

Problem 1. Strings in C#.

- Describe the strings in C#.
- What is typical for the string data type?
- Describe the most important methods of the String class.

Problem 2. Reverse string

- Write a program that reads a string, reverses it and prints the result at the console.

Example:

Input	Output
sample	elpmas

Problem 3. Correct brackets

- Write a program to check if in a given expression the brackets are put correctly.

Example of correct expression: $((a+b)/5-d)$. *Example of incorrect expression:* $)(a+b))$.

Problem 4. Sub-string in text

- Write a program that finds how many times a sub-string is contained in a given text (perform case insensitive search).

Example:

The target sub-string is `in`

The text is as follows: We are living in an yellow submarine. We don't have anything else. inside the submarine is very tight. So we are drinking all the day. We will move out of it in 5 days.

The result is: 9

Problem 5. Parse tags

- You are given a text. Write a program that changes the text in all regions surrounded by the tags `<upcase>` and `</upcase>` to upper-case.
- The tags cannot be nested.

Example: We are living in a `<upcase>`yellow submarine`</upcase>`. We don't have `<upcase>`anything`</upcase>` else.

The expected result: We are living in a YELLOW SUBMARINE. We don't have ANYTHING else.

Problem 6. String length

- Write a program that reads from the console a string of maximum 20 characters. If the length of the string is less than 20, the rest of the characters should be filled with `*`.
- Print the result string into the console.

Problem 7. Encode/decode

- Write a program that encodes and decodes a string using a given encryption key (cipher).
- The key consists of a sequence of characters.
- The encoding/decoding is done by performing XOR (exclusive or) operation over the first letter of the string with the first of the key, the second – with the second, etc. When the last key character is reached, the next is the first.

Problem 8. Extract sentences

- Write a program that extracts from a given text all sentences containing a given word.

Example:

The word is: in

The text is: We are living in a yellow submarine. We don't have anything else. Inside the submarine is very tight. So we are drinking all day. We will move out of it in 5 days.

The expected result is: We are living in a yellow submarine. We will move out of it in 5 days.

Consider that the sentences are separated by . and the words – by non-letter symbols.

Problem 9. Forbidden words

- We are given a string containing a list of forbidden words and a text containing some of these words.
- Write a program that replaces the forbidden words with asterisks.

Example text: Microsoft announced its next generation PHP compiler today. It is based on .NET Framework 4.0 and is implemented as a dynamic language in CLR.HI

Forbidden words: PHP, CLR, Microsoft

The expected result: ***** announced its next generation *** compiler today.
It is based on .NET Framework 4.0 and is implemented as a dynamic language in
***.

Problem 10. Unicode characters

- Write a program that converts a string to a sequence of C# Unicode character literals.
- Use format strings.

Example:

Input	Output
Hi!	\u0048\u0069\u0021

Problem 11. Format number

- Write a program that reads a number and prints it as a decimal number, hexadecimal number, percentage and in scientific notation.
- Format the output aligned right in 15 symbols.

Problem 12. Parse URL

- Write a program that parses an URL address given in the format:
`[protocol]://[server]/[resource]` and extracts from it the `[protocol]`, `[server]` and `[resource]` elements.

Example:

URL	Information
<code>http://telerikacademy.com/Courses/Courses/Details/212</code>	<code>[protocol] = http</code> <code>[server] = telerikacademy.com</code> <code>[resource] = /Courses/Courses/Details/212</code>

Problem 13. Reverse sentence

- Write a program that reverses the words in given sentence.

Example:

Input	Output
<code>C# is not C++, not PHP and not Delphi!</code>	<code>Delphi not and PHP, not C++ not is C#!</code>

Problem 14. Word dictionary

- A dictionary is stored as a sequence of text lines containing words and their A.
- Write a program that enters a word and translates it by using the dictionary.

Sample dictionary:

input	Output
.NET	platform for applications from Microsoft
CLR	managed execution environment for .NET
namespace	hierarchical organization of classes

Problem 15. Replace tags

- Write a program that replaces in a HTML document given as string all the tags `...` with corresponding tags `[URL=...].../URL]`.

Example:1

Input	Output
<pre><p>Please visit our site to choose a training course. Also visit our forum to discuss the courses.</p></pre>	<pre><p>Please visit [URL=http://academy.telerik. com]our site[/URL] to choose a training course. Also visit [URL=www.devbgo.org]our forum[/URL] to discuss the courses.</p></pre>

Problem 16. Date difference

- Write a program that reads two dates in the format: `day.month.year` and calculates the number of days between them.

Example:

```
Enter the first date: 27.02.2006
Enter the second date: 3.03.2006
Distance: 4 days
```

Problem 17. Date in Bulgarian

- Write a program that reads a date and time given in the format: `day.month.year hour:minute:second` and prints the date and time after 6 hours and 30 minutes (in the same format) along with the day of week in Bulgarian.

Problem 18. Extract e-mails

- Write a program for extracting all email addresses from given text.
- All sub-strings that match the format `<identifier>@<host>...<domain>` should be recognized as emails.

Problem 19. Dates from text in Canada

- Write a program that extracts from a given text all dates that match the format `DD.MM.YYYY.`
- Display them in the standard date format for Canada.

Problem 20. Palindromes

- Write a program that extracts from a given text all palindromes, e.g. `ABBA`, `1ama1`, `exe.`

Problem 21. Letters count

- Write a program that reads a string from the console and prints all different letters in the string along with information how many times each letter is found.

Problem 22. Words count

- Write a program that reads a string from the console and lists all different words in the string along with information how many times each word is found.

Problem 23. Series of letters

- Write a program that reads a string from the console and replaces all series of consecutive identical letters with a single one.

Example:

Input	Output
aaaaabbbbcbdddeeeedssaa	abcdedsa

Problem 24. Order words

- Write a program that reads a list of words, separated by spaces and prints the list in an alphabetical order.

Problem 25. Extract text from HTML

- Write a program that extracts from given HTML file its title (if available), and its body text without the HTML tags.

Example input:

```
<html>
<head><title>News</title></head>
```

```
<body><p><a href="http://academy.telerik.com">Telerik  
  Academy</a>aims to provide free real-world practical  
  training for young people who want to turn into  
  skilful .NET software engineers.</p></body>  
</html>
```

Output:

Title: News

Text: Telerik Academy aims to provide free real-world practical training for young people who want to turn into skilful .NET software engineers.