CAC_FINALCODE_22112028

April 15, 2023

[3]:
```
class Chocolate:
    def __init__(self, Name, Price, Cocoa_Percentage):
        self.Name = Name
        self.Price = Price
        self.Cocoa_Percentage = Cocoa_Percentage

def Display(D):
    for i in range(20):
        print(D[i].Name, D[i].Price, D[i].Cocoa_Percentage)

def LinearSearch(D, n, k):
    for j in range(0, n):
        if D[j].Price == k:
            return j
    return -1

def BinarySearch(D, k, low, high):
    while low <= high:
        mid = low + (high - low)//2
        if D[mid].Price == k:
            return mid
        elif D[mid].Price < k:
            low = mid + 1
        else:
            high = mid - 1
    return -1

def BubbleSort(D):
    n = len(D)

    for i in range(n):
        for j in range(0, n-i-1):
            if D[j].Cocoa_Percentage > D[ j + 1].Cocoa_Percentage:
                D[j], D[j + 1] = D[j + 1], D[j]

def merge(D, l, m, r):
    n1 = m - l + 1
```

```
    n2 = r - m

    L = [0] * (n1)
    R = [0] * (n2)

    for i in range(0, n1):
        L[i] = Chocolate("", 0, D[l + i].Cocoa_Percentage)

    for j in range(0, n2):
        R[j] = Chocolate("", 0, D[m + 1 + j].Cocoa_Percentage)

    i = 0
    j = 0
    k = l

    while i < n1 and j < n2 :
        if L[i].Cocoa_Percentage <= R[j].Cocoa_Percentage:
            D[k].Cocoa_Percentage = L[i].Cocoa_Percentage
            i += 1
        else:
            D[k].Cocoa_Percentage = R[j].Cocoa_Percentage
            j += 1
        k += 1

    while i < n1:
        D[k].Cocoa_Percentage = L[i].Cocoa_Percentage
        i += 1
        k += 1

    while j < n2:
        D[k].Cocoa_Percentage = R[j].Cocoa_Percentage
        j += 1
        k += 1
def mergeSort(D,l,r):
    for i in range(l, r + 1):
        if l < r:
            m = (l+(r-1))//2
            mergeSort(D, l, m)
            mergeSort(D, m+1, r)
            merge(D, l, m, r)

def main():
    D = []

    for i in range(20):
        name = input("Enter name of Chocolate: ")
        price = float(input("Enter price of Chocolate: "))
```

```
        Cocoa_Percentage = float(input("Enter Cocoa Percentage of Chocolate: "))
        D.append(Chocolate(name, price, Cocoa_Percentage))

    while True:
        print("1 - Display all the Chocolates")
        print("2 - Search the Name of the Chocolate by entering Price and using␣
↪Linear Search Method")
        print("3 - Search the Name of the Chocolate by entering Price and using␣
↪Binary Search Method ")
        print("4 - Sorting the Chocolates on the basis of their Cocoa␣
↪Percentage using Bubble Sort Method")
        print("5 - Sorting the Chocolates on the basis of their Cocoa␣
↪Percentage using Merge Sort Method")
        print("0 - Exit")

        ch = int(input("Enter your choice: "))
        if ch == 0:
            print("Exit")
            break

        if ch == 1:
            print("Name", "Prices", "Cocoa-Percentage")
            Display(D)

        if ch == 2:
            k = int(input("Enter the Price of the Chocolate that you want to␣
↪search: "))
            n = len(D)
            result = LinearSearch(D, n, k)

            if(result == -1):
                print("Chocolate not found")
            else:

                print("The details of the Chocolate that you wanted to search␣
↪is: ", D[result].Name, D[result].Price, D[result].Cocoa_Percentage)

        if ch == 3:
                k = int(input("Enter the Price of the Chocolate that you want␣
↪to search: "))
                n = len(D)
                result = BinarySearch(D, k, 0, len(D)-1)
                if result != -1:
                    print("The details of the Chocolate that you wanted to␣
↪search is: ", D[result].Name, D[result].Price, D[result].Cocoa_Percentage)
                else:
```

```
                    print("Not-Found")
        if ch == 4:
            BubbleSort(D)
            print("Your Sorted array of Chocolates on the basis of␣
 ↪Cocoa-Percentage is: ")
            for i in range(20):
                print(D[i].Name, D[i].Price, D[i].Cocoa_Percentage)

        if ch == 5:
            n = len(D)
            mergeSort(D,0,n-1)
            print("\n\n Sorted array of Chocolates on the basis of␣
 ↪Cocoa-Percentage is: ")
            for i in range(n):
                print(D[i].Name, D[i].Price, D[i].Cocoa_Percentage)


main()
```

```
Enter name of Chocolate: Munch
Enter price of Chocolate: 20
Enter Cocoa Percentage of Chocolate: 5
Enter name of Chocolate: Kitkat
Enter price of Chocolate: 45
Enter Cocoa Percentage of Chocolate: 18
Enter name of Chocolate: Bournville
Enter price of Chocolate: 80
Enter Cocoa Percentage of Chocolate: 26
Enter name of Chocolate: Amul Dark
Enter price of Chocolate: 120
Enter Cocoa Percentage of Chocolate: 99
Enter name of Chocolate: Choco Moco
Enter price of Chocolate: 12
Enter Cocoa Percentage of Chocolate: 3
Enter name of Chocolate: Melody
Enter price of Chocolate: 2
Enter Cocoa Percentage of Chocolate: 8
Enter name of Chocolate: Twix
Enter price of Chocolate: 65
Enter Cocoa Percentage of Chocolate: 27
Enter name of Chocolate: Snickers
Enter price of Chocolate: 25
Enter Cocoa Percentage of Chocolate: 46
Enter name of Chocolate: Ferrero Rocher
Enter price of Chocolate: 400
Enter Cocoa Percentage of Chocolate: 55
```

```
Enter name of Chocolate: Toblerone
Enter price of Chocolate: 280
Enter Cocoa Percentage of Chocolate: 37
Enter name of Chocolate: Lotus DC
Enter price of Chocolate: 210
Enter Cocoa Percentage of Chocolate: 78
Enter name of Chocolate: Hershey's Milk
Enter price of Chocolate: 70
Enter Cocoa Percentage of Chocolate: 22
Enter name of Chocolate: Hershey's DC
Enter price of Chocolate: 85
Enter Cocoa Percentage of Chocolate: 92
Enter name of Chocolate: Pacari
Enter price of Chocolate: 550
Enter Cocoa Percentage of Chocolate: 41
Enter name of Chocolate: Lotte
Enter price of Chocolate: 150
Enter Cocoa Percentage of Chocolate: 17
Enter name of Chocolate: Ghiradelli
Enter price of Chocolate: 420
Enter Cocoa Percentage of Chocolate: 65
Enter name of Chocolate: Lindt
Enter price of Chocolate: 600
Enter Cocoa Percentage of Chocolate: 90
Enter name of Chocolate: Fabelle
Enter price of Chocolate: 320
Enter Cocoa Percentage of Chocolate: 83
Enter name of Chocolate: Perk
Enter price of Chocolate: 10
Enter Cocoa Percentage of Chocolate: 6
Enter name of Chocolate: Waffy
Enter price of Chocolate: 35
Enter Cocoa Percentage of Chocolate: 2
1 - Display all the Chocolates
2 - Search the Name of the Chocolate by entering Price and using Linear Search
Method
3 - Search the Name of the Chocolate by entering Price and using Binary Search
Method
4 - Sorting the Chocolates on the basis of their Cocoa Percentage using Bubble
Sort Method
5 - Sorting the Chocolates on the basis of their Cocoa Percentage using Merge
Sort Method
0 - Exit
Enter your choice: 1
Name Prices Cocoa-Percentage
Munch 20.0 5.0
Kitkat 45.0 18.0
Bournville 80.0 26.0
```

```
Amul Dark 120.0 99.0
Choco Moco 12.0 3.0
Melody 2.0 8.0
Twix 65.0 27.0
Snickers 25.0 46.0
Ferrero Rocher 400.0 55.0
Toblerone 280.0 37.0
Lotus DC 210.0 78.0
Hershey's Milk 70.0 22.0
Hershey's DC 85.0 92.0
Pacari 550.0 41.0
Lotte 150.0 17.0
Ghiradelli 420.0 65.0
Lindt 600.0 90.0
Fabelle 320.0 83.0
Perk 10.0 6.0
Waffy 35.0 2.0
1 - Display all the Chocolates
2 - Search the Name of the Chocolate by entering Price and using Linear Search
Method
3 - Search the Name of the Chocolate by entering Price and using Binary Search
Method
4 - Sorting the Chocolates on the basis of their Cocoa Percentage using Bubble
Sort Method
5 - Sorting the Chocolates on the basis of their Cocoa Percentage using Merge
Sort Method
0 - Exit
Enter your choice: 2
Enter the Price of the Chocolate that you want to search: 400
The details of the Chocolate that you wanted to search is:  Ferrero Rocher 400.0
55.0
1 - Display all the Chocolates
2 - Search the Name of the Chocolate by entering Price and using Linear Search
Method
3 - Search the Name of the Chocolate by entering Price and using Binary Search
Method
4 - Sorting the Chocolates on the basis of their Cocoa Percentage using Bubble
Sort Method
5 - Sorting the Chocolates on the basis of their Cocoa Percentage using Merge
Sort Method
0 - Exit
Enter your choice: 3
Enter the Price of the Chocolate that you want to search: 320
The details of the Chocolate that you wanted to search is:  Fabelle 320.0 83.0
1 - Display all the Chocolates
2 - Search the Name of the Chocolate by entering Price and using Linear Search
Method
3 - Search the Name of the Chocolate by entering Price and using Binary Search
```

```
Method
4 - Sorting the Chocolates on the basis of their Cocoa Percentage using Bubble
Sort Method
5 - Sorting the Chocolates on the basis of their Cocoa Percentage using Merge
Sort Method
0 - Exit
Enter your choice: 4
Your Sorted array of Chocolates on the basis of Cocoa-Percentage is:
Waffy 35.0 2.0
Choco Moco 12.0 3.0
Munch 20.0 5.0
Perk 10.0 6.0
Melody 2.0 8.0
Lotte 150.0 17.0
Kitkat 45.0 18.0
Hershey's Milk 70.0 22.0
Bournville 80.0 26.0
Twix 65.0 27.0
Toblerone 280.0 37.0
Pacari 550.0 41.0
Snickers 25.0 46.0
Ferrero Rocher 400.0 55.0
Ghiradelli 420.0 65.0
Lotus DC 210.0 78.0
Fabelle 320.0 83.0
Lindt 600.0 90.0
Hershey's DC 85.0 92.0
Amul Dark 120.0 99.0
1 - Display all the Chocolates
2 - Search the Name of the Chocolate by entering Price and using Linear Search
Method
3 - Search the Name of the Chocolate by entering Price and using Binary Search
Method
4 - Sorting the Chocolates on the basis of their Cocoa Percentage using Bubble
Sort Method
5 - Sorting the Chocolates on the basis of their Cocoa Percentage using Merge
Sort Method
0 - Exit
Enter your choice: 5


 Sorted array of Chocolates on the basis of Cocoa-Percentage is:
Waffy 35.0 2.0
Choco Moco 12.0 3.0
Munch 20.0 5.0
Perk 10.0 6.0
Melody 2.0 8.0
Lotte 150.0 17.0
```

```
Kitkat 45.0 18.0
Hershey's Milk 70.0 22.0
Bournville 80.0 26.0
Twix 65.0 27.0
Toblerone 280.0 37.0
Pacari 550.0 41.0
Snickers 25.0 46.0
Ferrero Rocher 400.0 55.0
Ghiradelli 420.0 65.0
Lotus DC 210.0 78.0
Fabelle 320.0 83.0
Lindt 600.0 90.0
Hershey's DC 85.0 92.0
Amul Dark 120.0 99.0
1 - Display all the Chocolates
2 - Search the Name of the Chocolate by entering Price and using Linear Search
Method
3 - Search the Name of the Chocolate by entering Price and using Binary Search
Method
4 - Sorting the Chocolates on the basis of their Cocoa Percentage using Bubble
Sort Method
5 - Sorting the Chocolates on the basis of their Cocoa Percentage using Merge
Sort Method
0 - Exit
Enter your choice: 0
Exit
```

[ ]: