DIVIDE AND CONQUER

PROBLEM 3:

3-FINDING FLOOR VALUE

AIM:

Given a sorted array and a value x, the floor of x is the largest element in array smaller than or equal to x. Write divide and conquer algorithm to find floor of x.

CODE:

```
#include <stdio.h>
int findFloorRec(int arr[], int left, int right, int x) {
  if (left > right) {
     return -1;}
  if (x < arr[left]) {
     return -1;
  }
  int mid = left + (right - left) / 2;
  if (arr[mid] == x) {
     return arr[mid];
  }
  if (arr[mid] < x && (mid == right || arr[mid + 1] > x)) {
     return arr[mid];
  }
  if (arr[mid] < x) {
     return findFloorRec(arr, mid + 1, right, x);
  }
  return findFloorRec(arr, left, mid - 1, x);
```

```
}

int main() {
  int n, x;
  scanf("%d", &n);

  int arr[n];
  for (int i = 0; i < n; i++) {
     scanf("%d", &arr[i]);
  }
  scanf("%d", &x);
  int floorValue = findFloorRec(arr, 0, n - 1, x);

  if (floorValue == -1) {
     printf("%d\n", x);
  } else {
     printf("%d\n", floorValue);
  }

  return 0;
}
```

INPUT AND OUTPUT:

	Input	Expected	Got	
✔	6 1 2 8 10 12 19 5	2	2	✔
✔	5 10 22 85 108 129 100	85	85	✔
✔	7 3 5 7 9 11 13 15 10	9	9	✔