public class ExponentialSearch {

public static int exponentialSearch(int[] arr, int target) {

int n = arr.length;

if (arr[0] == target)

return 0;

int i = 1;

while (i < n && arr[i] <= target)

i \*= 2;

return binarySearch(arr, i / 2, Math.min(i, n - 1), target);

}

public static int binarySearch(int[] arr, int left, int right, int target) {

if (right >= left) {

int mid = left + (right - left) / 2;

if (arr[mid] == target)

return mid;

if (arr[mid] > target)

return binarySearch(arr, left, mid - 1, target);

return binarySearch(arr, mid + 1, right, target);

}

return -1;

}

public static void main(String[] args) {

int[] arr = { 2, 4, 8, 10, 16, 20, 25, 30, 35, 40 };

int target = 16;

int result = exponentialSearch(arr, target);

if (result == -1)

System.out.println("Element not found in the array.");

else

System.out.println("Element found at index " + result);

}

}