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Write a program to reverse an array or string

Difficulty Level : Basic ● Last Updated : 08 Sep, 2020

Given an array (or string), the task is to reverse the array/string.

Examples :

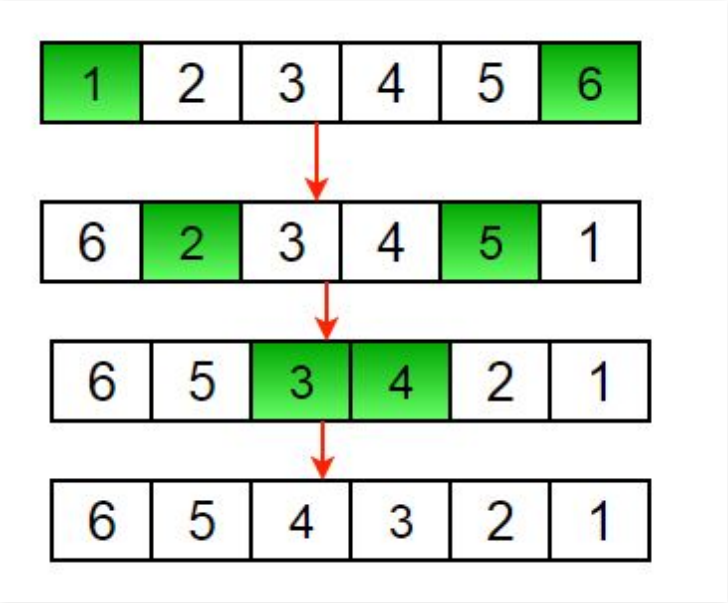
```
Input  : arr[] = {1, 2, 3}
Output : arr[] = {3, 2, 1}

Input :  arr[] = {4, 5, 1, 2}
Output : arr[] = {2, 1, 5, 4}
```

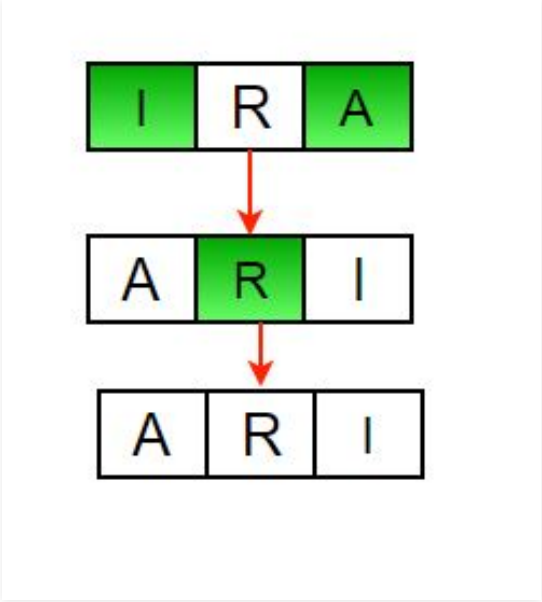
Recommended: Please solve it on "***PRACTICE***" first, before moving on to the solution.

Iterative way :

1) Initialize start and end indexes as start = 0, end = n-1
2) In a loop, swap arr[start] with arr[end] and change start and end as follows :
start = start +1, end = end – 1



Another example to reverse a string:



Below is the implementation of the above approach :

C++

```
// Iterative C++ program to reverse an array
#include <bits/stdc++.h>
using namespace std;

/* Function to reverse arr[] from start to end*/
void rvereseArray(int arr[], int start, int end)
{
    while (start < end)
    {
        int temp = arr[start];
        arr[start] = arr[end];
        arr[end] = temp;
        start++;
        end--;
    }
}

/* Utility function to print an array */
void printArray(int arr[], int size)
{
   for (int i = 0; i < size; i++)
   cout << arr[i] << " ";

   cout << endl;
}
```

```
/* Driver function to test above functions */
int main()
{
    int arr[] = {1, 2, 3, 4, 5, 6};

    int n = sizeof(arr) / sizeof(arr[0]);

    // To print original array
    printArray(arr, n);

    // Function calling
    rvereseArray(arr, 0, n-1);

    cout << "Reversed array is" << endl;

    // To print the Reversed array
    printArray(arr, n);

    return 0;
}
```

C

```
// Iterative C program to reverse an array
#include<stdio.h>

/* Function to reverse arr[] from start to end*/
void rvereseArray(int arr[], int start, int end)
{
    int temp;
    while (start < end)
    {
        temp = arr[start];
        arr[start] = arr[end];
        arr[end] = temp;
        start++;
        end--;
    }
}

/* Utility that prints out an array on a line */
void printArray(int arr[], int size)
{
  int i;
  for (i=0; i < size; i++)
    printf("%d ", arr[i]);

  printf("\n");
}
```

```
/* Driver function to test above functions */
int main()
{
    int arr[] = {1, 2, 3, 4, 5, 6};
    int n = sizeof(arr) / sizeof(arr[0]);
    printArray(arr, n);
    rvereseArray(arr, 0, n-1);
    printf("Reversed array is \n");
    printArray(arr, n);
    return 0;
}
```

Java

```
// Iterative java program to reverse an
// array
public class GFG {

   /* Function to reverse arr[] from
    start to end*/
    static void rvereseArray(int arr[],
                    int start, int end)
    {
        int temp;

        while (start < end)
        {
            temp = arr[start];
            arr[start] = arr[end];
            arr[end] = temp;
            start++;
            end--;
        }
    }

    /* Utility that prints out an
    array on a line */
    static void printArray(int arr[],
                           int size)
    {
        for (int i = 0; i < size; i++)
             System.out.print(arr[i] + " ");

         System.out.println();
    }

    // Driver code
    public static void main(String args[]) {
```

```
        int arr[] = {1, 2, 3, 4, 5, 6};
        printArray(arr, 6);
        rvereseArray(arr, 0, 5);
        System.out.print("Reversed array is \n");
        printArray(arr, 6);

    }
}

// This code is contributed by Sam007
```

Python

```
# Iterative python program to reverse an array

# Function to reverse A[] from start to end
def reverseList(A, start, end):
    while start < end:
        A[start], A[end] = A[end], A[start]
        start += 1
        end -= 1

# Driver function to test above function
A = [1, 2, 3, 4, 5, 6]
print(A)
reverseList(A, 0, 5)
print("Reversed list is")
print(A)
# This program is contributed by Pratik Chhajer
```

C#

```
// Iterative C# program to reverse an
// array
using System;

class GFG {

    /* Function to reverse arr[] from
    start to end*/
    static void rvereseArray(int []arr,
                    int start, int end)
    {
        int temp;

        while (start < end)
```

```
            {
                temp = arr[start];
                arr[start] = arr[end];
                arr[end] = temp;
                start++;
                end--;
            }
        }

        /* Utility that prints out an
        array on a line */
        static void printArray(int []arr,
                               int size)
        {
            for (int i = 0; i < size; i++)
                Console.Write(arr[i] + " ");

            Console.WriteLine();
        }

        // Driver function
        public static void Main()
        {
            int []arr = {1, 2, 3, 4, 5, 6};
            printArray(arr, 6);
            rvereseArray(arr, 0, 5);
            Console.Write("Reversed array is \n");
            printArray(arr, 6);
        }
    }

    // This code is contributed by Sam007
```

PHP

```
    <?php
    // Iterative PHP program
    // to reverse an array

    /* Function to reverse
    $arr from start to end*/
    function rvereseArray(&$arr, $start,
                          $end)
    {
        while ($start < $end)
        {
            $temp = $arr[$start];
            $arr[$start] = $arr[$end];
            $arr[$end] = $temp;
```

```
        $start++;
        $end--;
    }
}

/* Utility function to
   print an array */
function printArray(&$arr, $size)
{
for ($i = 0; $i < $size; $i++)
echo $arr[$i] . " ";

echo "\n";
}

// Driver code
$arr = array(1, 2, 3, 4, 5, 6);

// To print original array
printArray($arr, 6);

// Function calling
rvereseArray($arr, 0, 5);

echo "Reversed array is" ."\n";

// To print the Reversed array
printArray($arr, 6);

// This code is contributed
// by ChitraNayal
?>
```

Output :

```
1 2 3 4 5 6
Reversed array is
6 5 4 3 2 1
```

Time Complexity : O(n)

Recursive Way :

1) Initialize start and end indexes as start = 0, end = n-1
2) Swap arr[start] with arr[end]
3) Recursively call reverse for rest of the array.

Below is the implementation of the above approach :

C++

```
// Recursive C++ program to reverse an array
#include <bits/stdc++.h>
using namespace std;

/* Function to reverse arr[] from start to end*/
void rvereseArray(int arr[], int start, int end)
{
    if (start >= end)
    return;

    int temp = arr[start];
    arr[start] = arr[end];
    arr[end] = temp;

    // Recursive Function calling
    rvereseArray(arr, start + 1, end - 1);
}


/* Utility function to print an array */
void printArray(int arr[], int size)
{
   for (int i = 0; i < size; i++)
   cout << arr[i] << " ";

   cout << endl;
}

/* Driver function to test above functions */
int main()
{
    int arr[] = {1, 2, 3, 4, 5, 6};

    // To print original array
    printArray(arr, 6);
```

```
    // Function calling
    rvereseArray(arr, 0, 5);

    cout << "Reversed array is" << endl;

    // To print the Reversed array
    printArray(arr, 6);

    return 0;
}
```

C

```
// Recursive C program to reverse an array
#include <stdio.h>

/* Function to reverse arr[] from start to end*/
void rvereseArray(int arr[], int start, int end)
{
   int temp;
   if (start >= end)
     return;
   temp = arr[start];
   arr[start] = arr[end];
   arr[end] = temp;
   rvereseArray(arr, start+1, end-1);
}

/* Utility that prints out an array on a line */
void printArray(int arr[], int size)
{
  int i;
  for (i=0; i < size; i++)
    printf("%d ", arr[i]);

  printf("\n");
}

/* Driver function to test above functions */
int main()
{
    int arr[] = {1, 2, 3, 4, 5, 6};
    printArray(arr, 6);
    rvereseArray(arr, 0, 5);
    printf("Reversed array is \n");
    printArray(arr, 6);
    return 0;
}
```

Java

```java
// Recursive Java Program to reverse an array
import java.io.*;

class ReverseArray {

    /* Function to reverse arr[] from start to end*/
    static void rvereseArray(int arr[], int start, int end)
    {
        int temp;
        if (start >= end)
            return;
        temp = arr[start];
        arr[start] = arr[end];
        arr[end] = temp;
        rvereseArray(arr, start+1, end-1);
    }

    /* Utility that prints out an array on a line */
    static void printArray(int arr[], int size)
    {
        for (int i=0; i < size; i++)
            System.out.print(arr[i] + " ");
        System.out.println("");
    }

    /*Driver function to check for above functions*/
    public static void main (String[] args) {
        int arr[] = {1, 2, 3, 4, 5, 6};
        printArray(arr, 6);
        rvereseArray(arr, 0, 5);
        System.out.println("Reversed array is ");
        printArray(arr, 6);
    }
}
/*This article is contributed by Devesh Agrawal*/
```

Python

```python
# Recursive python program to reverse an array

# Function to reverse A[] from start to end
def reverseList(A, start, end):
    if start >= end:
        return
```

```
        A[start], A[end] = A[end], A[start]
        reverseList(A, start+1, end-1)

    # Driver function to test above function
    A = [1, 2, 3, 4, 5, 6]
    print(A)
    reverseList(A, 0, 5)
    print("Reversed list is")
    print(A)
    # This program is contributed by Pratik Chhajer
```

C#

```
    // C# program to reverse an array
    using System;

    class GFG
    {
        /* Function to reverse arr[]
        from start to end*/
        static void rvereseArray(int []arr, int start,
                                             int end)
        {
            int temp;
            if (start >= end)
                return;

            temp = arr[start];
            arr[start] = arr[end];
            arr[end] = temp;

            rvereseArray(arr, start+1, end-1);
        }

        /* Utility that prints out an
        array on a line */
        static void printArray(int []arr, int size)
        {
            for (int i =  0; i < size; i++)
                Console.Write(arr[i] + " ");

            Console.WriteLine("");
        }

        // Driver Code
        public static void Main ()
        {
            int []arr = {1, 2, 3, 4, 5, 6};
```

```
            printArray(arr, 6);
            rvereseArray(arr, 0, 5);

            Console.WriteLine("Reversed array is ");
            printArray(arr, 6);
        }
    }

    // This code is contributed by Sam007
```

PHP

```
    <?php
    // Iterative PHP program
    // to reverse an array

    /* Function to reverse
    $arr from start to end*/
    function rvereseArray(&$arr,
                          $start, $end)
    {
        if ($start >= $end)
        return;

        $temp = $arr[$start];
        $arr[$start] = $arr[$end];
        $arr[$end] = $temp;

        //Recursive Function calling
        rvereseArray($arr, $start + 1,
                          $end - 1);
    }

    /* Utility function
    to print an array */
    function printArray(&$arr, $size)
    {
    for ($i = 0; $i < $size; $i++)
    echo $arr[$i] . " ";

    echo "\n";
    }

    // Driver code
    $arr = array(1, 2, 3, 4, 5, 6);

    // To print original array
    printArray($arr, 6);
```

```
// Function calling
rvereseArray($arr, 0, 5);

echo "Reversed array is" ."\n";

// To print the Reversed array
printArray($arr, 6);

// This code is contributed
// by ChitraNayal
?>
```

Output :

```
1 2 3 4 5 6
Reversed array is
6 5 4 3 2 1
```

Time Complexity : O(n)

Another Approach: Using Python List slicing

Python3

```
def reverseList(A):
  print( A[::-1])

# Driver function to test above function
A = [1, 2, 3, 4, 5, 6]
print(A)
print("Reversed list is")
reverseList(A)
```

Output:

```
[1, 2, 3, 4, 5, 6]
Reversed list is
[6, 5, 4, 3, 2, 1]
```

Please write comments if you find any bug in the above programs or other ways to solve the same problem.

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