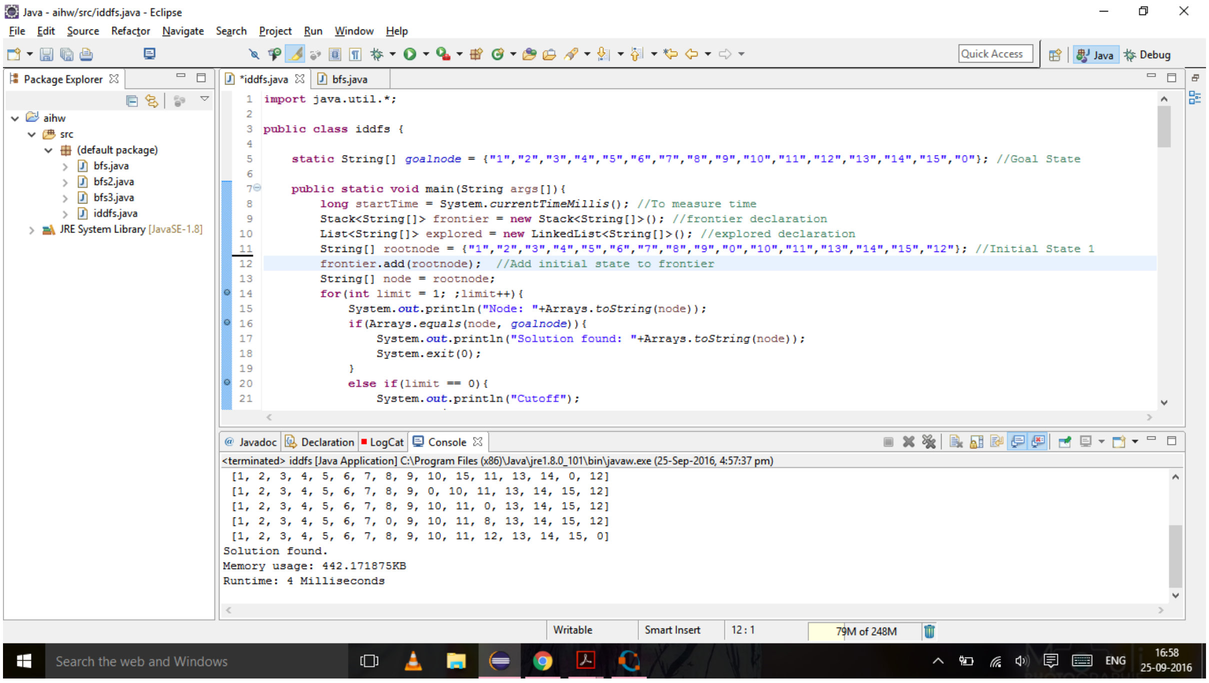
Initial State 1:

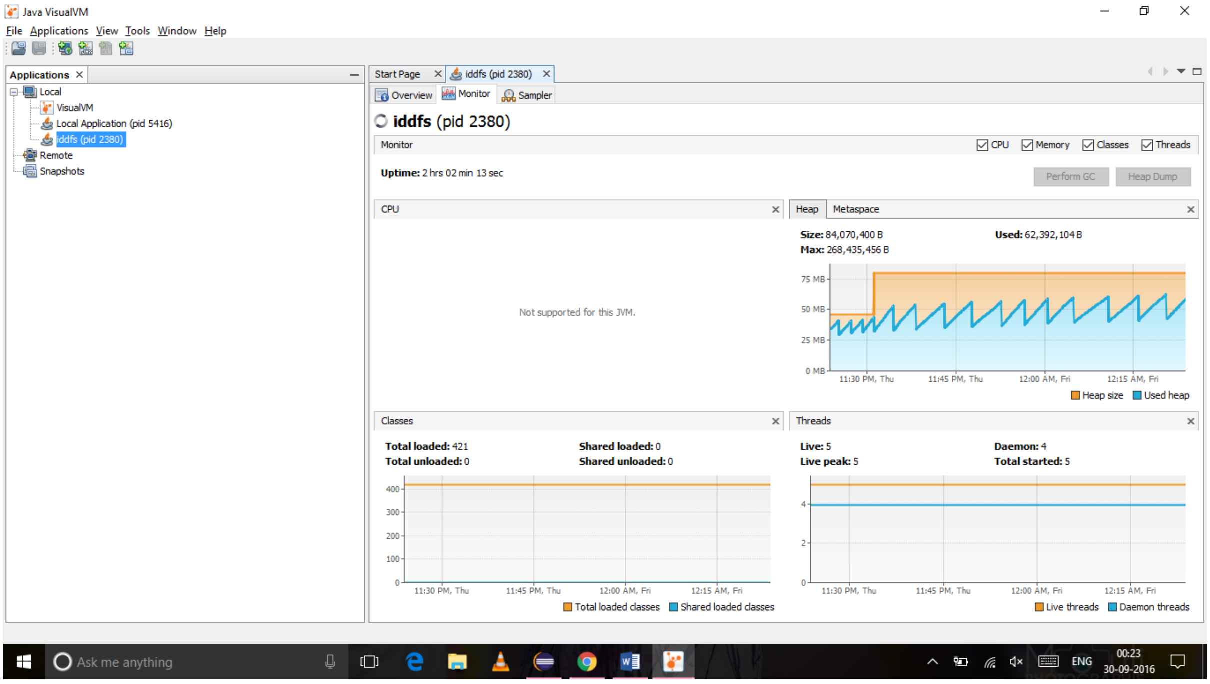
```
Memory usage: 442.171875KB
Runtime: 4 Milliseconds
```



```java
import java.util.*;

public class iddfs {

    static String[] goalnode = {"1","2","3","4","5","6","7","8","9","10","11","12","13","14","15","0"}; //Goal State

    public static void main(String args[]){
        long startTime = System.currentTimeMillis(); //To measure time
        Stack<String[]> frontier = new Stack<String[]>(); //frontier declaration
        List<String[]> explored = new LinkedList<String[]>(); //explored declaration
        String[] rootnode = {"1","2","3","4","5","6","7","8","9","0","10","11","13","14","15","12"}; //Initial State 1
        frontier.add(rootnode);  //Add initial state to frontier
        String[] node = rootnode;
        for(int limit = 1; ;limit++){
            System.out.println("Node: "+Arrays.toString(node));
            if(Arrays.equals(node, goalnode)){
                System.out.println("Solution found: "+Arrays.toString(node));
                System.exit(0);
            }
            else if(limit == 0){
                System.out.println("Cutoff");
```

```
<terminated> iddfs [Java Application] C:\Program Files (x86)\Java\jre1.8.0_101\bin\javaw.exe (25-Sep-2016, 4:57:37 pm)
 [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 11, 13, 14, 0, 12]
 [1, 2, 3, 4, 5, 6, 7, 8, 9, 0, 10, 11, 13, 14, 15, 12]
 [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 0, 13, 14, 15, 12]
 [1, 2, 3, 4, 5, 6, 7, 0, 9, 10, 11, 8, 13, 14, 15, 12]
 [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 0]
Solution found.
Memory usage: 442.171875KB
Runtime: 4 Milliseconds
```

Initial State 2:

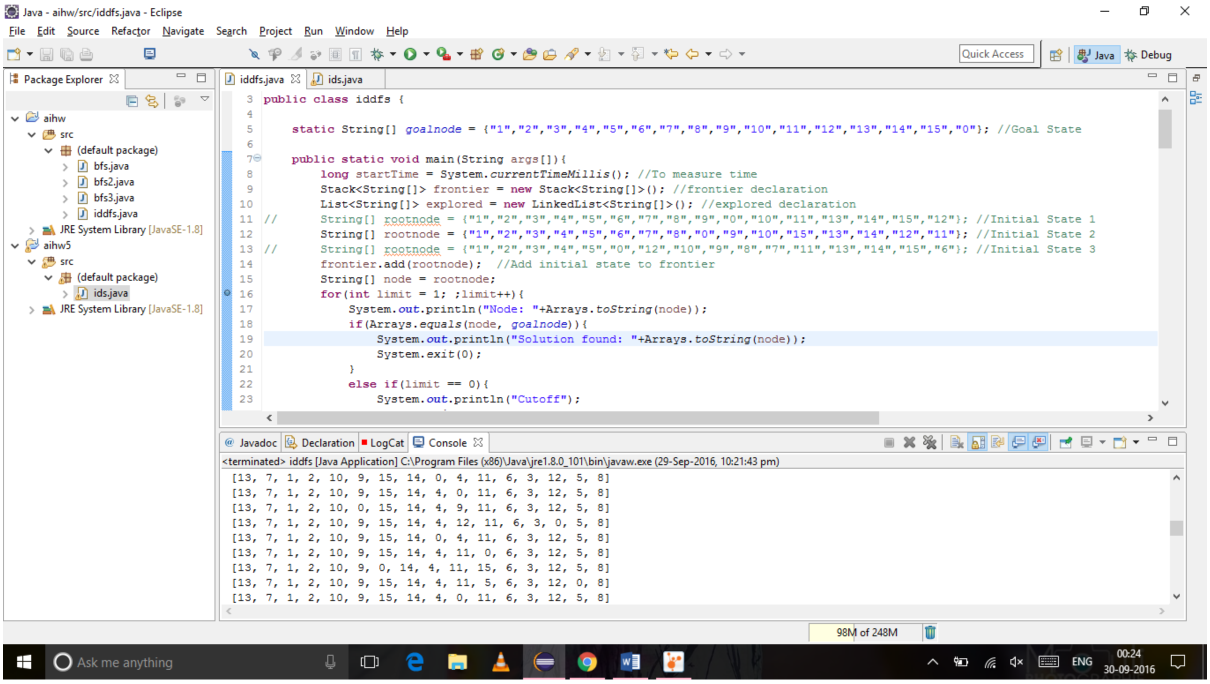


Uptime: 2 hrs 02 min 13 sec

Size: 84,070,400 B
Max: 268,435,456 B
Used: 62,392,104 B

Total loaded: 421
Total unloaded: 0
Shared loaded: 0
Shared unloaded: 0

Live: 5
Live peak: 5
Daemon: 4
Total started: 5

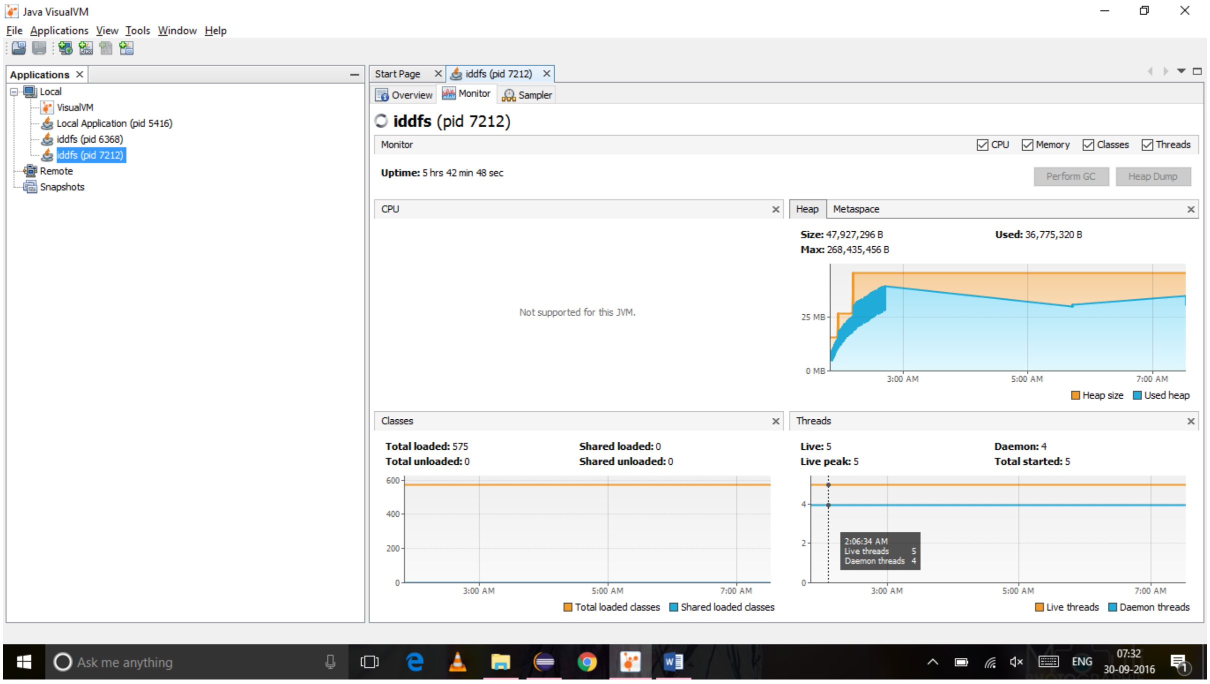


```java
public class iddfs {

    static String[] goalnode = {"1","2","3","4","5","6","7","8","9","10","11","12","13","14","15","0"}; //Goal State

    public static void main(String args[]){
        long startTime = System.currentTimeMillis(); //To measure time
        Stack<String[]> frontier = new Stack<String[]>(); //frontier declaration
        List<String[]> explored = new LinkedList<String[]>(); //explored declaration
//      String[] rootnode = {"1","2","3","4","5","6","7","8","9","0","10","11","13","14","15","12"}; //Initial State 1
        String[] rootnode = {"1","2","3","4","5","6","7","8","0","9","10","15","13","14","12","11"}; //Initial State 2
//      String[] rootnode = {"1","2","3","4","5","0","12","10","9","8","7","11","13","14","15","6"}; //Initial State 3
        frontier.add(rootnode);  //Add initial state to frontier
        String[] node = rootnode;
        for(int limit = 1; ;limit++){
            System.out.println("Node: "+Arrays.toString(node));
            if(Arrays.equals(node, goalnode)){
                System.out.println("Solution found: "+Arrays.toString(node));
                System.exit(0);
            }
            else if(limit == 0){
                System.out.println("Cutoff");
```

<terminated> iddfs [Java Application] C:\Program Files (x86)\Java\jre1.8.0_101\bin\javaw.exe (29-Sep-2016, 10:21:43 pm)

```
 [13, 7, 1, 2, 10, 9, 15, 14, 0, 4, 11, 6, 3, 12, 5, 8]
 [13, 7, 1, 2, 10, 9, 15, 14, 4, 0, 11, 6, 3, 12, 5, 8]
 [13, 7, 1, 2, 10, 0, 15, 14, 4, 9, 11, 6, 3, 12, 5, 8]
 [13, 7, 1, 2, 10, 9, 15, 14, 4, 12, 11, 6, 3, 0, 5, 8]
 [13, 7, 1, 2, 10, 9, 15, 14, 0, 4, 11, 6, 3, 12, 5, 8]
 [13, 7, 1, 2, 10, 9, 15, 14, 4, 11, 0, 6, 3, 12, 5, 8]
 [13, 7, 1, 2, 10, 9, 0, 14, 4, 11, 15, 6, 3, 12, 5, 8]
 [13, 7, 1, 2, 10, 9, 15, 14, 4, 11, 5, 6, 3, 12, 0, 8]
 [13, 7, 1, 2, 10, 9, 15, 14, 4, 0, 11, 6, 3, 12, 5, 8]
```

Initial State 3:



iddfs (pid 7212)

Monitor ☑ CPU ☑ Memory ☑ Classes ☑ Threads

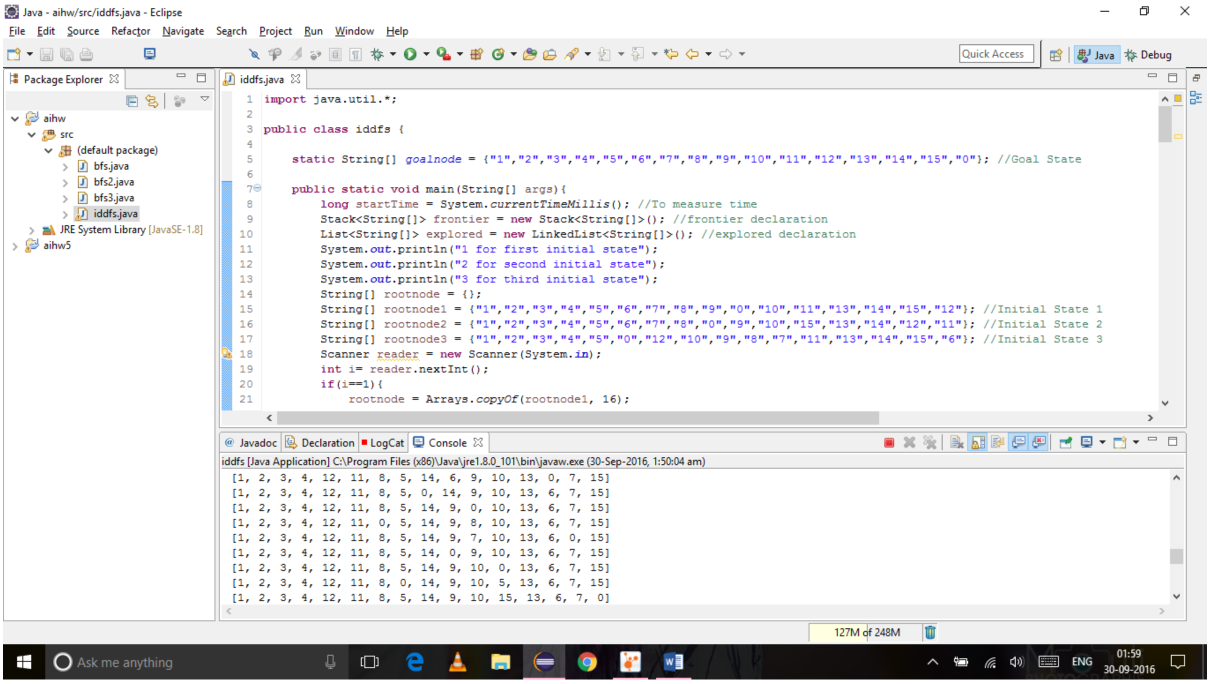
Uptime: 5 hrs 42 min 48 sec

Not supported for this JVM.

Size: 47,927,296 B **Used:** 36,775,320 B
Max: 268,435,456 B

Total loaded: 575 **Shared loaded:** 0
Total unloaded: 0 **Shared unloaded:** 0

Live: 5 **Daemon:** 4
Live peak: 5 **Total started:** 5



```java
import java.util.*;

public class iddfs {

    static String[] goalnode = {"1","2","3","4","5","6","7","8","9","10","11","12","13","14","15","0"}; //Goal State

    public static void main(String[] args){
        long startTime = System.currentTimeMillis(); //To measure time
        Stack<String[]> frontier = new Stack<String[]>(); //frontier declaration
        List<String[]> explored = new LinkedList<String[]>(); //explored declaration
        System.out.println("1 for first initial state");
        System.out.println("2 for second initial state");
        System.out.println("3 for third initial state");
        String[] rootnode = {};
        String[] rootnode1 = {"1","2","3","4","5","6","7","8","9","0","10","11","13","14","15","12"}; //Initial State 1
        String[] rootnode2 = {"1","2","3","4","5","6","7","8","0","9","10","15","13","14","12","11"}; //Initial State 2
        String[] rootnode3 = {"1","2","3","4","5","0","12","10","9","8","7","11","13","14","15","6"}; //Initial State 3
        Scanner reader = new Scanner(System.in);
        int i= reader.nextInt();
        if(i==1){
            rootnode = Arrays.copyOf(rootnode1, 16);
```

iddfs [Java Application] C:\Program Files (x86)\Java\jre1.8.0_101\bin\javaw.exe (30-Sep-2016, 1:50:04 am)

```
[1, 2, 3, 4, 12, 11, 8, 5, 14, 6, 9, 10, 13, 0, 7, 15]
[1, 2, 3, 4, 12, 11, 8, 5, 0, 14, 9, 10, 13, 6, 7, 15]
[1, 2, 3, 4, 12, 11, 8, 5, 14, 9, 0, 10, 13, 6, 7, 15]
[1, 2, 3, 4, 12, 11, 0, 5, 14, 9, 8, 10, 13, 6, 7, 15]
[1, 2, 3, 4, 12, 11, 8, 5, 14, 9, 7, 10, 13, 6, 0, 15]
[1, 2, 3, 4, 12, 11, 8, 5, 14, 0, 9, 10, 13, 6, 7, 15]
[1, 2, 3, 4, 12, 11, 8, 5, 14, 9, 10, 0, 13, 6, 7, 15]
[1, 2, 3, 4, 12, 11, 8, 0, 14, 9, 10, 5, 13, 6, 7, 15]
[1, 2, 3, 4, 12, 11, 8, 5, 14, 9, 10, 15, 13, 6, 7, 0]
```