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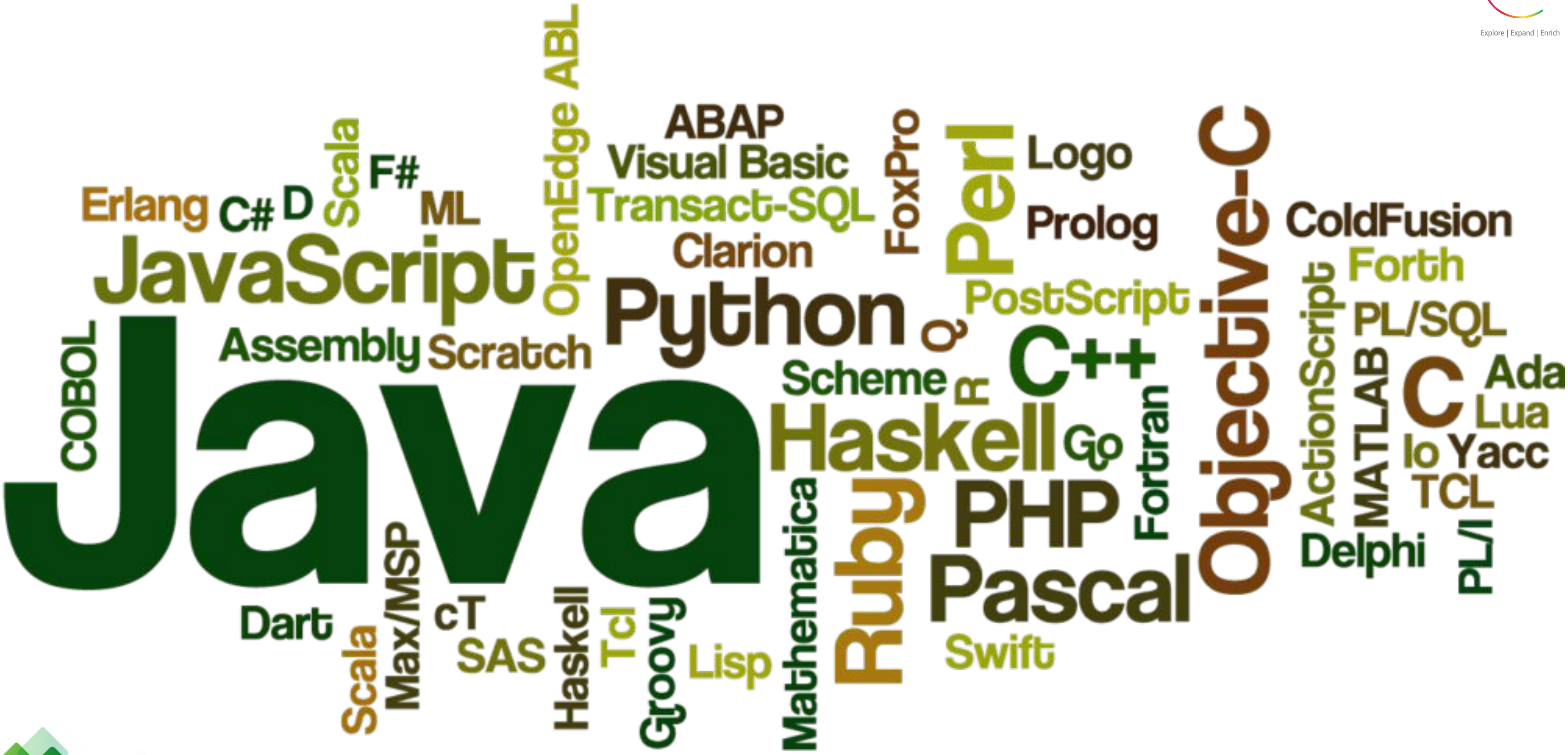
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ADVANCE PROGRAMS 2D IN JAVA

AN HOUR GLASS PROBLEM

You are given a 2D array. An hourglass in an array is a portion shaped like this

A B C

D

E F G:

For example, if we create an hourglass using the number 1 within an array full of zeros, it may look like this:

```
1 1 1 0 0 0
0 1 0 0 0 0
1 1 1 0 0 0
0 0 0 0 0 0
0 0 0 0 0 0
0 0 0 0 0 0
```

Actually, there are many hourglasses in the array above. The three leftmost hourglasses are the following:

```
1 1 1    1 1 0    1 0 0
  1        0        0
1 1 1    1 1 0    1 0 0
```

The sum of an hourglass is the sum of all the numbers within it. The sum for the hourglasses above are 7, 4, and 2, respectively.

In this problem you have to print the largest sum among all the hourglasses in the array.

Input Format :There will be exactly lines, each containing integers separated by spaces. Each integer will be between and inclusive.

Output Format

EXPLAINATION

Sample Input

```
1 1 1 0 0 0
0 1 0 0 0 0
1 1 1 0 0 0
0 0 2 4 4 0
0 0 0 2 0 0
0 0 1 2 4 0
```

```
2 4 4
  2
1 2 4
```

Sample Output

```
19
```

CODE :

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

class Solution{
     public static void main(String []argh){
          int[][] arr = new int[10][10];
          Scanner sc = new Scanner(System.in);
          for(int i=0;i<6;i++){
               for(int j=0;j<6;j++){
                    arr[i][j]=sc.nextInt();

               }

          }
```

CONTINUED....

```
int maxi=-100000;
          for(int i=0;i<6;i++){
               for(int j=0;j<6;j++){
                    if(i<=3 && j<=3){
                        int
sum=arr[i][j]+arr[i][j+1]+arr[i][j+2]+(arr[i+1][j+1])+arr[i+2][j]+arr[i+2][j+1]+arr[i+2]
[j+2];
                        if(sum>maxi) maxi=sum;
                    }
               }
          }
          System.out.println(maxi);
     }

  }
```

Q2 :SPIRAL MATRIX

Given a 2D array, print it in spiral form.

```
Input:
  1    2   3   4
  5    6   7   8
  9   10  11  12
  13  14  15  16

  Output:
1 2 3 4 8 12 16 15 14 13 9 5 6 7 11 10
```

```
 Input:
1   2   3   4  5   6
7   8   9  10  11  12
13  14  15 16  17  18

    Output:
    1 2 3 4 5 6 12 18 17 16 15 14 13 7 8 9 10 11
```

```
import java.io.*;
class Main {
    // Function print matrix in spiral form
    static void spiralPrint(int m, int n, int a[][])
    {
        int i, k = 0, l = 0;
        /* k - starting row index
        m - ending row index
        l - starting column index
        n - ending column index
        i - iterator
        */
```

CONTINUED……

```
while (k < m && l < n) {
            // Print the first row from the remaining rows
            for (i = l; i < n; ++i) {
                System.out.print(a[k][i] + " ");
            }
            k++;
```

CONTINUED.....

```
// Print the last column from the remaining columns
            for (i = k; i < m; ++i) {
                System.out.print(a[i][n - 1] + " ");
            }
            n--;

            // Print the last row from the remaining rows */
            if (k < m) {
                for (i = n - 1; i >= l; --i) {
                    System.out.print(a[m - 1][i] + " ");
                }
                m--;
            }
   // Print the first column from the remaining columns */
            if (l < n) {
                for (i = m - 1; i >= k; --i) {
                    System.out.print(a[i][l] + " ");
                }
                l++;
            }
```

CONTINUED...

```
 public static void main(String[] args)
    {
        int R = 3;
        int C = 6;
        int a[][] = { { 1, 2, 3, 4, 5, 6 },
                      { 7, 8, 9, 10, 11, 12 },
                      { 13, 14, 15, 16, 17, 18 } };
        spiralPrint(R, C, a);
    }
}
```

THANK YOU