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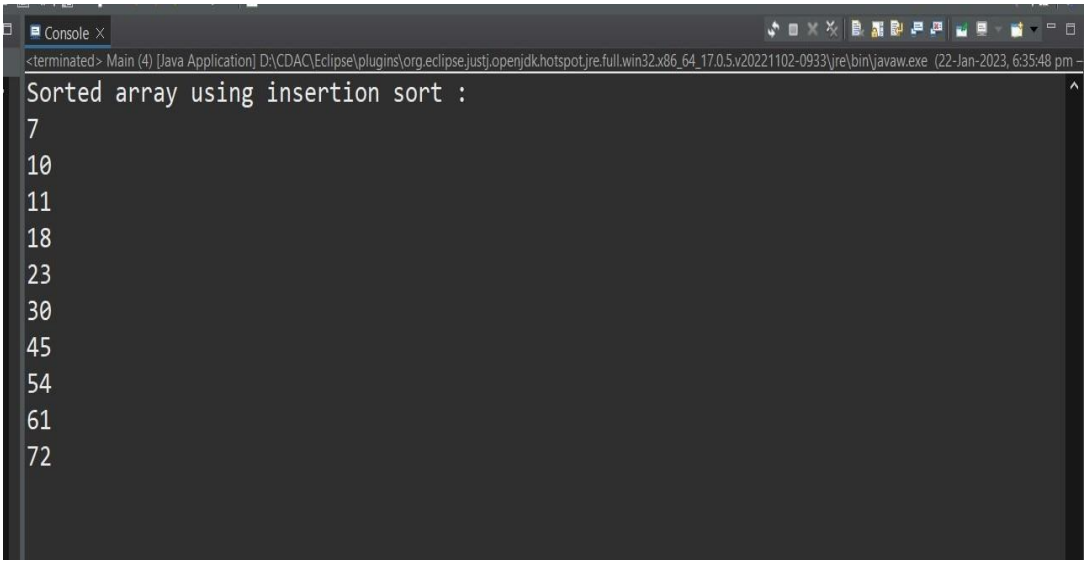
1. Write a Java program to

    a. Sort elements using insertion sort

```
package insertionsort;
public class InsertionSort {
void sort(int arr[]) {
for(int i=1; i<arr.length;++i) {
int key=arr[i];
int j=i-1;
while(j>=0 && arr[j]>key) {
arr[j+1]=arr[j];
j=j-1;
}
arr[j+1]=key;
}
}
void PrintArray(int arr[]) {
for(int i=0;i<arr.length;++i) {
System.out.println(arr[i]);
```

```
}

}

}
```

```
package insertionsort;

public class Main {

public static void main(String[] args) {

int[] arr= {72,30,45,23,61,54,11,7,10,18};

InsertionSort i= new InsertionSort();

System.out.println("Sorted array using insertion
sort :");

i.sort(arr);

i.PrintArray(arr);

}

}
```

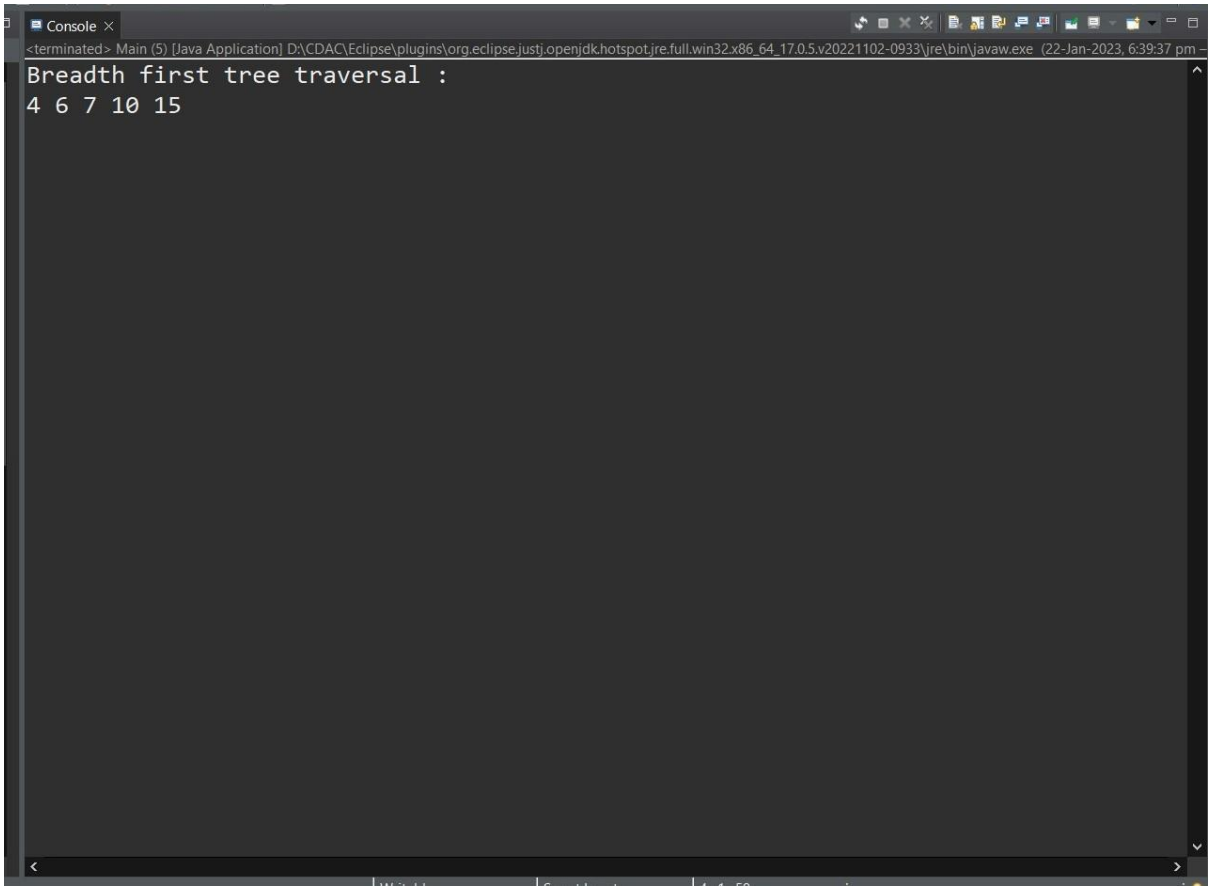


b. Implement breadth first tree traversal

```
package breadthfirsttreetraversal;

public class Node {

int data;

Node left, right;

public Node(int item)

{

data = item;

left = right = null;

}

}

package breadthfirsttreetraversal;

public class Main {

Node root;
```

```
public Main() { root = null; }
void LevelOrder()
{
int h = height(root);
for (int i=1; i<=h; i++)
CurrentLevel(root, i);
}
int height(Node root) {
if (root == null)
return 0;
else {
int lheight = height(root.left);
int rheight = height(root.right);
if (lheight > rheight)
return(lheight+1);
else return(rheight+1);
}
}
void CurrentLevel (Node root ,int level) {
if (root == null){
return;
```

```
}
if (level == 1){
System.out.print(root.data + " ");
}
else if (level > 1) {
CurrentLevel(root.left, level-1);
CurrentLevel(root.right, level-1);
}
}
public static void main(String args[])
{
Main tree = new Main();
tree.root = new Node(4);
tree.root.left = new Node(6);
tree.root.right = new Node(7);
tree.root.left.left = new Node(10);
tree.root.left.right = new Node(15);
System.out.println("Breadth first tree traversal
:");
tree.LevelOrder();
}
}
```


Console
<terminated> Main (5) [Java Application] D:\CDAC\Eclipse\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_17.0.5.v20221102-0933\jre\bin\javaw.exe (22-Jan-2023, 6:39:37 pm –
Breadth first tree traversal :
4 6 7 10 15