

---

# Two Sum

---

**Ke Xu**

Electrical and Computing Engineering  
Carnegie Mellon University  
Pittsburgh, PA 15213  
kxu2@andrew.cmu.edu

## 1 Description

Given an array of integers `nums` and an integer `target`, return indices of the two numbers such that they add up to `target`.

You may assume that each input would have exactly one solution, and you may not use the same element twice.

You can return the answer in any order.

## 2 Solution

1. Brute Force  
Using two nested loops to examine whether the solution exists.
2. Hash Table  
When we iterate and insert elements into the hash table, we check whether the element's complement already exists in the table.

## 3 Hash table

A hash table is a data structure which maps keys and values. It can greatly accelerate the searching speed since the hash function is used to find the stored value. The average time complexity is  $O(1)$ . But the worst case is  $O(n)$ .