

1) Given a row wise sorted matrix of size  $R \times C$  where  $R$  and  $C$  are always **odd**, find the median of the matrix.

**Test Case 1:**

**MEDIAN=5**

```

PC File Edit View Navigate Code Refactor Run Tools VCS Window Help daa-ass-1
daa-ass-1 > main.py
Project main.py x
1 from bisect import bisect_right as upper_bound
2 MAX=2000;
3 def binaryMedian(matrix,row,column):
4     minimum=matrix[0][0]
5     maximum=0
6     for i in range(row):
7         if matrix[i][0]<minimum:
8             minimum=matrix[i][0]
9             if matrix[i][column-1]>maximum:
10                 maximum=matrix[i][column-1]
11     required=(row*column+1)//2
12     while(minimum<maximum):
13         mid=minimum+(maximum-minimum)//2
14         place=[0];
15         for i in range(row):
16             j=upper_bound(matrix[i],mid)
17             place[0]=place[0]+j-1
18     return (matrix[0][place[0]]+matrix[0][place[0]+1])/2
19
20 matrix=[[1,2,3],[4,5,6],[7,8,9]]
21 print(binaryMedian(matrix,3,3))
22
Run: main x
C:\Users\sss\PycharmProjects\daa-ass-1\venv\Scripts\python.exe
Median is 5
Process finished with exit code 0

```

**Test Case 2:**

**Input:**  $R = 3, C = 1$   $M = [[1], [2], [3]]$  **Output:** 2 **Explanation:** Sorting matrix elements gives us {1,2,3}. Hence, 2 is median.

```
PC File Edit View Navigate Code Refactor Run Tools VCS Window Help daa-
daa-ass-1 > main.py
Project main.py x
13 mid=minimum+(maximum-minimum)//2
14 place=[0];
15 for i in range(row):
16     j=upper_bound(matrix[i],mid)
17     place[0]=place[0]+j
18     if place[0]<required:
19         minimum=mid+1
20     else:
21         maximum=mid
22 print("Median is",minimum)
23 return
24 row,column=3,3
25 matrix=[[1,3,5],[2,6,9],[3,6,9]]
26 binaryMedian(matrix,row,column)
binaryMedian() > for i in range(row) > if matrix[i][0]<minimum
Run: main x
C:\Users\sss\PycharmProjects\daa-ass-1\venv\Scripts\python.exe
Median is 5
Process finished with exit code 0
```

2) 2) 2. Given the arrival and departure times of all trains that reach a railway station, the task is to find the minimum number of platforms required for the railway station so that no train waits. We are given two arrays that represent the arrival and departure times of trains that stop.

#### Test case 1

**Input:** `arr[] = {9:00, 9:40, 9:50, 11:00, 15:00, 18:00}, dep[] = {9:10, 12:00, 11:20, 11:30, 19:00, 20:00}`

**Output:** 3

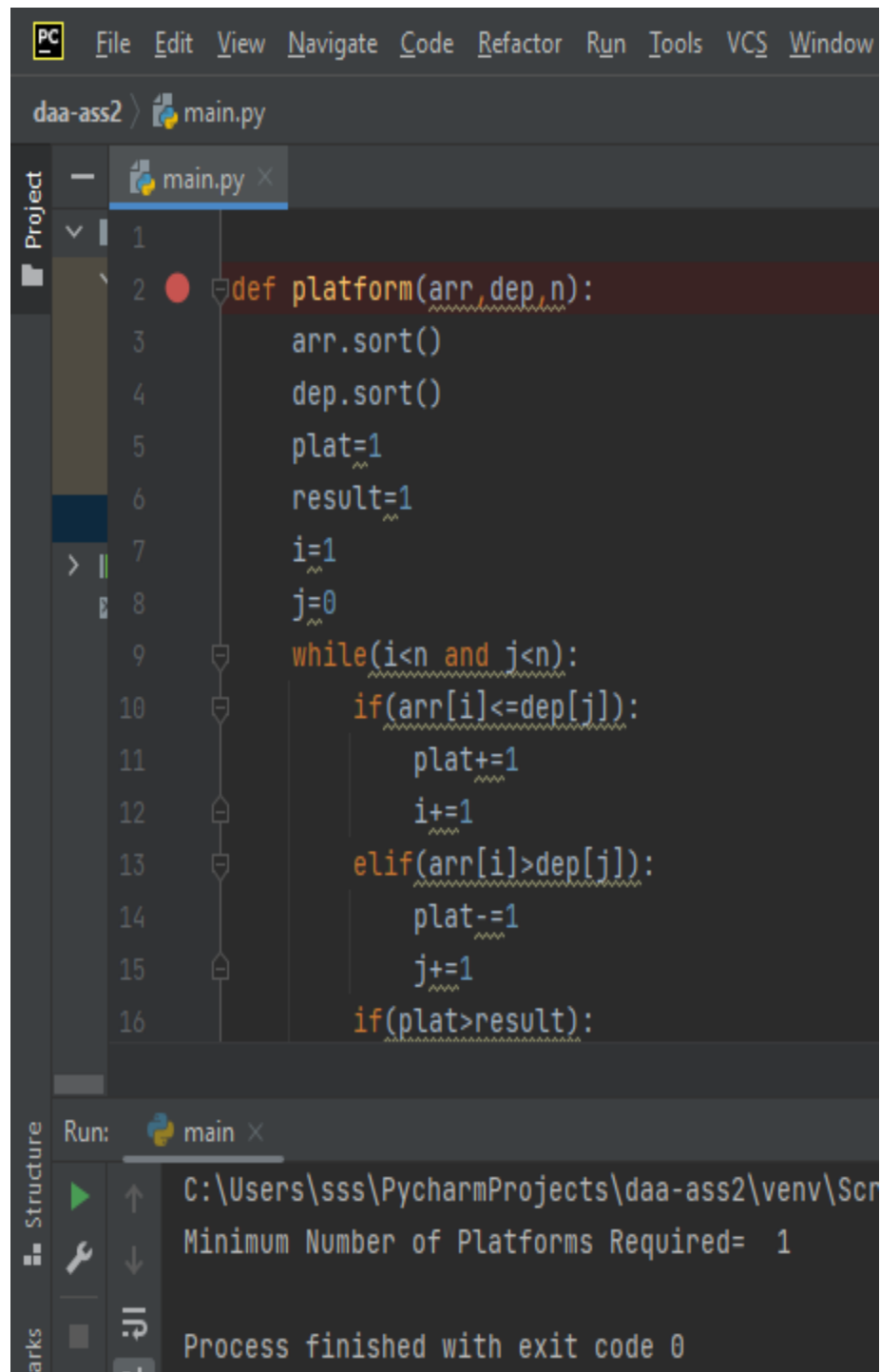
**Explanation:** There are at-most three trains at a time (time between 9:40 to 12:00)

```
PC File Edit View Navigate Code Refactor Run Tools VCS Window Help
daa-ass-1 > main.py
Project main.py x
1 from bisect import bisect_right as upper_bound
2 MAX=2000;
3 def binaryMedian(matrix,row,column):
4     minimum=matrix[0][0]
5     maximum=0
6     for i in range(row):
7         if matrix[i][0]<minimum:
8             minimum=matrix[i][0]
9         if matrix[i][column-1]>maximum:
10             maximum=matrix[i][column-1]
11     required=(row*column+1)//2
12     while(minimum<maximum):
13         mid=minimum+(maximum-minimum)//2
14         place=[0];
15         for i in range(row):
16             j=upper_bound(matrix[i],mid)
17             place[0]=place[0]+j
18     return place[0]
Run: main x
C:\Users\sss\PycharmProjects\daa-ass-1\venv\Scripts\python.exe
Median is 2
```

### Test case 2

**Input:**  $arr[] = \{9:00, 9:40\}$ ,  $dep[] = \{9:10, 12:00\}$

**Output:** 1



The image shows a PyCharm IDE window with a menu bar at the top (File, Edit, View, Navigate, Code, Refactor, Run, Tools, VCS, Window). The main editor displays a file named `main.py` with the following Python code:

```
1
2 def platform(arr, dep, n):
3     arr.sort()
4     dep.sort()
5     plat=1
6     result=1
7     i=1
8     j=0
9     while(i<n and j<n):
10         if(arr[i]<=dep[j]):
11             plat+=1
12             i+=1
13         elif(arr[i]>dep[j]):
14             plat-=1
15             j+=1
16         if(plat>result):
```

The left sidebar shows the Project and Structure toolbars. At the bottom, the Run tool window is open, showing the execution of `main`. The output is as follows:

```
Run: main x
C:\Users\sss\PycharmProjects\daa-ass2\venv\Scr
Minimum Number of Platforms Required= 1
Process finished with exit code 0
```