Date: 10.1.2024

Session Topic: 2D - Arrays

Task 1

Question:

Spiral Matrix II

Solution:

```
class Solution {
    public int[][] generateMatrix(int n) {
        int spiral[][]=new int[n][n];
        int arr[]=new int[n*n];
        for(int i=0;i<n*n;i++)
        {
            arr[i]=i+1;
        }
        int rowSt=0,rowEd=n;
        int colSt=0,colEd=n;
        int index=0;
        while(rowSt<rowEd && colSt<colEd)
        {
            for(int i=colSt;i<colEd;i++)
            {
                if(index<=n*n-1)
                {
                    spiral[rowSt][i]=arr[index];
                    index++;
                }


            }

            rowSt++;

            for(int i=rowSt;i<rowEd-1;i++)

            {

                 if(index<=n*n-1)

                {

                spiral[i][colEd-1]=arr[index];

                index++;

                 }

            }

            colEd--;

            for(int i=colEd;i>=colSt;i--)

            {

                  if(index<=n*n-1)

                {

                spiral[rowEd-1][i]=arr[index];

                index++;

                }

            }

            rowEd--;

            for(int i=rowEd-1;i>=rowSt;i--)

            {

                  if(index<=n*n-1)

                {
```

```
                spiral[i][colSt]=arr[index];

                index++;

                }

            }

            colSt++;

        }

        return spiral;

    }

}
```

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Task 2

Question:Richest Customer Wealth

Solution:

```
class Solution {

    public int maximumWealth(int[][] accounts) {

        int max=0;

        for(int row=0;row<accounts.length;row++)

        {

            int sum=0;

            for(int col=0;col<accounts[row].length;col++)

            {

                sum+=accounts[row][col];

            }

            if(sum>max)
            {
               max=sum;
            }
        }
        return max;
    }
}
```

Date: 10.1.2024

Session Topic: 2D - Arrays

Task 4

Question:Matrix Diagonal Sum

Solution:

```
class Solution {
    public int diagonalSum(int[][] mat) {
        int sum=0;
        int row=0,col=mat.length-1;
        for(int i=0;i<mat.length;i++)
        {
            for(int j=0;j<mat[i].length;j++)
            {
                if(i==j)
                {
                 sum+=mat[i][j];
                }
                if(i==row && j==col)
                {
                    sum+=mat[i][j];
                    row++;
                    col--;
                }
            }
        }
        if(mat.length==mat[0].length && mat.length%2==1)
        {
            int temp=mat.length/2;
            sum-=mat[temp][temp];
        }
        return sum;
    }
}
```

Date: 10.1.2024

Session Topic: 2D - Arrays

Task 5

Question:Count Negative Numbers in a Sorted Matrix

Solution:

```
class Solution {
    public int countNegatives(int[][] grid) {
        int count=0;
        for(int i=0;i<grid.length;i++)
        {
            for(int j=0;j<grid[i].length;j++)
            {
                if(grid[i][j]<0)
                {
                    count++;
                }
            }
        }
        return count;
    }
}
```

Date: 10.1.2024

Session Topic: 2D - Arrays

Task 6

Question:Transpose Matrix

Solution:

```
class Solution {
    public int[][] transpose(int[][] matrix) {
        int arr[][]=new int[matrix[0].length][matrix.length];
        for(int i=0;i<matrix[0].length;i++)
        {
            for(int j=0;j<matrix.length;j++)
            {
                arr[i][j]=matrix[j][i];
            }
        }

        return arr;

    }

}
```

Date: 10.1.2024

Session Topic: 2D - Arrays

Task 7

Question: Set Matrix Zeroes

Solution:

```
class Solution {

    public void setZeroes(int[][] matrix) {

        int arr[]=new int[matrix.length];

        int arr1[]=new int[matrix[0].length];

        int row=matrix.length;

        int col=matrix[0].length;

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

        {

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

            {

                if(matrix[i][j]==0)

                {

                    arr[i]=1;

                    arr1[j]=1;

                }

            }
        }
        for(int i=0;i<row;i++)
        {
            for(int j=0;j<col;j++)
            {
                if(arr[i]==1||arr1[j]==1)
                {
                    matrix[i][j]=0;
                }
            }
        }
    }
}
```

Date: 10.1.2024

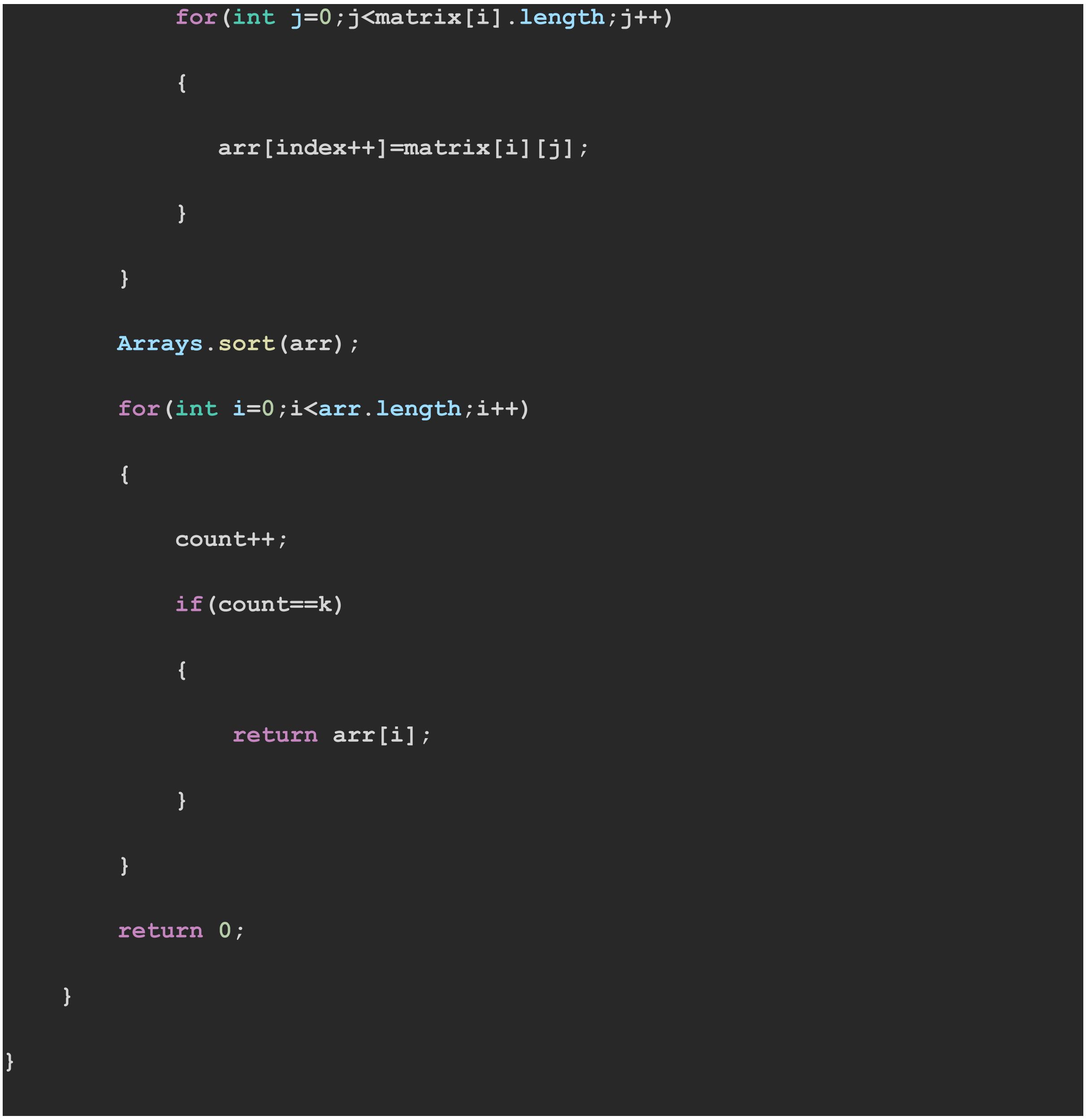
Session Topic: 2D - Arrays

Task 8

Question: Kth Smallest Element in a Sorted Matrix

Solution:

```
class Solution {
    public int kthSmallest(int[][] matrix, int k) {
        int count=0;
        int arr[]=new int[matrix.length*matrix.length];
        int index=0;
        for(int i=0;i<matrix.length;i++)
        {
```



```
            for(int j=0;j<matrix[i].length;j++)

            {

               arr[index++]=matrix[i][j];

            }

        }

        Arrays.sort(arr);

        for(int i=0;i<arr.length;i++)

        {

            count++;

            if(count==k)

            {

                return arr[i];

            }

        }

        return 0;

    }

}
```