Practical File (CS)

Kunal Kumar

Roll No.: 21

Class: 12 A

Practical 1

Aim

Write a python program to search first occurrence of an element in a list by using Linear search and display frequency of each element present in list (List and search element should be entered by user).

Solution

```python
input_lst = eval(input("Enter a List: "))

search_ele = input("Enter the element to search: ")


# Searches for an element in list

def list_search(lst, search):

    ele_found = False

    for i in lst:

        if str(i) == search:

            ele_found = True

            print(f"{i} first occurred in list at index: {lst.index(i)}")

            break


    if ele_found == False:

        print("Element Not Found")


# Checks frequency of all elements in list

def list_freq_ele(lst):

    checked = []

    for i in lst:

        if i not in checked:

            print(f"Frequency of {i}: {lst.count(i)}")

            checked.append(i)

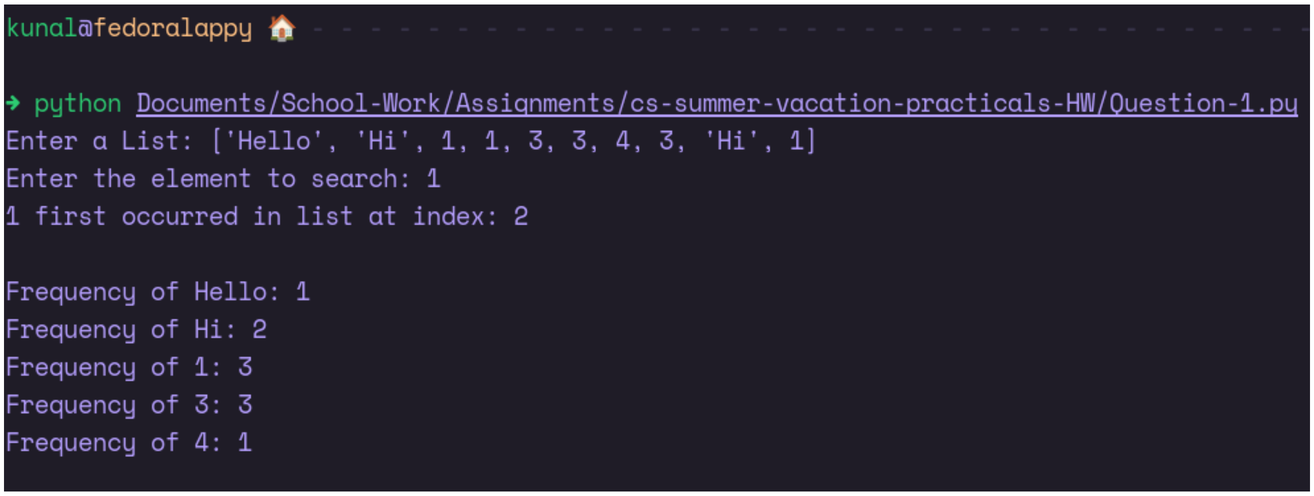

# Function Calls

list_search(input_lst, search_ele)

print()

list_freq_ele(input_lst)
```

Output



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➜ python Documents/School-Work/Assignments/cs-summer-vacation-practicals-HW/Question-1.py
Enter a List: ['Hello', 'Hi', 1, 1, 3, 3, 4, 3, 'Hi', 1]
Enter the element to search: 1
1 first occurred in list at index: 2

Frequency of Hello: 1
Frequency of Hi: 2
Frequency of 1: 3
Frequency of 3: 3
Frequency of 4: 1
```

Practical 2

Aim

Write a python program to sort elements of a list in ascending and descending order by using bubble sort. Write user defined function.

Solution

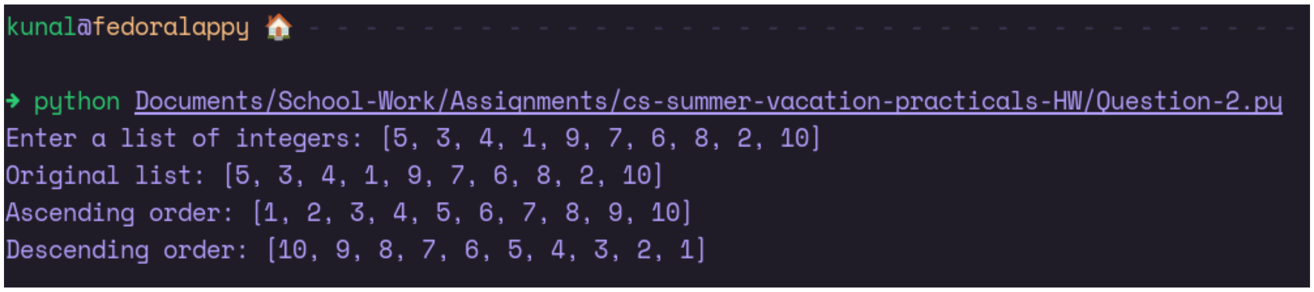
```python
input_lst = eval(input("Enter a list of integers: "))


# Function to sort list in ascending order through bubble sort
def bubble_sort_asc(lst):
    for i in range(len(lst) - 1):
        for j in range(len(lst) - 1 - i):
            if lst[j] > lst[j + 1]:
                lst[j], lst[j + 1] = lst[j + 1], lst[j]


# Function to srt list in descending order through bubble sort
def bubble_sort_desc(lst):
    for i in range(len(lst) - 1):
        for j in range(len(lst) - 1 - i):
            if lst[j] < lst[j + 1]:
                lst[j], lst[j + 1] = lst[j + 1], lst[j]


# Function Calls
print("Original list:", input_lst)
bubble_sort_asc(input_lst)
print("Ascending order:", input_lst)
bubble_sort_desc(input_lst)
print("Descending order:", input_lst)
```

Output



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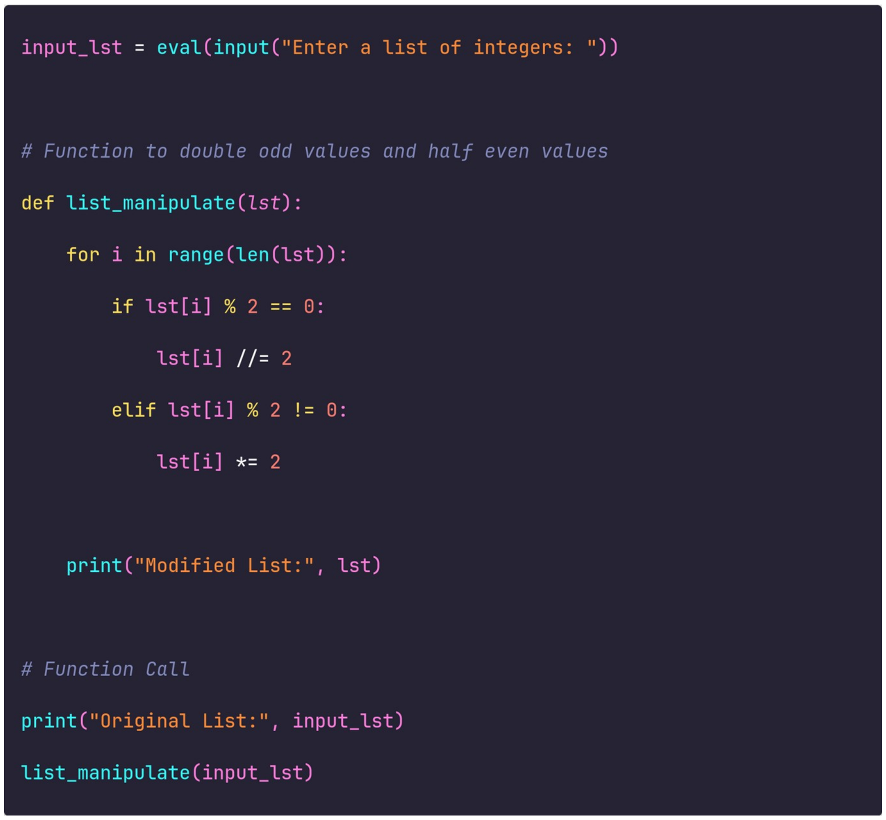
➜ python Documents/School-Work/Assignments/cs-summer-vacation-practicals-HW/Question-2.py
Enter a list of integers: [5, 3, 4, 1, 9, 7, 6, 8, 2, 10]
Original list: [5, 3, 4, 1, 9, 7, 6, 8, 2, 10]
Ascending order: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
Descending order: [10, 9, 8, 7, 6, 5, 4, 3, 2, 1]
```

Practical 3

Aim

Write a python program using function to pass list to a function and double the odd values and half even values of a list and display list element after changing.

Solution



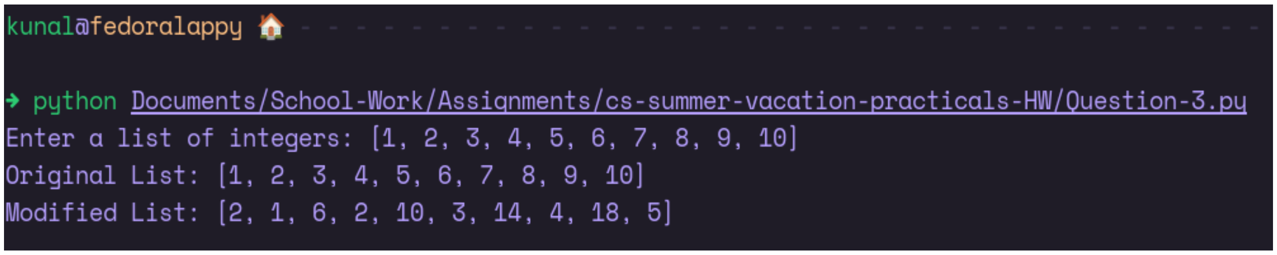
```python
input_lst = eval(input("Enter a list of integers: "))


# Function to double odd values and half even values
def list_manipulate(lst):
    for i in range(len(lst)):
        if lst[i] % 2 == 0:
            lst[i] //= 2
        elif lst[i] % 2 != 0:
            lst[i] *= 2

    print("Modified List:", lst)


# Function Call
print("Original List:", input_lst)
list_manipulate(input_lst)
```

Output



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➜ python Documents/School-Work/Assignments/cs-summer-vacation-practicals-HW/Question-3.py
Enter a list of integers: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
Original List: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
Modified List: [2, 1, 6, 2, 10, 3, 14, 4, 18, 5]
```

Practical 4

Aim

Write a Python program input n numbers in tuple and count how many even and odd numbers are entered.

Solution

```python
input_tup = eval(input("Enter a tuple of integers: "))

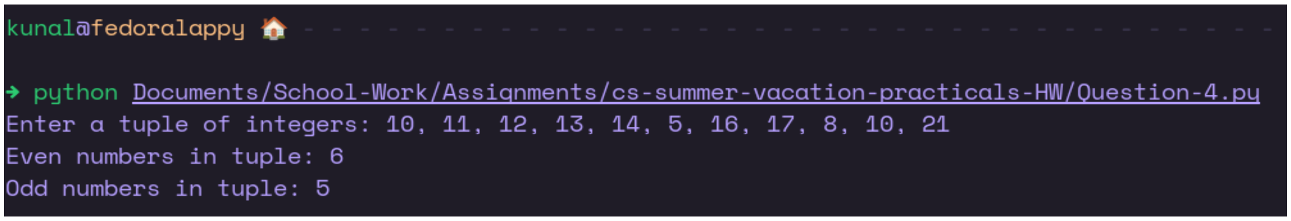

# Function to count the number of even and odd numbers in tuple
def even_odd_count(tup):
    even_count = 0
    odd_count = 0

    for i in tup:
        if i % 2 == 0:
            even_count += 1
        elif i % 2 != 0:
            odd_count += 1

    print("Even numbers in tuple:", even_count)
    print("Odd numbers in tuple:", odd_count)

# Function Calls
even_odd_count(input_tup)
```

Output



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➜ python Documents/School-Work/Assignments/cs-summer-vacation-practicals-HW/Question-4.py
Enter a tuple of integers: 10, 11, 12, 13, 14, 5, 16, 17, 8, 10, 21
Even numbers in tuple: 6
Odd numbers in tuple: 5
```

Practical 5

Aim

Write a menu driven program in python to delete name of a student from dictionary and to search phone no of a student by student name. Create menu as below:

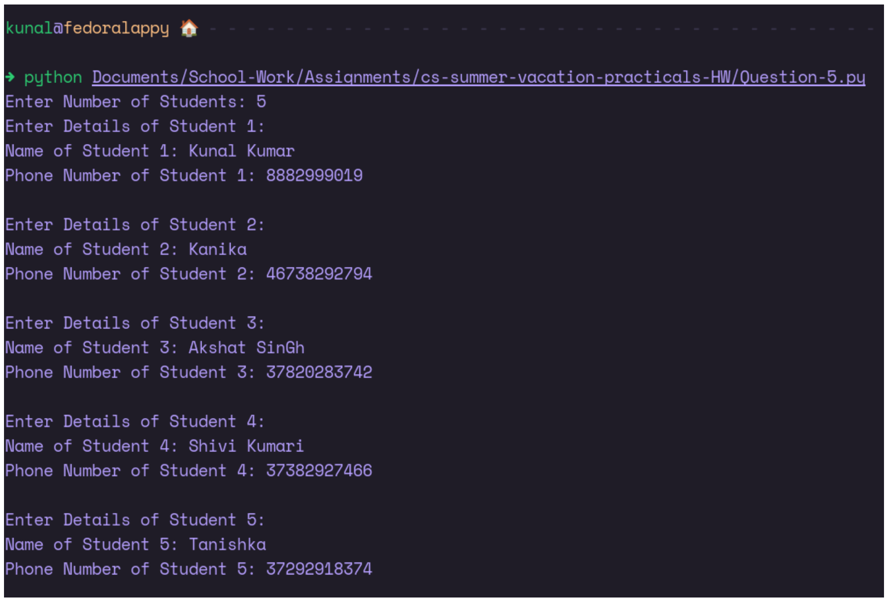
******MENU*******

1. Delete from Dictionary

2. Search Phone number using name from Dictionary

3. Exit

Output



```
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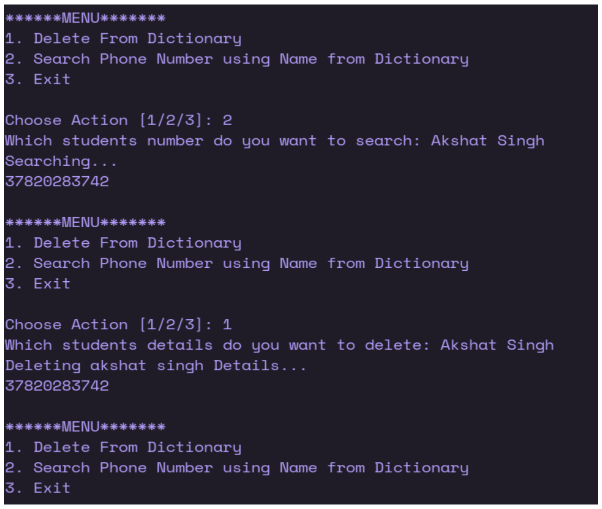
➜ python Documents/School-Work/Assignments/cs-summer-vacation-practicals-HW/Question-5.py
Enter Number of Students: 5
Enter Details of Student 1:
Name of Student 1: Kunal Kumar
Phone Number of Student 1: 8882999019

Enter Details of Student 2:
Name of Student 2: Kanika
Phone Number of Student 2: 46738292794

Enter Details of Student 3:
Name of Student 3: Akshat SinGh
Phone Number of Student 3: 37820283742

Enter Details of Student 4:
Name of Student 4: Shivi Kumari
Phone Number of Student 4: 37382927466

Enter Details of Student 5:
Name of Student 5: Tanishka
Phone Number of Student 5: 37292918374
```



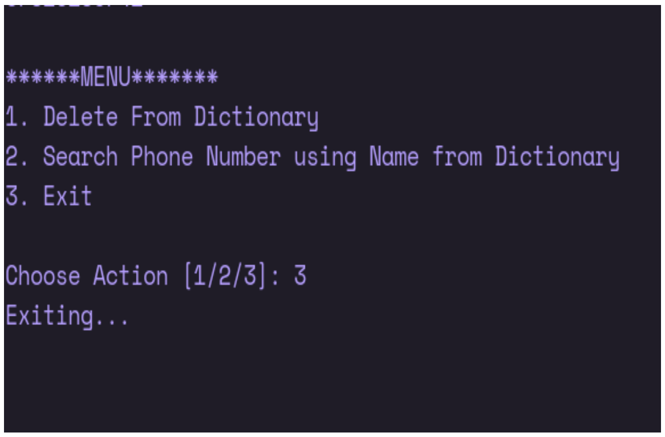
```
******MENU*******
1. Delete From Dictionary
2. Search Phone Number using Name from Dictionary
3. Exit

Choose Action [1/2/3]: 2
Which students number do you want to search: Akshat Singh
Searching...
37820283742

******MENU*******
1. Delete From Dictionary
2. Search Phone Number using Name from Dictionary
3. Exit

Choose Action [1/2/3]: 1
Which students details do you want to delete: Akshat Singh
Deleting akshat singh Details...
37820283742

******MENU*******
1. Delete From Dictionary
2. Search Phone Number using Name from Dictionary
3. Exit
```



```
******MENU*******
1. Delete From Dictionary
2. Search Phone Number using Name from Dictionary
3. Exit

Choose Action [1/2/3]: 3
Exiting...
```

Solution

```
# Dictionary Creation and Inputs
student_dict = {}
n = int(input("Enter Number of Students: "))
for i in range(n):
    print(f"Enter Details of Student {i+1}:")
    name = input(f"Name of Student {i+1}: ")
    phone_no = int(input(f"Phone Number of Student {i+1}: "))
    student_dict[name.lower()] = phone_no
    print()

# Menu
while True:
    print("""******MENU*******
1. Delete From Dictionary
2. Search Phone Number using Name from Dictionary
3. Exit
""")
    option = input("Choose Action [1/2/3]: ")
```

```
    if option == "1":
        del_name = input("Which students details do you want to delete: ")
        print(f"Deleting {del_name.lower()} Details...")
        print(student_dict.pop(del_name.lower(),
"Student Not Found! Try Again."))
        print()
    elif option == "2":
        search_name = input(
"Which students number do you want to search: ")
        print("Searching...")
        print(student_dict.get(search_name.lower(),
"Student Not Found! Try Again."))
        print()
    elif option == "3":
        print("Exiting...")
        break
    else:
        print("Invalid Action! Please Enter Valid Action.")
        print()
```

Practical 6

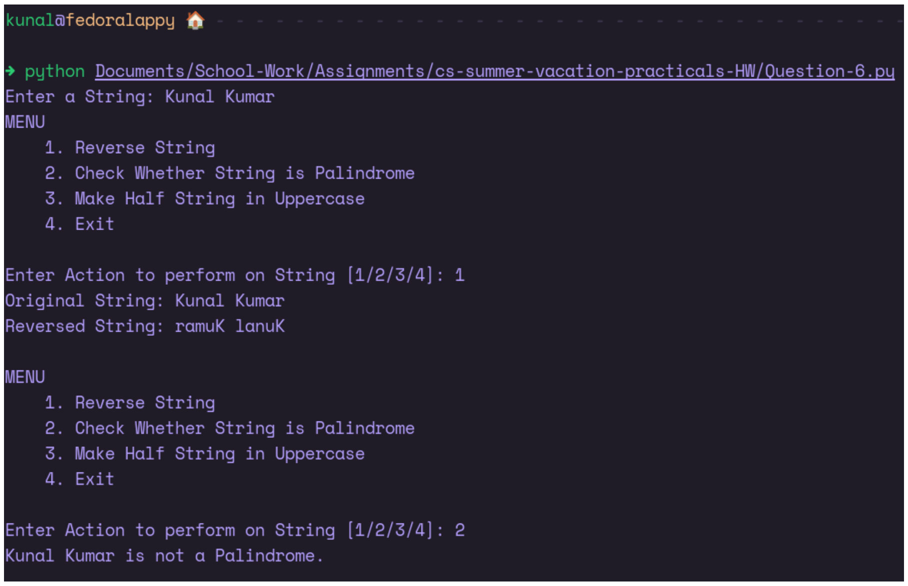
Aim

Write a menu driven program in python to do following

MENU

1. Reverse String
2. Check Whether string is Palindrome
3. Make half string in Uppercase
4. Exit

Output



```
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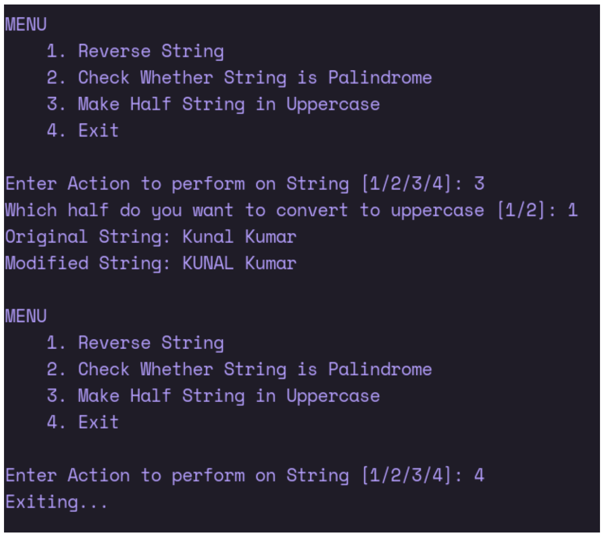
➜ python Documents/School-Work/Assignments/cs-summer-vacation-practicals-HW/Question-6.py
Enter a String: Kunal Kumar
MENU
    1. Reverse String
    2. Check Whether String is Palindrome
    3. Make Half String in Uppercase
    4. Exit

Enter Action to perform on String [1/2/3/4]: 1
Original String: Kunal Kumar
Reversed String: ramuK lanuK

MENU
    1. Reverse String
    2. Check Whether String is Palindrome
    3. Make Half String in Uppercase
    4. Exit

Enter Action to perform on String [1/2/3/4]: 2
Kunal Kumar is not a Palindrome.
```



```
MENU
    1. Reverse String
    2. Check Whether String is Palindrome
    3. Make Half String in Uppercase
    4. Exit

Enter Action to perform on String [1/2/3/4]: 3
Which half do you want to convert to uppercase [1/2]: 1
Original String: Kunal Kumar
Modified String: KUNAL Kumar

MENU
    1. Reverse String
    2. Check Whether String is Palindrome
    3. Make Half String in Uppercase
    4. Exit

Enter Action to perform on String [1/2/3/4]: 4
Exiting...
```

Solution

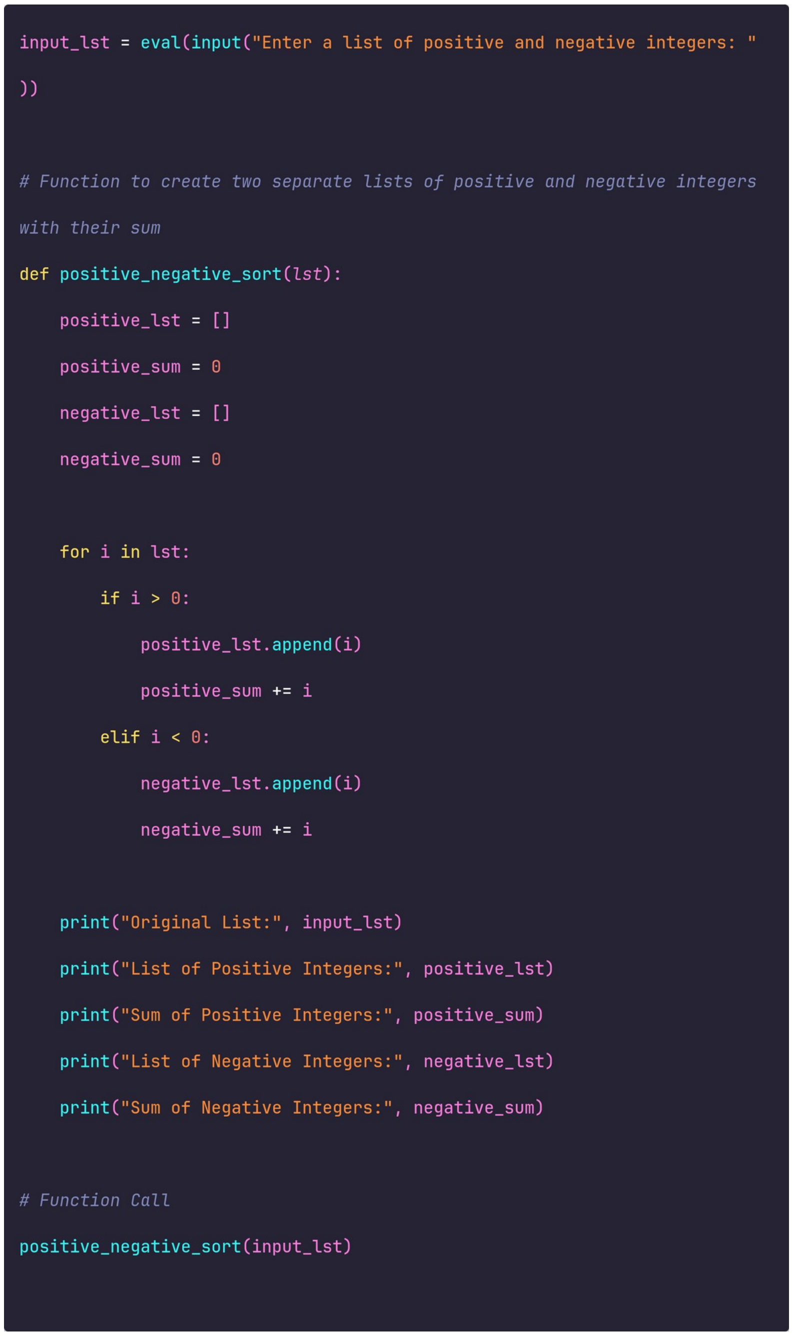
```python
main_str = input("Enter a String: ")


# Menu
while True:
    print("""MENU
    1. Reverse String
    2. Check Whether String is Palindrome
    3. Make Half String in Uppercase
    4. Exit
""")
    option = input("Enter Action to perform on String [1/2/3/4]: ")


    if option == "1":
        rev_str = main_str[::-1]
        print("Original String:", main_str)
        print("Reversed String:", rev_str)
        print()
    elif option == "2":
        if main_str == main_str[::-1]:
            print(f"{main_str} is a Palindrome.")
        else:
            print(f"{main_str} is not a Palindrome.")
        print()
    elif option == "3":
        half_option = input(
"Which half do you want to convert to uppercase [1/2]: ")
        if half_option == "1":
            upper_str = main_str[:len(main_str)//2].upper() + main_str[len
(main_str)//2:]
            print("Original String:", main_str)
            print("Modified String:", upper_str)
        elif half_option == "2":
            upper_str = main_str[:len(main_str)//2] + main_str[len
(main_str)//2:].upper()
            print("Original String:", main_str)
            print("Modified String:", upper_str)
        else:
            print("Invalid Option! Try Again.")
        print()
    elif option == "4":
        print("Exiting...")
        break
    else:
        print("Invalid Option! Try Again.")
        print()
```

Practical 7

Aim

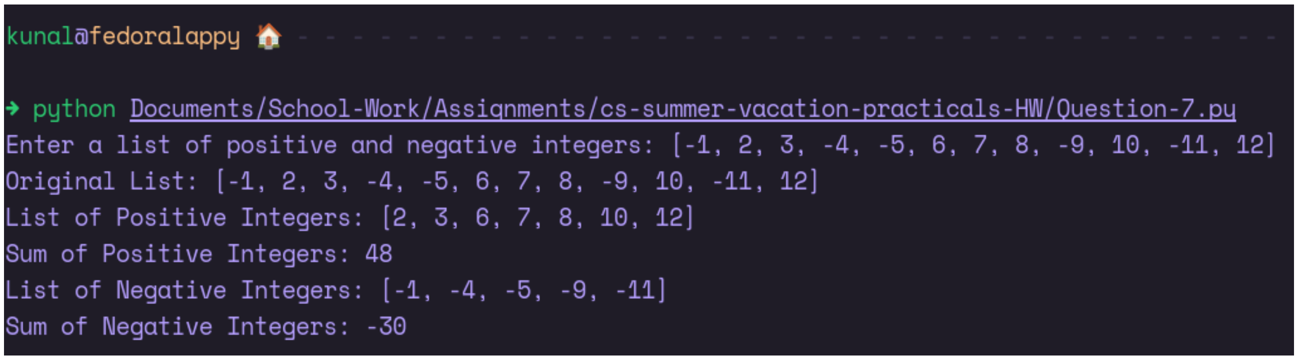
Write a program to read a list of n integers (positive as well asnegative). Create two new lists, one having all positive numbers with sum and the other having all negative numbers with sum from the given list.

Solution



```python
input_lst = eval(input("Enter a list of positive and negative integers: "
))

# Function to create two separate lists of positive and negative integers
with their sum
def positive_negative_sort(lst):
    positive_lst = []
    positive_sum = 0
    negative_lst = []
    negative_sum = 0

    for i in lst:
        if i > 0:
            positive_lst.append(i)
            positive_sum += i
        elif i < 0:
            negative_lst.append(i)
            negative_sum += i

    print("Original List:", input_lst)
    print("List of Positive Integers:", positive_lst)
    print("Sum of Positive Integers:", positive_sum)
    print("List of Negative Integers:", negative_lst)
    print("Sum of Negative Integers:", negative_sum)

# Function Call
positive_negative_sort(input_lst)
```

Output



```
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➜ python Documents/School-Work/Assignments/cs-summer-vacation-practicals-HW/Question-7.py
Enter a list of positive and negative integers: [-1, 2, 3, -4, -5, 6, 7, 8, -9, 10, -11, 12]
Original List: [-1, 2, 3, -4, -5, 6, 7, 8, -9, 10, -11, 12]
List of Positive Integers: [2, 3, 6, 7, 8, 10, 12]
Sum of Positive Integers: 48
List of Negative Integers: [-1, -4, -5, -9, -11]
Sum of Negative Integers: -30
```
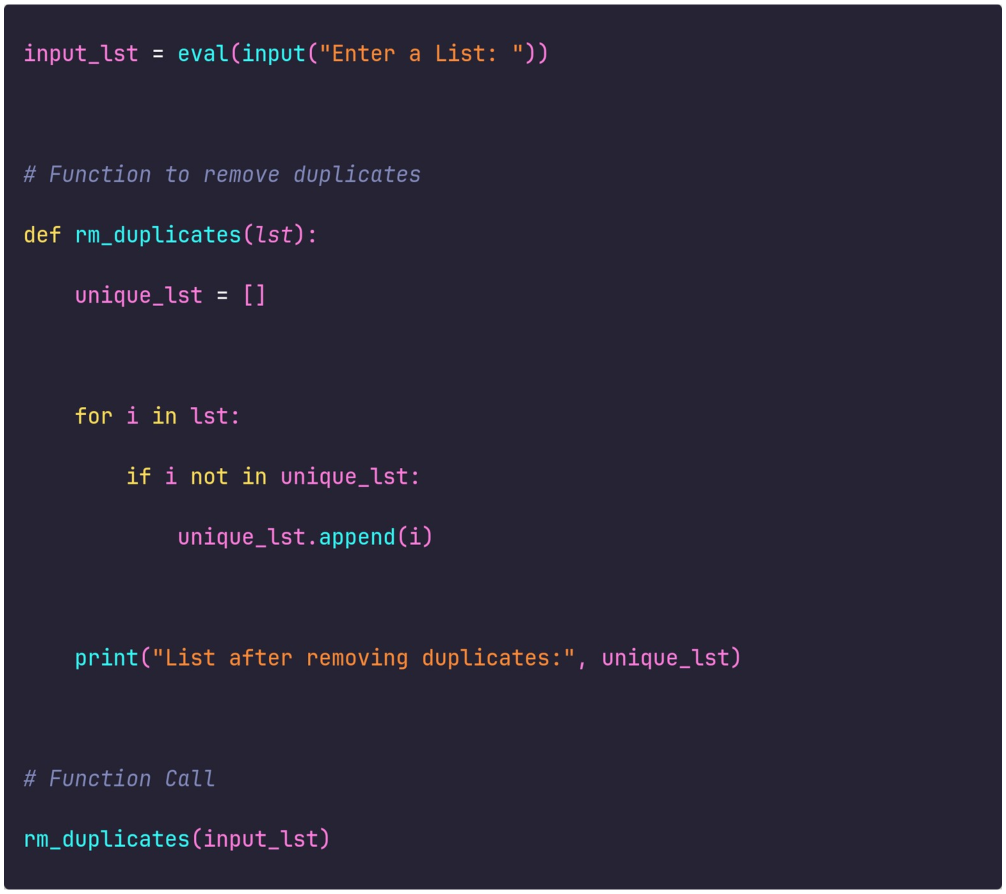

Practical 8

Aim

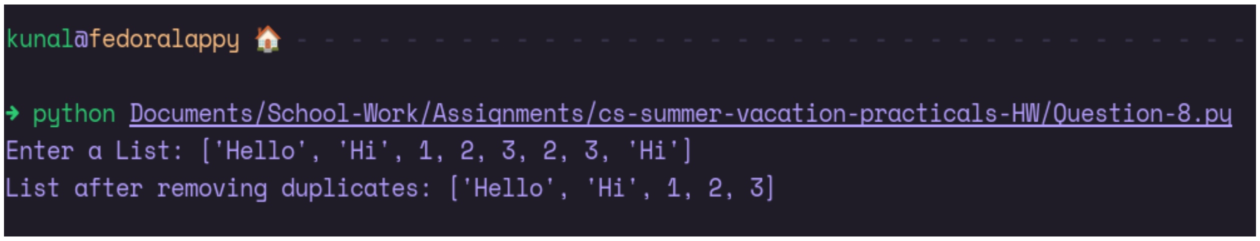
Write a Python program to remove duplicates from a list.

Solution



```python
input_lst = eval(input("Enter a List: "))


# Function to remove duplicates
def rm_duplicates(lst):
    unique_lst = []

    for i in lst:
        if i not in unique_lst:
            unique_lst.append(i)

    print("List after removing duplicates:", unique_lst)

# Function Call
rm_duplicates(input_lst)
```

Output



```
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→ python Documents/School-Work/Assignments/cs-summer-vacation-practicals-HW/Question-8.py
Enter a List: ['Hello', 'Hi', 1, 2, 3, 2, 3, 'Hi']
List after removing duplicates: ['Hello', 'Hi', 1, 2, 3]
```

Practical 9

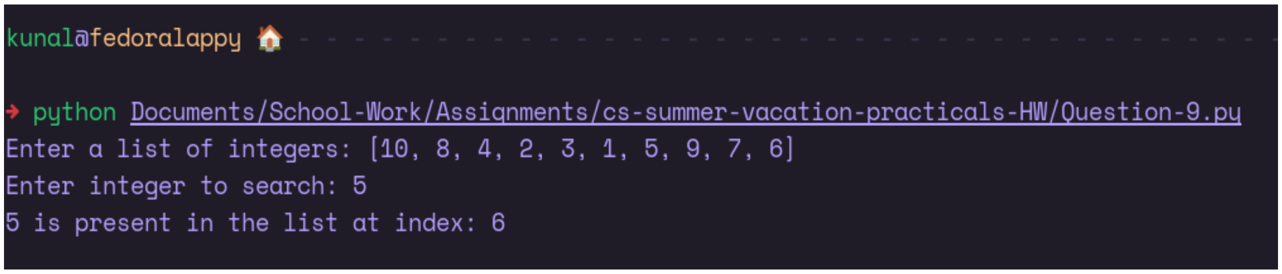
Aim

Write a python code using function to search an element in a list using Binary search method.

Solution

```python
input_lst = eval(input("Enter a list of integers: "))
search_ele = int(input("Enter integer to search: "))

def lst_search(lst, search):
    high = len(lst) -1
    low = 0

    while high >= low:
        mid = (high + low)//2

        if lst[mid] < search:
            low = mid + 1
        elif lst[mid] > search:
            high = mid - 1
        else:
            return mid

    return -1


# Function Call
found_at = lst_search(input_lst, search_ele)
if found_at != -1:
    print(f"{search_ele} is present in the list at index: {found_at}")
else:
    print("Element Not Found!")
```

Output


```
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➜ python Documents/School-Work/Assignments/cs-summer-vacation-practicals-HW/Question-9.py
Enter a list of integers: [10, 8, 4, 2, 3, 1, 5, 9, 7, 6]
Enter integer to search: 5
5 is present in the list at index: 6
```
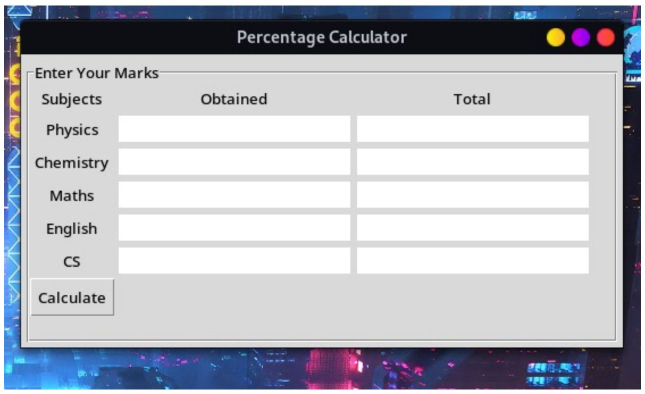

Practical 10

Aim

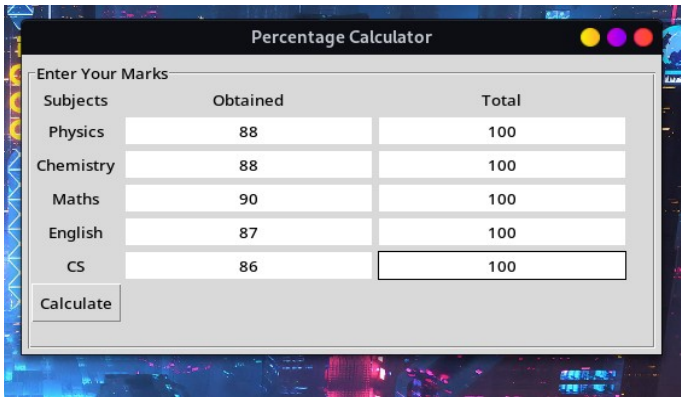
Create an application using Tkinter to enter your personal details and marks in 5 subjects. Calculate the total marks & percentage and display it on clicking a button.

Output


Percentage Calculator

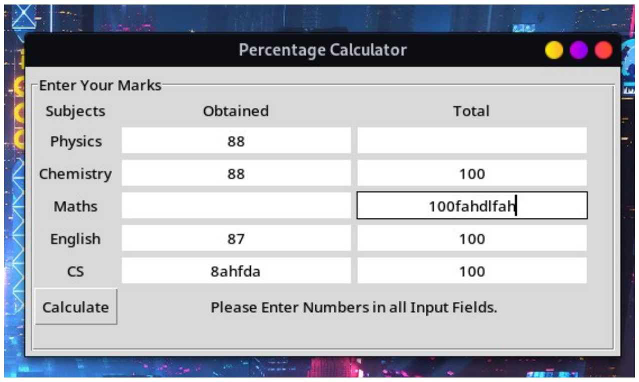
Enter Your Marks

Subjects	Obtained	Total
Physics		
Chemistry		
Maths		
English		
CS		


Percentage Calculator

Enter Your Marks

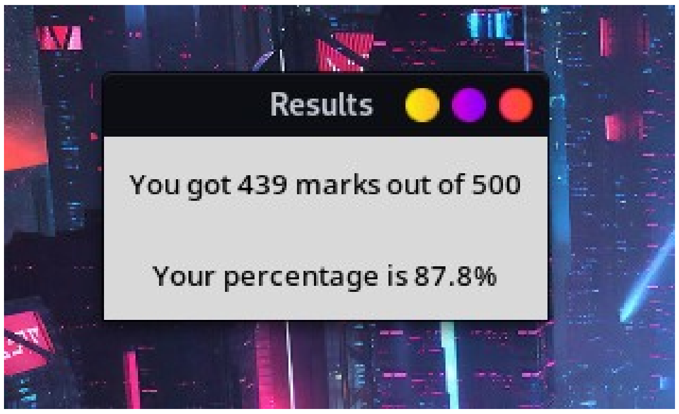
Subjects	Obtained	Total
Physics	88	100
Chemistry	88	100
Maths	90	100
English	87	100
CS	86	100


Percentage Calculator

Enter Your Marks

Subjects	Obtained	Total
Physics	88	
Chemistry	88	100
Maths		100fahdlfah
English	87	100
CS	8ahfda	100

Please Enter Numbers in all Input Fields.


Results

You got 439 marks out of 500

Your percentage is 87.8%

Solution

```python
# Imports TKinter and TTK
from tkinter import *
from tkinter import ttk

# Sets root window, changes theme, adds title and makes the window un-resizable
root = Tk()
ttk.Style().theme_use('default')
root.title("Percentage Calculator")
root.resizable(False, False)

# Creates Labeled Frame
frame = LabelFrame(root, text="Enter Your Marks")
frame.grid(row=0, column=0, rowspan=5, columnspan=6, ipadx=10, ipady=10, padx=5, pady=5)

# Creates Indicator Labels
Label(frame, text="Subjects", justify='center', padx=2, pady=2).grid(row=0, column=0)
Label(frame, text="Obtained", justify='center', padx=2, pady=2).grid(row=0, column=1)
Label(frame, text="Total", justify='center', padx=2, pady=2).grid(row=0, column=2)
```

```python
# Physics Marks
phy_obtained = Entry(frame, relief='flat', width=25, justify='center')
phy_total = Entry(frame, relief='flat', width=25, justify='center')
Label(frame, text='Physics', justify='left', padx=2, pady=2).grid(row=1,
column=0)
phy_obtained.grid(row=1, column=1, padx=2, pady=2)
phy_total.grid(row=1, column=2, padx=2, pady=2)

# Chemistry Marks
chem_obtained = Entry(frame, relief='flat', width=25, justify='center')
chem_total = Entry(frame, relief='flat', width=25, justify='center')
Label(frame, text='Chemistry', justify='left', padx=2, pady=2).grid(row=2
, column=0)
chem_obtained.grid(row=2, column=1, padx=2, pady=2)
chem_total.grid(row=2, column=2, padx=2, pady=2)

# Maths Marks
maths_obtained = Entry(frame, relief='flat', width=25, justify='center')
maths_total = Entry(frame, relief='flat', width=25, justify='center')
Label(frame, text='Maths', justify='left', padx=2, pady=2).grid(row=3,
column=0)
maths_obtained.grid(row=3, column=1, padx=2, pady=2)
maths_total.grid(row=3, column=2, padx=2, pady=2)

# English Marks
eng_obtained = Entry(frame, relief='flat', width=25, justify='center')
eng_total = Entry(frame, relief='flat', width=25, justify='center')
Label(frame, text='English', justify='left', padx=2, pady=2).grid(row=4,
column=0)
eng_obtained.grid(row=4, column=1, padx=2, pady=2)
eng_total.grid(row=4, column=2, padx=2, pady=2)

# CS Marks
cs_obtained = Entry(frame, relief='flat', width=25, justify='center')
cs_total = Entry(frame, relief='flat', width=25, justify='center')
Label(frame, text='CS', justify='left', padx=2, pady=2).grid(row=5, column
=0)
cs_obtained.grid(row=5, column=1, padx=2, pady=2)
cs_total.grid(row=5, column=2, padx=2, pady=2)
```

```python
# Percentage Calculation
# Creates Error Frame
error_label = Label(frame, text=
"Please Enter Numbers in all Input Fields.", justify='center')

# Calculation Function
def calculate():
    obtained_lst =
 [phy_obtained, chem_obtained, maths_obtained, eng_obtained, cs_obtained]
    total_lst = [phy_total, chem_total, maths_total, eng_total, cs_total]
    obtained = 0
    total = 0
    no_error = True

    # Checks if all entries input are digits
    for i in obtained_lst:
        if i.get().isdigit():
            obtained += int(i.get())
        else:
            error_label.grid(row=6, column=1, columnspan=2, padx=10, pady=
5)
            no_error = False
            break

    if no_error:
        for i in total_lst:
            if i.get().isdigit():
                total += int(i.get())
            else:
                error_label.grid(row=6, column=1, columnspan=2, padx=10,
pady=5)
                no_error = False
                break
```

```python
# Creates new window showing result, only if there were no errors before
    if no_error:
        result_window = Toplevel(root)
        result_window.title("Results")
        result_window.resizable(False, False)
        percentage = (obtained/total)*100
        Label(result_window, text=f"You got {obtained} marks out of {total}").grid(row=0, column=0, padx=10, pady=10)
        Label(result_window, text=f"Your percentage is {percentage}%").grid(row=1, column=0, padx=10, pady=10)

# Creates Calculate Button
Button(frame, justify='center', text="Calculate", command=calculate ,padx=5, pady=5).grid(row=6, column=0)

root.mainloop()
```