TITLE PAGE

Submitter's Details :

Name: Karanpreet Singh

Enrollment Number : 18114036

Class : B.tech , CSE 2nd year

Email: ksingh2@cs.iitr.ac.in

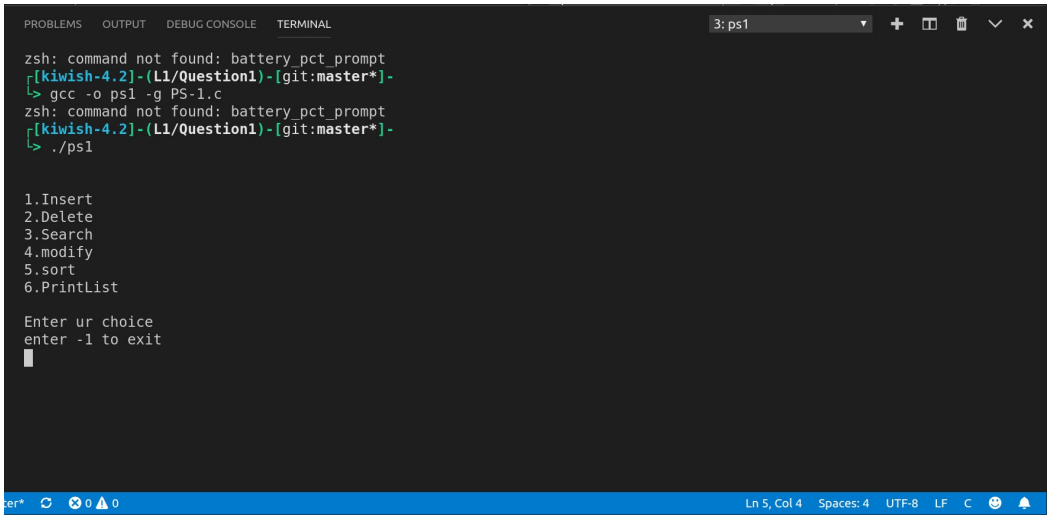
Phone – 9530894998

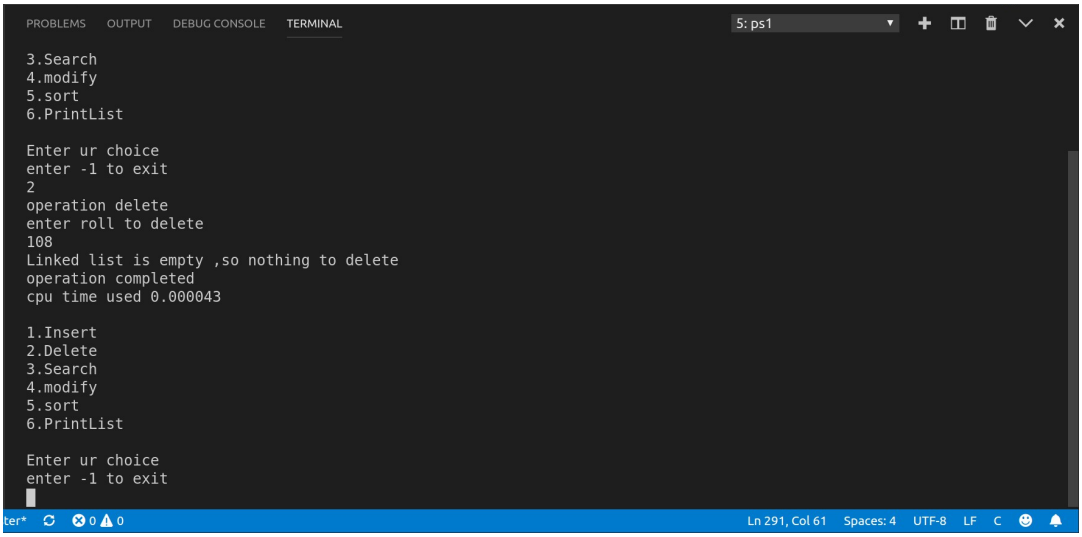
Question 1:
Write a C program to create a student management system, where the students' information are stored in a doubly circular linked list, as shown in Figure 1. The structure of each node from the list is shown in Figure 2. Initially, the circular doubly linked list is empty and the student personal data is entered from the filename "StudentData.xlsx" that contains the data of 13 students)name, D.O.B., address and phone no(in tabular form. The program should have the following operations: insert, delete, search, modify, sort and print. While inserting, a unique roll number in the linked list is assigned to each student, where the starting roll number should be 101 and the list should always be in sorted according to their roll number)ascending order(. However, when a deletion operation is performed, the roll number of the deleted student node is stored in a queue named unusedRollNo. These deleted roll numbers from the unusedRollNo queue will be allotted to the new students on next insertion operations.

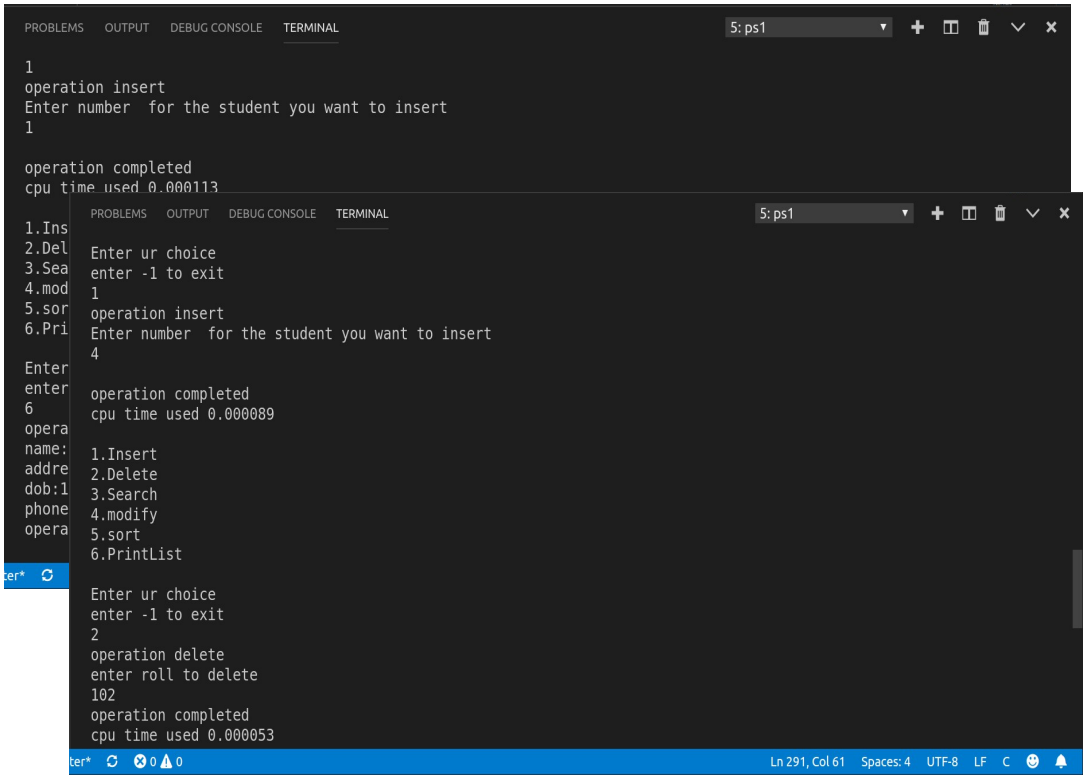
Data Structures used :
i) Circular Doubly linked list
ii) Queue

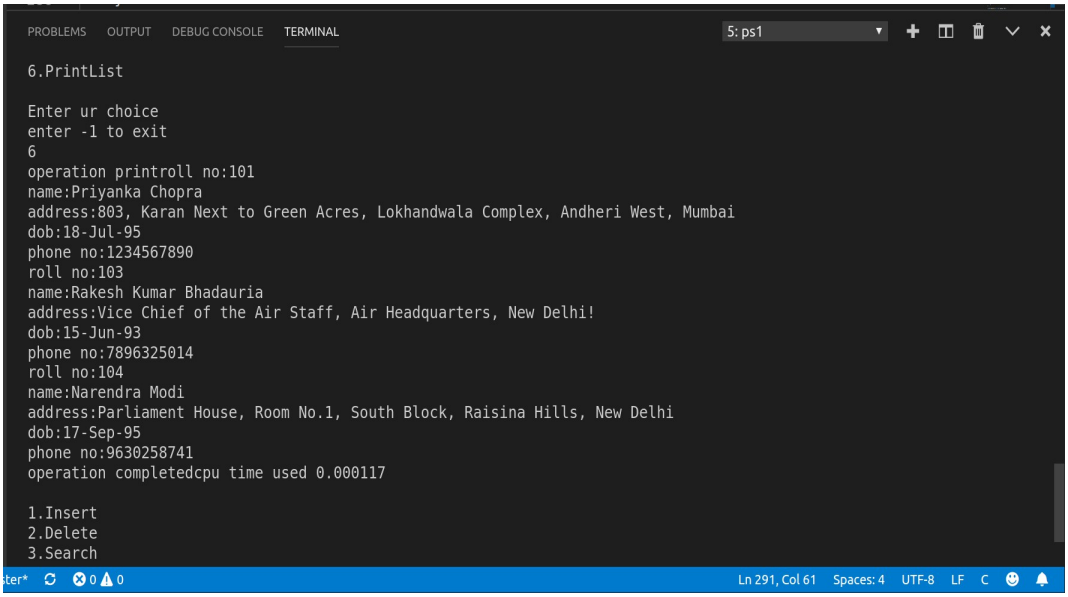
Algorithms used :
i) Bubble Sort
ii) Sequential Search

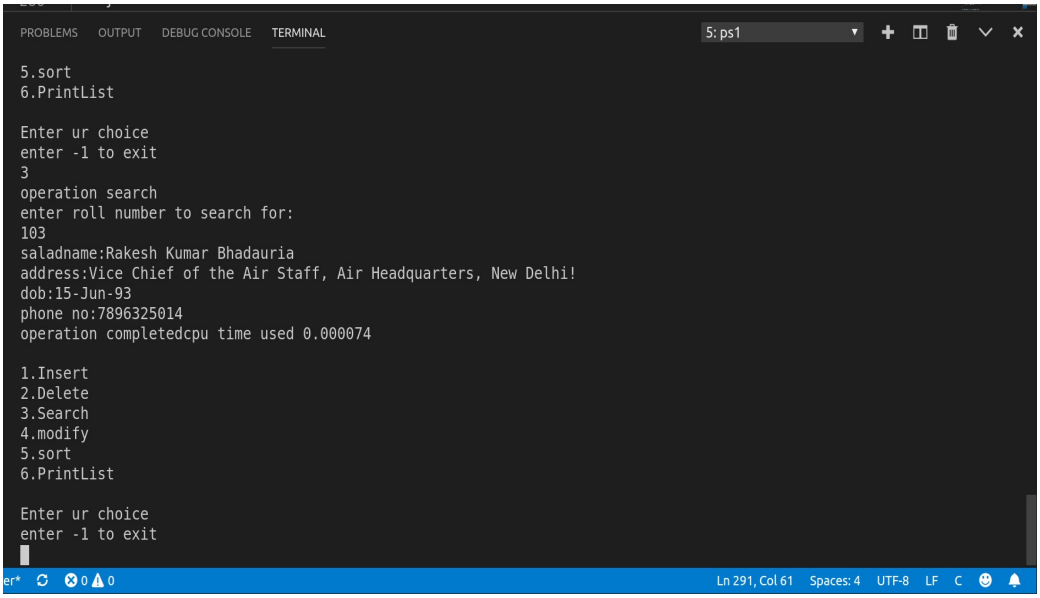
Screenshots :

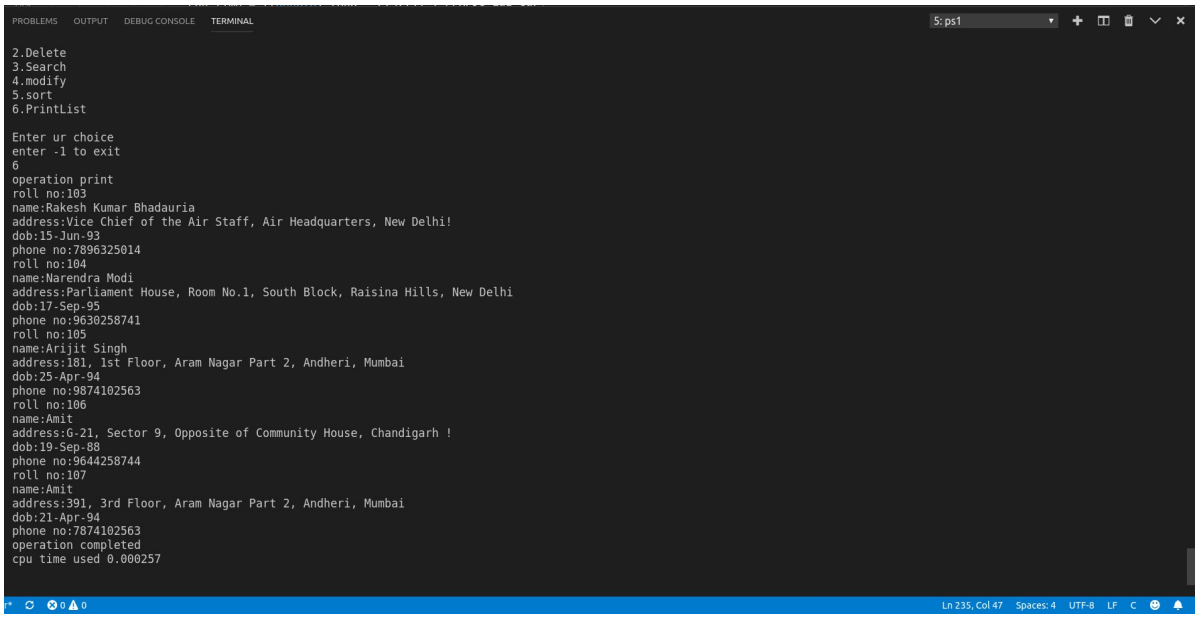

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
3: ps1
zsh: command not found: battery_pct_prompt
[kiwish-4.2]-(L1/Question1)-[git:master*]-
> gcc -o ps1 -g PS-1.c
zsh: command not found: battery_pct_prompt
[kiwish-4.2]-(L1/Question1)-[git:master*]-
> ./ps1
1.Insert
2.Delete
3.Search
4.modify
5.sort
6.PrintList
Enter ur choice
enter -1 to exit
Ln 5, Col 4 Spaces: 4 UTF-8 LF C

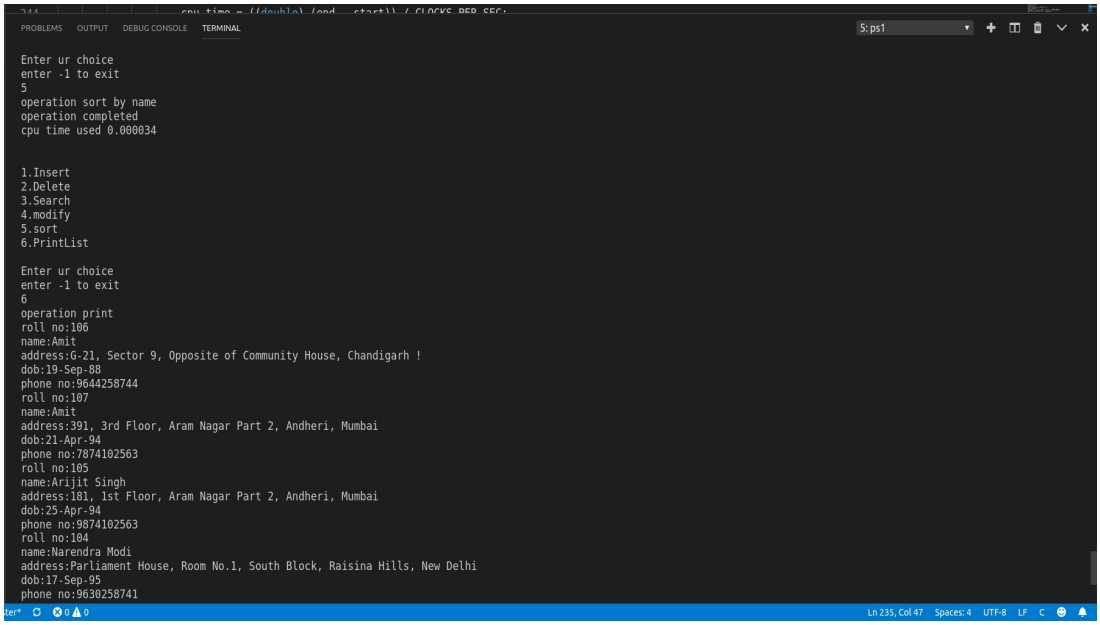

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
5: ps1
3.Search
4.modify
5.sort
6.PrintList
Enter ur choice
enter -1 to exit
2
operation delete
enter roll to delete
108
Linked list is empty ,so nothing to delete
operation completed
cpu time used 0.000043
1.Insert
2.Delete
3.Search
4.modify
5.sort
6.PrintList
Enter ur choice
enter -1 to exit
Ln 291, Col 61 Spaces: 4 UTF-8 LF C

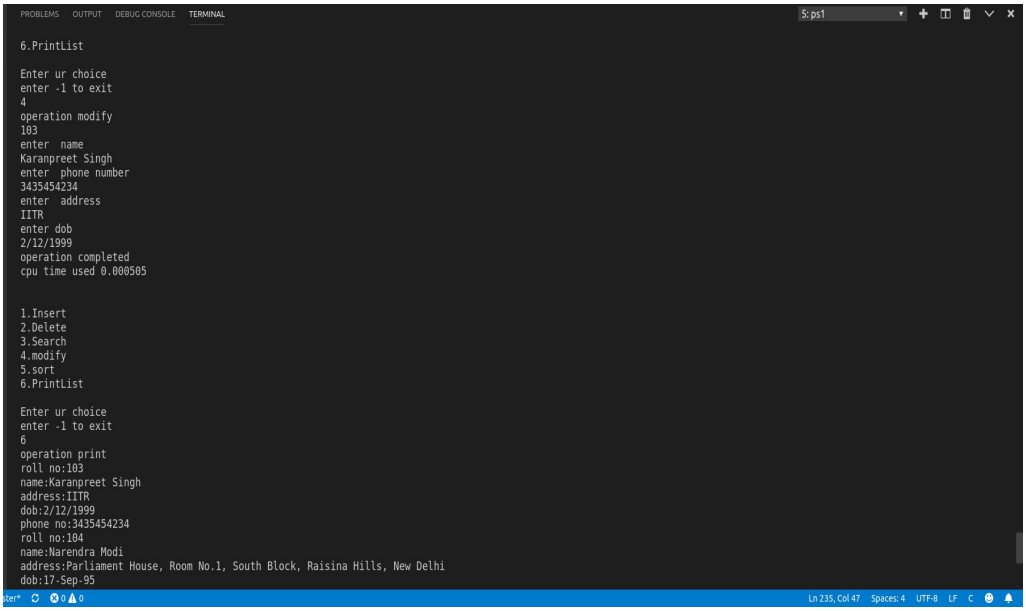

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
5: ps1
1
operation insert
Enter number for the student you want to insert
1
operation completed
cpu time used 0.000113
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
5: ps1
Enter ur choice
enter -1 to exit
1
operation insert
Enter number for the student you want to insert
4
operation completed
cpu time used 0.000089
1.Insert
2.Delete
3.Search
4.modify
5.sort
6.PrintList
Enter ur choice
enter -1 to exit
2
operation delete
enter roll to delete
102
operation completed
cpu time used 0.000053
Ln 291, Col 61 Spaces: 4 UTF-8 LF C


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
5: ps1
6.PrintList
Enter ur choice
enter -1 to exit
6
operation printroll no:101
name:Priyanka Chopra
address:803, Karan Next to Green Acres, Lokhandwala Complex, Andheri West, Mumbai
dob:18-Jul-95
phone no:1234567890
roll no:103
name:Rakesh Kumar Bhadauria
address:Vice Chief of the Air Staff, Air Headquarters, New Delhi!
dob:15-Jun-93
phone no:7896325014
roll no:104
name:Narendra Modi
address:Parliament House, Room No.1, South Block, Raisina Hills, New Delhi
dob:17-Sep-95
phone no:9630258741
operation completedcpu time used 0.000117
1.Insert
2.Delete
3.Search
Ln 291, Col 61
Spaces: 4
UTF-8
LF
C


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
5: ps1
5.sort
6.PrintList
Enter ur choice
enter -1 to exit
3
operation search
enter roll number to search for:
103
saladname:Rakesh Kumar Bhadauria
address:Vice Chief of the Air Staff, Air Headquarters, New Delhi!
dob:15-Jun-93
phone no:7896325014
operation completedcpu time used 0.000074
1.Insert
2.Delete
3.Search
4.modify
5.sort
6.PrintList
Enter ur choice
enter -1 to exit
Ln 291, Col 61
Spaces: 4
UTF-8
LF
C


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
5: ps1
2.Delete
3.Search
4.modify
5.sort
6.PrintList
Enter ur choice
enter -1 to exit
6
operation print
roll no:103
name:Rakesh Kumar Bhadauria
address:Vice Chief of the Air Staff, Air Headquarters, New Delhi!
dob:15-Jun-93
phone no:7896325014
roll no:104
name:Narendra Modi
address:Parliament House, Room No.1, South Block, Raisina Hills, New Delhi
dob:17-Sep-95
phone no:9630258741
roll no:105
name:Arijit Singh
address:181, 1st Floor, Aram Nagar Part 2, Andheri, Mumbai
dob:25-Apr-94
phone no:9874102563
roll no:106
name:Amit
address:G-21, Sector 9, Opposite of Community House, Chandigarh !
dob:19-Sep-88
phone no:9644258744
roll no:107
name:Amit
address:391, 3rd Floor, Aram Nagar Part 2, Andheri, Mumbai
dob:21-Apr-94
phone no:7874102563
operation completed
cpu time used 0.000257
Ln 235, Col 47
Spaces: 4
UTF-8
LF
C


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
5: ps1
Enter ur choice
enter -1 to exit
5
operation sort by name
operation completed
cpu time used 0.000034
1.Insert
2.Delete
3.Search
4.modify
5.sort
6.PrintList
Enter ur choice
enter -1 to exit
6
operation print
roll no:106
name:Amit
address:G-21, Sector 9, Opposite of Community House, Chandigarh !
dob:19-Sep-88
phone no:9644258744
roll no:107
name:Amit
address:391, 3rd Floor, Aram Nagar Part 2, Andheri, Mumbai
dob:21-Apr-94
phone no:7874102563
roll no:105
name:Arijit Singh
address:181, 1st Floor, Aram Nagar Part 2, Andheri, Mumbai
dob:25-Apr-94
phone no:9874102563
roll no:104
name:Narendra Modi
address:Parliament House, Room No.1, South Block, Raisina Hills, New Delhi
dob:17-Sep-95
phone no:9630258741
Ln 235, Col 47
Spaces: 4
UTF-8
LF
C


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
5: ps1
6.PrintList
Enter ur choice
enter -1 to exit
4
operation modify
103
enter name
Karanpreet Singh
enter phone number
3435454234
enter address
IITR
enter dob
2/12/1999
operation completed
cpu time used 0.000505
1.Insert
2.Delete
3.Search
4.modify
5.sort
6.PrintList
Enter ur choice
enter -1 to exit
6
operation print
roll no:103
name:Karanpreet Singh
address:IITR
dob:2/12/1999
phone no:3435454234
roll no:104
name:Narendra Modi
address:Parliament House, Room No.1, South Block, Raisina Hills, New Delhi
dob:17-Sep-95
Ln 235, Col 47
Spaces: 4
UTF-8
LF
C

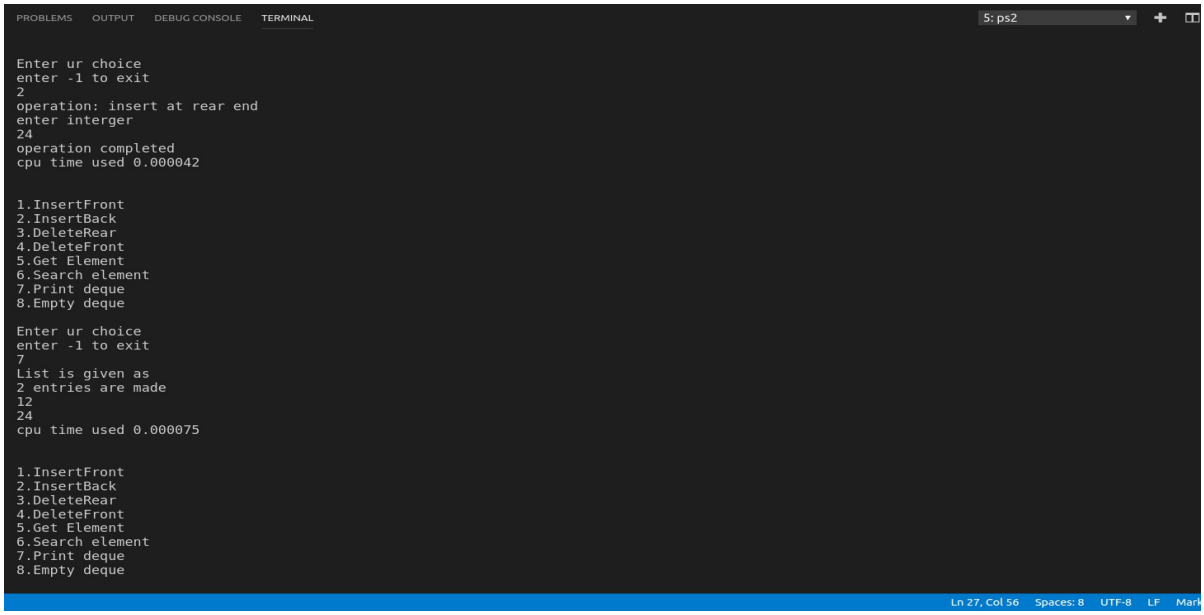
Question 2

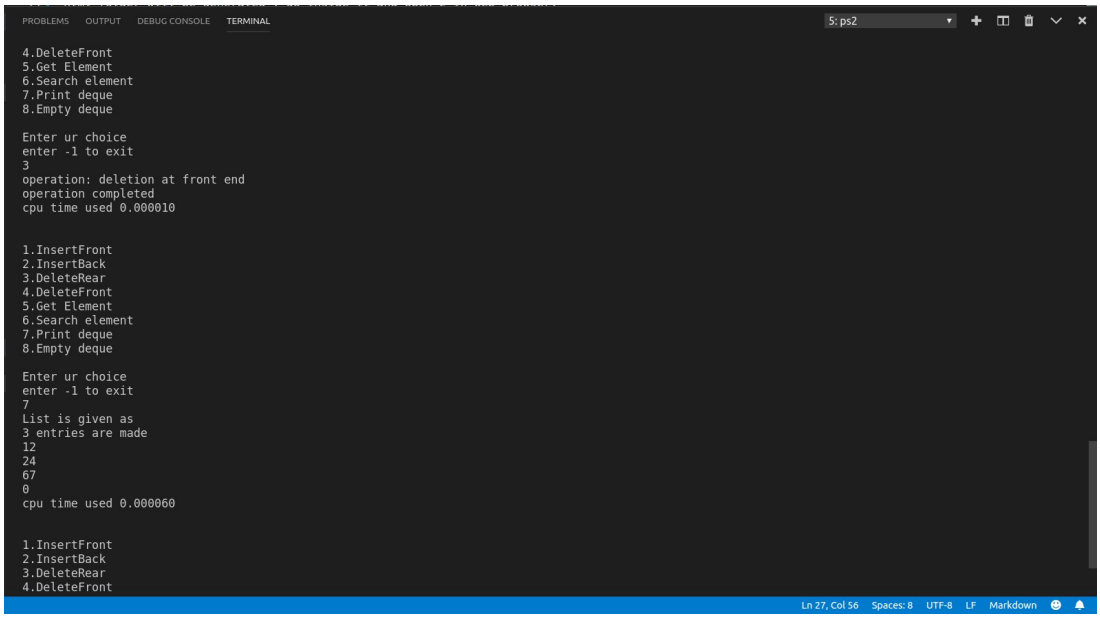
Write a C Program for resizeable deque using dynamic memory allocation, where a deque can perform the insertion and deletion operations at its both ends. The capacity of the deque depends on the number of elements currently stored in it, according to the following two rules: ●If an element is being inserted into a deque, when it is already full, then its capacity is doubled of its current size. ●After removing an element from a deque, if the number of elements are equal to the half of the capacity of the deque, then its capacity is made half of its current size

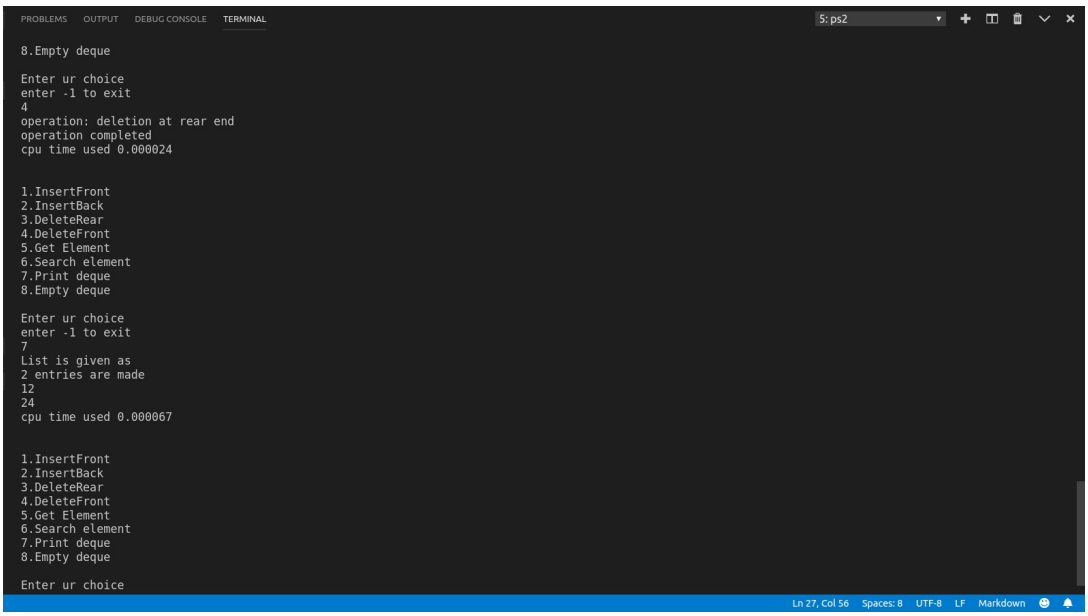
Data Structure : i) Deque

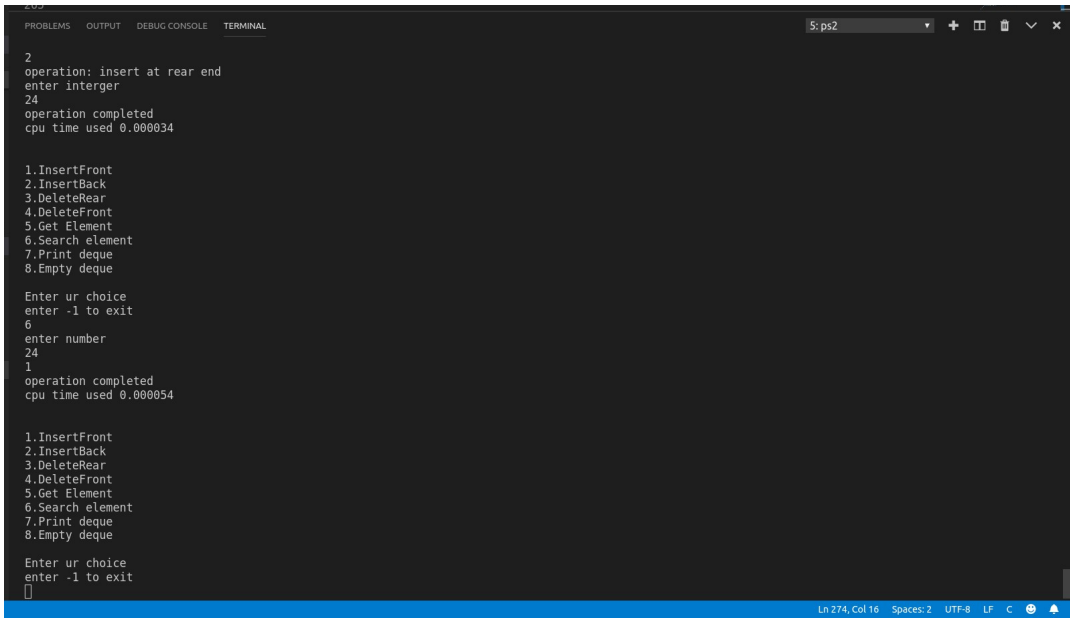
Algorithm : Sequential search

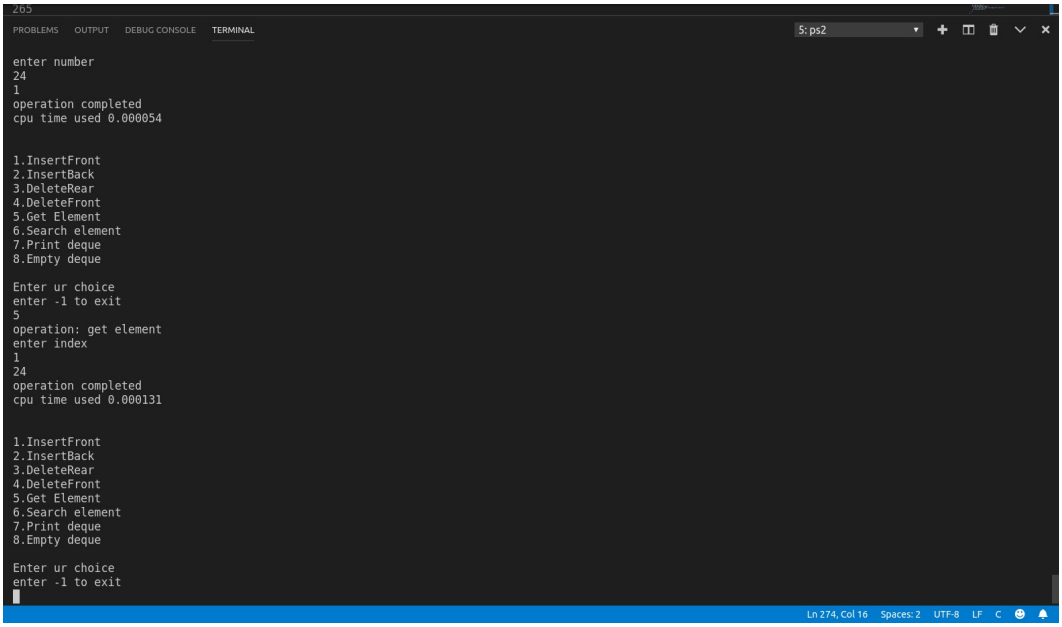
ScreenShots:


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
5: ps2
Enter ur choice
enter -1 to exit
2
operation: insert at rear end
enter interger
24
operation completed
cpu time used 0.000042
1.InsertFront
2.InsertBack
3.DeleteRear
4.DeleteFront
5.Get Element
6.Search element
7.Print deque
8.Empty deque
Enter ur choice
enter -1 to exit
7
List is given as
2 entries are made
12
24
cpu time used 0.000075
1.InsertFront
2.InsertBack
3.DeleteRear
4.DeleteFront
5.Get Element
6.Search element
7.Print deque
8.Empty deque
Ln 27, Col 56
Spaces: 8
UTF-8
LF


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
5: ps2
4.DeleteFront
5.Get Element
6.Search element
7.Print deque
8.Empty deque
Enter ur choice
enter -1 to exit
3
operation: deletion at front end
operation completed
cpu time used 0.000010
1.InsertFront
2.InsertBack
3.DeleteRear
4.DeleteFront
5.Get Element
6.Search element
7.Print deque
8.Empty deque
Enter ur choice
enter -1 to exit
7
List is given as
3 entries are made
12
24
67
0
cpu time used 0.000060
1.InsertFront
2.InsertBack
3.DeleteRear
4.DeleteFront
Ln 27, Col 56
Spaces: 8
UTF-8
LF
Markdown


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
5: ps2
8.Empty deque
Enter ur choice
enter -1 to exit
4
operation: deletion at rear end
operation completed
cpu time used 0.000024
1.InsertFront
2.InsertBack
3.DeleteRear
4.DeleteFront
5.Get Element
6.Search element
7.Print deque
8.Empty deque
Enter ur choice
enter -1 to exit
7
List is given as
2 entries are made
12
24
cpu time used 0.000067
1.InsertFront
2.InsertBack
3.DeleteRear
4.DeleteFront
5.Get Element
6.Search element
7.Print deque
8.Empty deque
Enter ur choice
Ln 27, Col 56
Spaces: 8
UTF-8
LF
Markdown


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
5: ps2
2
operation: insert at rear end
enter interger
24
operation completed
cpu time used 0.000034
1.InsertFront
2.InsertBack
3.DeleteRear
4.DeleteFront
5.Get Element
6.Search element
7.Print deque
8.Empty deque
Enter ur choice
enter -1 to exit
6
enter number
24
1
operation completed
cpu time used 0.000054
1.InsertFront
2.InsertBack
3.DeleteRear
4.DeleteFront
5.Get Element
6.Search element
7.Print deque
8.Empty deque
Enter ur choice
enter -1 to exit
Ln 274, Col 16
Spaces: 2
UTF-8
LF
C

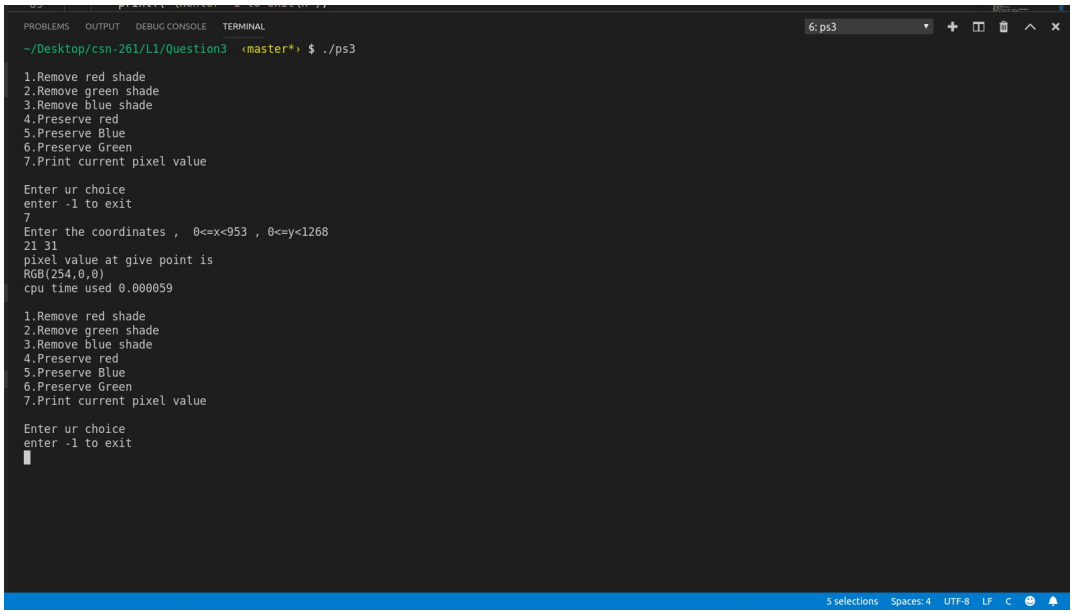


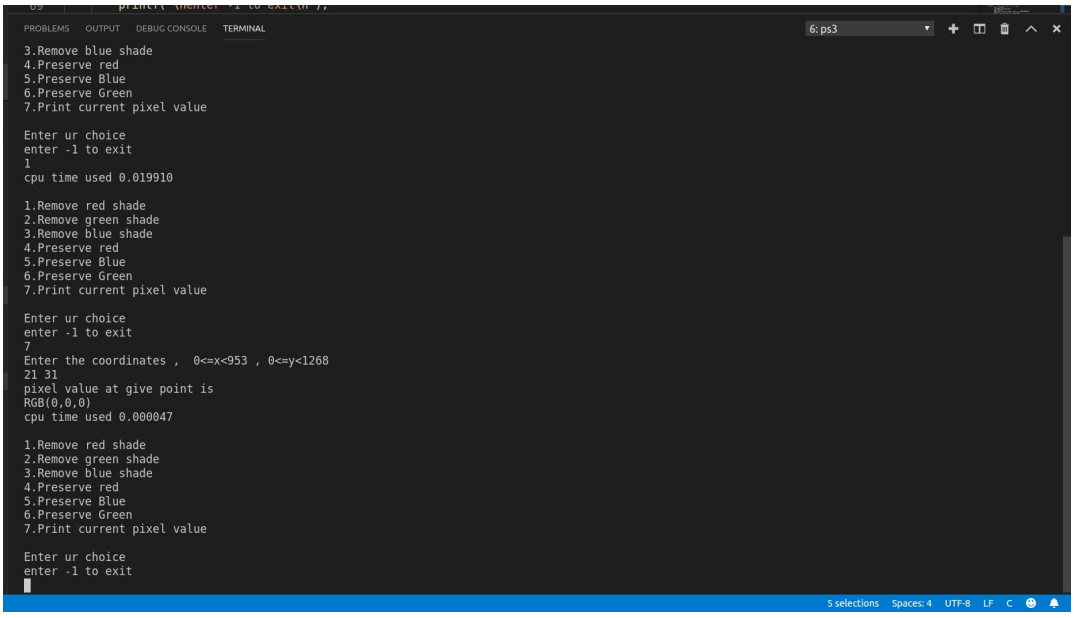
Question 3:

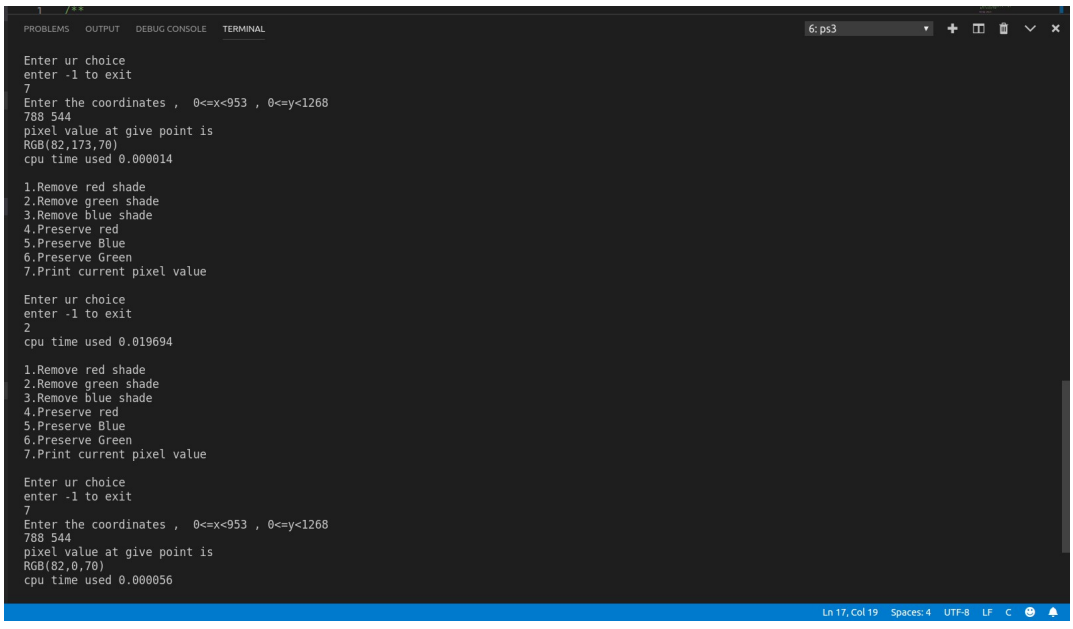
Given three 2D arrays (for red, green and blue color pixels) of a digital image. For a particular image pixel, the color shade of that pixel is Red if the pixel value at that position of the matrix corresponding to RED is greater than that of GREEN and BLUE. Same goes for GREEN and BLUE shades also. Write a C program that can perform following operations on the given image file: ● Remove all Red shades. ● Remove all Green shades. ● Remove all Blue shades. ● RedOnly: Preserve any red shades in the image, but remove all green and blue. ● GreenOnly: Preserve any green shades in the image, but remove all red and blue. ● BlueOnly: Preserve any blue shades in the image, but remove all red and green. Write a function pixelValue() that has x and y as two parameters and displays the current pixel (RED, GREEN and BLUE) values of the input image at the point with coordinates (x,y), where xand y are the row and column numbers in that image file, respectively.

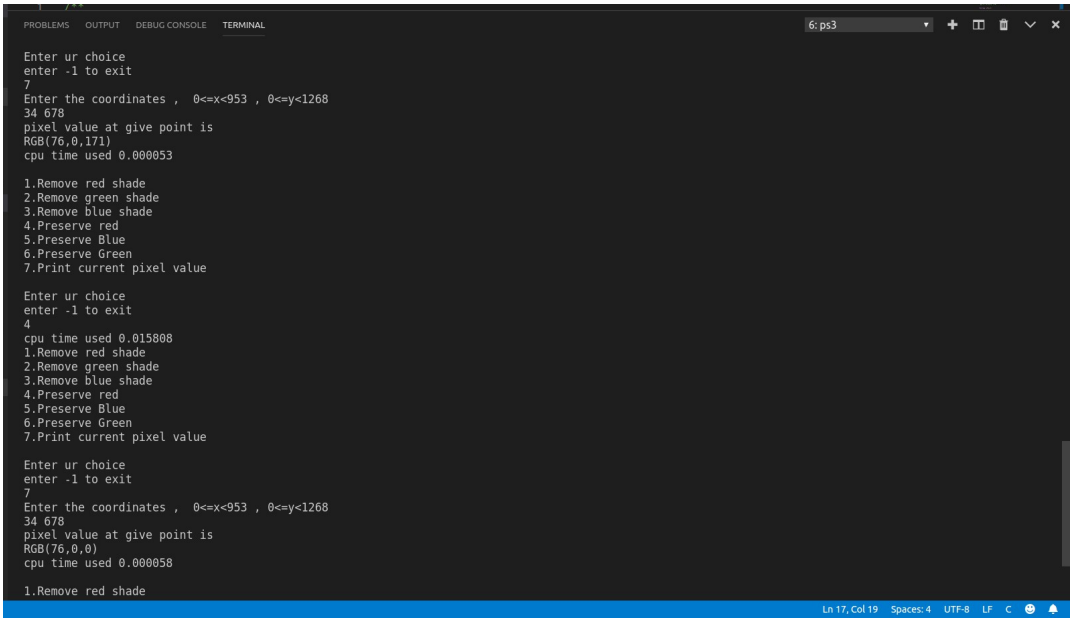
Data structure : Arrays

Screenshots :


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
6: ps3
~/Desktop/csn-261/L1/Question3 <master*> $ ./ps3
1.Remove red shade
2.Remove green shade
3.Remove blue shade
4.Preserve red
5.Preserve Blue
6.Preserve Green
7.Print current pixel value
Enter ur choice
enter -1 to exit
7
Enter the coordinates , 0<=x<953 , 0<=y<1268
21 31
pixel value at give point is
RGB(254,0,0)
cpu time used 0.000059
1.Remove red shade
2.Remove green shade
3.Remove blue shade
4.Preserve red
5.Preserve Blue
6.Preserve Green
7.Print current pixel value
Enter ur choice
enter -1 to exit
5 selections
Spaces: 4
UTF-8
LF
C


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
6: ps3
3.Remove blue shade
4.Preserve red
5.Preserve Blue
6.Preserve Green
7.Print current pixel value
Enter ur choice
enter -1 to exit
1
cpu time used 0.019910
1.Remove red shade
2.Remove green shade
3.Remove blue shade
4.Preserve red
5.Preserve Blue
6.Preserve Green
7.Print current pixel value
Enter ur choice
enter -1 to exit
7
Enter the coordinates , 0<=x<953 , 0<=y<1268
21 31
pixel value at give point is
RGB(0,0,0)
cpu time used 0.000047
1.Remove red shade
2.Remove green shade
3.Remove blue shade
4.Preserve red
5.Preserve Blue
6.Preserve Green
7.Print current pixel value
Enter ur choice
enter -1 to exit
5 selections
Spaces: 4
UTF-8
LF
C


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
6: ps3
Enter ur choice
enter -1 to exit
7
Enter the coordinates , 0<=x<953 , 0<=y<1268
788 544
pixel value at give point is
RGB(82,173,70)
cpu time used 0.000014
1.Remove red shade
2.Remove green shade
3.Remove blue shade
4.Preserve red
5.Preserve Blue
6.Preserve Green
7.Print current pixel value
Enter ur choice
enter -1 to exit
2
cpu time used 0.019694
1.Remove red shade
2.Remove green shade
3.Remove blue shade
4.Preserve red
5.Preserve Blue
6.Preserve Green
7.Print current pixel value
Enter ur choice
enter -1 to exit
7
Enter the coordinates , 0<=x<953 , 0<=y<1268
788 544
pixel value at give point is
RGB(82,0,70)
cpu time used 0.000056
Ln 17, Col 19
Spaces: 4
UTF-8
LF
C


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
6: ps3
Enter ur choice
enter -1 to exit
7
Enter the coordinates , 0<=x<953 , 0<=y<1268
34 678
pixel value at give point is
RGB(76,0,171)
cpu time used 0.000053
1.Remove red shade
2.Remove green shade
3.Remove blue shade
4.Preserve red
5.Preserve Blue
6.Preserve Green
7.Print current pixel value
Enter ur choice
enter -1 to exit
4
cpu time used 0.015808
1.Remove red shade
2.Remove green shade
3.Remove blue shade
4.Preserve red
5.Preserve Blue
6.Preserve Green
7.Print current pixel value
Enter ur choice
enter -1 to exit
7
Enter the coordinates , 0<=x<953 , 0<=y<1268
34 678
pixel value at give point is
RGB(76,0,0)
cpu time used 0.000058
1.Remove red shade
Ln 17, Col 19
Spaces: 4
UTF-8
LF
C