**Question :**

Which of the following scenarios leads to expected linear running time for a random search hit in a linear-probing hash table?

a. All keys hash to the same index.
b. All keys hash to different indices.
c. All keys hash to an even-numbered index.
d. All keys hash to different even-numbered indices.

**Solution :**

a. All keys hash to the same index

If all the keys are hashed to the same index then the searching time for the value will be linear running time and it is not recommended.

b. All keys hash to different indices.

If all the keys are hashed to different index then searching the value will be easy and it does not take linear time. This can be done with a good hashing function and it is highly recommended.

c. All keys hash to an even-numbered index.

If all the keys are hashed to an even numbered index then the searching time for the value will be linear running time and it is not recommended.

d. All keys hash to different even-numbered indices.

If all the keys are hashed to different even numbered index then searching the value will be easy and it does not take linear time. This can be done but 50% of the array size will be wasted and it will not be recommended.