

```
In [1]: #-----
# Libraries used in ithis program.
#-----

import pandas as pd
from datetime import datetime
import csv
from csv import writer
```

```
In [2]: #-----
#importing letter price guide from provided csv file
#-----

path_letterprice = "Economy air letters price.csv"
letter_price = pd.read_csv(path_letterprice)

letter_price
```

Out[2]:

	Weight	Zone 1	Zone 2,3 and 5	Zone 4, 6, 7, 8 and 9
0	Up to 50g	2.1	2.3	3
1	Over 50g up to 250g	5.5	6.0	9
2	Over 250g up to 500g	11.0	12.0	18

```
In [3]: #-----
#yeilding shipping price based on index of the columns using .iloc
#-----

shipping_price = letter_price.iloc[1,1]

print('Unitprice', shipping_price)

Unitprice 5.5
```

```
In [4]: #-----
#importing parcel price guide from provided csv file
#-----

path_parcel = 'Economy Parcel sea price.csv'
parcel_price = pd.read_csv(path_parcel)

parcel_price
```

Out[4]:

	Weight	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9
0	Over 2.5 kg up to 3kg	-	-	-	42.79	-	45.94	48.20	50.59	53.11
1	Up to 5kg	-	-	-	58.92	-	63.06	66.03	69.25	72.63
2	Up to 10kg	-	-	-	97.87	-	101.78	104.83	109.03	113.39
3	Up to 15kg	-	-	-	134.26	-	144.33	151.54	159.12	167.08
4	Up to 20kg	-	-	-	165.50	-	177.91	186.81	196.15	205.96

```
In [5]: #-----
# Yeilding shipping price based on column but using name zone, using .loc
#-----
```

```
shipping_price = parcel_price.loc[0, 'Zone 6']
print(shipping_price)
```

45.94

```
In [6]: #-----
# importing countries and zones from provided csv file
# and converting them to dictionary to yeild zone no for respective country.
#-----

path_countries = "Countries_Zones.csv"
countries_zones = pd.read_csv(path_countries)
pd.set_option("max_rows", None)
countries_dict= countries_zones.set_index('Destination country')['Zones'].to_dict()
countries_dict

print(type(countries_zones)) # checking type of the countries_zones.

<class 'pandas.core.frame.DataFrame'>
```

```
In [7]: #-----
# importing sale_history csv file and checking the last sale_id using .tail
#-----

path_sale_history = "sales_history.csv"
sale_history = pd.read_csv(path_sale_history)
sale_history.tail(1)
```

```
Out[7]:
```

	sale_id	date_time	item type	weight	country name	cost
4954	2680	2020-09-28 10:39:29	Parcel	3.0	Canada	42.79

```
In [8]: #-----
# sorting the provided countries in ascending order of their zones used as a
#-----

sorted_countries = countries_zones.sort_values(by=['Zones'])
sorted_df = sorted_countries.reset_index(drop=True)
sorted_df
```

```
Out[8]:
```

	Destination country	Zones
0	New Zealand	Zone 1
1	China	Zone 2
2	Vietnam	Zone 3
3	Malaysia	Zone 3
4	Korea	Zone 3
5	Japan	Zone 3
6	Singapore	Zone 3
7	Indonesia	Zone 3
8	Hong Kong	Zone 3
9	Taiwan	Zone 3
10	India	Zone 3
11	Thailand	Zone 3
12	Canada	Zone 4
13	United States	Zone 4

	Destination country	Zones
14	Cook Islands	Zone 5
15	Philippines	Zone 5
16	New Caledonia	Zone 5
17	Nepal	Zone 5
18	Nauru	Zone 5
19	Myanmar	Zone 5
20	Vanuatu	Zone 5
21	Lao	Zone 5
22	Samoa	Zone 5
23	Tonga	Zone 5
24	Brunei Darussalam	Zone 5
25	Papua New Guinea	Zone 5
26	Cambodia	Zone 5
27	Solomon Islands	Zone 5
28	Sri Lanka	Zone 5
29	French Polynesia	Zone 5
30	Pakistan	Zone 5
31	Fiji	Zone 5
32	Ireland	Zone 6
33	United Kingdom	Zone 6
34	France	Zone 7
35	Norway	Zone 7
36	Switzerland	Zone 7
37	Sweden	Zone 7
38	Netherlands	Zone 7
39	Spain	Zone 7
40	Italy	Zone 7
41	Germany	Zone 7
42	South Africa	Zone 8
43	Portugal	Zone 8
44	Romania	Zone 8
45	Russian Federation	Zone 8
46	Ukraine	Zone 8
47	Turkey	Zone 8
48	Serbia	Zone 8
49	Poland	Zone 8
50	Slovenia	Zone 8

	Destination country	Zones
51	Malta	Zone 8
52	Finland	Zone 8
53	Austria	Zone 8
54	Macedonia	Zone 8
55	Belgium	Zone 8
56	Brazil	Zone 8
57	Croatia	Zone 8
58	Cyprus	Zone 8
59	Hungary	Zone 8
60	Greece	Zone 8
61	Czech Republic	Zone 8
62	Estonia	Zone 8
63	Denmark	Zone 8
64	Argentina	Zone 9
65	Bahrain	Zone 9
66	Chile	Zone 9
67	Nigeria	Zone 9
68	Iran	Zone 9
69	Israel	Zone 9
70	Saudi Arabia	Zone 9
71	Kenya	Zone 9
72	Kuwait	Zone 9
73	Qatar	Zone 9
74	Mauritius	Zone 9
75	Mexico	Zone 9
76	Peru	Zone 9
77	Arab Emirates	Zone 9

In [9]:

```

#-----
#creating a class for post office, stamp selling machine.
#-----

class Sale:

#-----
#Initializing the class Sale and creating, instance variables.
#-----

    def __init__ (self, counter = 0, total_cost = 0.0, item_type= ' ', \
                  cart = [], item_weight= 0.0, item_destination = ' '):

        self.item_type = item_type
        self.item_destination = item_destination
        self.item_weight = item_weight

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        self.cart = cart
        self.counter = counter
        self.total_cost = total_cost
        self.sale_id = 0

#-----
# Setting sale id
#-----

    def set_sale_id(self, n):
        self.sale_id = n

#-----
# Giving users guide to choose different options to proceed with their sale w
# as per their requirement.
#-----

    def greet(self):
        x = input("\n 1. Click q/quit to exit \n 2. Click z/zone to display l
        return x

#-----
#Validating the type of item
#-----

    def _is_valid_type(self, item_type):
        if item_type == '' or item_type != 'Letter' and item_type != 'Parcel'
            return False
        else:
            return True

#-----
#Validating the type of type of item and error handling
#-----

    def validate_item_type(self, item_type):
        if item_type == '' or item_type != 'Letter' and item_type != 'Parcel'
            raise InputError('Please try again and enter a valid item t

#-----
# Getting user input after validating the item type and storing the values to
# all inputs are converted to capitalize using .capitalize
#-----

    def _get_item_type(self):
        item_type = input("Please enter the type of item to be posted as
        self.validate_item_type(item_type)
        return item_type

#-----
#Validating the weight of an item user wants to post according to weight in k
#-----

    def _is_valid_weight(self, item_weight):
        if item_weight == 0.0 or item_weight>20:
            return False
        else:
            return True

#-----
# Validating the weight and error handling
#-----

    def validate_item_weight(self, item_weight):
        if item_weight <= 0.0 or item_weight>20:

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        raise InputError('Item weight cannot be zero / weight should be

#-----
# Getting user input after validating the weight and storing the values to cl
# all inputs are converted to float.
#-----

    def _get_item_weight(self):
        item_weight = float(input("Please enter the weight of item in kgs: "))
        self.validate_item_weight(item_weight)
        return item_weight

#-----
# Validating the destination to check whether the destination user wants is a
#-----

    def _is_valid_destination(self):
        if item_destination != countries_dict:
            return False
        else:
            return True

#-----
# Validating the destination, getting respective zone numbers when user puts
#-----

    def validate_item_destination(self, item_destination):
        if item_destination in countries_dict.keys():
            return countries_dict[item_destination]
            print( item_destination, end = " ")
            print( countries_dict[item_destination])
        else:
            print("Do not post to this country")

#-----
# Getting user input after validating the item destination and storing the va
# all inputs are converted to title using .title
#-----

    def _get_item_destination(self):
        item_destination = input("Please enter the name of the destination co
        item_zone = self.validate_item_destination(item_destination)
        return (item_zone, item_destination)

#-----
#Here indexing is used to acess variables in the cart which are not class var
#giving user the option to amend an item based on weight only.
#-----

    def amend_item(self):

        self.view_cart()

        t = input('you can amend weight in the same weight category only! \n')
        if t == 'n':
            self.user_input()
        else:
            i = int(input("Which item do you want to amend? Please put item no
            print('\n')
            w = float(input("Enter the new weight required: "))

            print('item updated')

            for x in range(len(self.cart)):
                if int(self.cart[x][0]) == i:

```

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        print('Value updated')
        self.cart[x][2] = w

    self.update_cost()

#-----
# Clearing the contents of the cart after each checkout or cancelled transact
#-----

    def clear_cart(self):
        self.cart = []

#-----
# getting the total cost of the items in the cart
#-----

    def update_cost(self):
        total = 0.0

        for i in self.cart:
            total += i[4]

        self.total_cost = total

#-----
# Updating the item no for every purchase
#-----

    def reset_itemno(self):
        self.counter = 0
        for i in self.cart:
            self.counter += 1
            i[0] = self.counter

#-----
# printing the cart for users to view while they are purchasing stamps.
#-----

    def view_cart(self):

        for each in self.cart:
            print('Item no: ', each[0], ' Item type: ', each[1], \
                  ' Weight: ', "{:.4f}".format(each[2]), ' Destination: '
                  'Unitprice: $', each[4])

        self.update_cost() # after each purchase to get the total cos

        print('The total cost of the items is: ', self.total_cost)

#-----
# This will let user decide if they want to delete the item by input y/n.
# It will print the shopping cart for user and then ask if they want to delet
# If they decided to delete the item the cart will get updated.
#-----

    def delete_items(self):
        while True:

            if len(self.cart) >= 1:

                print("Your shopping cart: \n\n")
                self.view_cart()
                print('\n\n')

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```

x = int(input("Which item do you want to delete from the cart

for i in self.cart:
    if i[0] == int(x):
        del(self.cart[int(x)-1])
print("Item deleted!")

self.update_cost()

self.reset_itemno()

y = input("Do you want to delete more items? Y/N ").lower()

if y.lower() == 'y' and len(self.cart) >= 1:
    continue
else:
    print('Cart is already empty!')

else:
    break

#-----
# This will provide users different choices to input in for price guide, zone
# or add items in the cart.If they finish or want to cancel then they can qu
#-----

def user_input(self):

    print("Welcome to the store!")
    quit = True
    while quit:
        try:
            x = self.greet().lower()
            if x == 'q' or x == 'quit': # quit if finish their purchase.
                self.clear_cart()
                self.reset_itemno()
                break
            quit == False

            elif x== 'l'or x =='letter':
                print('The price list for letter\n\n', letter_price) # vi

            elif x == 'p' or x == 'parcel':
                print('The price list for parcel\n\n', parcel_price) #vie

            elif x=='z'or x=='zone':
                print('List of countries and zones\n\n', sorted_df) #view

            elif x == 'v'or x == 'view':
                self.view_cart()
            elif x == 'd' or x == 'delete':
                self.delete_items()
            elif x=='i' or x=='invoice':
                self.checkout()
                break
            elif x == 'amend' or x== 'm':
                self.amend_item()

        else:

```



```

x == 'a' or x == 'add'

item_type = self._get_item_type()
item_destination, item_location = self._get_item_destinat
item_weight = self._get_item_weight()

# creating weight_category and shipping_price to yeild repective

weight_category = -1 # flag for weight category
shipping_price = -1 # flag for shipping price

# yeild values of different weight categories from csv files prov
if item_type.lower() == 'letter':

    if 0 < item_weight <= 0.05:
        weight_category = 0

    elif 0.05 < item_weight <= 0.25:
        weight_category = 1

    elif 0.25 < item_weight <= 0.50:
        weight_category = 2

    else: # Error handling to let users know about
        print('Sorry, we only ship letters within weight ')
        continue

    if item_destination == 'Zone 1':
        shipping_price = letter_price.iloc[weight_category]
        print('Your total shipping charges for ', item_de

    elif item_destination in {'Zone 2', 'Zone 3', 'Zone 5
        shipping_price = letter_price.iloc[weight_category]
        print('Your total shipping charges for ', item_de

    elif item_destination in {'Zone 4', 'Zone 6' 'Zone 7'
        shipping_price = letter_price.iloc[weight_category]
        print('Your total shipping charges for ', item_de

    else:
        print('sorry! we do not ship to this destination,
        continue # Error handling by letting user know

# yeild values of different weight categories from csv fil
elif item_type.lower() == 'parcel':

    if 2.5 <= item_weight <= 3:
        weight_category = 0

    elif 3 < item_weight <= 5:
        weight_category = 1

    elif 5 < item_weight <= 10:
        weight_category = 2

    elif 10 < item_weight <= 15:
        weight_category = 3

    elif 15 < item_weight <= 20:
        weight_category = 4

    else: # Error handling for weight of parcels
        print('Sorry, we only ship parcels within weight ')
        continue

```



```

for i in self.cart:
    formatted_str += 'Item no: ' + str(i[0]) + ' ' + 'Item type: ' + str(i[1]) + ' ' + 'Weight: ' + str( "{:.4f}".format(i[2])) + ' kg ' + ' ' + 'Destination: ' + str(i[3]) + ' ' + 'Unit price: $' + str( "{:.2f}".format(i[4])) + '\n'

formatted_str += 'Total Cost: ' + str(self.total_cost)

formatted_str += '\n\n' + '-----End of Invoice-----' + '\n\n'

for i in self.cart:
    formatted_str += '-----Purchased Stamps -----' + '\n\n\n'

    formatted_str += i[1] + '\nDestination: ' + i[3] + ' ' + 'Weight: ' + str(i[2]) + '\n'

    formatted_str += '-----'

invoice = open(time1+'.txt', 'wt')
invoice.write(formatted_str)

#-----

self.record() #saving record to sale history file.

self.clear_cart()

#a = Sale()
#a.user_input()

```

```

In [ ]: #-----

        # starting point to the program which serves one customer at a time.
#-----

def main():

    s = Sale()

    while True :

        print("Welcome")

        x = input("No more users! press enter start!") #checkpoint to make s
        if x.lower() == 'exit':                          # so new transaction can start
            break

        user = input("Please enter your name: ")

        nomore = True if x.lower() == 'exit' else False

        # Read the sale file to yeild last sale number and append accordingly
        sale_history = pd.read_csv("sales_history.csv")

        # last sale number
        last_sale = int(sale_history.tail(1).sale_id)

        s.set_sale_id(last_sale+1) #incrementing sale id by pevious sale id

        s.user_input() # starting to choose different options for post and

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```
s.clear_cart() # making sure cart is clear after each completed tran

print('Sale for ', user, ' completed!')
```

```
main()
```

Welcome

No more users! press enter start!

Please enter your name: ash

Welcome to the store!

1. Click q/quit to exit
2. Click z/zone to display list of countries and zones.
3. Click p/parcel to display the price list for parcels.
5. Click l/letter to display the price list for letters.
6. Click v/view to veiw the items in the cart items.
7. Click m/amend to amend the weight of the item.
8. Click d/delete to remove items from the cart.
9. Click i/invoice to get the invoice and checkout.
10. Click a/add to add items to the cart.

z

List of countries and zones

	Destination country	Zones
0	New Zealand	Zone 1
1	China	Zone 2
2	Vietnam	Zone 3
3	Malaysia	Zone 3
4	Korea	Zone 3
5	Japan	Zone 3
6	Singapore	Zone 3
7	Indonesia	Zone 3
8	Hong Kong	Zone 3
9	Taiwan	Zone 3
10	India	Zone 3
11	Thailand	Zone 3
12	Canada	Zone 4
13	United States	Zone 4
14	Cook Islands	Zone 5
15	Philippines	Zone 5
16	New Caledonia	Zone 5
17	Nepal	Zone 5
18	Nauru	Zone 5
19	Myanmar	Zone 5
20	Vanuatu	Zone 5
21	Lao	Zone 5
22	Samoa	Zone 5
23	Tonga	Zone 5
24	Brunei Darussalam	Zone 5
25	Papua New Guinea	Zone 5
26	Cambodia	Zone 5
27	Solomon Islands	Zone 5
28	Sri Lanka	Zone 5
29	French Polynesia	Zone 5
30	Pakistan	Zone 5
31	Fiji	Zone 5
32	Ireland	Zone 6
33	United Kingdom	Zone 6
34	France	Zone 7
35	Norway	Zone 7
36	Switzerland	Zone 7
37	Sweden	Zone 7
38	Netherlands	Zone 7
39	Spain	Zone 7
40	Italy	Zone 7
41	Germany	Zone 7
42	South Africa	Zone 8
43	Portugal	Zone 8

44	Romania	Zone 8
45	Russian Federation	Zone 8
46	Ukraine	Zone 8
47	Turkey	Zone 8
48	Serbia	Zone 8
49	Poland	Zone 8
50	Slovenia	Zone 8
51	Malta	Zone 8
52	Finland	Zone 8
53	Austria	Zone 8
54	Macedonia	Zone 8
55	Belgium	Zone 8
56	Brazil	Zone 8
57	Croatia	Zone 8
58	Cyprus	Zone 8
59	Hungary	Zone 8
60	Greece	Zone 8
61	Czech Republic	Zone 8
62	Estonia	Zone 8
63	Denmark	Zone 8
64	Argentina	Zone 9
65	Bahrain	Zone 9
66	Chile	Zone 9
67	Nigeria	Zone 9
68	Iran	Zone 9
69	Israel	Zone 9
70	Saudi Arabia	Zone 9
71	Kenya	Zone 9
72	Kuwait	Zone 9
73	Qatar	Zone 9
74	Mauritius	Zone 9
75	Mexico	Zone 9
76	Peru	Zone 9
77	Arab Emirates	Zone 9

1. Click q/quit to exit
2. Click z/zone to display list of countries and zones.
3. Click p/parcel to display the price list for parcels.
5. Click l/letter to display the price list for letters.
6. Click v/view to view the items in the cart items.
7. Click m/amend to amend the weight of the item.
8. Click d/delete to remove items from the cart.
9. Click i/invoice to get the invoice and checkout.
10. Click a/add to add items to the cart.

p

The price list for parcel

		Weight	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
\									
0	Over 2.5 kg up to 3kg	-	-	-	42.79	-	45.94	48.20	
1	Up to 5kg	-	-	-	58.92	-	63.06	66.03	
2	Up to 10kg	-	-	-	97.87	-	101.78	104.83	
3	Up to 15kg	-	-	-	134.26	-	144.33	151.54	
4	Up to 20kg	-	-	-	165.50	-	177.91	186.81	

	Zone 8	Zone 9
0	50.59	53.11
1	69.25	72.63
2	109.03	113.39
3	159.12	167.08
4	196.15	205.96

1. Click q/quit to exit
2. Click z/zone to display list of countries and zones.
3. Click p/parcel to display the price list for parcels.
5. Click l/letter to display the price list for letters.
6. Click v/view to view the items in the cart items.
7. Click m/amend to amend the weight of the item.
8. Click d/delete to remove items from the cart.

9. Click i/invoice to get the invoice and checkout.
10. Click a/add to add items to the cart.

1

The price list for letter

	Weight	Zone 1	Zone 2,3 and 5	Zone 4, 6, 7, 8 and 9
0	Up to 50g	2.1	2.3	3
1	Over 50g up to 250g	5.5	6.0	9
2	Over 250g up to 500g	11.0	12.0	18

1. Click q/quit to exit
2. Click z/zone to display list of countries and zones.
3. Click p/parcel to display the price list for parcels.
5. Click l/letter to display the price list for letters.
6. Click v/view to view the items in the cart items.
7. Click m/amend to amend the weight of the item.
8. Click d/delete to remove items from the cart.
9. Click i/invoice to get the invoice and checkout.
10. Click a/add to add items to the cart.

v

The total cost of the items is: 0.0

```
In [ ]: #-----
# Test case 1: validating and checking if countries are present in the dictio
#-----

def valid_destination(countries_dict, key):
    if key in countries_dict.keys():
        print("Present ", key, end = " ")
        print(countries_dict[key])
    else:
        print("Not present")

valid_destination(countries_dict, 'Australia')
```

```
In [ ]: #-----
# Test case 2 adding item to cart
#-----

def add_to_cart(items):
    cart = []

    for i in items:
        if i in cart:
            print("item already in cart")
        else:
            cart.append(i)
            print("item added to cart")
            print(cart)
```

```
In [ ]: #-----
# Test Case 3 validating the price of the item
#-----

def _is_valid_price(item_price):
    if item_price < 0.0:
        return False
    else:
        return True

_is_valid_price(2.30)
```