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Sub: CA314: Object Oriented Programming through JAVA Practical Assignment-3 Introduction to Java

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/\* 1. Write a program that will print the default values of all

primitive data types and one object reference. \*/

package cmpica;

public class Assignment3\_1 {

byte b;

int i;

double d;

short sh;

float f;

boolean bl;

char c;

String s;

public static void main(String args[])

{

Assignment3\_1 a = new Assignment3\_1();

System.out.println(a.b);

System.out.println(a.i);

System.out.println(a.d);

System.out.println(a.sh);

System.out.println(a.f);

System.out.println(a.bl);

System.out.println(a.c);

System.out.println(a.s);

}

}

/\* 2. Write a Java program to implement the Stack using arrays. Write Push(), Pop(), and Display() methods to demonstrate its working. \*/

package cmpica;

import java.util.Scanner;

public class Assignment3\_2 {

static int top;

Assignment3\_2()

{

top=-1;

}

public static void main(String args[])

{

int max,i,ch;

Assignment3\_2 objj= new Assignment3\_2();

System.out.println("Enter The Size of Stack: ");

Scanner obj= new Scanner(System.in);

max= Integer.parseInt(obj.nextLine());

int a[]=new int[max];

do

{

System.out.println("1. Push\n2. Pop\n3. Display\n4. Exit"); System.out.println("Select Particular: ");

Scanner sc= new Scanner(System.in);

ch= Integer.parseInt(sc.nextLine());

switch (ch)

{

case 1:

{

push(a,max);

break;

}

case 2:

{

pop(a);

break;

}

case 3:

{

Display(a);

break;

}

case 4:

{

break;

}

}

}while (ch!=4);

}

static void push(int array[],int n)

{

int value;

if (top>=n)

{

System.out.println("Stack Overflow!!!");

}

else

{

++top;

System.out.println("Enter The value to Store into Stack: ");

Scanner obj2=new Scanner(System.in); value=Integer.parseInt(obj2.nextLine());

array[top]=value;

System.out.println("Value is Stored Successfully!!!"+top);

}

}

static void pop(int array[])

{

if (top==-1)

{

System.out.println("Stack Underflow!!!");

}

else

{

System.out.println("poped item:"+array[top]);

top--;

System.out.println("Value is Poped Successfully!!!");

}

}

static void Display(int array[])

{

System.out.println("elements in stack are:");

for(int i=top; i>-1; i--)

System.out.println(array[i]);

}

}

/\* 3. Write a program for Authentication for User Name & password using command Line argument. \*/

package cmpica;

import java.util.Scanner;

public class Assignment3\_3

{

static String UID="shivam";

static String PASS="Shivam1234";

Scanner obj= new Scanner(System.in);

public static void main(String args[])

{

String Uid=args[0];

String Pass=args[1];

CheckAuthentication(Uid, Pass);

}

static void CheckAuthentication(String Uid, String Pass)

{

if (UID.equals(Uid) && PASS.equals(Pass))

{

System.out.println("Valid User");

}

else

{

System.out.println("Invalid User");

}

}

}

/\* 4. Write a Java program to implement the Queue using Array,Write deleteF (), insertR () and Display () methods to demonstrate its working. \*/

package cmpica;

import java.util.Scanner;

class Assignment3\_4

{

int SIZE = 5;

static Scanner obj= new Scanner(System.in);

int items[] = new int[SIZE];

int front, rear;

Assignment3\_4()

{

front = -1;

rear = -1;

}

void insertR()

{

if (front == 0 && rear == SIZE - 1)

{

System.out.println("Queue is full");

}

else

{

if (front == -1)

{

front = 0;

}

System.out.println("Enter Element: ");

int element= Integer.parseInt(obj.nextLine());

rear++;

items[rear] = element;

System.out.println("Insert " + element);

}

}

int DeleteF()

{

int element;

if (front == -1)

{

System.out.println("Queue is empty");

return (-1);

}

else

{

element = items[front];

if (front >= rear)

{

front = -1;

rear = -1;

}

else   
{

front++;

}

System.out.println( element + " Deleted");

return (element);

}

}

void display()

{

int i;

if (front == -1)

{

System.out.println("Empty Queue");

}

else

{

System.out.println("\nFront index-> " + front); System.out.println("Items -> ");

for (i = front; i <= rear; i++)

System.out.print(items[i] + " ");

System.out.println("\nRear index-> " + rear);

}

}

public static void main(String[] args)

{

Assignment3\_4 q = new Assignment3\_4();

do

{

System.out.println("\n1. Insert\n2. Delete\n3. Display\n4. Exit\nPlease Select Particular: ");

int choice=Integer.parseInt(obj.nextLine());

switch (choice)

{

case 1:

{

q.insertR();

break;

}

case 2:

{

q.DeleteF();

break;

}

case 3:

{

q.display();

break;

}

case 4:

{

break;

}

}

if (choice==4) return ;

}

while(true);

}

}

/\* 5. Write a JAVA program to search for an element in a given list of elements using binary search mechanism.\*/

package cmpica;

import java.util.Scanner;

public class Assignment3\_5

{

int binarySearch(int arr[], int l, int r, int x)

{

if (r >= l)

{

int mid = l + (r - l) / 2;

if (arr[mid] == x)

return mid;

if (arr[mid] > x)

return binarySearch(arr, l, mid - 1, x);

return binarySearch(arr, mid + 1, r, x);

}

return -1;

}

public static void main(String args[])

{

Assignment3\_5 obj = new Assignment3\_5();

int arr[] = { 2, 3, 4, 10, 40 };

int n = arr.length;

Scanner scan= new Scanner(System.in);

System.out.println("Enter Element You want to Search: ");

int value= Integer.parseInt(scan.nextLine());

int result = obj.binarySearch(arr, 0, n - 1, value);

if (result == -1)

System.out.println("Element not present");

else

System.out.println("Element found at index " + result);

}

}

/\* 6. Write a JAVA program to sort for an element in a given list of elements using bubble sort. \*/

package cmpica;

public class Assignment3\_6

{

void bubbleSort(int arr[])

{

int n = arr.length;

for (int i = 0; i < n-1; i++)

for (int j = 0; j < n-i-1; j++)

if (arr[j] > arr[j+1])

{

// swap arr[j+1] and arr[j]

int temp = arr[j];

arr[j] = arr[j+1];

arr[j+1] = temp;

}

}

public static void main(String args[])

{

Assignment3\_6 obj = new Assignment3\_6();

int arr[] = {64, 34, 25, 12, 22, 11, 90};

obj.bubbleSort(arr);

int n=arr.length;

System.out.println("Sorted array");

for (int i=0;i<n;i++)

{

System.out.println(arr[i]);

}

}

}

/\* 7. Write a JAVA program to sort for an element in a given list of elements using merge sort. \*/

package cmpica;

public class Assignment3\_7

{

void merge(int arr[], int l, int m, int r)

{

// Find sizes of two subarrays to be merged

int n1 = m - l + 1;

int n2 = r - m;

/\* Create temp arrays \*/

int L[] = new int[n1];

int R[] = new int[n2];

/\*Copy data to temp arrays\*/

for (int i = 0; i < n1; ++i)

L[i] = arr[l + i];

for (int j = 0; j < n2; ++j)

R[j] = arr[m + 1 + j];

/\* Merge the temp arrays \*/

// Initial indexes of first and second subarrays

int i = 0, j = 0;

// Initial index of merged subarry array

int k = l;

while (i < n1 && j < n2)

{

if (L[i] <= R[j])

{

arr[k] = L[i];

i++;

}

else

{

arr[k] = R[j];

j++;

}

k++;

}

/\* Copy remaining elements of L[] if any \*/

while (i < n1)

{

arr[k] = L[i];

i++;

k++;

}

/\* Copy remaining elements of R[] if any \*/

while (j < n2) {

arr[k] = R[j];

j++;

k++;

}

}

void sort(int arr[], int l, int r)

{

if (l < r)

{

// Find the middle point

int m =l+ (r-l)/2;

// Sort first and second halves

sort(arr, l, m);

sort(arr, m + 1, r);

// Merge the sorted halves

merge(arr, l, m, r);

}

}

public static void main(String args[])

{

int arr[] = { 12, 11, 13, 5, 6, 7 };

int n=arr.length;

System.out.println("Given Array");

for (int i=0;i<n;i++)

{

System.out.println(arr[i]);

}

Assignment3\_7 obj = new Assignment3\_7();

obj.sort(arr, 0, arr.length - 1);

System.out.println("\nSorted array");

for (int i=0;i<n;i++)

{

System.out.println(arr[i]);

}

}

}