### 0. Introduction

## 1. The secret to nailing your C# interview

### 2. Understand the different types of technical interviews

### 3. Get ready for your technical interview

### 4. How to use CoderPad

### Chapter Quiz

Question 1 of 2

You should always be getting ready for interviews, even if you're not actively looking for a new job.

TRUE

Correct

FALSE

Incorrect

Question 2 of 2

What technical topic should Java developers be familiar with?

data structures

Incorrect

object-oriented programming

Incorrect

algorithms

Incorrect

all of these answers

Correct

## 1. Answering Foundational C# and .NET Questions

### 1. How is C# different from other languages

### 2. What's the difference between C# and .NET

### 3. What is Common Language Runtime (CLR)

### 4. Managed vs. unmanaged code

### Chapter Quiz

## 2. Answering C# Language-Specific Questions

### 1. What are classes, instances, and constructors

### 2. What's the difference between static and non-static members

### 3. Boxing vs. unboxing

### 4. Pass by reference vs. pass by value

### 5. Readonly versus const

### Chapter Quiz

Question 1 of 5

In C#, you can use the ref and out keywords to \_\_\_\_\_.

pass by reference

Correct

pass by value

pass by object

Question 2 of 5

You want to keep a variable's value consistent, but don't want to instantiate it until runtime. What keyword should you use?

readonly

const

Incorrect

void

Incorrect

new

Incorrect

Readonly versus const

Replay

Review this video

Readonly versus const

4m 13s

Question 3 of 5

When should you use a static method?

when your method is related to the object’s characteristics

when your method is dependent on the specific instance that calls it

Incorrect

when you want your method to function independently from your instances

Correct

Question 4 of 5

What operation do you need to perform to unbox an object?

saving the output into a new variable

explicit casting

Correct

iteration

Question 5 of 5

What construct do you use to define an object's properties and functionality?

class

instance

Incorrect

object

Incorrect

What are classes, instances, and constructors?

Replay

Review this video

What are classes, instances, and constructors?

2m 44s

## 3. Solving Technical Interview Questions - String Manipulation

### 1. Concatenate strings with different methods

### 2. Normalize string input

### 3. Validate string input

### 4. Access data from strings

### 5. Create algorithm-driven strings in C#

### 6. <> Code Challenge - Developing a palindrome checker

Instructions

**Create a palindrome checker**

In this challenge, you will create a palindrome checker. A palindrome is a word or phrase that reads the same backwards as it does forwards. "Civic" and "racecar" are both palindromes. Words like "swims," "mad," and "Wi-Fi" are not palindromes because they do not read the same backwards and forwards.

Your palindrome checker function will take in one string input and output true or false, depending on whether the string is a palindrome or not. Any other punctuation or symbols must also follow the palindrome rules. The only exception is for lowercase and uppercase letters. These shall be considered the same. For example, civic with an uppercase c should count as a palindrome.

**Your task**: Implement isPalindrome and return the true or false depending on if the input string is a palindrome.

**Parameters**

**original**: The input string that may or may not be a palindrome

Result

**Boolean**: True or false depending on if the input string is a palindrome

**Constraints**

Lowercase and uppercase letters should be considered the same

**Example 1:**

Input: "madaM"

Result: true

**Example 2:**

Input: "wifi"

Result: false

**Example 3:**

Input: ""

Result: true

Want a hint?

Learn about C# Strings in [this course](https://www.linkedin.com/learning/c-sharp-algorithms) on LinkedIn Learning.

Answer

// C# code below

using System;

// Write your answer here, and then test your code.

public class Answer {

    // Change these Boolean values to control whether you see

    // the expected result and/or hints.

   public  static Boolean ShowExpectedResult = false;

   public  static Boolean ShowHints = false;

    public static Boolean IsPalindrome(string original) {

        // Your code goes here.

        return false;

    }

}

**Test code**

// This is how your code will be called.

// You can edit this code to try different testing cases.

string original = "Madam";

Boolean learnerResult = Answer.IsPalindrome(original);

### 7. Solution - Developing a palindrome checker

### 8. <> Code Challenge - Reverse each word

Instructions

**Reverse each word**

In this challenge, you’ll create an algorithm that reverses each word in a sentence. The input to the function will be a string and the output will be a new string, where each word is reversed.

Throughout this chapter, we’ve looked at how to validate strings, how to normalize strings, how to search strings, and how to dynamically create new strings using input data. Use these tools as you create your algorithm. You can also Google around and see what other operations are built into C#, as we did not cover every possible operation you can perform on a string.

**Your task**: Return a new string that has the reversed words of the input string in order.

**Parameters**

**sentence**: A string

Result

**string**: The new string with the words of the input string **sentence** reserved

**Constraints**

The **sentence** string will not contain punctuation

Casing should remain the same: if a given letter was uppercase, it should remain uppercase in the reversal

Each sentence will contain at least one word

Each word will be separated by spaces

The string will not be null

**Example 1:**

Input: "sally is a great worker"

Result: "yllas si a taerg rekrow"

**Example 2:**

Input: "racer racecar madam"

Result: "racer racecar madam

Want a hint?

Learn about C# strings in [this course](https://www.linkedin.com/learning/c-sharp-algorithms) on LinkedIn Learning.

Answer

// C# code below

using System;

using System.Linq;

// Write your answer here, and then test your code.

// Your job is to implement the ReverseEachWord() method.

public class Answer

{

    // Change these Boolean values to control whether you see

    // the expected result and/or hints.

   public static Boolean ShowExpectedResult = false;

   public static Boolean ShowHints = false;

   public static string Reverse(string word)

   {

        char[] characters = word.ToCharArray();

        Array.Reverse(characters);

        string reversedWord = new string(characters);

        return reversedWord;

   }

    // Return a new string with each word reversed.

    public static string ReverseEachWord(string sentence)

    {

        // Your code goes here.

        return "";

Test code

// This is how your code will be called.

// You can edit this code to try different testing cases.

string sentence = "sally is a great worker";

string learnerResult = Answer.ReverseEachWord(sentence);

### 9. Solution - Reverse each word

### Chapter Quiz

Question 1 of 5

What tool can you use to work with strings more efficiently?

StringBuilder

Correct

for loops

built-in functions

Strings are already efficient to work with because they are mutable.

Question 2 of 5

Which of these is an example of normalizing a string?

checking whether the string's contents meet a certain set of properties

iterating through the string to search for a piece of data

Incorrect

converting the input to all lowercase or all uppercase

Correct

Question 3 of 5

You want to determine if a certain substring exists within a string. What would you do?

Use the built-in null or equals method.

Use the built-in contains method.

Correct

Use a for loop to iterate the string and check whether the substring exists.

Question 4 of 5

You have a paragraph of plain text saved in a string variable called txt. What would text.split(" "); return?

the number of sentences in the string

the number of characters in the string

Incorrect

the number of words in the string

Correct

Question 5 of 5

What type of data does a validation algorithm return?

String

Boolean

Correct

Integer

## 4. Solving Technical Interview Questions - Arrays and Linked Lists

### 1. Review arrays for technical interviews

### 2. <> Code Challenge - Maximum product of two numbers

Instructions

**Find maximum product of two numbers**

In this challenge, you will implement a function that finds the maximum product of two numbers in an unsorted array. The function will take one input, an array containing integers, and it will output the maximum product of two integers inside that array.

**Your task**: Return the maximum product of two integers inside an array.

**Parameters**

**numbers**: An array of integers

Result

**int**: The maximum product of two integers inside the array

**Constraints**

If the numbers array contains **less than two numbers,**returnInt32.MinValue as the maximum product.

Each integer can be either positive or negative

**Example 1:**

Input: [5]

Result: -2147483648

**Example 2:**

Input: [5, 3, 2, 5, 7, 0, 1]

Result: 35

**Example 3:**

Input: [-2, -1, -3, 4, -8, 0]

Result: 24

Answer

// C# code below

using System;

// Write your answer here, and then test your code.

public class Answer {

    // Change these Boolean values to control whether you see

    // the expected result and/or hints.

   public  static Boolean ShowExpectedResult = false;

   public  static Boolean ShowHints = false;

    public static int MaxProductOfTwoNumbers(int[] numbers) {

        // Your code goes here.

        return 0;

    }

}

**Test code**

// This is how your code will be called.

// You can edit this code to try different testing cases.

int[] numbers = { 7, 17, 13, 19, 5 };

int learnerResult = Answer.MaxProductOfTwoNumbers(numbers);

### 3. Solution - Maximum product of two numbers

### 4. Mastering linked lists for whiteboard coding interviews

### 5. <> Code Challenge - Delete the middle of a linked list

Instructions

**Sum contents of a linked list**

You're given a linked list of integers.

**Your task**: Return the sum of the numbers in the linked list.

**Parameters**

**head**: A ListNode containing a reference to the next node and int data

Result

**int**: The sum of the numbers in the linked list

**Constraints**

The **head**  will always contains **at least one number**

Each integer can be either positive or negative

**Example 1:**

Input: **ListNode** containing a null next pointer and the int data 3

Result: 3

**Example 2:**

Input: **ListNode** containing with int data -3 and a next pointer to a **ListNode** with int data 3, which has a next pointer to a **ListNode** with int data 1 and a null next pointer.

Result: **1**

Answer

   {

        public int val;

        public ListNode next;

        public ListNode(int val)

        {

            this.val = val;

            this.next = null;

        }

        public override string ToString()

        {

            return val.ToString();

        }

   }

    // Return the sum of the contents in the linked list.

    public static int Sum(ListNode head)

    {

        return 0;

    }

}

Test code

// This is how your code will be called.

// You can edit this code to try different testing cases.

Answer.ListNode head = new Answer.ListNode(7);

head.next = new Answer.ListNode(5);

head.next.next = new Answer.ListNode(3);

head.next.next.next = new Answer.ListNode(4);

head.next.next.next.next = new Answer.ListNode(1);

int result = Answer.Sum(head);

### 6. Solution - Delete the middle of a linked list

### Chapter Quiz

Question 1 of 2

Which statement about arrays is true?

Arrays have less overhead than other data structures.

This was the correct answer

If you will need to search through your data for specific items often, an array is the best data structure to use.

Incorrect

It's not very efficient to access a specific item at a specific index in an array.

Incorrect

Question 2 of 2

If you change the value of the next pointer of a given node to null, what happens to that node?

The node is added to a new linked list.

The node becomes the last node in the linked list.

Correct

The node is deleted from the linked list.

Incorrect

The node becomes the first node in the linked list.

Incorrect

## 5. Solving Technical Interview Questions - Stacks, Queues, and Hash-Based Structures

### 1. Leverage stacks as a data structure

### 2. Use queues in technical interviews

### 3. Master hash-based structures

### 4. <> Code Challenge - Generate binary numbers

Instructions

Generate n binary numbers

In this challenge, you will generate the first **n** binary numbers. Your algorithm will take in a number n as input and return an array of the first n binary numbers, in numerical order. As a reminder, a binary number is a number that consists of 1s and 0s and is on the base-2 numeral system.

**Your task**: Return an array of the first n binary numbers.

**Parameters**

**n**: The number of binary numbers to generate in the array

Result

**int[]**: An array of the first n binary numbers

**Constraints**

n will always be **non-negative**

**Example 1:**

Input: 6

Result: [1, 10, 11, 100, 101, 110]

**Example 2:**

Input: 0

Result: []

Answer

// C# code below

using System;

using System.Collections.Generic;

// Write your answer here, and then test your code.

public class Answer {

    // Change these Boolean values to control whether you see

    // the expected result and/or hints.

   public  static Boolean ShowExpectedResult = false;

   public  static Boolean ShowHints = false;

    public static int[] GenerateBinaryNumbers(int n) {

        return new int[1];

    }

}

Test code

// This is how your code will be called.

// You can edit this code to try different testing cases.

int n = 6;

int[] learnerResult = Answer.GenerateBinaryNumbers(n);

### 5. Solution - Generate binary numbers

### 6. <> Code Challenge - Matching parentheses

Instructions

Determine matching parentheses

In this challenge, you’ll develop a function that determines if a given piece of text has matching parentheses. We define matching parentheses as a set of symbols that have an opening symbol with a corresponding closing symbol. The opening symbol must also come before the closing symbol.

Although parentheses are traditionally curved characters **( )**, we are also considering square brackets **[ ]** and arrow brackets **< >**parentheses-like symbols as well.

**Your task**: Return true or false depending on whether the input string has matching parentheses or not.

**Parameters**

**s**: A string of characters

Result

**Boolean**: True or false depending on whether the input string has matching parenthesis or not

Constraint

An opening symbol must be closed by its corresponding closed symbol: for example, the opening **[**must be closed by the closing **]**and the opening **<**must be closed by the closing **>**

**Example 1:**

Input: ""

Result: true

**Example 2:**

Input: [(<[ ]>)]

Result: true

**Example 3:**

Input: [<incre>ment]

Result: true

**Example 4:**

Input: ()incre<>ment<>[]

Result: true

**Example 5:**

Input: <increment(

Result: false

**Example 6:**

Input:[)incr]ement(

Result: false

**Example 7:**

Input:(<increment>

Result: false

**Answer**

// C# code below

using System;

using System.Collections.Generic;

// Write your answer here, and then test your code.

public class Answer {

    // Change these Boolean values to control whether you see

    // the expected result and/or hints.

   public  static Boolean ShowExpectedResult = false;

   public  static Boolean ShowHints = false;

    public static Boolean HasMatchingParentheses(string s) {

        // Your code goes here.

        return false;

    }

}

Test code

// This is how your code will be called.

// You can edit this code to try different testing cases.

string s = "()incre<>ment<>[]";

Boolean learnerResult = Answer.HasMatchingParentheses(s);

### 7. Solution - Matching parentheses

### 8. <> Code Challenge - Find the most repeated word

Instructions

Find the most repeated word in a string

In this challenge, you'll determine the most repeated word in a given string. A word is defined as something separated by spaces or punctuation. No words should include spaces or punctuation. For example, if you have something like “she likes apples, bananas, and oranges,” the words would be **"she" "likes" "apples" "bananas" "and" "oranges"** without the punctuation or spaces included.

We’d also like to take out common words so they don’t count as part of the repetition. Here is a list of common words we do not want to count: **"the", "a", "or", "an", "it", "and", "but", "is", "are", "of", "on", "to", "was", "were", "in", "that", "i", "your", "his", "their", "her", "you", "me", "they", "at", "be"**.

**Your task**: Return the most repeated word in the string.

**Parameters**

**text**: A string containing words

Result

**string**: The most repeated word in the string

**Constraints**

A word is defined as something separated by spaces or punctuation. Consider this set of delimiters:**[ \\n\\t\\r.,;:!?(){]**

The uppercase and lowercase version of a word should be counted as the same

If there are two words that are repeated an equal amount of times, whichever set of words came first should be returned

**Example 1:**

Input: "Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book. It has survived not only five centuries, but also the leap into electronic typesetting, remaining essentially unchanged. It was popularised in the 1960s with the release of Letraset sheets containing Lorem Ipsum passages, and more recently with desktop publishing software like Aldus PageMaker including versions of Lorem Ipsum."

Result: lorem

**Example 2:**

Input: "Penguins are aquatic, flightless birds that are highly adapted to life in the water. Their distinct tuxedo-like appearance is called countershading, a form of camouflage that helps keep them safe in the water. Penguins do have wing bones, though they are flipper like and extremely suited to swimming. Penguins are found almost exclusively in the southern hemisphere, where they catch their food underwater and raise their young on land."

Result: penguins

**Example 3:**

Input: "In the heart of Serendipity, a village draped in mystique and charm, the Ethereal Luminance captivated all. Aurelia, the sage, tirelessly deciphered its arcane secrets, sparking fervent communal speculation. Festivities pulsed with an ethereal energy, uniting villagers in a shared enchantment. In animated conversations and hushed whispers alike, the most echoed word remained constant: ethereal, ethereal, ethereal, ethereal, ethereal."

Result: ethereal

Answer

// C# code below

using System;

using System.Collections.Generic;

using System.Linq;

// Write your answer here, and then test your code.

public class Answer {

    // Change these Boolean values to control whether you see

    // the expected result and/or hints.

   public  static Boolean ShowExpectedResult = false;

   public  static Boolean ShowHints = false;

    public static string FindMostRepeatedWord(string text) {

        // Your code goes here.

        return "";

    }

}

Test code

// This is how your code will be called.

// You can edit this code to try different testing cases.

string text = "Lorem Ipsum is simply dummy text of the printing and typesetting industry.

Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an

unknown printer took a galley of type and scrambled it to make a type specimen book. It has

survived not only five centuries, but also the leap into electronic typesetting, remaining

essentially unchanged. It was popularised in the 1960s with the release of Letraset sheets

containing Lorem Ipsum passages, and more recently with desktop publishing software like

Aldus PageMaker including versions of Lorem Ipsum.";

string learnerResult = Answer.FindMostRepeatedWord(text);

### 9. Solution - Find the most repeated word

### Chapter Quiz

Question 1 of 3

If you need to store a collection of unique items, what C# hash structure would you use?

Dictionary

Incorrect

Hashtable

Incorrect

HashSet

This was the correct answer

Question 2 of 3

Which policy does a stack follow when adding and removing items?

It depends on the contents of the stack.

FIFO: First In First Out

LIFO: Last In First Out

Correct

Question 3 of 3

If a stack is empty, what will TryPeek return?

It throws an exception.

FALSE

Correct

TRUE

### 6. Solving Technical Interview Questions - Abstraction, Encapsulation, Inheritance, and Polymorphism

### 1. Master abstraction for technical interviews

### 2. Add encapsulation to your programs to impress interviewers

### 3. Leverage inheritance in your technical interview solutions

### 4. Explore the polymorphism built into C#

### Chapter Quiz

Question 1 of 4

What keyword would you use to access the parent constructor in a subclass?

base

Correct

@override

extends

implements

Question 2 of 4

You can achieve \_\_\_\_\_ polymorphism with \_\_\_\_\_.

compile time; method overriding

runtime; method overloading

Incorrect

compile time; method overloading

Correct

Question 3 of 4

Which statement about abstraction is true?

Abstraction provides generalization to the program.

With data abstraction, only essential details are displayed to the user.

all of these answers

Correct

You use abstraction in Java to hide the implementation complexity offered by an API, design, or system so that you can generalize certain features of your program

Question 4 of 4

In C#, you can achieve encapsulation by declaring all the fields in a class as \_\_\_\_\_ and writing \_\_\_\_\_ methods in the class to set and get the values of variables.

protected; public

public; private

Incorrect

private; public

Correct

private; protected

Incorrect

## 7. Conclusion

### 1. Good luck with your interview