Point of Sales System

Project Documentation

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1. Introduction

This is a Point of Sales System made for a small retail shop. This system can be used by any type of business for billing purpose. This system creates a bill with the subtotal and balance when the user input the items and related information through keyboard. Recently, many businesses have difficulty in recording down each and every record manually and there is a high chance of records getting misplaced. Therefore, Point of Sales system is made aimed for billing and recording sales through an interface by using a computer. This system consists of a simple functionality where the user can manage the system easily without any complexities. The basic functionalities of this system are user login, calculate the total and balance of items purchased and save the total of each invoice in a text file. The login function is created for the security purpose allowing only the authorized personnel to operate the system. The billing functionality is the fundamental or basic functionality of this system. The user is given an option to record each invoice's subtotal to calculate daily sales or monthly sales optionally as an added functionality of this system. The operator of this system can be a cashier or an employee of the shop. Simple layout of Graphical User Interface (GUI) makes it easier for any user who does not even have any computer literacy to operate the system. The GUI and other functionalities are coded using Python language and PyCharm Edu IDE (Integrated Development Environment). This project mainly focuses on file handling, therefore all the require data are stored in text files in the root directory upon installing the system. In this documentation, the main functionalities and the system overview is discussed clarifying how to handle the system properly.

2. Motivation

The Point of Sales system is developed for small retail shops for billing purposes. Through this system, user can manage basic functionality of a cashier easily. In a manual system, the cashier would have to write down every entry and calculate the total of every item separately then to get a subtotal. This system is developed to address the difficulty and drawbacks of such a manual system by replacing it with a computerized system. The motivation behind developing a POS system lies with seeing the contrast between how the billing of a small retail is done and how the billing of a supermarket is done. Basically, the billing of a supermarket was efficient and quick. Most importantly the accuracy of the bill is in a good scale. But in a small retail shop, the customers have to wait a longer time compared to supermarkets to pay for the products purchased. And employees of the shop have to do double the work. Because of that many people are persuaded to do shopping from supermarkets these days. The reason for

developing this system is to increase the efficiency and accuracy of the billing in a shop and also to increase customer satisfaction thus. The case study is done based on a retail shop in the town where they get a sufficient number of customers every day. But on festive days, the management of the shop becomes hectic and miscalculations in billings are seen mostly. This system is motivated upon seeing how a retail shop works in a daily basis and is dedicated to increase the efficiency of the retail shop.

3. Problem and Objectives

There are various problems identified in the current manual system. This system best tries to give solutions for the identified problems. The problems identified regarding the billing of the retail shop as follows.

- The bill items are to be written down manually.
- Calculate the total of every item manually.
- Calculate the subtotal at the end manually.
- Has to record down each days' sales in a different book.
- Customers have to wait a long time thus the efficiency is lacking.
- Sometimes the total could be wrong having accuracy issues in billing.
- Additional work is needed to update and manage the billing books.
- Cashier has a lot of work and risk in his hands.
- Harder to maintain the billings in festive days like New Year and year end.

The POS system is made in order to overcome the above identified problems in the retail shop. The main objectives of the system are as follows.

- Create a computer-based system to do the calculations automatically.
- Ensure the accuracy of the bills issued.
- Security of the system have to be ensured so that unauthorized people cannot get the details of the system.
- Being able to add items into the bill.
- Being able to calculate the total and the balance automatically.
- Save the total in the computer for future usages such as daily sales and monthly sales.
- Create a user-friendly Interface because the workers are not much literate in computer related things.
- Give the workers an experience in technological field.

- Create a system easy to understand and easy to implemented by any worker.
- Easy the workload of workers in the shop.

4. System Overview

POS is a system designed for cashier for billing purposes.

- A software system based on the Windows Platform.
- Graphically created interfaces
- User login, enter items, calculate total and balance and save the data in a text file
- Authorized user permission only
- System name or title: POS.exe
- System coded language: Python
- System developed environment: PyCharm Edu

4.1. Acronyms Abbreviations

Below is a list of the acronyms and abbreviations used in this document and the meaning of each.

GUI – Graphical User Interface

IDE – Integrated Development Environment

POS – Point of Sales System

4.2 System Functionalities

The main system functionalities are considered to be

1. User login
2. Add items
3. Calculate total of every item
4. Calculate subtotal
5. Calculate balance
6. Save invoice data into a text file

4.2.3. Login Window

The login window is the first window that will be first opened when running the program. The user is asked to enter the username and password correctly and click the login button. If the user wants to exit the system, then click the cancel button. The credentials are given to the user upon installing the software. This function is created in order to ensure the security of the system so that unauthorized individuals cannot enter the system without the required credentials and do changes in the system.

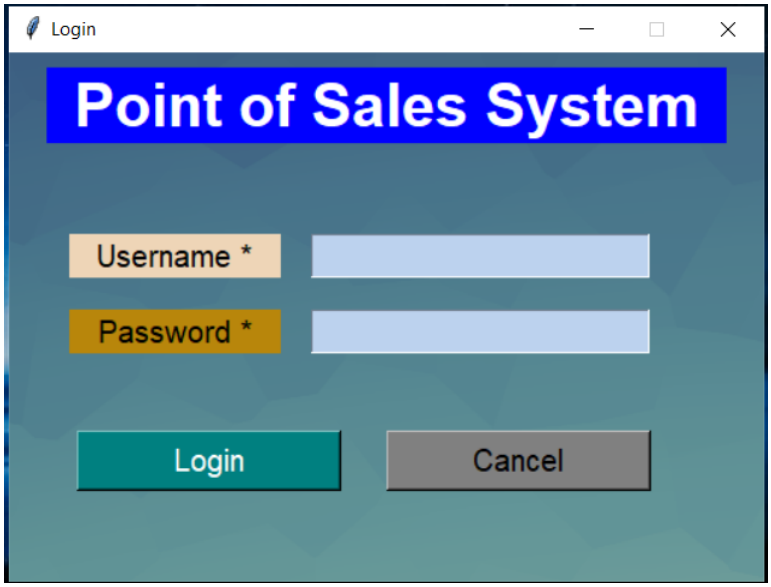

Figure 1:Login window

Credentials are as follows. User can first enter these credentials to enter the system.

Username: sasa

Password: 123

Login Button – When user click the login button a message box will show up with the message of 'Login Successful' and user will be directed to invoice window.

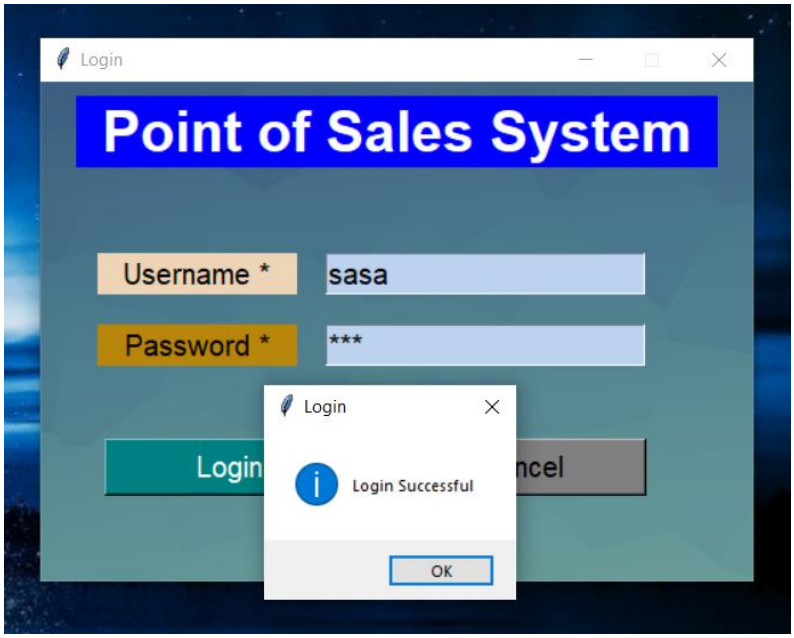

Figure 2:login successful

If the username or password is incorrect then a message of 'incorrect username or password' will be shown.

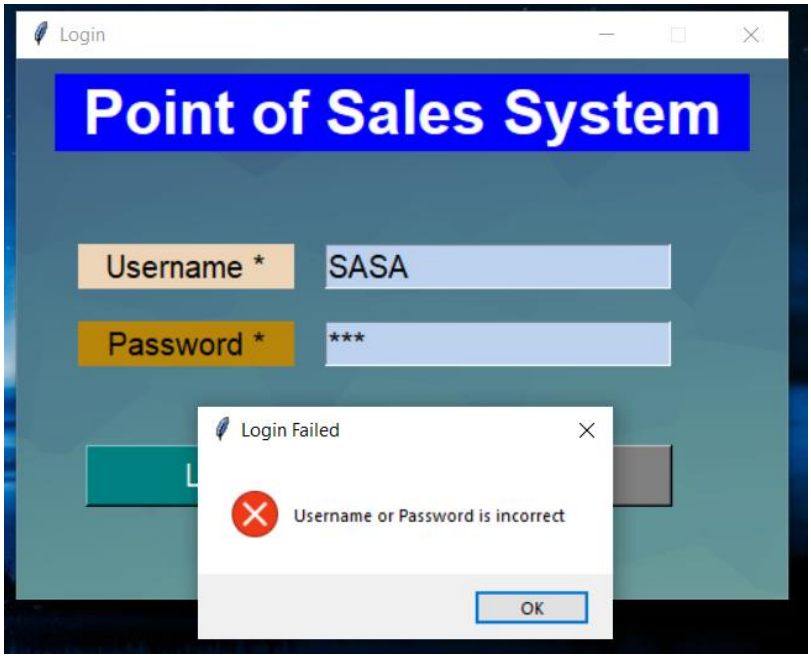

Figure 3:incorrect username or password

If either of entries are left empty and login button is clicked then the user is alerted with a message as follows.

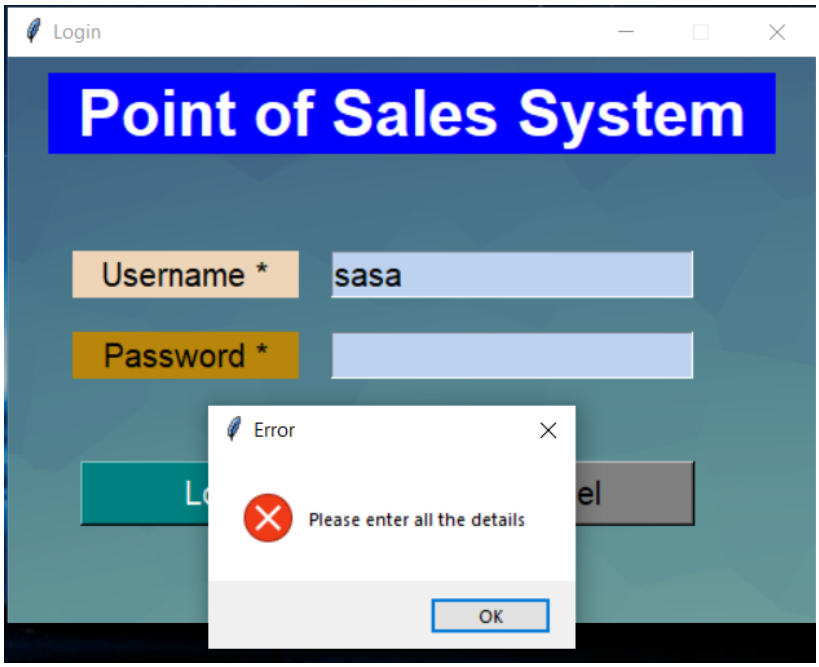

Figure 4: entries are empty alert

If the user wants to change the password and username, then there is a text file in the directory named as ‘userlogin’ and basically can change the existing username and password by the preferred credentials and save the file.

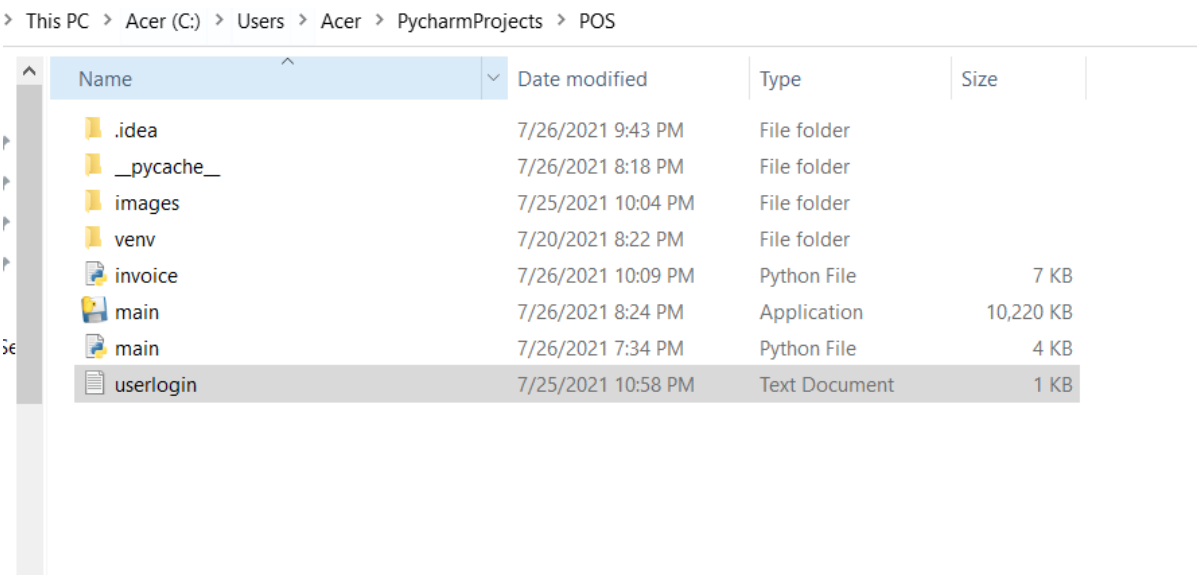

Figure 5: userlogin

Once the text file is opened it will have information as follows.

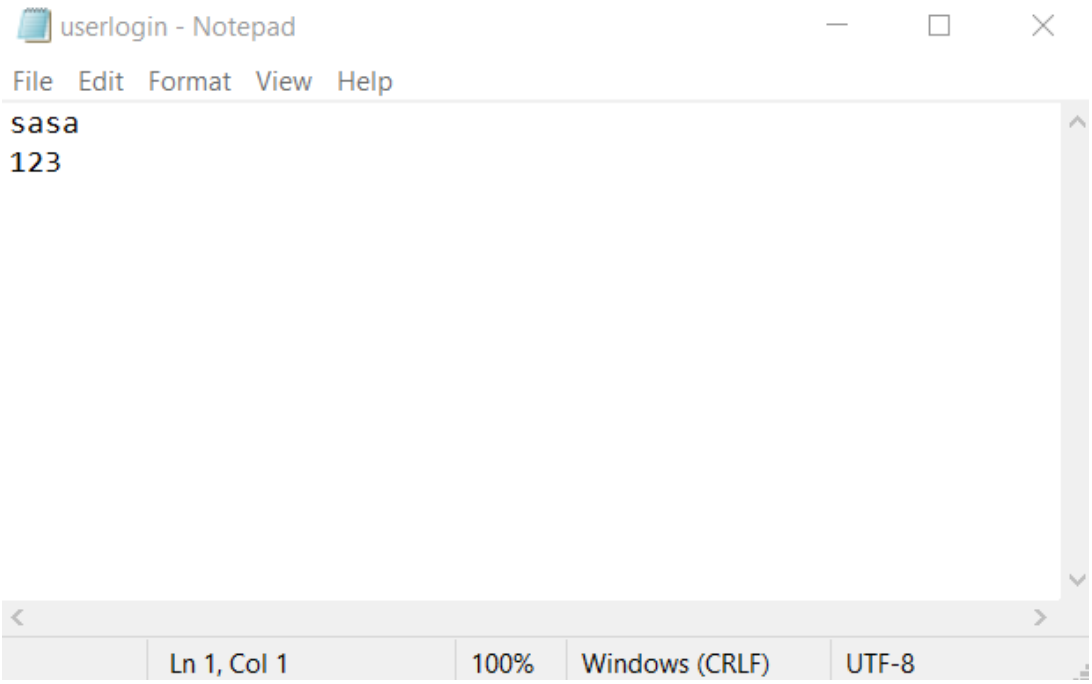

Figure 6: userlogin.txt

User can change the username and password as they prefer by clearing the existing data and entering new credentials. Finally save the text file. Then use the updated username and password in the next time to log into the system.

If the ‘userlogin’ text file is missing in the root directory or is being deleted, then the user will be notified when he tries to login to the system.

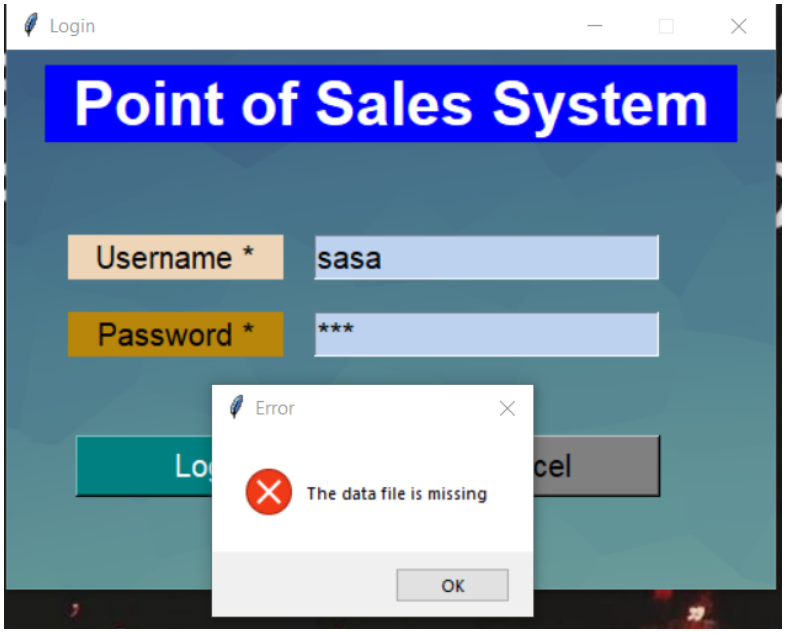

Figure 7: file is missing

Cancel Button – The cancel button is used to exit the system. Then a confirmation box shows up asking the user whether to cancel or not. If user click yes, the system will close execution. Otherwise, if no is clicked, he will retain in the login window.

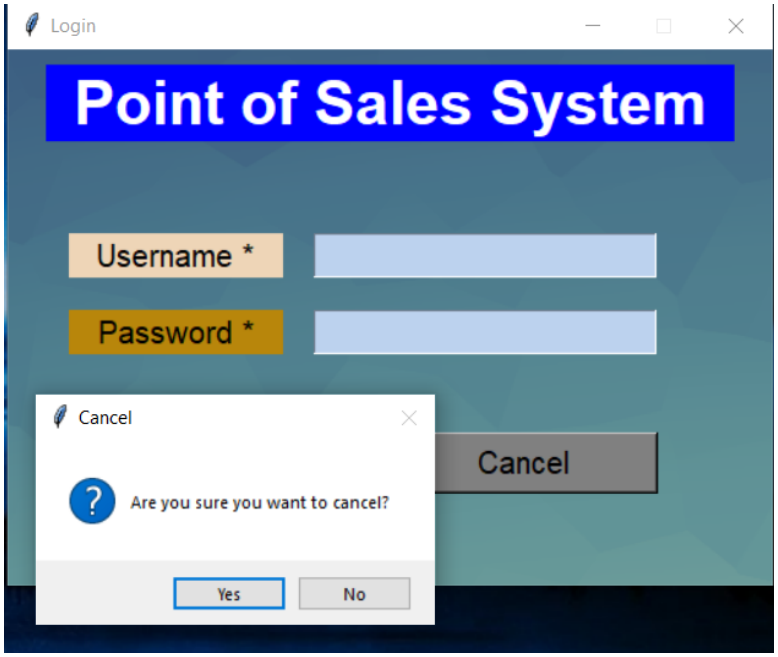

Figure 8: cancel message

4.2.3. Invoice Window

This window will be opened if only the user has entered correct credentials. This window performs the fundamental functionalities of the system such as adding items, calculating total of each item, calculating a subtotal and balance and save data into a text file.

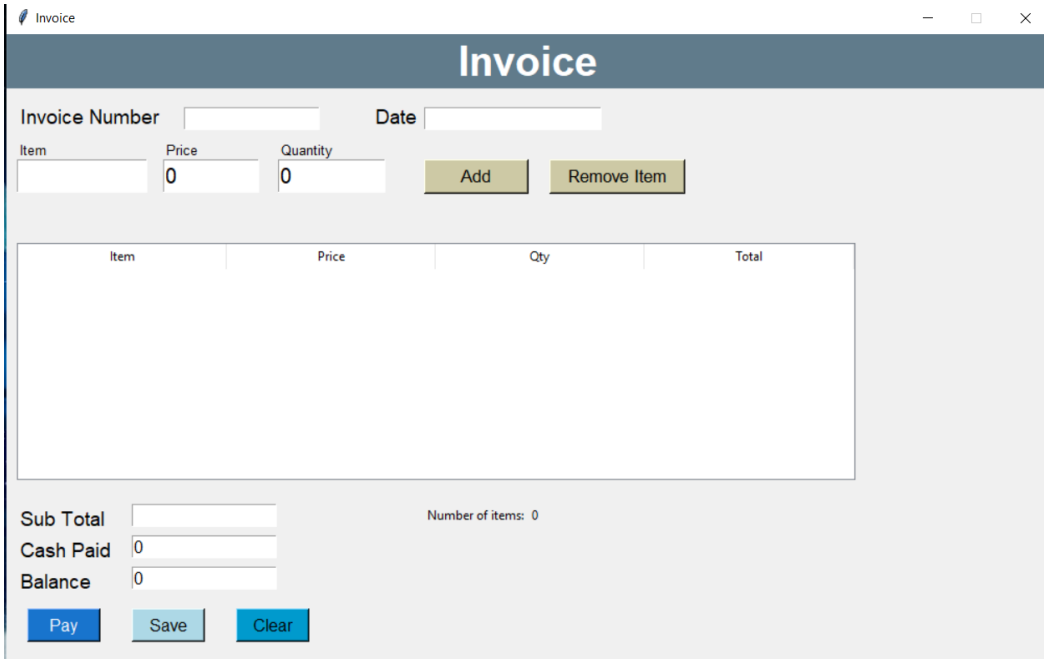

Figure 9:invoice window

Add Button – The user has to enter the item, price and quantity through keyboard. And once the add button is clicked the data will be entered into a grid with the new column of total of each item. Then below the subtotal will be updated automatically calculating subtotal of the total of the items entered. Then the number of items will also be updated automatically according to the count of entered items. In addition to that, the entry boxes will be cleared for the next item to input with the add button.

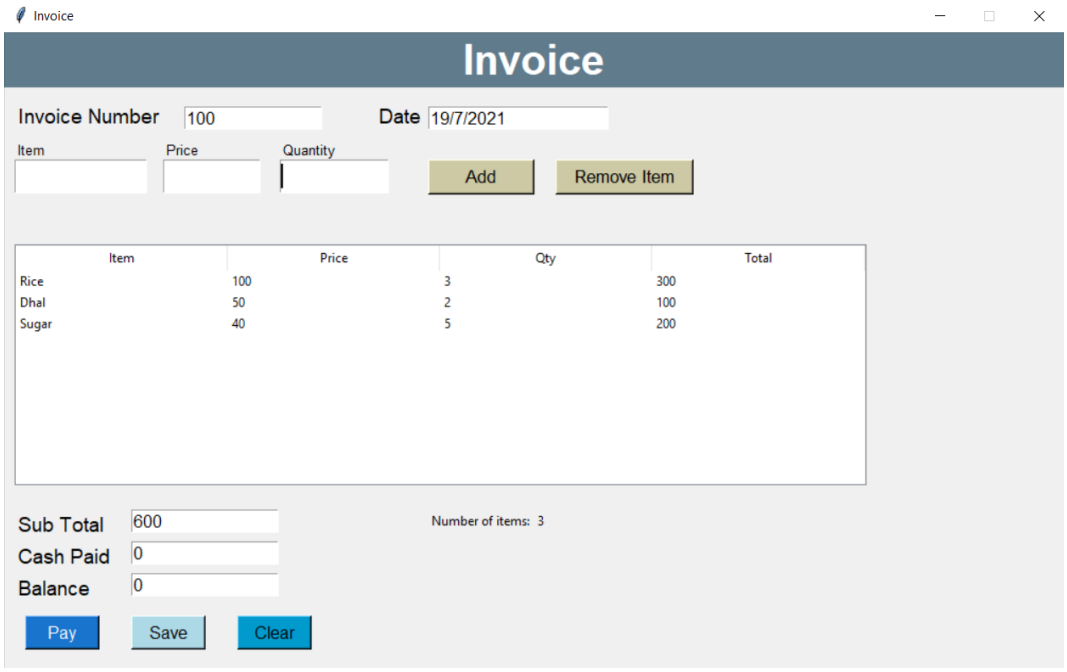

Figure 10: Add button

User can only insert digits as price and quantity. If he tries to add string values an error message will pop up informing the user to add digits only.

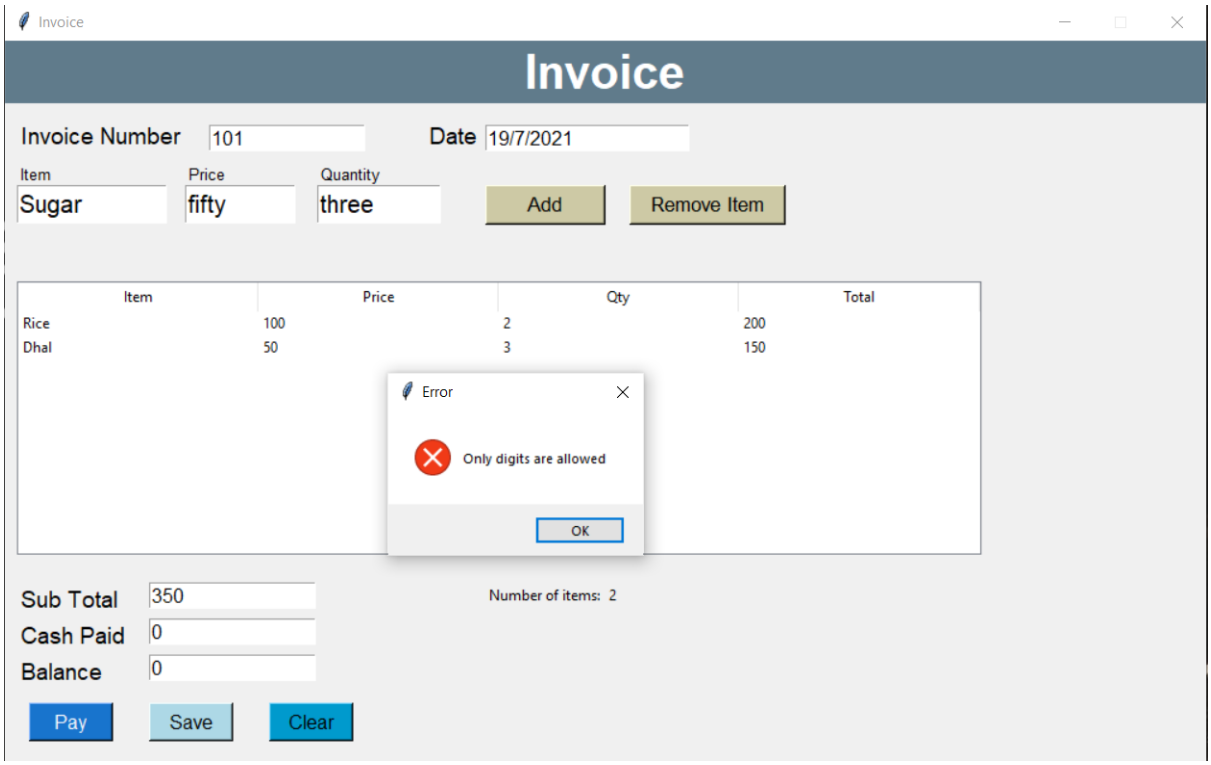

Figure 11: only digits are allowed

Remove Item Button - If the user wants to remove an item that is added onto the grid, he can select the item that needs to be removed from the grid view and click the remove button. Then the item will be removed from the current list of items. The total will be reset by deducting the removed item's total from the current total and the new total will be displayed.

1. First select the item needs to be removed from the list.

2. Click remove button.

3. The item will be removed from the list.

4. The total will be updated according to the following formula.

New Total = Current total – Removed Item Total

5. No of items will also be updated

No of items = Current No of items - 1

Select the item needed to be removed as below. Then click the Remove Item button.

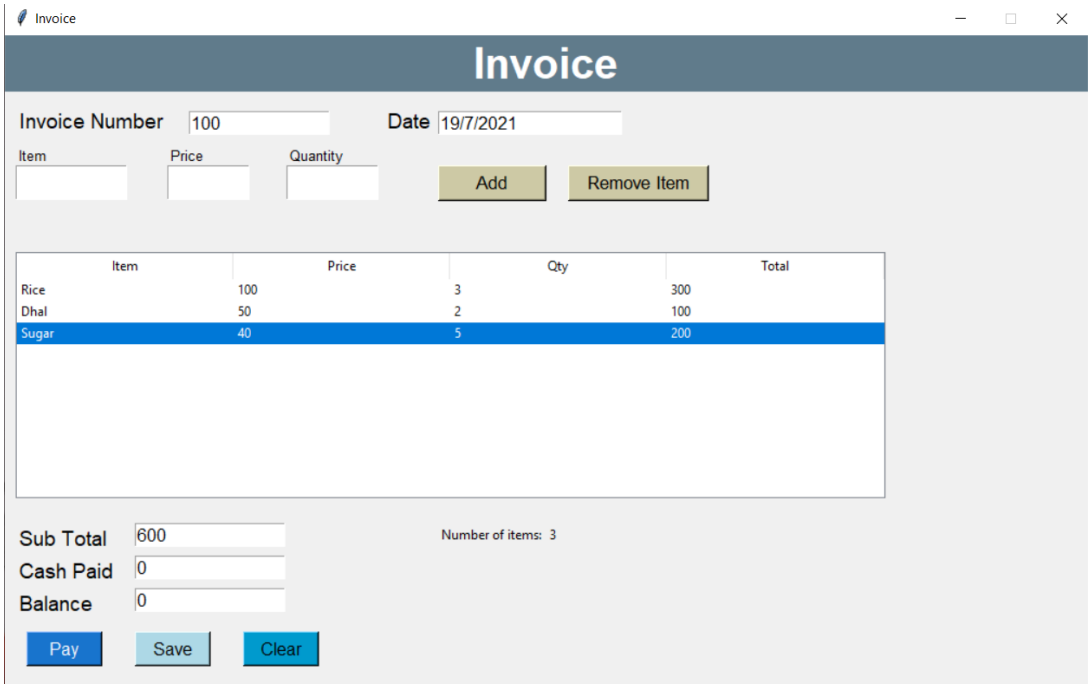

Figure 12: remove button (1)

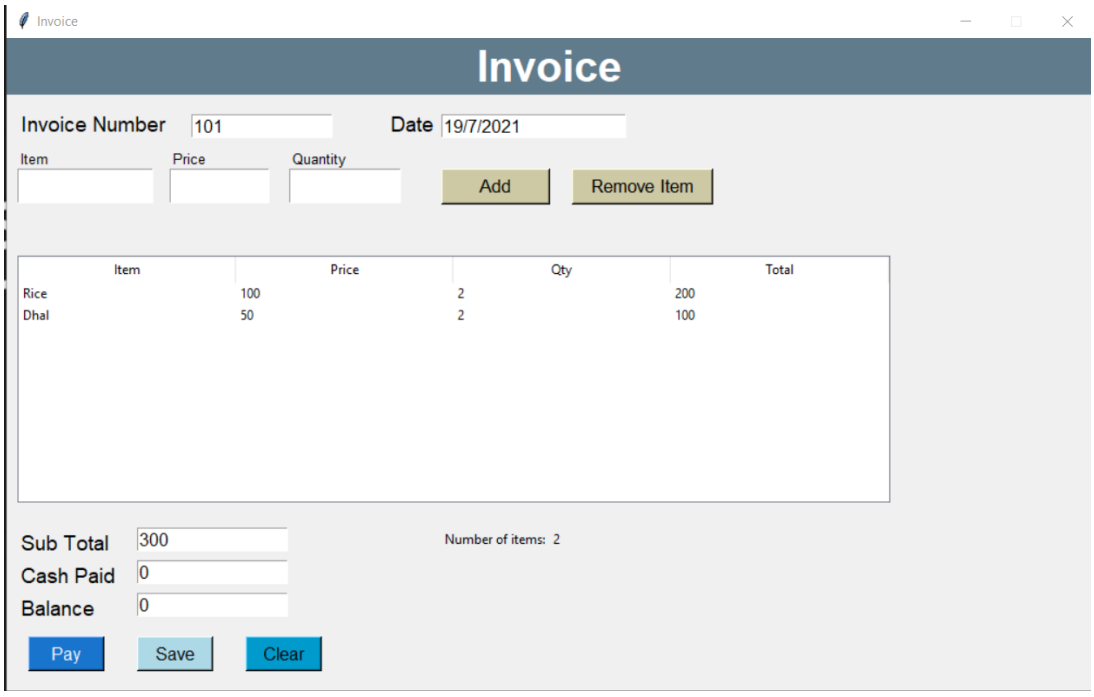

Figure 13: Remove button (2)

Here the item Sugar is removed from the list and the total is updated once the Remove Item button is clicked.

Pay Button – Pay button is used to calculate the balance once a customer pays money. The pay button acts according to the following formula.

Balance = Sub Total – Cash Paid

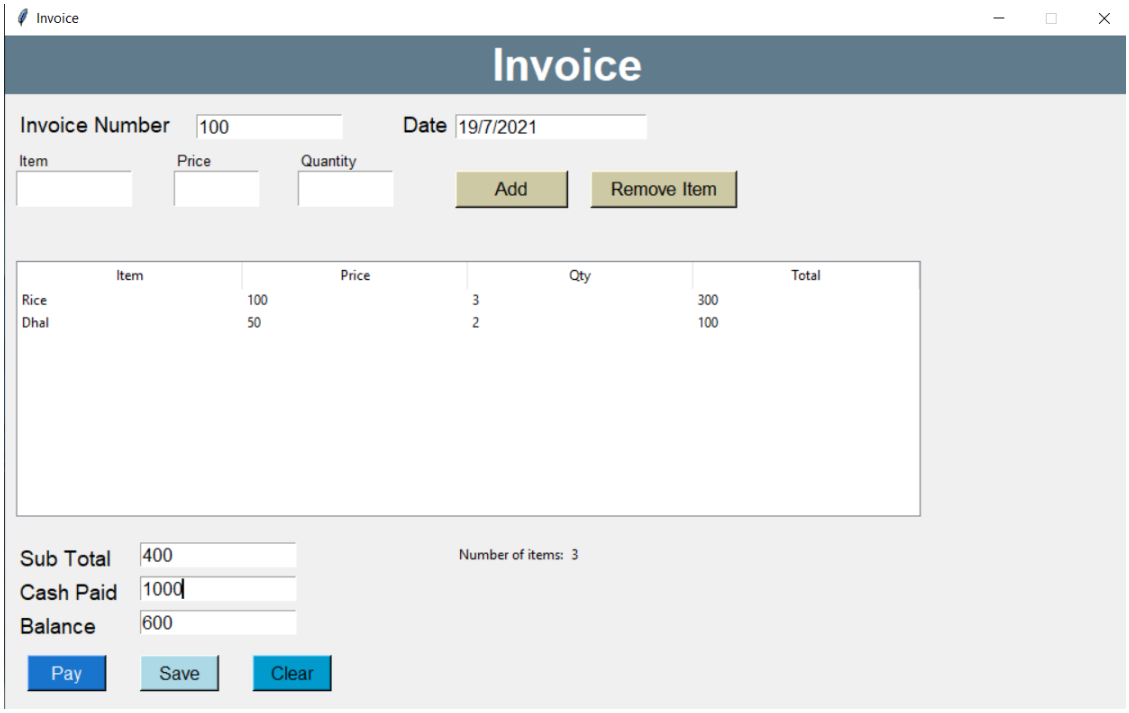

Figure 14: Pay Button

The balance is calculated once the user enters the cash paid and clicks the Pay button.

Save Button – Save button is used to save the invoice number, date and subtotal into a text file. A message box will notify that the data is saved successfully.

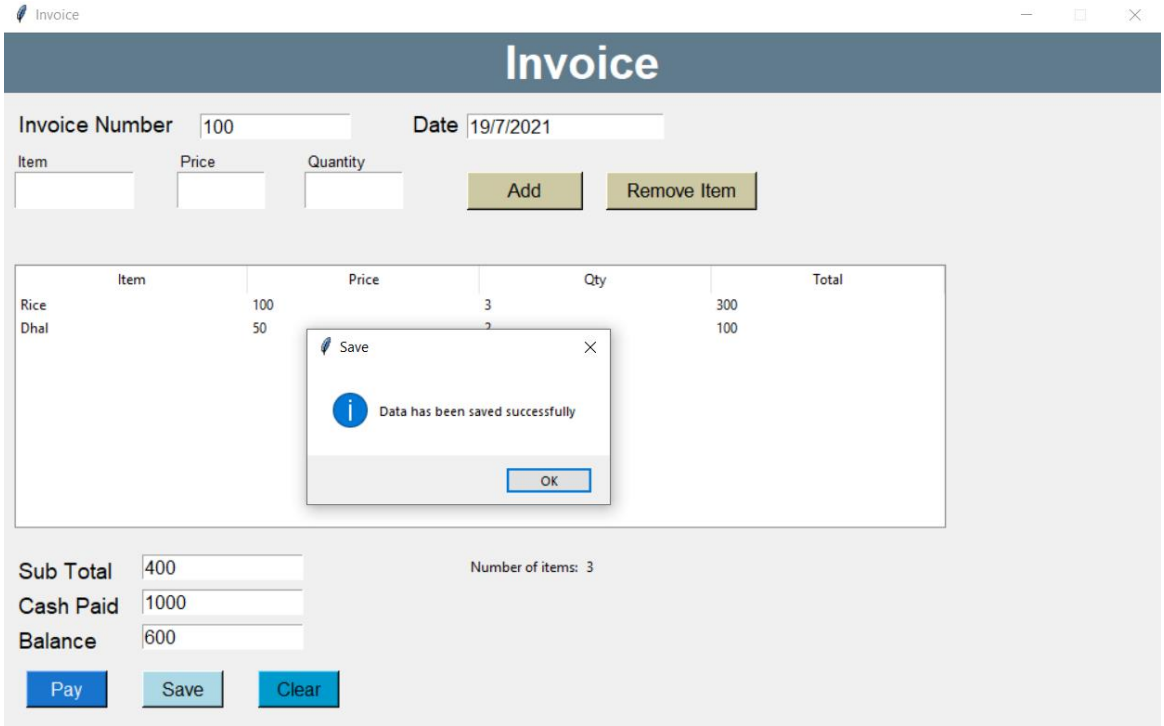

Figure 15: Save Button

Here a new text file is created as ‘bill’ if there is no existing file or if there is the file in the directory already, data will be appended.

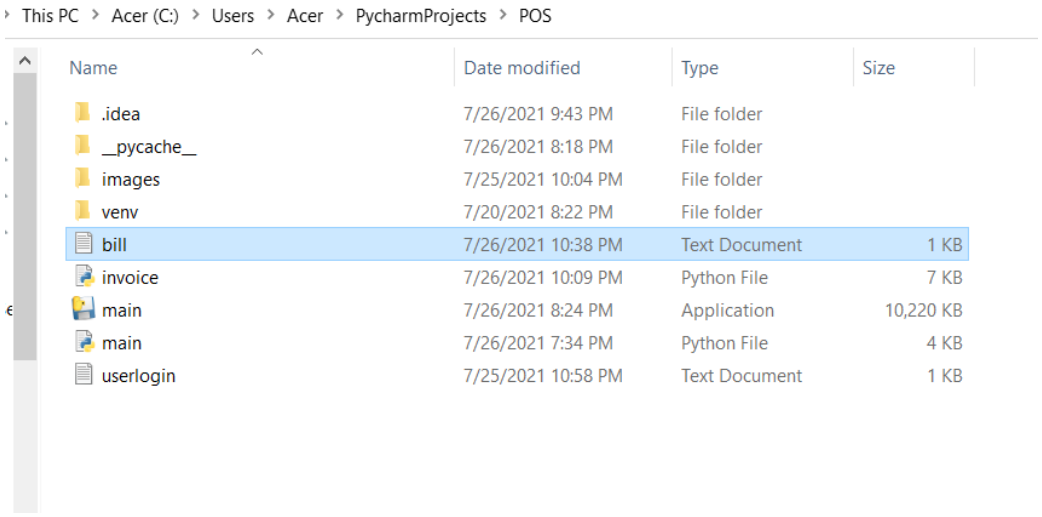

Figure 16: bill

When the text file is opened it will be shown as below recording the data of the invoice.

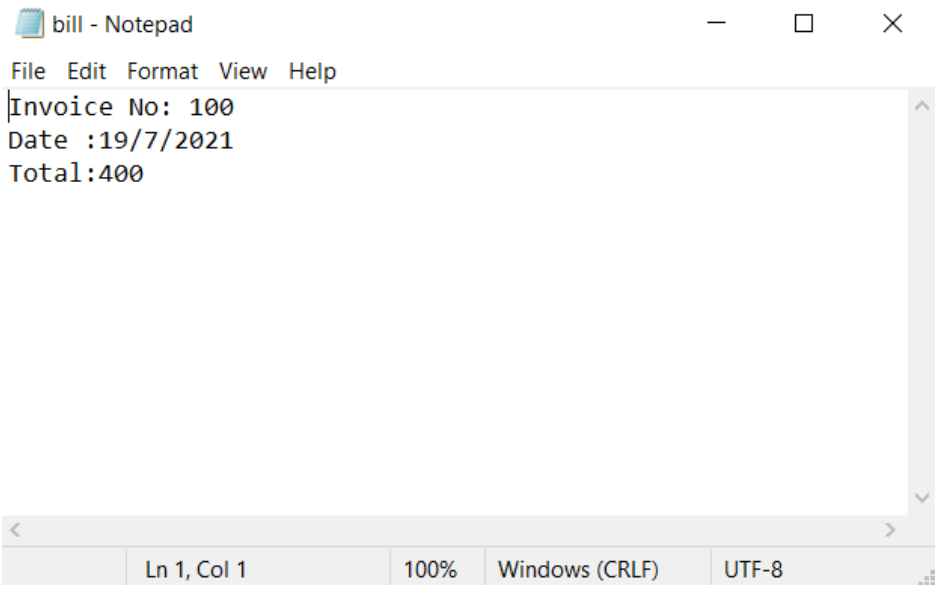

Figure 17: bill.txt

If the user has not entered the invoice number system will notify to enter the invoice number. This is to prevent entering empty values into the invoice number data into the text file. Text file needs to have the three entry boxes filled in order to store the data successfully.

Below is the message box shown when the invoice number entry is empty and save button is clicked.

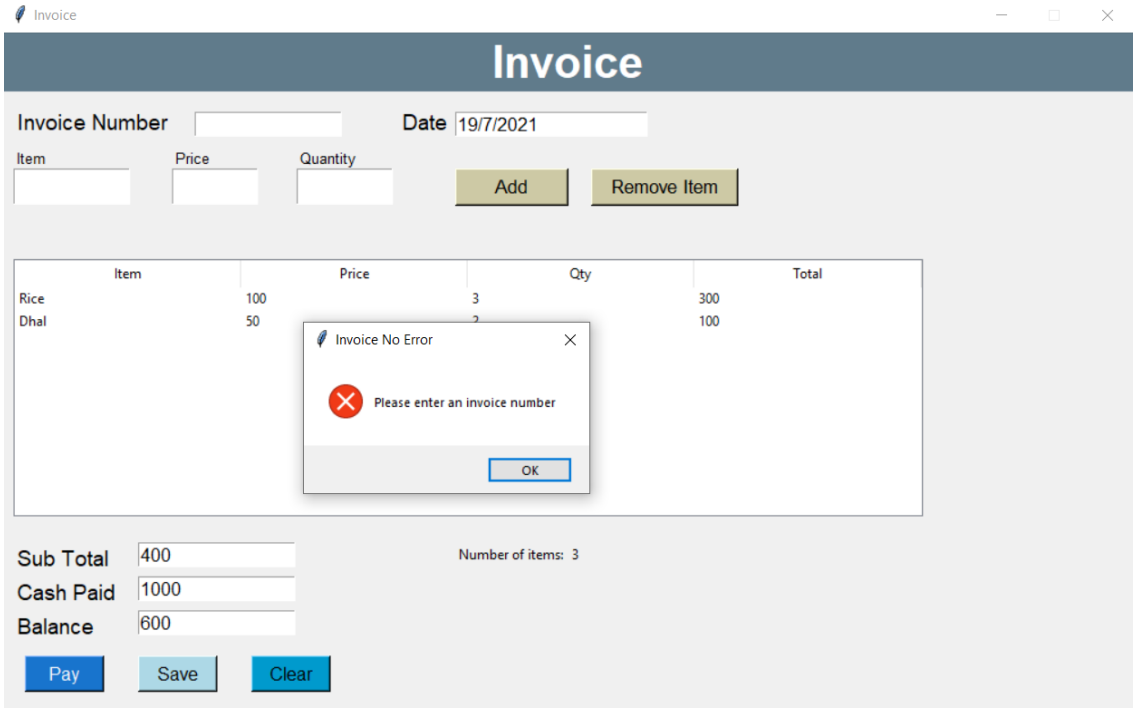

Figure 18: Invoice number is empty

Below is the message box shown when the date entry is empty and save button is clicked.

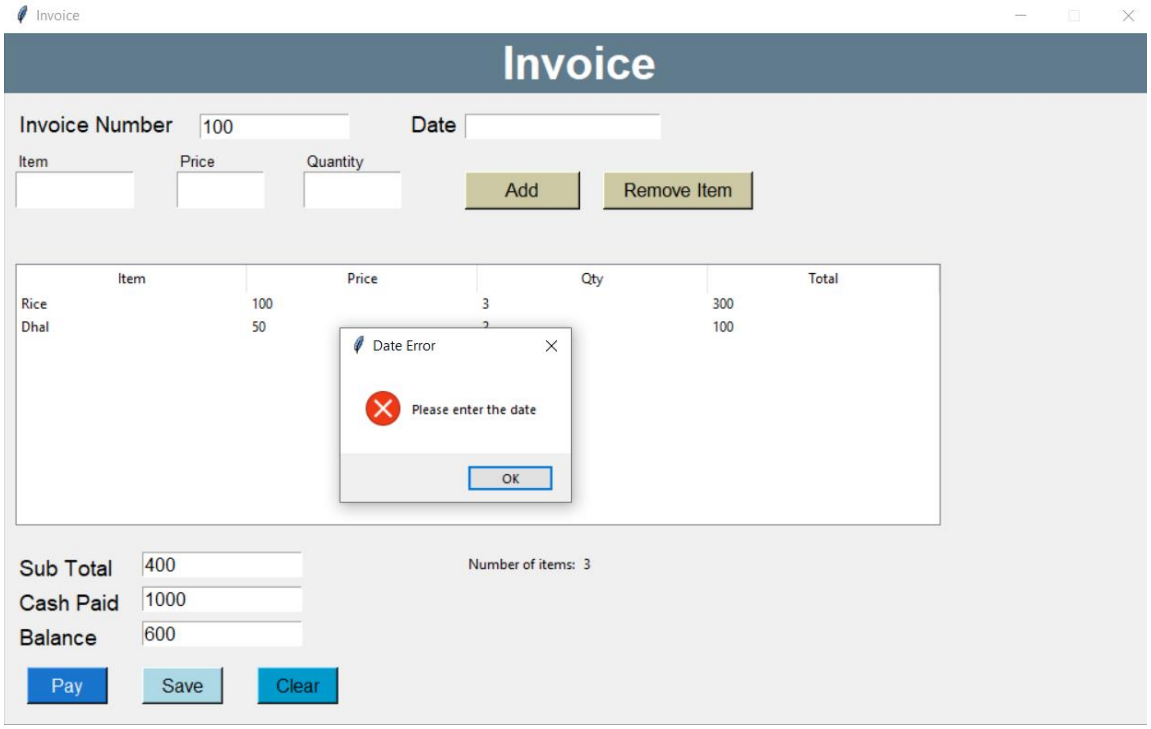

Figure 19: date is empty

Below is the message box shown when the Sub Total entry is empty and save button is clicked. The subtotal is needed to be calculated to save the data into the text file.

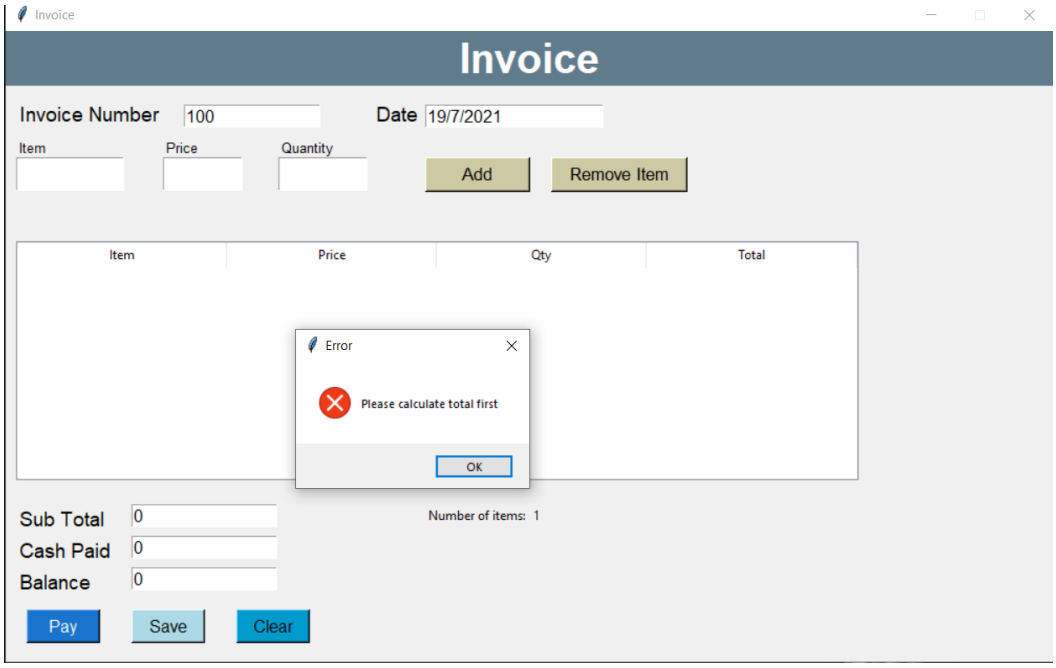

Figure 20: Total is empty

Clear Button - Clear button is used to clear all the data entered in the data fields in this window. It is used for the next billing as the user need to enter a new data set for the next billing.

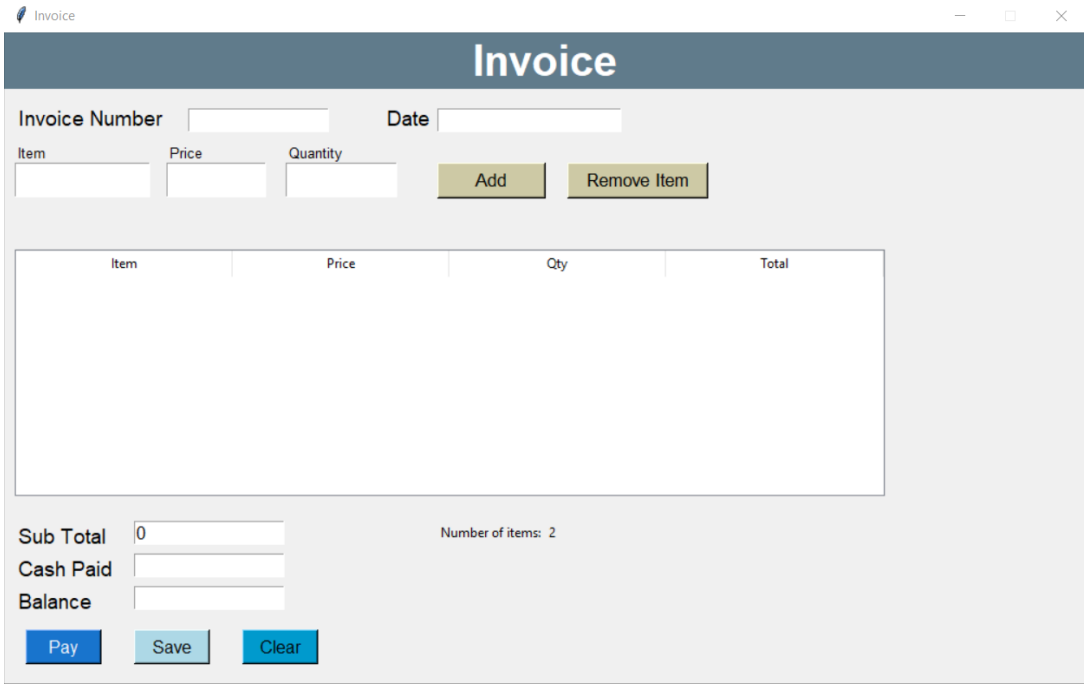

Figure 21: Clear Button

User will be able to get a new window by clicking the Clear button.

4.3 Hardware and Software Requirements

For the implementation of this system user should meet the software and hardware requirements specified below. Both hardware and software requirements must be satisfied in order to install and work in this system.

4.3.1. Software Requirements

POS.exe file contains all the required components for the operation. Install the application then under the root directory there is a main.exe file. By double clicking on that file user will be able to run the application.

It is advisable for user to have an Operating System (OS) after the version of Windows 7, 8, 8.1 or 10.

4.3.2. Hardware Requirements

Memory or RAM:

- 2GB Memory
- 4GB Memory
- 8GB DDR4 Memory

Hard Driver: Minimum 50 GB

Processor:

- Intel Pentium 4
- Intel Core – i3
- Intel Core – i5 (1st Gen. to 8th Gen.)
- Intel Core – i7 (1st Gen. to 8th Gen.)

These are minimum to maximum requirements considered when installing the application.

5. Summary

This Point of Sales system is developed for a small retail shop for easing the billing of the daily purchases. Currently, workers have to write down every bill manually and it is both inefficient and accuracy is low. Customers have to wait for a long time to get their bill and some misplacements could also occur. Therefore, this system aims to overcome those drawbacks identified of the current system. This system consists of a user login for security purposes, then a window for billing purposes. User can enter various items and get the subtotal and the balance at the end. Then user can save the details of the bill in a text file for future usages. Even though

this system is able to find solutions for some of the identified drawbacks, it still lacks in some areas. The system could be upgraded more in order to automate the functions. But at the moment, the workers are not familiar with computer or technology. Therefore, a simple and user-friendly interface without much functionalities are needed to train the workers. Then after sometime, the next goal is to upgrade this system furthermore with more advanced functionalities.