VIDHI ROHIRA

SY BTECH

COMPUTER ENGINEERING

DAA LAB 4

OUTPUTS

231071052

TEST CASE 1:-

```
students_random_numbers = [
    [5, 2, 3, 6], [1, 1, 5, 2], [7, 6, 4, 1], [6, 2, 8, 7], [2, 3, 8, 4], [5, 5, 5, 4], [4, 8, 5, 3], [8, 1, 9, 6],
    [3, 4, 1, 1], [8, 3, 5, 3], [8, 7, 3, 8], [1, 4, 4, 8], [1, 2, 5, 4], [5, 7, 1, 6], [6, 5, 7, 6], [9, 7, 5, 5],
    [5, 8, 2, 2], [4, 4, 7, 8], [2, 3, 8, 2], [8, 6, 7, 4], [9, 6, 9, 9], [6, 5, 8, 9], [5, 2, 3, 8], [9, 3, 1, 4],
    [4, 5, 2, 9], [7, 3, 1, 1], [5, 6, 7, 9], [8, 5, 1, 1], [2, 2, 2, 3], [9, 6, 9, 4], [7, 5, 1, 4], [6, 2, 1, 4],
    [6, 2, 8, 9], [8, 6, 6, 7], [6, 6, 5, 9], [8, 5, 9, 5], [1, 6, 2, 6], [3, 4, 6, 9], [3, 7, 1, 4], [4, 1, 1, 6],
    [5, 5, 6, 6], [6, 5, 4, 2], [4, 2, 5, 3], [2, 2, 4, 1], [2, 7, 9, 9], [6, 4, 7, 8], [6, 7, 3, 3], [5, 4, 5, 4],
    [3, 4, 6, 9], [2, 7, 8, 2], [5, 7, 5, 3], [9, 8, 2, 2], [9, 8, 3, 6], [3, 8, 7, 7], [4, 6, 6, 9], [2, 1, 1, 2],
    [3, 6, 6, 2], [4, 7, 9, 8], [6, 1, 4, 1], [8, 3, 7, 8], [1, 1, 3, 6], [9, 3, 4, 5], [6, 3, 3, 5], [5, 4, 1, 9],
    [5, 2, 7, 4], [4, 7, 2, 8], [5, 1, 2, 1], [8, 9, 5, 4], [3, 1, 9, 5], [9, 4, 9, 4], [8, 1, 8, 5], [6, 2, 1, 6],
    [3, 4, 1, 7], [8, 5, 2, 5], [9, 3, 9, 1], [2, 9, 7, 5], [5, 4, 8, 5], [4, 4, 9, 8], [8, 2, 3, 8], [4, 5, 5, 1],
    [4, 9, 5, 5], [8, 5, 6, 3], [3, 2, 6, 3], [5, 1, 7, 5], [6, 5, 7, 8], [3, 7, 3, 4], [2, 1, 4, 5], [2, 6, 3, 8],
    [4, 3, 8, 2], [3, 3, 5, 6], [3, 7, 5, 1], [1, 5, 5, 3], [9, 1, 9, 7], [1, 2, 5, 5], [4, 6, 7, 6], [6, 8, 1, 1],
    [2, 2, 6, 9], [3, 4, 4, 8], [2, 3, 3, 9], [3, 2, 7, 3]
]
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS                                   Python: count_inv_tc1

PS F:\VIDHI ROHIRA SY BTECH CE\SEMESTER 3\DAA LAB 4> & C:/Users/DELL/AppData/Local/Microsoft/WindowsApps/python3.11.exe "f:/VIDHI ROHIRA SY BTECH CE/SEMEST
ER 3/DAA LAB 4/count_inv_tc1.py"
Total inversion count (Brute Force) across all students: 244
Total inversion count (Divide and Conquer) across all students: 244

Categorized Inversion Counts (Brute Force):
Inversion Count 0: Students [12, 18, 27, 29, 38, 41, 45, 49, 55, 61, 90, 94, 97, 98, 99]
Inversion Count 1: Students [2, 5, 13, 21, 22, 33, 37, 46, 58, 78, 85, 87, 88, 95]
Inversion Count 2: Students [1, 4, 15, 19, 23, 25, 35, 40, 50, 54, 56, 60, 66, 69, 73, 77, 79, 81, 83, 84, 86, 92, 100]
Inversion Count 3: Students [6, 8, 11, 14, 34, 36, 39, 43, 44, 48, 57, 62, 63, 64, 65, 70, 71, 72, 76, 80, 93]
Inversion Count 4: Students [7, 9, 10, 17, 24, 30, 32, 47, 51, 59, 67, 74, 75, 89, 91, 96]
Inversion Count 5: Students [16, 20, 26, 28, 31, 52, 53, 68, 82]
Inversion Count 6: Students [3, 42]

Categorized Inversion Counts (Divide and Conquer):
Inversion Count 0: Students [12, 18, 27, 29, 38, 41, 45, 49, 55, 61, 90, 94, 97, 98, 99]
Inversion Count 1: Students [2, 5, 13, 21, 22, 33, 37, 46, 58, 78, 85, 87, 88, 95]
Inversion Count 2: Students [1, 4, 15, 19, 23, 25, 35, 40, 50, 54, 56, 60, 66, 69, 73, 77, 79, 81, 83, 84, 86, 92, 100]
Inversion Count 3: Students [6, 8, 11, 14, 34, 36, 39, 43, 44, 48, 57, 62, 63, 64, 65, 70, 71, 72, 76, 80, 93]
Inversion Count 4: Students [7, 9, 10, 17, 24, 30, 32, 47, 51, 59, 67, 74, 75, 89, 91, 96]
Inversion Count 5: Students [16, 20, 26, 28, 31, 52, 53, 68, 82]
Inversion Count 6: Students [3, 42]
PS F:\VIDHI ROHIRA SY BTECH CE\SEMESTER 3\DAA LAB 4>
```

TEST CASE 2:-

```
students_random_numbers = [
    [1, 2, 3, 4], [1, 1, 5, 2], [7, 6, 4, 1], [6, 2, 8, 7], [2, 3, 8, 4], [5, 5, 5, 4], [4, 8, 5, 3], [8, 1, 9, 6],
    [3, 4, 1, 1], [8, 3, 5, 3], [8, 7, 3, 8], [1, 4, 4, 8], [1, 2, 5, 4], [5, 7, 1, 6], [6, 5, 7, 6], [9, 7, 5, 5],
    [5, 8, 2, 2], [1, 3, 7, 8], [2, 3, 8, 2], [8, 6, 7, 4], [9, 6, 9, 9], [6, 5, 8, 9], [5, 2, 3, 8], [9, 3, 1, 4],
    [4, 5, 2, 9], [7, 3, 1, 1], [5, 6, 7, 9], [8, 5, 1, 1], [2, 2, 2, 3], [9, 6, 9, 4], [7, 5, 1, 4], [6, 2, 1, 4],
    [6, 2, 8, 9], [8, 6, 6, 7], [6, 6, 5, 9], [8, 5, 9, 5], [1, 6, 2, 6], [1, 4, 6, 9], [3, 7, 1, 4], [4, 1, 1, 6],
    [5, 5, 6, 6], [6, 5, 4, 2], [4, 2, 5, 3], [2, 2, 4, 1], [2, 7, 9, 9], [6, 4, 7, 8], [6, 7, 3, 3], [5, 4, 5, 4],
    [3, 4, 6, 9], [2, 7, 8, 2], [5, 7, 5, 3], [9, 8, 2, 2], [9, 8, 3, 6], [3, 8, 7, 7], [4, 6, 6, 9], [2, 1, 1, 2],
    [3, 6, 6, 2], [4, 7, 9, 8], [6, 1, 4, 1], [4, 5, 7, 8], [1, 1, 3, 6], [9, 3, 4, 5], [6, 3, 3, 5], [5, 4, 1, 9],
    [5, 2, 7, 4], [4, 7, 2, 8], [5, 1, 2, 1], [8, 9, 5, 4], [3, 1, 9, 5], [9, 4, 9, 4], [8, 1, 8, 5], [6, 2, 1, 6],
    [3, 4, 1, 7], [8, 5, 2, 5], [9, 3, 9, 1], [2, 9, 7, 5], [5, 4, 8, 5], [4, 4, 9, 8], [8, 2, 3, 8], [4, 5, 5, 1],
    [4, 9, 5, 5], [8, 5, 6, 3], [3, 2, 6, 3], [5, 1, 7, 5], [6, 5, 7, 8], [3, 7, 3, 4], [2, 1, 4, 5], [2, 6, 3, 8],
    [4, 3, 8, 2], [3, 3, 5, 6], [3, 7, 5, 1], [1, 5, 5, 3], [9, 1, 9, 7], [1, 2, 5, 5], [4, 6, 7, 6], [6, 8, 1, 1],
    [2, 2, 6, 9], [3, 4, 4, 8], [2, 3, 3, 9], [3, 2, 7, 3]
]
(function) def count_inversions_brute_force(arr: Any) -> int
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS F:\VIDHI ROHIRA SY BTECH CE\SEMESTER 3\DAA LAB 4> & C:/Users/DELL/AppData/Local/Microsoft/WindowsApps/python3.11.exe "f:/VIDHI ROHIRA SY
BTECH CE/SEMESTER 3/DAA LAB 4/count_inv_tc2.py"
Total inversion count (Brute Force) across all students: 240
Total inversion count (Divide and Conquer) across all students: 240

Categorized Inversion Counts (Brute Force):
Inversion Count 0: Students [1, 12, 18, 27, 29, 38, 41, 45, 49, 55, 60, 61, 90, 94, 97, 98, 99]
Inversion Count 1: Students [2, 5, 13, 21, 22, 33, 37, 46, 58, 78, 85, 87, 88, 95]
Inversion Count 2: Students [4, 15, 19, 23, 25, 35, 40, 50, 54, 56, 66, 69, 73, 77, 79, 81, 83, 84, 86, 92, 100]
Inversion Count 3: Students [6, 8, 11, 14, 34, 36, 39, 43, 44, 48, 57, 62, 63, 64, 65, 70, 71, 72, 76, 80, 93]
Inversion Count 4: Students [7, 9, 10, 17, 24, 30, 32, 47, 51, 59, 67, 74, 75, 89, 91, 96]
Inversion Count 5: Students [16, 20, 26, 28, 31, 52, 53, 68, 82]
Inversion Count 6: Students [3, 42]

Categorized Inversion Counts (Divide and Conquer):
Inversion Count 0: Students [1, 12, 18, 27, 29, 38, 41, 45, 49, 55, 60, 61, 90, 94, 97, 98, 99]
Inversion Count 1: Students [2, 5, 13, 21, 22, 33, 37, 46, 58, 78, 85, 87, 88, 95]
Inversion Count 2: Students [4, 15, 19, 23, 25, 35, 40, 50, 54, 56, 66, 69, 73, 77, 79, 81, 83, 84, 86, 92, 100]
Inversion Count 3: Students [6, 8, 11, 14, 34, 36, 39, 43, 44, 48, 57, 62, 63, 64, 65, 70, 71, 72, 76, 80, 93]
Inversion Count 4: Students [7, 9, 10, 17, 24, 30, 32, 47, 51, 59, 67, 74, 75, 89, 91, 96]
Inversion Count 5: Students [16, 20, 26, 28, 31, 52, 53, 68, 82]
Inversion Count 6: Students [3, 42]
PS F:\VIDHI ROHIRA SY BTECH CE\SEMESTER 3\DAA LAB 4>
```

TEST CASE 3:-

```
students_random_numbers = [
    [1, 2, 3, 4], [1, 1, 5, 2], [7, 6, 4, 1], [6, 2, 8, 7], [2, 3, 8, 4], [5, 5, 5, 4], [4, 8, 5, 3], [8, 1, 9, 6],
    [3, 4, 1, 1], [8, 3, 5, 3], [8, 7, 3, 8], [1, 4, 4, 8], [1, 2, 5, 4], [5, 7, 1, 6], [6, 5, 7, 6], [9, 7, 5, 5],
    [5, 8, 2, 2], [1, 3, 7, 8], [2, 3, 8, 2], [8, 6, 7, 4], [9, 6, 9, 9], [6, 5, 8, 9], [5, 2, 3, 8], [9, 3, 1, 4],
    [4, 5, 2, 9], [7, 3, 1, 1], [5, 6, 7, 9], [8, 5, 1, 1], [2, 2, 2, 3], [9, 6, 9, 4], [7, 5, 1, 4], [6, 2, 1, 4],
    [6, 2, 8, 9], [8, 6, 6, 7], [6, 6, 5, 9], [8, 5, 9, 5], [1, 6, 2, 6], [1, 4, 6, 9], [3, 7, 1, 4], [4, 1, 1, 6],
    [5, 5, 6, 6], [1, 5, 4, 2], [4, 2, 5, 3], [2, 2, 4, 1], [1, 7, 9, 9], [6, 4, 7, 8], [6, 7, 3, 3], [5, 4, 5, 4],
    [3, 4, 6, 9], [1, 7, 8, 2], [5, 7, 5, 3], [9, 8, 2, 2], [1, 8, 3, 6], [3, 8, 7, 7], [4, 6, 6, 9], [2, 1, 1, 2],
    [3, 6, 6, 2], [1, 7, 9, 8], [6, 1, 4, 1], [4, 5, 7, 8], [1, 1, 3, 6], [9, 3, 4, 5], [6, 3, 3, 5], [5, 4, 1, 9],
    [5, 2, 7, 4], [1, 7, 2, 8], [5, 1, 2, 1], [8, 9, 5, 4], [1, 1, 9, 5], [9, 4, 9, 4], [8, 1, 8, 5], [6, 2, 1, 6],
    [3, 4, 1, 7], [1, 5, 2, 5], [9, 3, 9, 1], [2, 1, 7, 5], [1, 4, 8, 5], [4, 4, 9, 8], [8, 2, 3, 8], [4, 5, 5, 1],
    [4, 9, 5, 5], [8, 5, 6, 3], [3, 2, 6, 3], [5, 1, 7, 5], [6, 5, 7, 8], [3, 7, 3, 4], [2, 1, 4, 5], [2, 6, 3, 8],
    [4, 3, 8, 2], [3, 3, 5, 6], [3, 7, 5, 1], [1, 5, 5, 3], [9, 1, 9, 7], [1, 2, 5, 5], [4, 6, 7, 6], [6, 8, 1, 1],
    [2, 2, 6, 9], [3, 4, 4, 8], [2, 3, 3, 9], [3, 2, 7, 3]
]
```

```
PS F:\VIDHI ROHIRA SY BTECH CE\SEMESTER 3\DAA LAB 4> & C:/Users/DELL/AppData/Local/Microsoft/WindowsApps/python3.11.exe "f:/VIDHI ROHIRA SY BTECH CE/
SEMESTER 3/DAA LAB 4/count_inv_tc3.py"
Total inversion count (Brute Force) across all students: 227
Total inversion count (Divide and Conquer) across all students: 227

Categorized Inversion Counts (Brute Force):
Inversion Count 0: Students [1, 12, 18, 27, 29, 38, 41, 45, 49, 55, 60, 61, 90, 94, 97, 98, 99]
Inversion Count 1: Students [2, 5, 13, 21, 22, 33, 37, 46, 58, 66, 69, 74, 77, 78, 85, 87, 88, 95]
Inversion Count 2: Students [4, 15, 19, 23, 25, 35, 40, 50, 53, 54, 56, 73, 76, 79, 81, 83, 84, 86, 92, 100]
Inversion Count 3: Students [6, 8, 11, 14, 34, 36, 39, 42, 43, 44, 48, 57, 62, 63, 64, 65, 70, 71, 72, 80, 93]
Inversion Count 4: Students [7, 9, 10, 17, 24, 30, 32, 47, 51, 59, 67, 75, 89, 91, 96]
Inversion Count 5: Students [16, 20, 26, 28, 31, 52, 68, 82]
Inversion Count 6: Students [3]

Categorized Inversion Counts (Divide and Conquer):
Inversion Count 0: Students [1, 12, 18, 27, 29, 38, 41, 45, 49, 55, 60, 61, 90, 94, 97, 98, 99]
Inversion Count 1: Students [2, 5, 13, 21, 22, 33, 37, 46, 58, 66, 69, 74, 77, 78, 85, 87, 88, 95]
Inversion Count 2: Students [4, 15, 19, 23, 25, 35, 40, 50, 53, 54, 56, 73, 76, 79, 81, 83, 84, 86, 92, 100]
Inversion Count 3: Students [6, 8, 11, 14, 34, 36, 39, 42, 43, 44, 48, 57, 62, 63, 64, 65, 70, 71, 72, 80, 93]
Inversion Count 4: Students [7, 9, 10, 17, 24, 30, 32, 47, 51, 59, 67, 75, 89, 91, 96]
Inversion Count 5: Students [16, 20, 26, 28, 31, 52, 68, 82]
Inversion Count 6: Students [3]
PS F:\VIDHI ROHIRA SY BTECH CE\SEMESTER 3\DAA LAB 4>
```

TEST CASE 4:-

```
students_random_numbers = [
    [1, 2, 3, 4], [1, 1, 5, 2], [7, 6, 4, 1], [6, 2, 8, 7], [2, 3, 8, 4], [1, 5, 5, 4], [4, 8, 5, 3], [8, 1, 9, 6],
    [1, 4, 1, 1], [1, 3, 5, 3], [8, 7, 3, 8], [1, 4, 4, 8], [1, 2, 5, 4], [1, 7, 1, 6], [6, 5, 7, 6], [9, 7, 5, 5],
    [1, 8, 2, 2], [1, 3, 7, 8], [2, 3, 8, 2], [8, 6, 7, 4], [9, 6, 9, 9], [1, 5, 8, 9], [5, 2, 3, 8], [9, 3, 1, 4],
    [1, 5, 2, 9], [1, 3, 1, 1], [5, 6, 7, 9], [8, 5, 1, 1], [2, 2, 2, 3], [1, 6, 9, 4], [7, 5, 1, 4], [6, 2, 1, 4],
    [1, 2, 8, 9], [1, 6, 6, 7], [6, 6, 5, 9], [8, 5, 9, 5], [1, 6, 2, 6], [1, 4, 6, 9], [3, 7, 1, 4], [4, 1, 1, 6],
    [1, 5, 6, 6], [1, 5, 4, 2], [4, 2, 5, 3], [2, 2, 4, 1], [1, 7, 9, 9], [1, 4, 7, 8], [6, 7, 3, 3], [5, 4, 5, 4],
    [1, 4, 6, 9], [1, 7, 8, 2], [5, 7, 5, 3], [9, 8, 2, 2], [1, 8, 3, 6], [1, 8, 7, 7], [4, 6, 6, 9], [2, 1, 1, 2],
    [1, 6, 6, 2], [1, 7, 9, 8], [6, 1, 4, 1], [4, 5, 7, 8], [1, 1, 3, 6], [1, 3, 4, 5], [6, 3, 3, 5], [5, 4, 1, 9],
    [1, 2, 7, 4], [1, 7, 2, 8], [5, 1, 2, 1], [8, 9, 5, 4], [1, 1, 9, 5], [1, 4, 9, 4], [8, 1, 8, 5], [6, 2, 1, 6],
    [1, 4, 1, 7], [1, 5, 2, 5], [9, 3, 9, 1], [2, 1, 7, 5], [1, 4, 8, 5], [4, 4, 9, 8], [8, 2, 3, 8], [4, 5, 5, 1],
    [1, 9, 5, 5], [8, 5, 6, 3], [3, 2, 6, 3], [5, 1, 7, 5], [6, 5, 7, 8], [1, 7, 3, 4], [2, 1, 4, 5], [2, 6, 3, 8],
    [1, 3, 8, 2], [3, 3, 5, 6], [3, 7, 5, 1], [1, 5, 5, 3], [9, 1, 9, 7], [1, 2, 5, 5], [4, 6, 7, 6], [6, 8, 1, 1],
    [1, 2, 6, 9], [1, 4, 4, 8], [2, 3, 3, 9], [1, 2, 7, 3]
]
```

```
SEMESTER 3/DAA LAB 4/count_inv_tc3.py"
Total inversion count (Brute Force) across all students: 194
Total inversion count (Divide and Conquer) across all students: 194

Categorized Inversion Counts (Brute Force):
Inversion Count 0: Students [1, 12, 18, 22, 27, 29, 33, 34, 38, 41, 45, 46, 49, 55, 60, 61, 62, 90, 94, 97, 98, 99]
Inversion Count 1: Students [2, 5, 10, 13, 21, 25, 37, 58, 65, 66, 69, 70, 73, 74, 77, 78, 85, 87, 88, 95, 100]
Inversion Count 2: Students [4, 6, 9, 14, 15, 17, 19, 23, 26, 30, 35, 40, 50, 53, 54, 56, 57, 76, 79, 81, 83, 84, 86, 89, 92]
Inversion Count 3: Students [8, 11, 36, 39, 42, 43, 44, 48, 63, 64, 71, 72, 80, 93]
Inversion Count 4: Students [7, 24, 32, 47, 51, 59, 67, 75, 91, 96]
Inversion Count 5: Students [16, 20, 28, 31, 52, 68, 82]
Inversion Count 6: Students [3]

Categorized Inversion Counts (Divide and Conquer):
Inversion Count 0: Students [1, 12, 18, 22, 27, 29, 33, 34, 38, 41, 45, 46, 49, 55, 60, 61, 62, 90, 94, 97, 98, 99]
Inversion Count 1: Students [2, 5, 10, 13, 21, 25, 37, 58, 65, 66, 69, 70, 73, 74, 77, 78, 85, 87, 88, 95, 100]
Inversion Count 2: Students [4, 6, 9, 14, 15, 17, 19, 23, 26, 30, 35, 40, 50, 53, 54, 56, 57, 76, 79, 81, 83, 84, 86, 89, 92]
Inversion Count 3: Students [8, 11, 36, 39, 42, 43, 44, 48, 63, 64, 71, 72, 80, 93]
Inversion Count 4: Students [7, 24, 32, 47, 51, 59, 67, 75, 91, 96]
Inversion Count 5: Students [16, 20, 28, 31, 52, 68, 82]
Inversion Count 6: Students [3]
PS F:\VIDHI ROHIRA SY BTECH CE\SEMESTER 3\DAA LAB 4>
```

TEST CASE 5:-

```
students_random_numbers = [
    [1, 2, 3, 4], [1, 1, 5, 2], [7, 6, 4, 1], [6, 2, 8, 7], [2, 3, 8, 4], [1, 5, 5, 4], [4, 8, 5, 3], [8, 1, 9, 6],
    [1, 4, 1, 1], [1, 3, 5, 3], [8, 7, 3, 8], [1, 4, 4, 8], [1, 2, 5, 4], [1, 7, 1, 6], [6, 5, 7, 6], [9, 7, 5, 5],
    [1, 8, 2, 2], [1, 3, 7, 8], [2, 3, 8, 2], [8, 6, 7, 4], [9, 6, 9, 9], [1, 5, 8, 9], [5, 2, 3, 8], [9, 3, 1, 4],
    [1, 5, 2, 9], [1, 3, 1, 1], [5, 6, 7, 9], [8, 5, 1, 1], [2, 2, 2, 3], [1, 6, 9, 4], [7, 5, 1, 4], [6, 2, 1, 4],
    [1, 2, 8, 9], [1, 6, 3, 7], [6, 6, 5, 9], [8, 5, 9, 5], [1, 6, 2, 6], [1, 4, 6, 9], [3, 7, 1, 4], [4, 1, 1, 6],
    [1, 5, 6, 6], [1, 5, 4, 2], [4, 2, 5, 3], [2, 2, 4, 1], [1, 7, 9, 9], [1, 4, 7, 8], [6, 7, 3, 3], [5, 4, 5, 4],
    [1, 4, 6, 9], [1, 7, 8, 2], [5, 7, 5, 3], [9, 8, 2, 2], [1, 8, 3, 6], [1, 8, 7, 7], [4, 6, 6, 9], [2, 1, 1, 2],
    [1, 6, 6, 2], [1, 7, 9, 8], [6, 1, 4, 1], [4, 5, 7, 8], [1, 1, 3, 6], [1, 3, 4, 5], [6, 3, 3, 5], [5, 4, 1, 9],
    [1, 2, 7, 4], [1, 7, 2, 8], [5, 1, 2, 1], [8, 9, 5, 4], [1, 1, 9, 5], [1, 4, 9, 4], [8, 1, 8, 5], [6, 2, 1, 6],
    [1, 4, 1, 7], [1, 5, 2, 5], [9, 3, 9, 1], [2, 1, 7, 5], [1, 4, 8, 5], [4, 4, 9, 8], [8, 2, 3, 8], [4, 5, 5, 1],
    [1, 9, 5, 5], [8, 5, 6, 3], [3, 2, 6, 3], [5, 1, 7, 5], [6, 5, 7, 8], [1, 7, 3, 4], [2, 1, 4, 5], [2, 6, 3, 8],
    [1, 3, 8, 2], [3, 3, 5, 6], [3, 7, 5, 1], [1, 5, 5, 3], [9, 1, 9, 7], [1, 2, 5, 5], [4, 6, 7, 6], [6, 8, 1, 1],
    [1, 2, 6, 9], [1, 4, 4, 8], [2, 3, 3, 9], [1, 2, 7, 3]
]
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

SEMESTER 3/DAA LAB 4/count_inv_tc3.py"
Total inversion count (Brute Force) across all students: 195
Total inversion count (Divide and Conquer) across all students: 195

Categorized Inversion Counts (Brute Force):
Inversion Count 0: Students [1, 12, 18, 22, 27, 29, 33, 38, 41, 45, 46, 49, 55, 60, 61, 62, 90, 94, 97, 98, 99]
Inversion Count 1: Students [2, 5, 10, 13, 21, 25, 34, 37, 58, 65, 66, 69, 70, 73, 74, 77, 78, 85, 87, 88, 95, 100]
Inversion Count 2: Students [4, 6, 9, 14, 15, 17, 19, 23, 26, 30, 35, 40, 50, 53, 54, 56, 57, 76, 79, 81, 83, 84, 86, 89, 92]
Inversion Count 3: Students [8, 11, 36, 39, 42, 43, 44, 48, 63, 64, 71, 72, 80, 93]
Inversion Count 4: Students [7, 24, 32, 47, 51, 59, 67, 75, 91, 96]
Inversion Count 5: Students [16, 20, 28, 31, 52, 68, 82]
Inversion Count 6: Students [3]

Categorized Inversion Counts (Divide and Conquer):
Inversion Count 0: Students [1, 12, 18, 22, 27, 29, 33, 38, 41, 45, 46, 49, 55, 60, 61, 62, 90, 94, 97, 98, 99]
Inversion Count 1: Students [2, 5, 10, 13, 21, 25, 34, 37, 58, 65, 66, 69, 70, 73, 74, 77, 78, 85, 87, 88, 95, 100]
Inversion Count 2: Students [4, 6, 9, 14, 15, 17, 19, 23, 26, 30, 35, 40, 50, 53, 54, 56, 57, 76, 79, 81, 83, 84, 86, 89, 92]
Inversion Count 3: Students [8, 11, 36, 39, 42, 43, 44, 48, 63, 64, 71, 72, 80, 93]
Inversion Count 4: Students [7, 24, 32, 47, 51, 59, 67, 75, 91, 96]
Inversion Count 5: Students [16, 20, 28, 31, 52, 68, 82]
Inversion Count 6: Students [3]
PS F:\VIDHI ROHIRA SY BTECH CE\SEMESTER 3\DAA LAB 4>
```

TEST CASE 6:-

```
students_random_numbers = [
    [5, 2, 3, 6], [-2, -1, -5, -2], [7, False, 4, 1], [6, 2, -5, -7],
    [2, 3, 8, 4], [5, 5, 5, 4], [True, False, 1, 0]
]
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS F:\VIDHI ROHIRA SY BTECH CE\SEMESTER 3\DAA LAB 4> & C:/Users/DELL/AppData/Local/Microsoft/WindowsApps/python3.11.exe "f:/VIDHI ROHIRA SY BTECH CE/
SEMESTER 3/DAA LAB 4/invcount-negative-tc5.py"

Categorized Inversion Counts (Valid Entries):
Student 1: Brute Force Inversion Count = 2, Divide and Conquer Inversion Count = 2
Student 4: Brute Force Inversion Count = 6, Divide and Conquer Inversion Count = 6
Student 5: Brute Force Inversion Count = 1, Divide and Conquer Inversion Count = 1
Student 6: Brute Force Inversion Count = 3, Divide and Conquer Inversion Count = 3

Negative Integer Entries:
Student 2: ERROR: Inversion count can't be found since course code can't be negative.

Error Messages for Invalid Entries:
Student 3: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 7: ERROR: Inversion count can't be found due to the presence of boolean values.
PS F:\VIDHI ROHIRA SY BTECH CE\SEMESTER 3\DAA LAB 4>
```

TEST CASE 7:-

```
students_random_numbers = [
    [1, 2, 3, 4], [1, 1, 5, 2], [7, 6, 4, 1], [6, 2, 8, 7], [2, 3, 8, 4], [5, 5, 5, 4], [4, 8, 5, 3], [8, 1, 9, 6],
    [3, 4, 1, 1], [8, 3, 5, 3], [8, 7, 3, 8], [1, 4, 4, 8], [1, 2, 5, 4], [5, 7, 1, 6], [6, 5, 7, 6], [9, 7, 5, 5],
    [5, 8, 2, 2], [1, 3, 7, 8], [2, 3, 8, 2], [8, 6, 7, 4], [9, 6, 9, 9], [6, 5, 8, 9], [5, 2, 3, 8], [9, 3, 1, 4],
    [4, 5, 2, 9], [7, 3, 1, 1], [5, 6, 7, 9], [8, 5, 1, 1], [2, 2, 2, 3], [9, 6, 9, 4], [7, 5, 1, 4], [6, 2, 1, 4],
    [6, 2, 8, 9], [8, 6, 6, 7], [6, 6, 5, 9], [8, 5, 9, 5], [1, 6, 2, 6], [1, 4, 6, 9], [3, 7, 1, 4], [4, 1, 1, 6],
    [5, 5, 6, 6], [6, 5, 4, 2], [4, 2, 5, 3], [2, 2, False, 1], [2, 7, 9, 9], [6, 4, 7, 8], [6, 7, 3, 3], [5, 4, 5, 4],
    [3, 4, 6, 9], [2, 7, 8, 2], [5, 7, 5, 3], [9, 8, 2, 2], [9, 8, 3, 6], [3, 8, 7, 7], [4, 6, 6, 9], [2, 1, 1, 2],
    [3, 6, 6, 2], [4, 7, 9, 8], [6, 1, 4, 1], [4, 5, 7, 8], [1, 1, 3, 6], [9, 3, 4, 5], [6, 3, 3, 5], [5, 4, 1, 9],
    [5, 2, 7, 4], [4, 7, 2, 8], [5, 1, 2, 1], [8, 9, 5, 4], [3, 1, 9, 5], [9, 4, 9, 4], [8, 1, 8, 5], [6, 2, 1, 6],
    [3, 4, 1, 7], [8, 5, 2, 5], [9, 3, 9, 1], [2, 9, 7, 5], [5, 4, 8, 5], [4, True, 9, 8], [8, 2, 3, 8], [4, 5, 5, 1],
    [4, 9, 5, 5], [8, 5, 6, 3], [3, 2, 6, 3], [5, 1, 7, 5], [6, 5, 7, 8], [3, 7, 3, 4], [2, 1, 4, 5], [2, 6, 3, 8],
    [4, 3, 8, 2], [3, 3, 5, 6], [3, 7, 5, 1], [1, 5, 5, 3], [9, 1, 9, 7], [1, 2, 5, 5], [4, 6, 7, 6], [6, 8, 1, 1],
    [2, 2, 6, 9], [3, 4, 4, 8], [2, 3, 3, 9], [3, 2, 7, 3]
]
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

Student 92: Brute Force Inversion Count = 2, Divide and Conquer Inversion Count = 2
Student 93: Brute Force Inversion Count = 3, Divide and Conquer Inversion Count = 3
Student 94: Brute Force Inversion Count = 0, Divide and Conquer Inversion Count = 0
Student 95: Brute Force Inversion Count = 1, Divide and Conquer Inversion Count = 1
Student 96: Brute Force Inversion Count = 4, Divide and Conquer Inversion Count = 4
Student 97: Brute Force Inversion Count = 0, Divide and Conquer Inversion Count = 0
Student 98: Brute Force Inversion Count = 0, Divide and Conquer Inversion Count = 0
Student 99: Brute Force Inversion Count = 0, Divide and Conquer Inversion Count = 0
Student 100: Brute Force Inversion Count = 2, Divide and Conquer Inversion Count = 2

Negative Integer Entries:

Error Messages for Invalid Entries:
Student 44: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 78: ERROR: Inversion count can't be found due to the presence of boolean values.
PS F:\VIDHI ROHIRA SY BTECH CE\SEMESTER 3\DAA LAB 4>
```

TEST CASE 8:-

```
students_random_numbers = [
    [1, 2, 3, 4], [False, 1, 5, 2], [7, 6, 4, 1], [6, 2, 8, 7], [2, 3, 8, 4], [5, 5, 5, 4], [4, 8, 5, 3], [8, 1, 9, 6],
    [3, 4, 1, 1], [8, 3, 5, 3], [8, 7, 3, 8], [1, 4, 4, 8], [1, 2, 5, 4], [5, 7, 1, 6], [6, 5, 7, 6], [9, 7, 5, 5],
    [5, 8, 2, 2], [1, 3, 7, 8], [2, 3, 8, 2], [8, 6, 7, 4], [False, 6, 9, 9], [6, 5, 8, 9], [5, 2, 3, 8], [9, 3, 1, 4],
    [4, 5, 2, 9], [7, 3, 1, 1], [5, 6, 7, 9], [8, 5, 1, 1], [2, 2, 2, 3], [9, 6, 9, 4], [7, 5, 1, 4], [6, 2, 1, 4],
    [6, 2, 8, 9], [8, 6, 6, 7], [6, 6, 5, 9], [8, 5, 9, 5], [1, 6, 2, 6], [1, 4, 6, 9], [3, 7, 1, 4], [4, 1, 1, 6],
    [5, 5, 6, 6], [6, 5, 4, 2], [4, 2, 5, 3], [2, 2, False, 1], [2, 7, 9, 9], [6, 4, 7, 8], [6, 7, 3, 3], [5, 4, 5, 4],
    [3, 4, 6, 9], [2, False, 8, 2], [5, 7, 5, 3], [9, 8, 2, 2], [9, 8, 3, 6], [3, 8, 7, 7], [4, 6, 6, 9], [2, 1, 1, 2],
    [3, 6, 6, 2], [4, 7, 9, 8], [6, 1, 4, 1], [4, 5, 7, 8], [1, 1, 3, 6], [9, 3, 4, 5], [6, 3, 3, 5], [5, 4, 1, 9],
    [5, 2, 7, 4], [4, 7, 2, 8], [5, 1, 2, 1], [8, 9, 5, 4], [3, 1, 9, 5], [9, 4, 9, 4], [8, 1, 8, 5], [6, 2, 1, 6],
    [3, 4, 1, 7], [8, 5, 2, 5], [9, 3, 9, 1], [2, 9, 7, 5], [5, 4, 8, 5], [4, True, 9, 8], [8, 2, 3, 8], [4, 5, 5, 1],
    [4, 9, 5, 5], [8, 5, 6, 3], [3, 2, 6, 3], [5, 1, 7, 5], [6, 5, 7, 8], [3, 7, 3, 4], [2, 1, 4, 5], [2, 6, 3, 8],
    [4, 3, 8, 2], [3, 3, 5, 6], [3, 7, 5, 1], [1, 5, 5, 3], [9, 1, 9, 7], [1, 2, 5, 5], [4, 6, 7, 6], [6, 8, 1, 1],
    [2, 2, 6, 9], [3, 4, 4, 8], [2, 3, 3, 9], [3, 2, 7, 3]
]
```

```
Negative Integer Entries:

Error Messages for Invalid Entries:
Student 2: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 21: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 44: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 50: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 78: ERROR: Inversion count can't be found due to the presence of boolean values.
PS F:\VIDHI ROHIRA SY BTECH CE\SEMESTER 3\DAA LAB 4>
```

TEST CASE 9:-

```
students_random_numbers = [
    [1, 2, 3, 4], [False, 1, 5, 2], [7, 6, 4, 1], [6, 2, 8, 7], [2, 3, 8, 4], [5, 5, 5, 4], [4, True, 5, 3], [8, 1, 9, 6],
    [3, 4, 1, 1], [8, 3, 5, 3], [8, 7, 3, 8], [1, 4, 4, 8], [1, 2, 5, 4], [5, 7, 1, 6], [6, 5, 7, 6], [9, 7, 5, 5],
    [5, 8, 2, 2], [1, 3, 7, 8], [2, 3, 8, 2], [8, 6, 7, 4], [False, 6, 9, 9], [6, 5, 8, 9], [5, 2, 3, 8], [9, 3, 1, 4],
    [4, 5, 2, 9], [7, 3, 1, 1], [5, 6, 7, 9], [8, 5, 1, 1], [2, 2, 2, 3], [9, 6, 9, 4], [7, 5, 1, 4], [6, 2, 1, 4],
    [6, 2, 8, 9], [8, 6, 6, 7], [6, 6, 5, 9], [8, 5, 9, 5], [1, 6, 2, 6], [1, 4, True, 9], [3, 7, 1, 4], [4, 1, 1, 6],
    [5, 5, 6, 6], [6, 5, 4, 2], [4, 2, 5, 3], [2, 2, False, 1], [2, 7, 9, 9], [6, 4, 7, 8], [6, 7, 3, 3], [5, 4, 5, 4],
    [3, 4, 6, 9], [2, False, 8, 2], [5, 7, 5, 3], [9, 8, 2, 2], [9, 8, 3, 6], [3, 8, 7, 7], [4, 6, 6, 9], [2, 1, 1, 2],
    [3, 6, 6, 2], [4, 7, 9, 8], [6, 1, 4, 1], [4, 5, 7, 8], [1, 1, 3, 6], [9, 3, 4, 5], [6, 3, 3, 5], [5, 4, 1, 9],
    [5, 2, 7, 4], [4, 7, 2, 8], [5, 1, 2, 1], [8, 9, 5, 4], [3, 1, 9, 5], [9, 4, 9, 4], [8, 1, 8, 5], [6, 2, 1, 6],
    [3, 4, 1, 7], [8, 5, 2, 5], [9, 3, 9, 1], [2, 9, 7, 5], [5, 4, 8, 5], [4, True, 9, 8], [8, 2, 3, 8], [4, 5, 5, 1],
    [4, True, 5, 5], [8, 5, 6, 3], [3, 2, True, 3], [5, 1, 7, 5], [6, 5, 7, 8], [3, 7, 3, 4], [2, 1, 4, 5], [2, 6, 3, 8],
    [4, 3, 8, 2], [3, 3, 5, 6], [3, 7, 5, 1], [1, 5, 5, 3], [9, 1, 9, 7], [1, 2, 5, 5], [4, 6, 7, 6], [6, 8, 1, 1],
    [2, 2, 6, 9], [3, 4, 4, 8], [2, 3, 3, 9], [3, 2, 7, 3]
]
```

```
Negative Integer Entries:

Error Messages for Invalid Entries:
Student 2: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 7: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 21: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 38: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 44: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 50: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 78: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 81: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 83: ERROR: Inversion count can't be found due to the presence of boolean values.
PS F:\VIDHI ROHIRA SY BTECH CE\SEMESTER 3\DAA LAB 4>
```

TEST CASE 10:-

```
students_random_numbers = [
    [1, 2, 3, 4], [False, 1, 5, 2], [-7, 6, 4, 1], [6, 2, 8, 7], [2, 3, 8, 4], [5, 5, 5, 4], [4, True, 5, 3], [8, 1, 9, 6],
    [3, 4, 1, 1], [8, 3, 5, 3], [8, 7, 3, 8], [1, 4, 4, 8], [1, 2, 5, 4], [5, 7, 1, 6], [6, 5, 7, 6], [9, 7, 5, 5],
    [5, 8, 2, 2], [1, 3, 7, 8], [2, 3, -8, 2], [8, 6, 7, 4], [False, 6, 9, 9], [6, 5, 8, 9], [5, 2, 3, 8], [9, 3, 1, 4],
    [4, 5, 2, 9], [7, 3, 1, 1], [5, 6, 7, 9], [8, 5, 1, 1], [2, 2, 2, 3], [9, 6, 9, 4], [7, 5, 1, 4], [6, 2, 1, 4],
    [6, 2, 8, 9], [8, 6, 6, 7], [6, 6, 5, 9], [8, 5, 9, 5], [1, 6, 2, 6], [1, 4, True, 9], [3, 7, 1, 4], [4, 1, 1, 6],
    [5, 5, 6, 6], [6, 5, 4, 2], [4, 2, 5, 3], [-2, 2, False, 1], [2, 7, 9, 9], [6, 4, 7, 8], [6, 7, 3, 3], [5, 4, 5, 4],
    [3, 4, 6, 9], [2, False, 8, 2], [5, 7, 5, 3], [9, 8, 2, 2], [9, 8, 3, 6], [3, 8, 7, 7], [4, 6, 6, 9], [2, 1, 1, 2],
    [3, 6, 6, 2], [4, 7, 9, 8], [6, 1, 4, 1], [4, 5, 7, 8], [1, 1, 3, 6], [9, 3, 4, 5], [6, 3, 3, 5], [5, 4, 1, 9],
    [5, 2, 7, 4], [4, 7, 2, 8], [5, 1, 2, 1], [8, 9, 5, 4], [3, 1, 9, 5], [9, 4, 9, 4], [8, 1, 8, 5], [6, 2, 1, 6],
    [3, 4, 1, 7], [8, 5, 2, 5], [9, 3, 9, 1], [2, 9, 7, 5], [5, 4, 8, 5], [4, True, 9, 8], [8, 2, 3, 8], [4, 5, 5, 1],
    [4, True, 5, 5], [8, 5, 6, 3], [3, 2, True, 3], [5, 1, 7, 5], [6, 5, 7, 8], [3, 7, 3, 4], [2, 1, 4, 5], [2, 6, 3, 8],
    [4, 3, 8, 2], [3, 3, 5, 6], [3, 7, 5, 1], [1, 5, 5, 3], [9, 1, 9, 7], [1, 2, 5, 5], [4, 6, 7, 6], [6, 8, 1, 1],
    [2, 2, 6, 9], [3, 4, 4, 8], [2, 3, 3, 9], [3, 2, 7, 3]
]
```

```
Negative Integer Entries:

Error Messages for Invalid Entries:
Student 2: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 7: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 21: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 38: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 44: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 50: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 78: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 81: ERROR: Inversion count can't be found due to the presence of boolean values.
Student 83: ERROR: Inversion count can't be found due to the presence of boolean values.
PS F:\VIDHI ROHIRA SY BTECH CE\SEMESTER 3\DAA LAB 4>
```