokia	Phone	4	598	20
SA01	Galaxy S8	Samsung	Smartphone	64	5698	3
SA02	Galaxy S8+	Samsung	Smartphone	64	6398	4
SA03	Galaxy S8+	Samsung	Smartphone	128	6998	3
SA04	Galaxy note 8	Samsung	Smartphone	64	6998	2
SA05	Galaxy note 8	Samsung	Smartphone	128	7598	5
SA06	Galaxy note 8	Samsung	Smartphone	256	8198	8
SA07	Galaxy S9	Samsung	Smartphone	64	6398	6

For example, change the brand of ‘iPhone7’ from ‘Apple’ to ‘Sony’

First, input ‘A03’ and press ‘Enter’ button; then choose ‘Brand’ and input ‘Sony’ and submit:

The screenshot shows a Python Tkinter application window titled "tk". The menu bar includes "Pay", "Check Products", "Product Update" (which is highlighted in blue), "Delete Products", and "Z-report". A sub-instruction "Please input the Product ID if you want to update that Product:" is displayed above a text input field containing "A03". Below this is a table with columns: ID, Product name, Brand, Type, Rom, Price, and Stock. The row for ID A03 shows iPhone 7, Apple, Smartphone, 32, 4688, and 3 respectively. A section titled "Please choose the data type of the product:" contains a dropdown menu set to "Brand" and a text input field containing "Sony". At the bottom are "New data:" and "submit" buttons.

Group 9

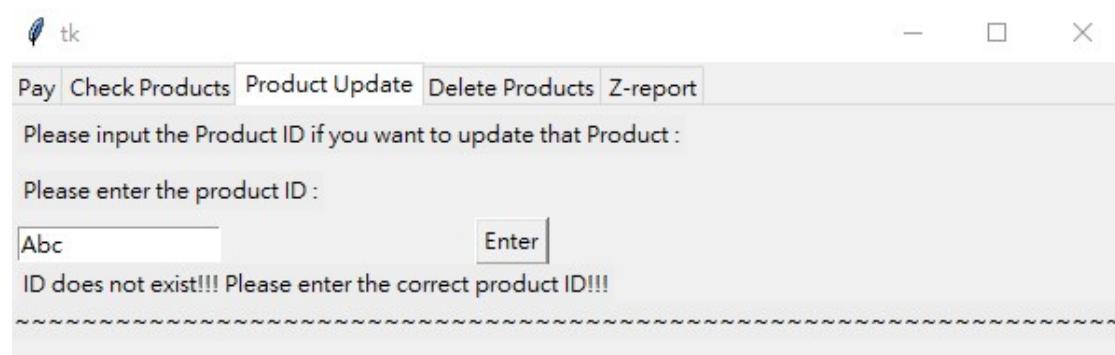
After press the ‘submit’ button, the data in the database after update:

A01	iPhone 6s plus	Apple	Smartphone	32	4688	5
A02	iPhone 6s plus	Apple	Smartphone	128	5588	4
A03	iPhone 7	Sony	Smartphone	32	4688	3
A04	iPhone 7	Apple	Smartphone	128	5588	2
A05	iPhone 7 plus	Apple	Smartphone	32	5788	2
A06	iPhone 7 plus	Apple	Smartphone	128	6688	3
A07	iPhone 8	Apple	Smartphone	64	5988	6
A08	iPhone 8	Apple	Smartphone	256	7288	5
A09	iPhone 8 plus	Apple	Smartphone	64	6888	6
A10	iPhone 8 plus	Apple	Smartphone	256	8188	6
A11	iPhone X	Apple	Smartphone	64	8588	10
A12	iPhone X	Apple	Smartphone	256	9888	14
AS01	zenfone 4	ASUS	Smartphone	128	3798	4
AS02	zenfone 4 Max Pro	ASUS	Smartphone	64	1798	2
HT01	U Ultra	HTC	Smartphone	64	4988	4
HT02	U play	HTC	Smartphone	32	1798	2
LG01	V30+	LG	Smartphone	64	5698	4
NK01	3310 4G	Nokia	Phone	4	598	20
SA01	Galaxy S8	Samsung	Smartphone	64	5698	3
SA02	Galaxy S8+	Samsung	Smartphone	64	6398	4
SA03	Galaxy S8+	Samsung	Smartphone	128	6998	3
SA04	Galaxy note 8	Samsung	Smartphone	64	6998	2
SA05	Galaxy note 8	Samsung	Smartphone	128	7598	5
SA06	Galaxy note 8	Samsung	Smartphone	256	8198	8
SA07	Galaxy S9	Samsung	Smartphone	64	6398	6

Error handling:

When input a product ID that non-recorded or have been deleted or updated:

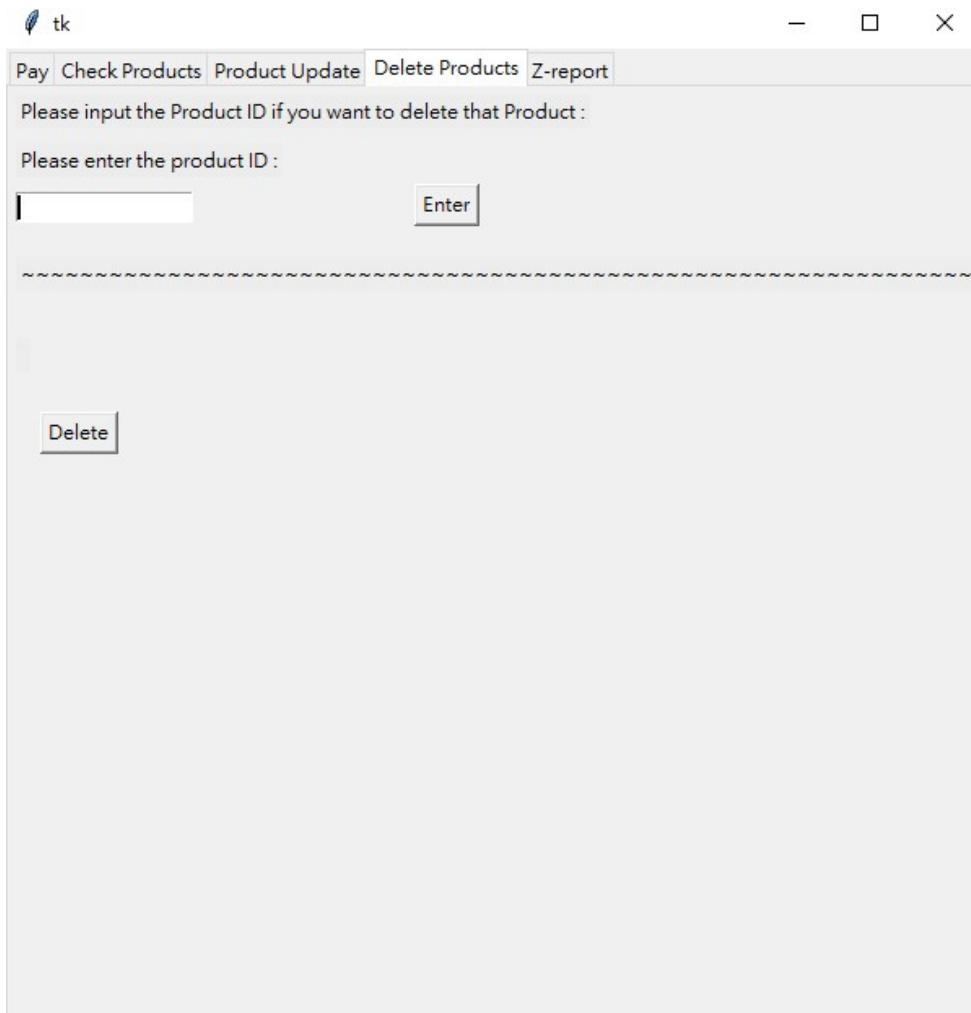
An error message will be shown and ask the user to input a correct product ID.



Delete Products function:

Sometimes there may have some needs to delete the information of the products. This function provides a way to change the data of the database. However, only listed user like manager of the store, the business manager or the staff in IT support team, has the permission to use this function in the POS system.

Main page of the function:

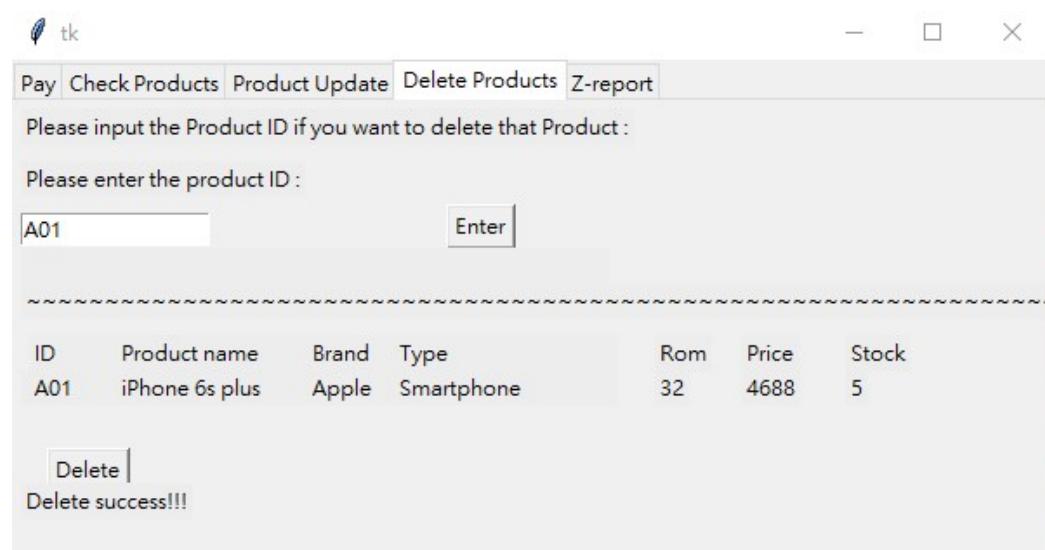


Group 9

The data in the database before delete data:

A01	iPhone 6s plus	Apple	Smartphone	32	4688	5
A02	iPhone 6s plus	Apple	Smartphone	128	5588	4
A03	iPhone 7	Sony	Smartphone	32	4688	3
A04	iPhone 7	Apple	Smartphone	128	5588	2
A05	iPhone 7 plus	Apple	Smartphone	32	5788	2
A06	iPhone 7 plus	Apple	Smartphone	128	6688	3
A07	iPhone 8	Apple	Smartphone	64	5988	6
A08	iPhone 8	Apple	Smartphone	256	7288	5
A09	iPhone 8 plus	Apple	Smartphone	64	6888	6
A10	iPhone 8 plus	Apple	Smartphone	256	8188	6
A11	iPhone X	Apple	Smartphone	64	8588	10
A12	iPhone X	Apple	Smartphone	256	9888	14
AS01	zenfone 4	ASUS	Smartphone	128	3798	4
AS02	zenfone 4 Max Pro	ASUS	Smartphone	64	1798	2
HT01	U Ultra	HTC	Smartphone	64	4988	4
HT02	U play	HTC	Smartphone	32	1798	2
LG01	V30+	LG	Smartphone	64	5698	4
NK01	3310 4G	Nokia	Phone	4	598	20
SA01	Galaxy S8	Samsung	Smartphone	64	5698	3
SA02	Galaxy S8+	Samsung	Smartphone	64	6398	4
SA03	Galaxy S8+	Samsung	Smartphone	128	6998	3
SA04	Galaxy note 8	Samsung	Smartphone	64	6998	2
SA05	Galaxy note 8	Samsung	Smartphone	128	7598	5
SA06	Galaxy note 8	Samsung	Smartphone	256	8198	8
SA07	Galaxy S9	Samsung	Smartphone	64	6398	6

For example, delete the data of iPhone 6s plus(ID:A01), input ‘A01’ and press ‘Enter’ button, the details of the product will be shown, then press ‘Delete’ button, it will deleted from database.



Group 9

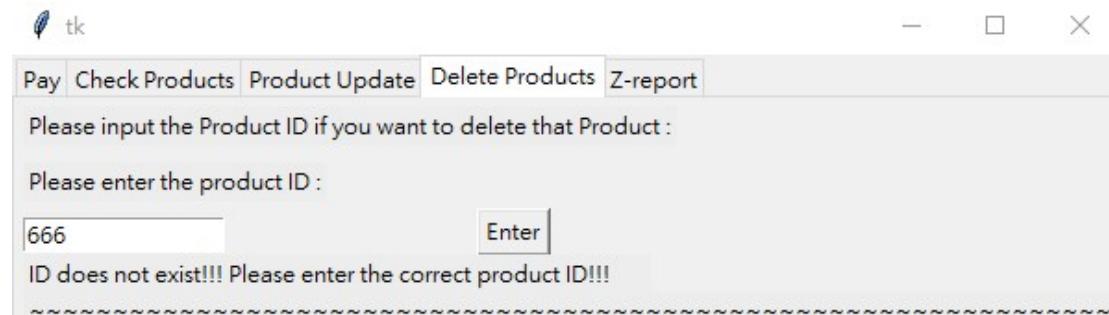
The data in the database after deleted data:

pd_ID	pd_Name	pd_Brand	pd_Type	pd_Rom	pd_Price	pd_Stock
A02	iPhone 6s plus	Apple	Smartphone	128	5588	4
A03	iPhone 7	Sony	Smartphone	32	4688	3
A04	iPhone 7	Apple	Smartphone	128	5588	2
A05	iPhone 7 plus	Apple	Smartphone	32	5788	2
A06	iPhone 7 plus	Apple	Smartphone	128	6688	3
A07	iPhone 8	Apple	Smartphone	64	5988	6
A08	iPhone 8	Apple	Smartphone	256	7288	5
A09	iPhone 8 plus	Apple	Smartphone	64	6888	6
A10	iPhone 8 plus	Apple	Smartphone	256	8188	6
A11	iPhone X	Apple	Smartphone	64	8588	10
A12	iPhone X	Apple	Smartphone	256	9888	14
AS01	zenfone 4	ASUS	Smartphone	128	3798	4
AS02	zenfone 4 Max Pro	ASUS	Smartphone	64	1798	2
HT01	U Ultra	HTC	Smartphone	64	4988	4
HT02	U play	HTC	Smartphone	32	1798	2
LG01	V30+	LG	Smartphone	64	5698	4
NK01	3310 4G	Nokia	Phone	4	598	20
SA01	Galaxy S8	Samsung	Smartphone	64	5698	3
SA02	Galaxy S8+	Samsung	Smartphone	64	6398	4
SA03	Galaxy S8+	Samsung	Smartphone	128	6998	3
SA04	Galaxy note 8	Samsung	Smartphone	64	6998	2
SA05	Galaxy note 8	Samsung	Smartphone	128	7598	5
SA06	Galaxy note 8	Samsung	Smartphone	256	8198	8
SA07	Galaxy S9	Samsung	Smartphone	64	6398	6
SA08	Galaxy S9+	Samsung	Smartphone	128	7298	7

Error handling:

When input a product ID that non-recorded or have been deleted or updated:

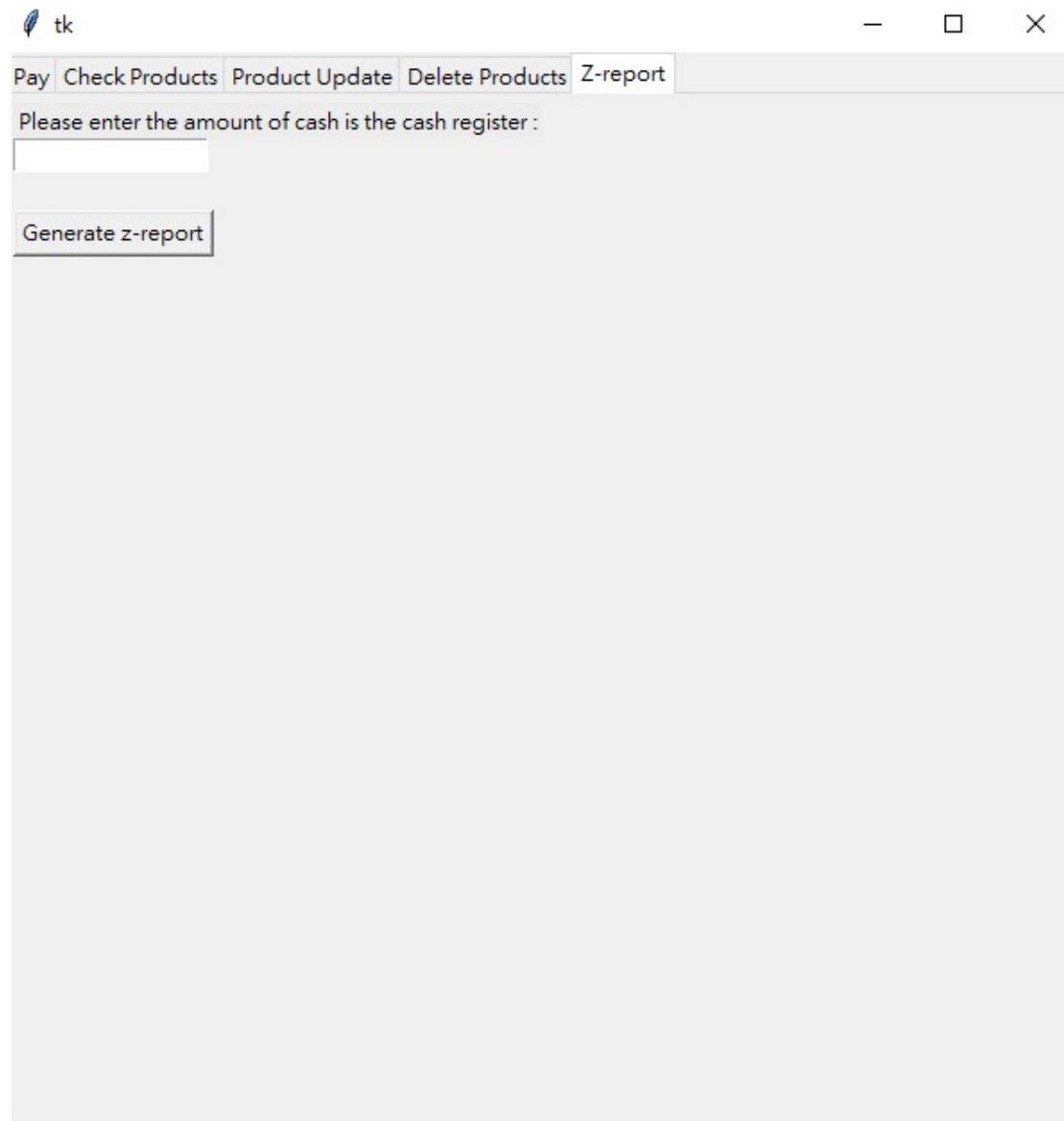
An error message will be shown and ask the user to input a correct product ID.



Z-report function:

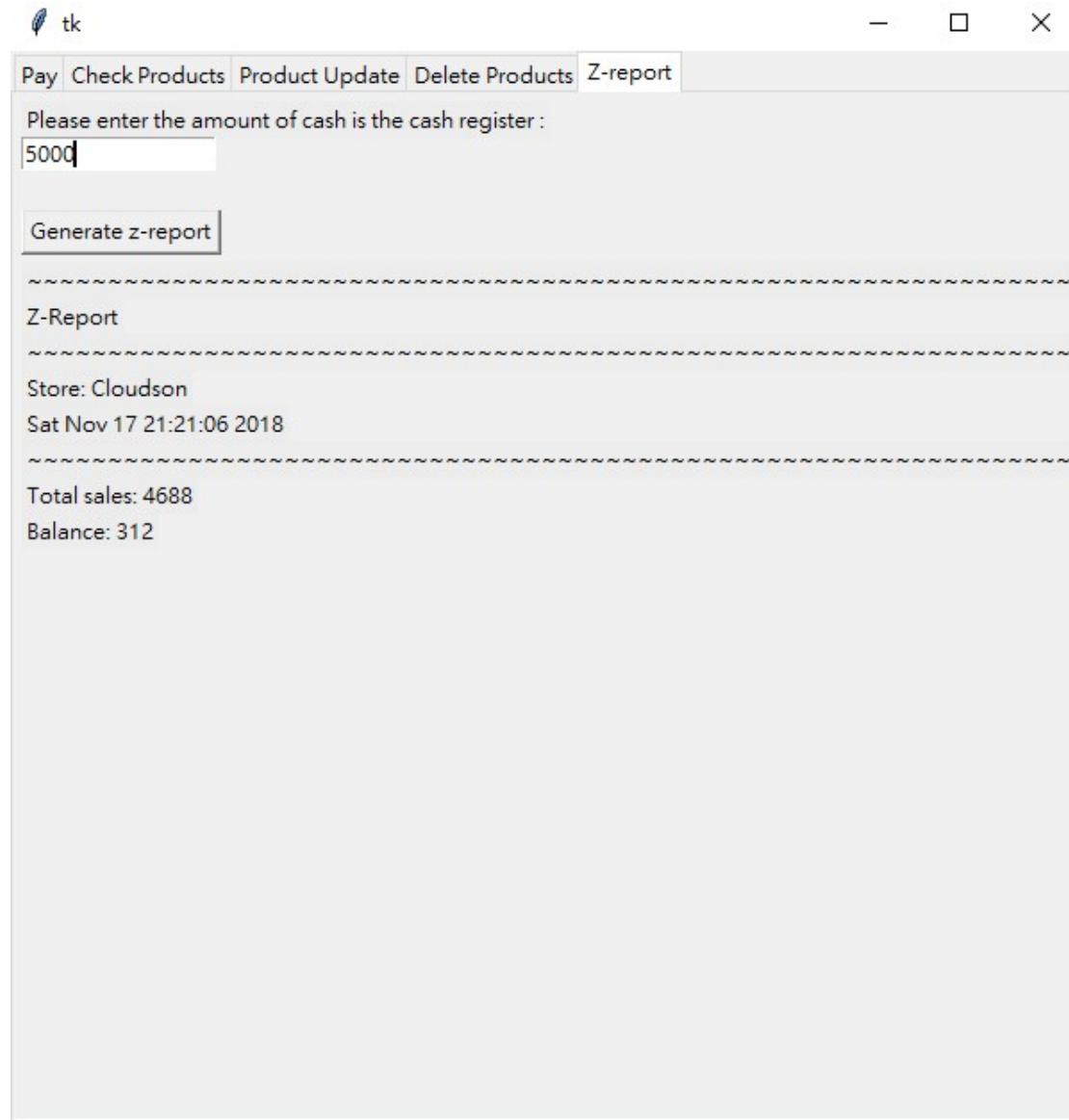
This function is used for printing a Z-report when the store is closed at everyday. It uses to record how much of products sold and compare to the money having in the cash register in that day. Staff must print out the Z-report before the store is totally closed at everyday.

Main page of the function:



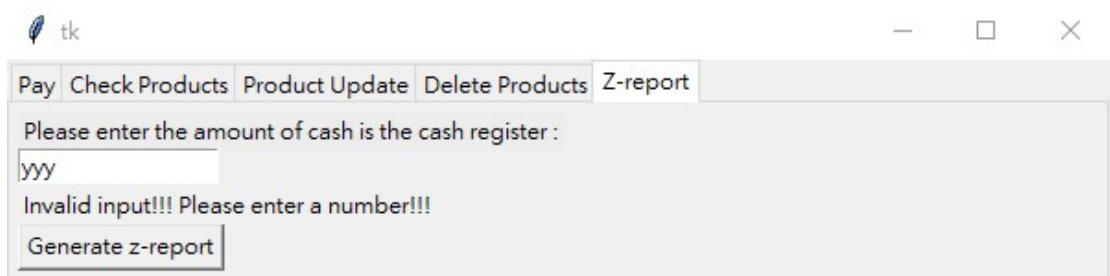
Group 9

For example, the store sold \$4688 today and the user input ‘5000’ amount in cash register, then and press the ‘Generate z-report’ button:



Error handling:

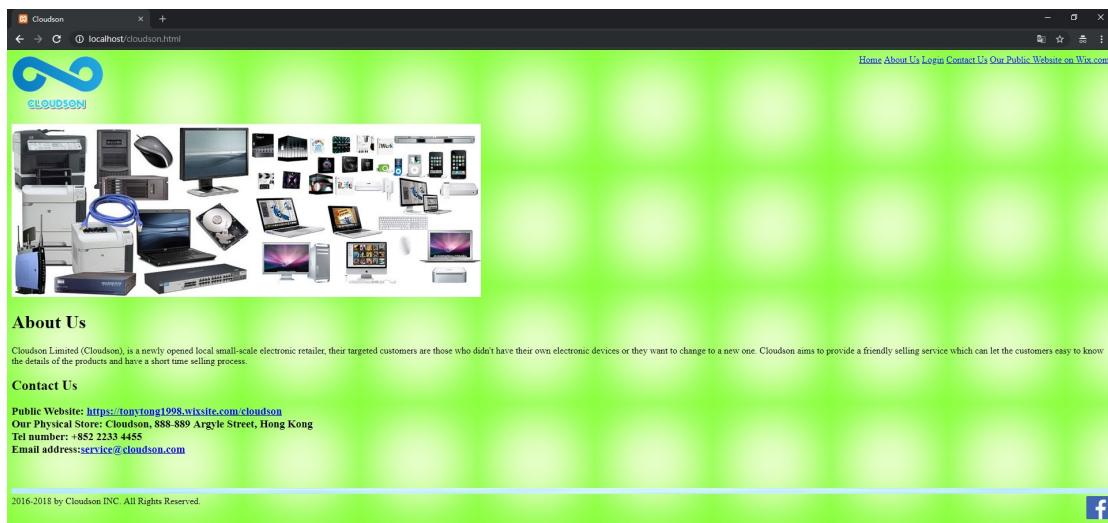
When input a value that is not a number:



Group 9

Program Test Result (For website system)

Home page of Cloudson (cloudson.html)



Navbar of Cloudosn's website



Group 9

Login system on Cloudson's website (cloudson_login.html)

You can log-in to our customer online service system here

User Login

Please enter your username:

And password:

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When input a username and password which have record in the database:
(cloudson_login.html)

You can log-in to our customer online service system here

User Login

Please enter your username:

And password:

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When login successful: (cloudson_login.py)

Cloudson Customer System

Welcome, hi123 !

You have [0] shopping point
[Shopping point will auto update in 3 days]

If you want to use your shopping point, please contact our customer service team. (+852 2233 4445)

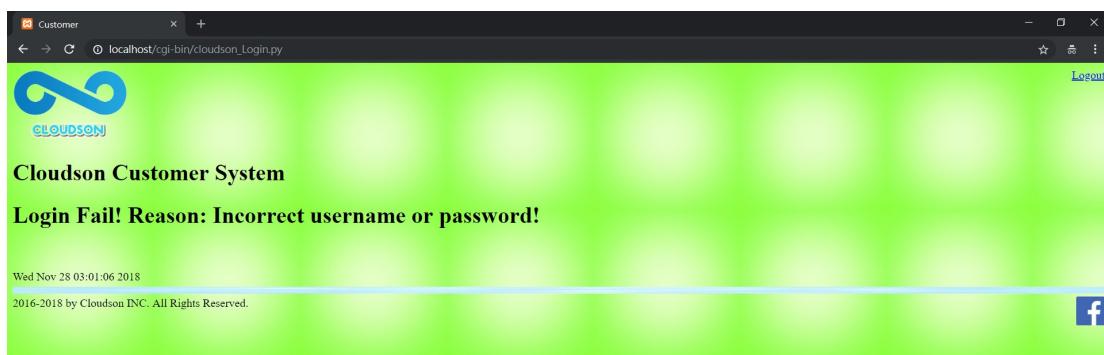
Wed Nov 28 03:00:40 2018

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Group 9

Error handling:

When login fail because of wrong username or password: (cloudson_login.py)



We have also provided another Cloudson website for the customer to use the online shop functions in the ALL project last year. However, we can't find ways to connect that website to the myphpsql database. That's why we decide to make this website for Cloudson customer.

Here is link of that website: <https://tonytong1998.wixsite.com/cloudson>

Limitation of both POS system and website system

For POS system,

- The program still cannot define the user type(e.g. Manager or normal staff) who have login the system, which means that the functions of update product and delete products are still available to use for anyone who login the system. We will try to fix it later.
- There is no 'cancel' function, which means that if the user deleted wrong product, they can't cancel the delete process.
- There are still some error cases that we haven't or couldn't handle. For example, if the user input something correctly but press the button more than once, they may have some errors that may affect the user who using this program. We will fix it out later.

For website system,

- The website is only available for the customers who have already recorded in the Cloudson database, and there is only function for user to check their points of shopping. Some functions may be external later.

Project Management

Group Weekly Schedule

Week	Works
1 - 2	Form the group and start the first meeting.
3 – 4	Proposal & Investigation: cooperate the works to find the data that program's need from internet.
5 - 6	Program Design: Start to write the program and have the second time cooperate works in programming and financial data mix up.
6	Prepared the MCQ
7 - 9	Prototype: Developing program and financial statements
10 - 11	Prototype: Program testing and debugging
12	Production: Finalize the report and program, and done the group presentation

Group Members Personal Portfolio

POON Tat Man (55201716),

<https://pandaericpoom.wixsite.com/profile>

TSUI Yeung Chun Jason(55202159),

<https://sites.google.com/view/jasontsuipersonalwesite/home?authuser=0>

WONG Tsun Wing(55208662),

<https://kentonwong2830.wixsite.com/profile>

YUEN Nok Hin(55201439)

<https://sites.google.com/view/ambrosepersonalportfolio/%E9%A6%96%E9%A0%81>

Reference

ASUS VivoBook 15 (2017) sell \$5980 at Price.com [online] available from
<<https://www.price.com.hk/product.php?p=281634&gp=18>> [12 November 2018]

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<http://www.seattletrading.com.hk/1973/en_main_cash_register.html> [12 November 2018]

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<<https://www.python.org/dev/peps/pep-0008/>> [15 October 2018]