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Source Code for Run Length Decoding:

```
import java.io.*;
import java.util.Scanner;

public class Decode {
   int numCols;
   int numRows;
   int minVal;
   int maxVal;

   int startCol, startRow,greyScale,length;
   int [][] img;

   Decode(Scanner input){
   loadHeader(input);
   }


    void loadHeader(Scanner imgFile) {
        numCols = imgFile.nextInt();
        numRows = imgFile.nextInt();
        minVal = imgFile.nextInt();
        maxVal = imgFile.nextInt();
    }

    void decoding(Scanner input, BufferedWriter output) throws IOException {
    int row=0;

    while(row<numRows && input.hasNextLine() ){
        int col=0;
        startRow=input.nextInt();
        startCol=input.nextInt();
        greyScale= input.nextInt();
        length=input.nextInt();
        int i=1;
        while(i<=length){
            output.write(greyScale+" ");
            i++;
            col++;
        }
        if(col>=numCols){
            output.write("\n");
        }
        row++;
    }
```

```
}

public static void main(String[] args) throws IOException{
    String inputName=args[0];
    FileReader inputReader=null;
    BufferedReader buffReader=null;
    Scanner input=null;

    String decodedFileName=args[1];
    FileWriter decodedFileWriter=null;
    BufferedWriter decodedFile=null;

    String debugFileName=args[2];
    FileWriter debugFileWriter=null;
    BufferedWriter debugFile=null;


    try {
       inputReader = new FileReader(inputName);
       buffReader = new BufferedReader(inputReader);
       input = new Scanner(buffReader);


       decodedFileWriter=new FileWriter(decodedFileName);
       decodedFile=new BufferedWriter(decodedFileWriter);

        debugFileWriter=new FileWriter(debugFileName);
        debugFile=new BufferedWriter(debugFileWriter);

        Decode d=new Decode(input);
        decodedFile.write(d.numRows+" "+d.numCols+" "+d.minVal+" "+d.maxVal+"\n");
        d.decoding(input, decodedFile);
    }

   finally{
     if(input!=null){
         input.close();
     }
     if(decodedFile!=null){
         decodedFile.close();
     }
     if(debugFile!=null){
         debugFile.close();
     }

   }
}
```

```
}
```

Output for Run Length Decoding:

Data_1:

```
Original Compressed File:

10 22 0 9
0 0 0 15
0 15 4 7
1 0 4 1
1 1 0 1
1 2 4 9
1 11 0 11
2 0 0 5
2 5 3 17
3 0 3 3
3 3 0 2
3 5 3 6
3 11 7 11
4 0 7 22
5 0 7 2
5 2 0 5
5 7 2 1
5 8 3 1
5 9 4 1
5 10 2 2
5 12 3 2
5 14 4 6
5 20 0 2
6 0 0 6
6 6 1 5
6 11 9 5
6 16 1 6
7 0 1 10
7 10 6 12
8 0 0 22
9 0 0 22


Decompressed Image:
22 10 0 9
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 4 4 4 4 4 4 4
4 0 4 4 4 4 4 4 4 4 4 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
3 3 3 0 0 3 3 3 3 3 3 7 7 7 7 7 7 7 7 7 7 7
7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
7 7 0 0 0 0 0 2 3 4 2 2 3 3 4 4 4 4 4 4 0 0
```

Data_2:

```
Original Compressed File
20 22 0 9
0 0 0 15
0 15 4 7
1 0 4 1
1 1 0 1
1 2 4 9
1 11 0 11
2 0 0 5
2 5 3 17
3 0 3 3
3 3 0 2
3 5 3 6
3 11 7 11
4 0 7 22
5 0 7 2
5 2 0 5
5 7 2 1
5 8 3 1
5 9 4 1
5 10 2 2
5 12 3 2
5 14 4 6
5 20 0 2
6 0 0 6
6 6 1 5
6 11 9 5
6 16 1 6
7 0 1 10
7 10 6 12
8 0 0 22
9 0 0 22
10 0 0 22
11 0 0 22
12 0 0 22
13 0 0 22
14 0 7 22
15 0 7 2
15 2 0 5
15 7 2 1
15 8 3 1
15 9 4 1
15 10 2 2
15 12 3 2
15 14 4 6
15 20 0 2
16 0 0 22
```

```
17 0 0 22
18 0 0 22
19 0 0 22


Decompressed Image:

22 20 0 9
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 4 4 4 4 4 4 4 4 0 4 4 4 4 4 4 4 4 4 4 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 0 0 3 3 3 3 3 3 7 7 7 7 7
7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
7 7 0 0 0 0 0 0 2 3 4 2 2 3 3 4 4 4 4 4 4 4 0 0
```