นางสาวรพีพรรณ มาสถิตทรัพย์ 61070507218

Receipt.py

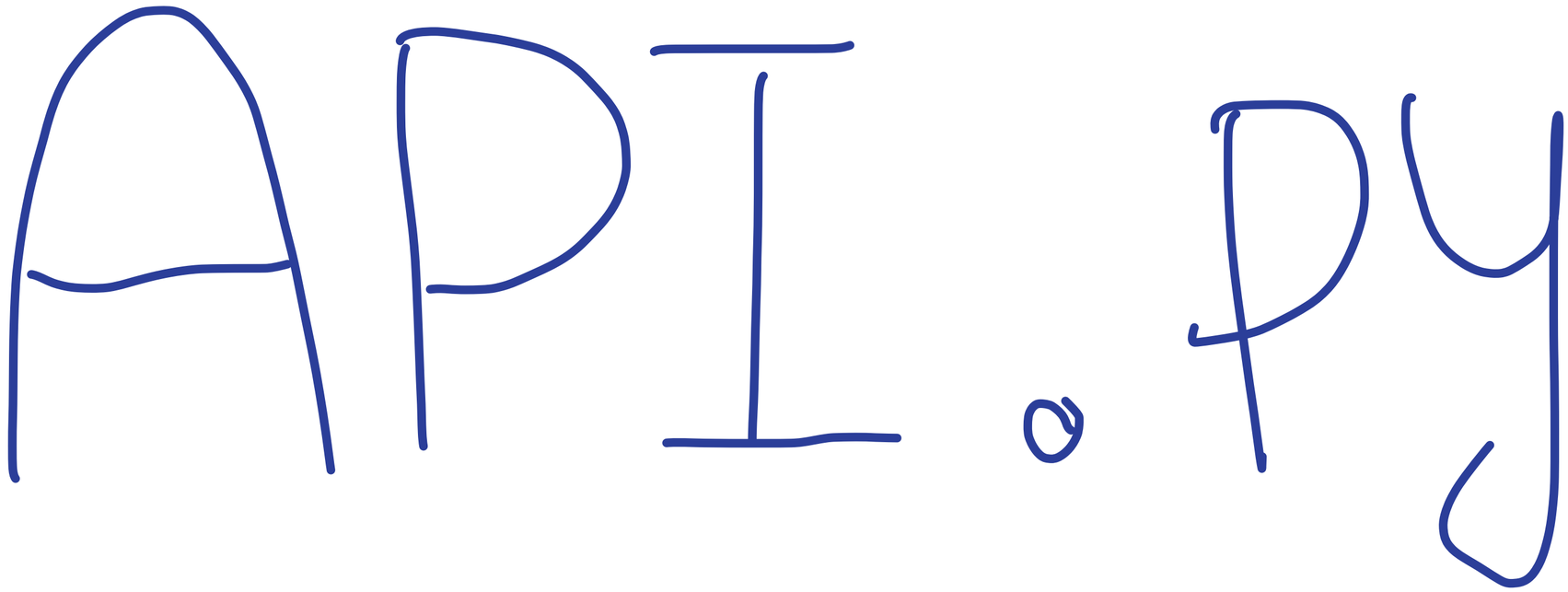
receipt.py

```
from DBHelper import DBHelper
from helper_functions import *
from Product import *
from Customer import *

class Receipt:
    def __init__(self):
        self.db = DBHelper()

    def __updateReceiptTotal (self, receiptNo):
        sql = ("UPDATE receipt SET "
               "total_receipt = new_total_receipt"
               " FROM (SELECT rli.receipt_no , SUM(rli.amount_paid_here) As new_total_receipt From receipt_line_item rli GROUP BY rli.receipt_no) rli "
               " Where receipt.receipt_no = rli.receipt_no "
               "AND receipt.receipt_no = '{}' ".format(receiptNo))
        self.db.execute (sql)

    def __updateReceiptAmountUnpaid (self, receiptNo):
        sql = ("UPDATE receipt_line_item SET "
               " amount_unpaid = new_amount_unpaid"
               " FROM (SELECT rli.receipt_no , SUM(rli.amount_paid_here) As new_total_receipt From receipt_line_item rli GROUP BY rli.receipt_no) rli "
               " Where receipt.receipt_no = rli.receipt_no "
               "AND receipt.receipt_no = '{}' ".format(receiptNo))
        self.db.execute (sql)

    def __updateLineItem (self, receiptNo, receiptLineItemList):
        self.db.execute ("DELETE FROM receipt_line_item WHERE receipt_no = '{}' ".format(receiptNo))
        for lineItem in receiptLineItemList:
            self.db.execute ("INSERT INTO receipt_line_item (receipt_no, invoice_no, amount_paid_here) VALUES ('{}' ,'{}','{}')".format(receiptNo,lineItem["Invoice No"],lineItem["Amount Paid Here"]))
        self.__updateReceiptTotal(receiptNo)


def create(self, receiptNo, receiptDate, customerCode, paymenMethod, paymenReference, remark, receiptLineItemList):
    data, columns = self.db.fetch ("SELECT * FROM receipt WHERE receipt_no = '{}' ".format(receiptNo))
    if len(data) > 0:
        return {'Is Error': True, 'Error Message': "Receipt No '{}' already exists. Cannot Create. ".format(receiptNo)}
    else:
        self.db.execute ("INSERT INTO receipt (receipt_no, receipt_date, customer_code, payment_method, payment_reference, remark) VALUES ('{}' ,{} ,'{}' ,'{}' ,'{}' ,'{}')".format(receiptNo,receiptDate,customerCode,paymenMethod,paymenReference,remark))
        self.__updateLineItem(receiptNo, receiptLineItemList)

    return {'Is Error': False, 'Error Message': ""}

def read(self, receiptNo):
    data, columns = self.db.fetch ("SELECT receipt_no, receipt_date, customer_code, payment_method, payment_reference, remark FROM receipt WHERE receipt_no = '{}' ".format(receiptNo))
    if len(data) > 0:
        retReceipt = row_as_dict(data, columns)
    else:
        return ({'Is Error': True, 'Error Message': "Receipt No '{}' not found. Cannot Read.".format(receiptNo)},{})

    return ({'Is Error': False, 'Error Message': ""},retReceipt)
```

```
  def update(self, receiptNo, newReceiptDate, newCustomerCode, newPaymenMethod, newPaymenReference, newRemark ,newReceiptLineItemList):
    # Finds the invoice number in invoices object and then changes the values to the new ones.
    # Returns dictionary {‘Is Error’: ___, ‘Error Message’: _____}.
    data, columns = self.db.fetch ("SELECT * FROM receipt WHERE receipt_no = '{}' ".format(receiptNo))
    if len(data) > 0:
      self.db.execute ("UPDATE receipt SET receipt_date = {}, customer_code = '{}', payment_method = '{}', payment_reference = '{}', remark= '{}' WHERE receipt_no = '{}' ".format(newReceiptDate, newCustomerCode, newPaymenMethod, newPaymenReference, newRemark,receiptNo))
      self.__updateLineItem(receiptNo, newReceiptLineItemList)
    else:
      return {'Is Error': True, 'Error Message': "Receipt No '{}' not found. Cannot Update.".format(receiptNo)}

    return {'Is Error': False, 'Error Message': ""}

  def delete(self, receiptNo):
    # Finds the invoice number invoices object and removes it from the dictionary.
    # Returns dictionary {‘Is Error’: ___, ‘Error Message’: _____}.
    data, columns = self.db.fetch ("SELECT * FROM receipt WHERE receipt_no = '{}' ".format(receiptNo))
    if len(data) > 0:
      self.db.execute ("DELETE FROM receipt WHERE receipt_no = '{}' ".format(receiptNo))
      self.db.execute ("DELETE FROM receipt_line_item WHERE receipt_no = '{}' ".format(receiptNo))
    else:
      return {'Is Error': True, 'Error Message': "Receipt No '{}' not found. Cannot Delete".format(receiptNo)}
    return {'Is Error': False, 'Error Message': ""}

  def dump(self):
    # Will dump all invoice data by returning 1 dictionary as output.
    data, columns = db.fetch ('SELECT r.receipt_no as "Receipt No", r.receipt_date as "Receipt Date", r.customer_code as "Customer Code", r.payment_method as "Payment Method", r.payment_reference as "Payment Reference", r.remark as "Remark" FROM receipt r JOIN customer c ON r.customer_code = c.customer_code')

    return row_as_dict(data, columns)

  def update_receipt_line(self, receiptNo, invoiceNo, newAmountPaid):
    data, columns = self.db.fetch ("SELECT * FROM receipt_line_item WHERE receipt_no = '{}' AND invoice_no = '{}' ".format(receiptNo, invoiceNo))
    if len(data) > 0:
      self.db.execute ("UPDATE receipt_line_item SET amount_paid_here = {} WHERE receipt_no = '{}' AND invoice_no = '{}' ".format(newAmountPaid, receiptNo, invoiceNo))
      self.__updateReceiptTotal(receiptNo)
    else:
      return {'Is Error': True, 'Error Message': "Invoice Code '{}' not found in Receipt No '{}'. Cannot Update.".format(invoiceNo, receiptNo)}

    return {'Is Error': False, 'Error Message': ""}

  def delete_receipt_line(self, receiptNo, invoiceNo):
    data, columns = self.db.fetch ("SELECT * FROM receipt_line_item WHERE receipt_no = '{}' AND invoice_no = '{}' ".format(receiptNo, invoiceNo))
    if len(data) > 0:
      self.db.execute ("DELETE FROM receipt_line_item WHERE receipt_no = '{}' AND invoice_no = '{}' ".format(receiptNo, invoiceNo))
      self.__updateReceiptTotal(receiptNo)

    else:
      return {'Is Error': True, 'Error Message': "Invoice Code '{}' not found in Receipt No '{}'. Cannot Delete.".format(invoiceNo, receiptNo)}

    return {'Is Error': False, 'Error Message': ""}
```

```python
from DBHelper import DBHelper
from helper_functions import *
from Product import *
from Customer import *

class Receipt:
    def __init__(self):
        self.db = DBHelper()

    def __updateReceiptTotal (self, receiptNo):
        sql = ("UPDATE receipt SET "
               "total_receipt = new_total_receipt"
               " FROM (SELECT rli.receipt_no , SUM(rli.amount_paid_here) As new_total_receipt From receipt_line_item rli GROUP BY rli.receipt_no) rli "
               " Where receipt.receipt_no = rli.receipt_no "
               "AND receipt.receipt_no = '{}' ".format(receiptNo))
        self.db.execute (sql)

    def __updateReceiptAmountUnpaid (self, receiptNo):
        sql = ("UPDATE receipt_line_item SET "
               " amount_unpaid = new_amount_unpaid"
               " FROM (SELECT rli.receipt_no , SUM(rli.amount_paid_here) As new_total_receipt From receipt_line_item rli GROUP BY rli.receipt_no) rli "
               " Where receipt.receipt_no = rli.receipt_no "
               "AND receipt.receipt_no = '{}' ".format(receiptNo))
        self.db.execute (sql)

    def __updateLineItem (self, receiptNo, receiptLineItemList):
        self.db.execute ("DELETE FROM receipt_line_item WHERE receipt_no = '{}' ".format(receiptNo))
        for lineItem in receiptLineItemList:
            self.db.execute ("INSERT INTO receipt_line_item (receipt_no, invoice_no, amount_paid_here) VALUES ('{}' ,'{}','{}')".format(receiptNo,lineItem["Invoice No"],lineItem["Amount Paid Here"]))
        self.__updateReceiptTotal(receiptNo)


    def create(self, receiptNo, receiptDate, customerCode, paymenMethod, paymenReference, remark, receiptLineItemList):
        data, columns = self.db.fetch ("SELECT * FROM receipt WHERE receipt_no = '{}' ".format(receiptNo))
        if len(data) > 0:
            return {'Is Error': True, 'Error Message': "Receipt No '{}' already exists. Cannot Create. ".format(receiptNo)}
        else:
            self.db.execute ("INSERT INTO receipt (receipt_no, receipt_date, customer_code, payment_method, payment_reference, remark) VALUES ('{}' ,{} ,'{}' ,'{}' ,'{}' ,'{}')".format(receiptNo,receiptDate,customerCode,paymenMethod,paymenReference,remark)
)
            self.__updateLineItem(receiptNo, receiptLineItemList)

        return {'Is Error': False, 'Error Message': ""}

    def read(self, receiptNo):
        data, columns = self.db.fetch ("SELECT receipt_no, receipt_date, customer_code, payment_method, payment_reference, remark FROM receipt WHERE receipt_no = '{}' ".format(receiptNo))
        if len(data) > 0:
            retReceipt = row_as_dict(data, columns)
        else:
            return ({'Is Error': True, 'Error Message': "Receipt No '{}' not found. Cannot Read.".format(receiptNo)},{})

        return ({'Is Error': False, 'Error Message': ""},retReceipt)

    def update(self, receiptNo, newReceiptDate, newCustomerCode, newPaymenMethod, newPaymenReference, newRemark ,newReceiptLineItemList):
        # Finds the invoice number in invoices object and then changes the values to the new ones.
        # Returns dictionary {'Is Error': ___, 'Error Message': _____}.
        data, columns = self.db.fetch ("SELECT * FROM receipt WHERE receipt_no = '{}' ".format(receiptNo))
        if len(data) > 0:
            self.db.execute ("UPDATE receipt SET receipt_date = {}, customer_code = '{}', payment_method = '{}', payment_reference = '{}', remark= '{}' WHERE receipt_no = '{}' ".format(newReceiptDate, newCustomerCode, newPaymenMethod, newPaymenReference, n
ewRemark,receiptNo))
            self.__updateLineItem(receiptNo, newReceiptLineItemList)
        else:
            return {'Is Error': True, 'Error Message': "Receipt No '{}' not found. Cannot Update.".format(receiptNo)}

        return {'Is Error': False, 'Error Message': ""}

    def delete(self, receiptNo):
        # Finds the invoice number invoices object and removes it from the dictionary.
        # Returns dictionary {'Is Error': ___, 'Error Message': _____}.
        data, columns = self.db.fetch ("SELECT * FROM receipt WHERE receipt_no = '{}' ".format(receiptNo))
        if len(data) > 0:
            self.db.execute ("DELETE FROM receipt WHERE receipt_no = '{}' ".format(receiptNo))
            self.db.execute ("DELETE FROM receipt_line_item WHERE receipt_no = '{}' ".format(receiptNo))
        else:
            return {'Is Error': True, 'Error Message': "Receipt No '{}' not found. Cannot Delete".format(receiptNo)}
        return {'Is Error': False, 'Error Message': ""}

    def dump(self):
        # Will dump all invoice data by returning 1 dictionary as output.

        data, columns = db.fetch ('SELECT r.receipt_no as "Receipt No", r.receipt_date as "Receipt Date", r.customer_code as "Customer Code", r.payment_method as "Payment Method", r.payment_reference as "Payment Reference", r.remark as "Remark" FROM receip
t r JOIN customer c ON r.customer_code = c.customer_code')

        return row_as_dict(data, columns)

    def update_receipt_line(self, receiptNo, invoiceNo, newAmountPaid):
        data, columns = self.db.fetch ("SELECT * FROM receipt_line_item WHERE receipt_no = '{}' AND invoice_no = '{}' ".format(receiptNo, invoiceNo))
        if len(data) > 0:
            self.db.execute ("UPDATE receipt_line_item SET amount_paid_here = {} WHERE receipt_no = '{}' AND invoice_no = '{}' ".format(newAmountPaid, receiptNo, invoiceNo))
            self.__updateReceiptTotal(receiptNo)
        else:
            return {'Is Error': True, 'Error Message': "Invoice Code '{}' not found in Receipt No '{}'. Cannot Update.".format(invoiceNo, receiptNo)}

        return {'Is Error': False, 'Error Message': ""}

    def delete_receipt_line(self, receiptNo, invoiceNo):
        data, columns = self.db.fetch ("SELECT * FROM receipt_line_item WHERE receipt_no = '{}' AND invoice_no = '{}' ".format(receiptNo, invoiceNo))
        if len(data) > 0:
            self.db.execute ("DELETE FROM receipt_line_item WHERE receipt_no = '{}' AND invoice_no = '{}' ".format(receiptNo, invoiceNo))
            self.__updateReceiptTotal(receiptNo)

        else:
            return {'Is Error': True, 'Error Message': "Invoice Code '{}' not found in Receipt No '{}'. Cannot Delete.".format(invoiceNo, receiptNo)}

        return {'Is Error': False, 'Error Message': ""}
```

นางสาวรพีพรรณ มาสถิตทรัพย์ 61070507218



API.py

นางสาวรพีพรรณ มาสถิตทรัพย์ 61070507218

```
from DBHelper import DBHelper
from helper_functions import *
#This file will contain all API functions calls exposed to outside world for users to use

# function about Product
def create_product(products, code, name, units):
    result = products.create(code, name, units)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Product Create Success.')
    return result #send result for caller program to use

def read_product(products, code):
    result = products.read(code) #returns tuple of (error dict, data dict)
    if result[0]['Is Error']: #in case error
        print(result[0]['Error Message'])
    else:
        print(result[1])
    return result #send result for caller program to use

def update_product(products, code, newName, newUnits):
    result = products.update(code, newName, newUnits) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Product Update Success.')
    return result #send result for caller program to use

def delete_product(products, code):
    result = products.delete(code)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Product Delete Success.')
    return result #send result for caller program to use

def report_list_products(products):
    result = products.dump()
    #printDictInCSVFormat(result, ('Code',), ('Name', 'Units'))
    print (result)
    return result #send result for caller program to use

# function about Customer
def create_customer(customers, customerCode, customerName, address, creditLimit, country):
    result = customers.create(customerCode, customerName, address, creditLimit, country)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Customer Create Success.')
    return result #send result for caller program to use

def read_customer(customers, customerCode):
    result = customers.read(customerCode) #returns tuple of (error dict, data dict)
    if result[0]['Is Error']: #in case error
        print(result[0]['Error Message'])
    else:
        print(result[1])
    return result #send result for caller program to use

def update_customer(customers, customerCode, newCustomerName, newAddress, newCreditLimit, newCountry):
    result = customers.update(customerCode, newCustomerName, newAddress, newCreditLimit, newCountry) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Customer Update Success.')
    return result #send result for caller program to use

def delete_customer(customers, customerCode):
    result = customers.delete(customerCode)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Customer Delete Success.')
    return result #send result for caller program to use

def report_list_all_customers(customers):
    result = customers.dump()
    printDictInCSVFormat(result, ('Customer Code',), ('Name', 'Address','Credit Limit', 'Country'))
    return result #send result for caller program to use
```

```
# function about Invoice
def create_invoice(invoices, invoiceNo, invoiceDate, customerCode, dueDate, invoiceLineTuplesList):
    if invoiceDate == None:
        invoiceDate = 'null'
    else:
        invoiceDate = "'" + invoiceDate + "'"
    if dueDate == None:
        dueDate = 'null'
    else:
        dueDate = "'" + dueDate + "'"
    result = invoices.create(invoiceNo, invoiceDate, customerCode, dueDate, invoiceLineTuplesList)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Invoice Create Success.')
    return result #send result for caller program to use

def read_invoice(invoices, invoiceNo):
    result = invoices.read(invoiceNo) #returns tuple of (error dict, data dict)
    if result[0]['Is Error']: #in case error
        print(result[0]['Error Message'])
    else:
        print(result[1])
    return result #send result for caller program to use

def update_invoice(invoices, invoiceNo, newInvoiceDate, newCustomerCode, newDueDate, newInvoiceLineTuplesList):
    if newInvoiceDate == None:
        newInvoiceDate = 'null'
    else:
        newInvoiceDate = "'" + newInvoiceDate + "'"
    if newDueDate == None:
        newDueDate = 'null'
    else:
        newDueDate = "'" + newDueDate + "'"
    result = invoices.update(invoiceNo, newInvoiceDate, newCustomerCode, newDueDate, newInvoiceLineTuplesList) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Invoice Update Success.')
    return result #send result for caller program to use

def delete_invoice(invoices, invoiceNo):
    result = invoices.delete(invoiceNo)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Invoice Delete Success.')
    return result #send result for caller program to use

def update_invoice_line(invoices, invoiceNo, productCode, newQuantity, newUnitPrice):
    result = invoices.update_invoice_line(invoiceNo, productCode, newQuantity, newUnitPrice) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Invoice Line Item Update Success.')
    return result #send result for caller program to use

def delete_invoice_line(invoices, invoiceNo, productCode):
    result = invoices.delete_invoice_line(invoiceNo, productCode) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Invoice Line Item Delete Success.')
    return result #send result for caller program to use

def report_list_all_invoices(invoices, customers, products):
    # Will dump all invoices data and return 1 dictionary as a result (with header and line item joined).
    # Please show the customer name and product name also.
    # A helper function such as def print_tabular_dictionary(tabularDictionary) can then be called to print this in a tabular (table-like) form with column headings and data.

    db = DBHelper()
    data, columns = db.fetch ('SELECT i.invoice_no as "Invoice No", i.date as "Date" '
                              ' , i.customer_code as "Customer Code", c.name as "Customer Name" '
                              ' , i.due_date as "Due Date", i.total as "Total", i.vat as "VAT", i.amount_due as "Amount Due" '
                              ' , ili.product_code as "Product Code", p.name as "Product Name" '
                              ' , ili.quantity as "Quantity", ili.unit_price as "Unit Price", ili.extended_price as "Extended Price" '
                              ' FROM invoice i JOIN customer c ON i.customer_code = c.customer_code '
                              '  JOIN invoice_line_item ili ON i.invoice_no = ili.invoice_no '
                              '  JOIN product p ON ili.product_code = p.code '
                              ' ')
    #print (result)
    result = row_as_dict(data, columns)
    printDictInCSVFormat(result, ('Invoice No',), ('Date', 'Customer Code', 'Customer Name','Due Date','Total','VAT','Amount Due'
                                       , 'Product Code', 'Product Name', 'Quantity', 'Unit Price', 'Extended Price'))
    return result #send result for caller program to use
```

```
def report_products_sold(invoices, products, dateStart, dateEnd):
    db = DBHelper()
    data, columns = db.fetch ('SELECT p.code as "Code", ili.product_code as "Product Code", p.name as "Product Name" '
                              ' , SUM(ili.quantity) as "Total Quantity Sold", SUM(ili.extended_price) as "Total Value Sold" '
                              ' FROM invoice i JOIN invoice_line_item ili ON i.invoice_no = ili.invoice_no '
                              '   JOIN product p ON ili.product_code = p.code '
                              ' WHERE i.date between \'' + dateStart + '\' and \'' + dateEnd + '\' '
                              ' GROUP BY p.code, ili.product_code, p.name ')
    result = row_as_dict(data, columns)
    data, columns = db.fetch ('SELECT 0 as "Footer", SUM(ili.extended_price) as "Total Value Sold" '
                              ' FROM invoice i JOIN invoice_line_item ili ON i.invoice_no = ili.invoice_no '
                              '   JOIN product p ON ili.product_code = p.code '
                              ' WHERE i.date between \'' + dateStart + '\' and \'' + dateEnd + '\' '
                              ' ')
    result2 = row_as_dict(data, columns)

    printDictInCSVFormat(result, (None), ('Product Code','Product Name', 'Total Quantity Sold', 'Total Value Sold'))
    printDictInCSVFormat(result2, (None), ('Total Value Sold',))
    return result, result2

def report_customer_products_sold_list(invoices, products, customers, dateStart, dateEnd):
    db = DBHelper()
    data, columns = db.fetch ('SELECT i.customer_code, c.customer_code as "Customer Code", c.name as "Customer Name" '
                              ' , ili.product_code as "Product Code", p.name as "Product Name" '
                              ' , i.invoice_no as "Invoice No" '
                              ' , SUM(ili.quantity) as "Quantity Sold", SUM(ili.extended_price) as "Value Sold" '
                              ' FROM invoice i JOIN invoice_line_item ili ON i.invoice_no = ili.invoice_no '
                              '   JOIN customer c ON i.customer_code = c.customer_code '
                              '   JOIN product p ON ili.product_code = p.code '
                              ' WHERE i.date between \'' + dateStart + '\' and \'' + dateEnd + '\' '
                              ' GROUP BY i.customer_code, c.customer_code, c.name, i.invoice_no, ili.product_code, p.name ')
    result = row_as_dict(data, columns)
    data, columns = db.fetch ('SELECT 0 as "Footer", SUM(ili.quantity) as "Quantity Sold", SUM(ili.extended_price) as "Value Sold" '
                              ' FROM invoice i JOIN invoice_line_item ili ON i.invoice_no = ili.invoice_no '
                              '   JOIN customer c ON i.customer_code = c.customer_code '
                              '   JOIN product p ON ili.product_code = p.code '
                              ' WHERE i.date between \'' + dateStart + '\' and \'' + dateEnd + '\' '
                              ' ')
    result2 = row_as_dict(data, columns)

    printDictInCSVFormat(result, (None), ('Customer Code','Customer Name', 'Product Code', 'Product Name', 'Invoice No', 'Quantity Sold', 'Value Sold'))
    printDictInCSVFormat(result2, (None), ('Quantity Sold','Value Sold'))
    return result.values(), result2

def report_customer_products_sold_total(invoices, products, customers, dateStart, dateEnd):
    # Will return 2 dictionaries:
    # 1) a dictionary as list customers and the total number and value of products sold to them in the given date range in this format:  Customer Code, Customer Name, Product Code,  Product Name, Total Quantity Sold, Total Value Sold. Here (customer code,
product code) will be unique.
    # And 2) a second footer dictionary showing: t the end also show the sum of Total Quantity Sold, sum of Total Value Sold.
    db = DBHelper()
    data, columns = db.fetch ('SELECT i.customer_code, c.customer_code as "Customer Code", c.name as "Customer Name" '
                              ' , ili.product_code as "Product Code", p.name as "Product Name" '
                              ' , SUM(ili.quantity) as "Total Quantity Sold", SUM(ili.extended_price) as "Total Value Sold" '
                              ' FROM invoice i JOIN invoice_line_item ili ON i.invoice_no = ili.invoice_no '
                              '   JOIN customer c ON i.customer_code = c.customer_code '
                              '   JOIN product p ON ili.product_code = p.code '
                              ' WHERE i.date between \'' + dateStart + '\' and \'' + dateEnd + '\' '
                              ' GROUP BY i.customer_code, c.customer_code, c.name, i.invoice_no, ili.product_code, p.name ')
    result = row_as_dict(data, columns)
    data, columns = db.fetch ('SELECT 0 as "Footer", SUM(ili.quantity) as "Total Quantity Sold", SUM(ili.extended_price) as "Total Value Sold" '
                              ' FROM invoice i JOIN invoice_line_item ili ON i.invoice_no = ili.invoice_no '
                              '   JOIN customer c ON i.customer_code = c.customer_code '
                              '   JOIN product p ON ili.product_code = p.code '
                              ' WHERE i.date between \'' + dateStart + '\' and \'' + dateEnd + '\' '
                              ' ')
    result2 = row_as_dict(data, columns)

    printDictInCSVFormat(result, (None), ('Customer Code','Customer Name', 'Product Code', 'Product Name', 'Total Quantity Sold', 'Total Value Sold'))
    printDictInCSVFormat(result2, (None), ('Total Quantity Sold','Total Value Sold'))
    return result.values(), result2

# function about Payment method
def create_PaymentMethod(PaymentMethods, paymentMethodCode, paymentMethodName):
    result = PaymentMethods.create(paymentMethodCode, paymentMethodName)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Payment Method Create Success.')
    return result #send result for caller program to use

def read_PaymentMethod(PaymentMethods, paymentMethodCode):
    result = PaymentMethods.read(paymentMethodCode) #returns tuple of (error dict, data dict)
    if result[0]['Is Error']: #in case error
        print(result[0]['Error Message'])
    else:
        print(result[1])
    return result #send result for caller program to use
```

```
def update_PaymentMethod(PaymentMethods, paymentMethodCode, newPaymentMethodName):
    result = PaymentMethods.update(paymentMethodCode, newPaymentMethodName) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Payment Method Update Success.')
    return result #send result for caller program to use

def delete_PaymentMethod(PaymentMethods, paymentMethodCode):
    result = PaymentMethods.delete(paymentMethodCode)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Payment Method Delete Success.')
    return result #send result for caller program to use

def report_list_payment_methods(PaymentMethods):
    result = PaymentMethods.dump()
    print(result)
    return result #send result for caller program to use


#function about Receipt
def create_receipt(receipts, receiptNo, receiptDate, customerCode, paymenMethod, paymenReference, remark, receiptLineItemList):
    if receiptDate == None:
        receiptDate = 'null'
    else:
        receiptDate = "'" + receiptDate + "'"
    result = receipts.create(receiptNo, receiptDate, customerCode, paymenMethod, paymenReference, remark, receiptLineItemList)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Receipts Create Success.')
    return result #send result for caller program to use

def read_receipt(receipts, receiptNo):
    result = receipts.read(receiptNo) #returns tuple of (error dict, data dict)
    if result[0]['Is Error']: #in case error
        print(result[0]['Error Message'])
    else:
        print(result[1])
    return result #send result for caller program to use

def update_receipt(receipts, receiptNo, newReceiptDate, newCustomerCode, newPaymenMethod, newPaymenReference, newRemark, newReceiptLineItemList):
    if newReceiptDate == None:
        newReceiptDate = 'null'
    else:
        newReceiptDate = "'" + newReceiptDate + "'"

    result = receipts.update(receiptNo, newReceiptDate, newCustomerCode, newPaymenMethod, newPaymenReference, newRemark, newReceiptLineItemList) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Receipt Update Success.')
    return result #send result for caller program to use

def delete_receipt(receipts, receiptNo):
    result = receipts.delete(receiptNo)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Receipt Delete Success.')
    return result #send result for caller program to use


def report_list_all_receipts(receipts, invoices, customers):
    db = DBHelper()
    data, columns = db.fetch ('SELECT r.receipt_no as "Receipt No", r.receipt_date as "Receipt Date", r.customer_code as "Customer Code", c.name as "Customer Name" '
                              ', r.payment_method as "Payment Method", r.payment_reference as "Payment Reference", r.remark as "Remark", rli.amount_paid_here As "Total Receipt"'
                              ', i.invoice_no AS "Invoice No", i.Date AS "Invoice Date", i.amount_due AS "Invoice Amount Due" ,rli.amount_paid_here AS "Invoice Amount Received"'
                              'FROM receipt r JOIN receipt_line_item rli ON rli.receipt_no = r.receipt_no '
                              'JOIN customer c ON c.customer_code = r.customer_code '
                              'JOIN invoice i ON i.invoice_no = rli.invoice_no')

    #print (result)
    result = row_as_dict(data, columns)
    #printDictInCSVFormat(result, ('Receipt No',), ('Receipt Date', 'Customer Code', 'Customer Name', 'Payment Method','Payment Reference','Remark','Total Receipt','Invoice No','Invoice Date','Invoice Amount Due', 'Invoice Amount Received'))
     #send result for caller program to use
    print(str(columns)[1:-1])
    for i in data:
        s = []
        for j in i:
            s.append(str(j))
        print(', '.join(s))
    return result
```

```
def update_receipt_line(receipts, receiptNo, invoiceNo, newAmountPaid):
    result = receipts.update_receipt_line(receiptNo, invoiceNo, newAmountPaid) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Receipt Line Item Update Success.')
    return result #send result for caller program to use


def delete_receipt_line(receipts, receiptNo, invoiceNo):
    result = receipts.delete_receipt_line(receiptNo, invoiceNo) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Receipt Line Item Delete Success.')
    return result #send result for caller program to use


def report_unpaid_invoices(invoices,customers,receipts):
    db = DBHelper()
    data, columns = db.fetch (' select i.invoice_no AS "Invoice No" , i.date AS "Invoice Date" , c.name AS "Customer Name" , i.amount_due AS "Invoice Amount Due" ,'
                              'sum(rli.amount_paid_here) AS "Invoice Amount Received" , (i.amount_due - sum(rli.amount_paid_here)) As "Unpaid"'
                              ' FROM receipt r JOIN receipt_line_item rli ON rli.receipt_no = r.receipt_no '
                              'JOIN invoice i ON i.invoice_no = rli.invoice_no '
                              'JOIN customer c ON c.customer_code = i.customer_code '
                              'Group by i.invoice_no, c.name , i.amount_due;')

    #print (result)
    result = row_as_dict(data, columns)

    db = DBHelper()
    data, columns = db.fetch (' select 0 as "Footer", count(unpaid) as "Number of invoices not paid", sum(unpaid) as "Total unpaid" , sum("Amount Paid Here") as "Total Receipt"'
                          ' from (SELECT rli."invoice_no" as "Invoice No", i.date as "Invoice Date", c.name as "Customer Name" ,'
                          ' i."amount_due" as "Amount Received", SUM(rli.amount_paid_here) as "Amount Paid Here", '
                          ' (i.amount_due - sum(rli.amount_paid_here)) as "unpaid" '
                          ' FROM receipt r JOIN receipt_line_item rli ON r."receipt_no" = rli."receipt_no"'
                          ' JOIN invoice i ON i."invoice_no" = rli."invoice_no" '
                          ' JOIN customer c ON c."customer_code" = i."customer_code" '
                          ' GROUP BY rli."invoice_no" ,i."date", c."name",i."amount_due") as total_un_re;')

    #print (result)
    result2 = row_as_dict(data, columns)
    printDictInCSVFormat(result, ('Invoice No',), ('Invoice Date', 'Customer Name', 'Invoice Amount Due', 'Invoice Amount Received','Unpaid'))
    printDictInCSVFormat(result2, (None), ('Number of invoices not paid', 'Total unpaid', 'Total Receipt'))

    return result, result2
```

```python
from DBHelper import DBHelper
from helper_functions import *
#This file will contain all API functions calls exposed to outside world for users to use

# function about Product
def create_product(products, code, name, units):
    result = products.create(code, name, units)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Product Create Success.')
    return result #send result for caller program to use

def read_product(products, code):
    result = products.read(code) #returns tuple of (error dict, data dict)
    if result[0]['Is Error']: #in case error
        print(result[0]['Error Message'])
    else:
        print(result[1])
    return result #send result for caller program to use

def update_product(products, code, newName, newUnits):
    result = products.update(code, newName, newUnits) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Product Update Success.')
    return result #send result for caller program to use

def delete_product(products, code):
    result = products.delete(code)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Product Delete Success.')
    return result #send result for caller program to use

def report_list_products(products):
    result = products.dump()
    #printDictInCSVFormat(result, ('Code',), ('Name', 'Units'))
    print (result)
    return result #send result for caller program to use

# function about Customer
def create_customer(customers, customerCode, customerName, address, creditLimit, country):
    result = customers.create(customerCode, customerName, address, creditLimit, country)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Customer Create Success.')
    return result #send result for caller program to use

def read_customer(customers, customerCode):
    result = customers.read(customerCode) #returns tuple of (error dict, data dict)
    if result[0]['Is Error']: #in case error
        print(result[0]['Error Message'])
    else:
        print(result[1])
    return result #send result for caller program to use

def update_customer(customers, customerCode, newCustomerName, newAddress, newCreditLimit, newCountry):
    result = customers.update(customerCode, newCustomerName, newAddress, newCreditLimit, newCountry) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Customer Update Success.')
    return result #send result for caller program to use

def delete_customer(customers, customerCode):
    result = customers.delete(customerCode)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Customer Delete Success.')
    return result #send result for caller program to use

def report_list_all_customers(customers):
    result = customers.dump()
    printDictInCSVFormat(result, ('Customer Code',), ('Name', 'Address','Credit Limit', 'Country'))
    return result #send result for caller program to use

# function about Invoice
def create_invoice(invoices, invoiceNo, invoiceDate, customerCode, dueDate, invoiceLineTuplesList):
    if invoiceDate == None:
        invoiceDate = 'null'
    else:
        invoiceDate = "'" + invoiceDate + "'"
    if dueDate == None:
        dueDate = 'null'
    else:
        dueDate = "'" + dueDate + "'"
    result = invoices.create(invoiceNo, invoiceDate, customerCode, dueDate, invoiceLineTuplesList)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Invoice Create Success.')
    return result #send result for caller program to use

def read_invoice(invoices, invoiceNo):
    result = invoices.read(invoiceNo) #returns tuple of (error dict, data dict)
    if result[0]['Is Error']: #in case error
        print(result[0]['Error Message'])
    else:
        print(result[1])
    return result #send result for caller program to use
```

```
def update_invoice(invoices, invoiceNo, newInvoiceDate, newCustomerCode, newDueDate, newInvoiceLineTuplesList):
    if newInvoiceDate == None:
        newInvoiceDate = 'null'
    else:
        newInvoiceDate = "'" + newInvoiceDate + "'"
    if newDueDate == None:
        newDueDate = 'null'
    else:
        newDueDate = "'" + newDueDate + "'"
    result = invoices.update(invoiceNo, newInvoiceDate, newCustomerCode, newDueDate, newInvoiceLineTuplesList) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Invoice Update Success.')
    return result #send result for caller program to use

def delete_invoice(invoices, invoiceNo):
    result = invoices.delete(invoiceNo)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Invoice Delete Success.')
    return result #send result for caller program to use

def update_invoice_line(invoices, invoiceNo, productCode, newQuantity, newUnitPrice):
    result = invoices.update_invoice_line(invoiceNo, productCode, newQuantity, newUnitPrice) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Invoice Line Item Update Success.')
    return result #send result for caller program to use

def delete_invoice_line(invoices, invoiceNo, productCode):
    result = invoices.delete_invoice_line(invoiceNo, productCode) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Invoice Line Item Delete Success.')
    return result #send result for caller program to use

def report_list_all_invoices(invoices, customers, products):
    # Will dump all invoices data and return 1 dictionary as a result (with header and line item joined).
    # Please show the customer name and product name also.
    # A helper function such as def print_tabular_dictionary(tabularDictionary) can then be called to print this in a tabular (table-like) form with column headings and data.

    db = DBHelper()
    data, columns = db.fetch ('SELECT i.invoice_no as "Invoice No", i.date as "Date" '
                              ' , i.customer_code as "Customer Code", c.name as "Customer Name" '
                              ' , i.due_date as "Due Date", i.total as "Total", i.vat as "VAT", i.amount_due as "Amount Due" '
                              ' , ili.product_code as "Product Code", p.name as "Product Name" '
                              ' , ili.quantity as "Quantity", ili.unit_price as "Unit Price", ili.extended_price as "Extended Price" '
                              ' FROM invoice i JOIN customer c ON i.customer_code = c.customer_code '
                              '  JOIN invoice_line_item ili ON i.invoice_no = ili.invoice_no '
                              '  JOIN product p ON ili.product_code = p.code '
                              ' ')
    #print (result)
    result = row_as_dict(data, columns)
    printDictInCSVFormat(result, ('Invoice No',), ('Date', 'Customer Code', 'Customer Name','Due Date','Total','VAT','Amount Due'
                                                   , 'Product Code', 'Product Name', 'Quantity', 'Unit Price', 'Extended Price'))
    return result #send result for caller program to use

def report_products_sold(invoices, products, dateStart, dateEnd):
    db = DBHelper()
    data, columns = db.fetch ('SELECT p.code as "Code", ili.product_code as "Product Code", p.name as "Product Name" '
                              ' , SUM(ili.quantity) as "Total Quantity Sold", SUM(ili.extended_price) as "Total Value Sold" '
                              ' FROM invoice i JOIN invoice_line_item ili ON i.invoice_no = ili.invoice_no '
                              '   JOIN product p ON ili.product_code = p.code '
                              ' WHERE i.date between \'' + dateStart + '\' and \'' + dateEnd + '\' '
                              ' GROUP BY p.code, ili.product_code, p.name ')
    result = row_as_dict(data, columns)
    data, columns = db.fetch ('SELECT 0 as "Footer", SUM(ili.extended_price) as "Total Value Sold" '
                              ' FROM invoice i JOIN invoice_line_item ili ON i.invoice_no = ili.invoice_no '
                              '   JOIN product p ON ili.product_code = p.code '
                              ' WHERE i.date between \'' + dateStart + '\' and \'' + dateEnd + '\' '
                              ' ')
    result2 = row_as_dict(data, columns)

    printDictInCSVFormat(result, (None), ('Product Code','Product Name', 'Total Quantity Sold', 'Total Value Sold'))
    printDictInCSVFormat(result2, (None), ('Total Value Sold',))
    return result, result2

def report_customer_products_sold_list(invoices, products, customers, dateStart, dateEnd):
    db = DBHelper()
    data, columns = db.fetch ('SELECT i.customer_code, c.customer_code as "Customer Code", c.name as "Customer Name" '
                              ' , ili.product_code as "Product Code", p.name as "Product Name" '
                              ' , i.invoice_no as "Invoice No" '
                              ' , SUM(ili.quantity) as "Quantity Sold", SUM(ili.extended_price) as "Value Sold" '
                              ' FROM invoice i JOIN invoice_line_item ili ON i.invoice_no = ili.invoice_no '
                              '   JOIN customer c ON i.customer_code = c.customer_code '
                              '   JOIN product p ON ili.product_code = p.code '
                              ' WHERE i.date between \'' + dateStart + '\' and \'' + dateEnd + '\' '
                              ' GROUP BY i.customer_code, c.customer_code, c.name, i.invoice_no, ili.product_code, p.name ')
    result = row_as_dict(data, columns)
    data, columns = db.fetch ('SELECT 0 as "Footer", SUM(ili.quantity) as "Quantity Sold", SUM(ili.extended_price) as "Value Sold" '
                              ' FROM invoice i JOIN invoice_line_item ili ON i.invoice_no = ili.invoice_no '
                              '   JOIN customer c ON i.customer_code = c.customer_code '
                              '   JOIN product p ON ili.product_code = p.code '
                              ' WHERE i.date between \'' + dateStart + '\' and \'' + dateEnd + '\' '
                              ' ')
    result2 = row_as_dict(data, columns)

    printDictInCSVFormat(result, (None), ('Customer Code','Customer Name', 'Product Code', 'Product Name', 'Invoice No', 'Quantity Sold', 'Value Sold'))
    printDictInCSVFormat(result2, (None), ('Quantity Sold','Value Sold'))
    return result.values(), result2
```

```
def report_customer_products_sold_total(invoices, products, customers, dateStart, dateEnd):
    # Will return 2 dictionaries:
    # 1) a dictionary as list customers and the total number and value of products sold to them in the given date range in this format:  Customer Code, Customer Name, Product Code,  Product Name, Total Quantity Sold, Total Value Sold. Here (customer code, product code) will be unique.
    # And 2) a second footer dictionary showing: t the end also show the sum of Total Quantity Sold, sum of Total Value Sold.
    db = DBHelper()
    data, columns = db.fetch ('SELECT i.customer_code, c.customer_code as "Customer Code", c.name as "Customer Name" '
                              ' , ili.product_code as "Product Code", p.name as "Product Name" '
                              ' , SUM(ili.quantity) as "Total Quantity Sold", SUM(ili.extended_price) as "Total Value Sold" '
                              ' FROM invoice i JOIN invoice_line_item ili ON i.invoice_no = ili.invoice_no '
                              '   JOIN customer c ON i.customer_code = c.customer_code '
                              '   JOIN product p ON ili.product_code = p.code '
                              ' WHERE i.date between \'' + dateStart + '\' and \'' + dateEnd + '\' '
                              ' GROUP BY i.customer_code, c.customer_code, c.name, i.invoice_no, ili.product_code, p.name ')
    result = row_as_dict(data, columns)
    data, columns = db.fetch ('SELECT 0 as "Footer", SUM(ili.quantity) as "Total Quantity Sold", SUM(ili.extended_price) as "Total Value Sold" '
                              ' FROM invoice i JOIN invoice_line_item ili ON i.invoice_no = ili.invoice_no '
                              '   JOIN customer c ON i.customer_code = c.customer_code '
                              '   JOIN product p ON ili.product_code = p.code '
                              ' WHERE i.date between \'' + dateStart + '\' and \'' + dateEnd + '\' '
                              ' ')
    result2 = row_as_dict(data, columns)

    printDictInCSVFormat(result, (None), ('Customer Code','Customer Name', 'Product Code', 'Product Name', 'Total Quantity Sold', 'Total Value Sold'))
    printDictInCSVFormat(result2, (None), ('Total Quantity Sold','Total Value Sold'))
    return result.values(), result2

# function about Payment method
def create_PaymentMethod(PaymentMethods, paymentMethodCode, paymentMethodName):
    result = PaymentMethods.create(paymentMethodCode, paymentMethodName)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Payment Method Create Success.')
    return result #send result for caller program to use

def read_PaymentMethod(PaymentMethods, paymentMethodCode):
    result = PaymentMethods.read(paymentMethodCode) #returns tuple of (error dict, data dict)
    if result[0]['Is Error']: #in case error
        print(result[0]['Error Message'])
    else:
        print(result[1])
    return result #send result for caller program to use

def update_PaymentMethod(PaymentMethods, paymentMethodCode, newPaymentMethodName):
    result = PaymentMethods.update(paymentMethodCode, newPaymentMethodName) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Payment Method Update Success.')
    return result #send result for caller program to use

def delete_PaymentMethod(PaymentMethods, paymentMethodCode):
    result = PaymentMethods.delete(paymentMethodCode)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Payment Method Delete Success.')
    return result #send result for caller program to use

def report_list_payment_methods(PaymentMethods):
    result = PaymentMethods.dump()
    print(result)
    return result #send result for caller program to use


#function about Receipt
def create_receipt(receipts, receiptNo, receiptDate, customerCode, paymenMethod, paymenReference, remark, receiptLineItemList):
    if receiptDate == None:
        receiptDate = 'null'
    else:
        receiptDate = "'" + receiptDate + "'"
    result = receipts.create(receiptNo, receiptDate, customerCode, paymenMethod, paymenReference, remark, receiptLineItemList)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Receipts Create Success.')
    return result #send result for caller program to use

def read_receipt(receipts, receiptNo):
    result = receipts.read(receiptNo) #returns tuple of (error dict, data dict)
    if result[0]['Is Error']: #in case error
        print(result[0]['Error Message'])
    else:
        print(result[1])
    return result #send result for caller program to use

def update_receipt(receipts, receiptNo, newReceiptDate, newCustomerCode, newPaymenMethod, newPaymenReference, newRemark, newReceiptLineItemList):
    if newReceiptDate == None:
        newReceiptDate = 'null'
    else:
        newReceiptDate = "'" + newReceiptDate + "'"

    result = receipts.update(receiptNo, newReceiptDate, newCustomerCode, newPaymenMethod, newPaymenReference, newRemark, newReceiptLineItemList) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Receipt Update Success.')
    return result #send result for caller program to use
```

```
def delete_receipt(receipts, receiptNo):
    result = receipts.delete(receiptNo)#returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Receipt Delete Success.')
    return result #send result for caller program to use


def report_list_all_receipts(receipts, invoices, customers):
    db = DBHelper()
    data, columns = db.fetch ('SELECT r.receipt_no as "Receipt No", r.receipt_date as "Receipt Date", r.customer_code as "Customer Code", c.name as "Customer Name" '
                              ', r.payment_method as "Payment Method", r.payment_reference as "Payment Reference", r.remark as "Remark", rli.amount_paid_here As "Total Receipt"'
                              ', i.invoice_no AS "Invoice No", i.Date AS "Invoice Date", i.amount_due AS "Invoice Amount Due" ,rli.amount_paid_here AS "Invoice Amount Received"'
                              'FROM receipt r JOIN receipt_line_item rli ON rli.receipt_no = r.receipt_no '
                              'JOIN customer c ON c.customer_code = r.customer_code '
                              'JOIN invoice i ON i.invoice_no = rli.invoice_no')

    #print (result)
    result = row_as_dict(data, columns)
    #printDictInCSVFormat(result, ('Receipt No',), ('Receipt Date', 'Customer Code', 'Customer Name', 'Payment Method','Payment Reference','Remark','Total Receipt','Invoice No','Invoice Date','Invoice Amount Due', 'Invoice Amount Received'))
     #send result for caller program to use
    print(str(columns)[1:-1])
    for i in data:
        s = []
        for j in i:
            s.append(str(j))
        print(', '.join(s))
    return result


def update_receipt_line(receipts, receiptNo, invoiceNo, newAmountPaid):
    result = receipts.update_receipt_line(receiptNo, invoiceNo, newAmountPaid) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Receipt Line Item Update Success.')
    return result #send result for caller program to use


def delete_receipt_line(receipts, receiptNo, invoiceNo):
    result = receipts.delete_receipt_line(receiptNo, invoiceNo) #returns error dictionary
    if result['Is Error']: #if error
        print(result['Error Message'])
    else:
        print('Receipt Line Item Delete Success.')
    return result #send result for caller program to use


def report_unpaid_invoices(invoices,customers,receipts):
    db = DBHelper()
    data, columns = db.fetch (' select i.invoice_no AS "Invoice No" , i.date AS "Invoice Date" , c.name AS "Customer Name" , i.amount_due AS "Invoice Amount Due" ,'
                              'sum(rli.amount_paid_here) AS "Invoice Amount Received" , (i.amount_due - sum(rli.amount_paid_here)) As "Unpaid"'
                              ' FROM receipt r JOIN receipt_line_item rli ON rli.receipt_no = r.receipt_no '
                              'JOIN invoice i ON i.invoice_no = rli.invoice_no '
                              'JOIN customer c ON c.customer_code = i.customer_code '
                              'Group by i.invoice_no, c.name , i.amount_due;')

    #print (result)
    result = row_as_dict(data, columns)

    db = DBHelper()
    data, columns = db.fetch (' select 0 as "Footer", count(unpaid) as "Number of invoices not paid", sum(unpaid) as "Total unpaid" , sum("Amount Paid Here") as "Total Receipt"'
                          ' from (SELECT rli."invoice_no" as "Invoice No", i.date as "Invoice Date", c.name as "Customer Name" ,'
                          ' i."amount_due" as "Amount Received", SUM(rli.amount_paid_here) as "Amount Paid Here", '
                          ' (i.amount_due - sum(rli.amount_paid_here)) as "unpaid" '
                          ' FROM receipt r JOIN receipt_line_item rli ON r."receipt_no" = rli."receipt_no"'
                          ' JOIN invoice i ON i."invoice_no" = rli."invoice_no" '
                          ' JOIN customer c ON c."customer_code" = i."customer_code" '
                          ' GROUP BY rli."invoice_no" ,i."date", c."name",i."amount_due") as total_un_re;')

    #print (result)
    result2 = row_as_dict(data, columns)

    printDictInCSVFormat(result, ('Invoice No',), ('Invoice Date', 'Customer Name', 'Invoice Amount Due', 'Invoice Amount Received','Unpaid'))
    printDictInCSVFormat(result2, (None), ('Number of invoices not paid', 'Total unpaid', 'Total Receipt'))

    return result, result2
```