

MIDTERM #1 FOR GROUP CSSE 1802

D: MS.NET FRAMEWORK

1 option

- a) Write a program, which finds in a given matrix the largest area of equal numbers. We define an area in the matrix as a set of neighbor cells (by row and column). Here is one example with an area containing 13 elements with equal value of 3:

1	3	2	2	2	4
3	3	3	2	4	4
4	3	1	2	3	3
4	3	1	3	3	1
4	3	3	3	1	1

→ 13

- b) Write a program, which checks whether there is a subset of given array of N elements, which has a sum S. The numbers N, S and the array values are read from the console. Same number can be used many times.

Example: {2, 1, 2, 4, 3, 5, 2, 6}, S = 14 - yes (1 + 2 + 5 + 6 = 14)

- c) Write a program that gets from the user the full path to a file (for example C:\Windows\win.ini), reads the content of the file and prints it to the console. Find in MSDN how to use the System.IO.File.ReadAllText(...) method. Make sure all possible exceptions will be caught and a user-friendly message will be printed on the console.

2 option

- a) Write a method ReadNumber(int start, int end) that reads an integer from the console in the range [start...end]. In case the input integer is not valid or it is not in the required range throw appropriate exception. Using this method, write a program that takes 10 integers a1, a2, ..., a10 such that $1 < a1 < \dots < a10 < 100$.

- b) Write a program that encrypts a text by applying XOR (excluding or) operation between the given source characters and given cipher code. The encryption should be done by applying XOR between the first letter of the text and the first letter of the code, the second letter of the text and the second letter of the code, etc. until the last letter of the code, then goes back to the first letter of the code and the next letter of the text. Print the result as a series of Unicode escape characters \xxxx. Sample source text: "Test". Sample cipher code:

"ab". The result should be the following:
"\u0035\u0007\u0012\u0016".

- c) Write a program that reads a string from the console and replaces every sequence of identical letters in it with a single letter (the repeating letter).

Example: "aaaaabbbbbcbdddeeeedssaa" - "abcdedsa".

3 option

- a) Write a program that extracts all the text without any tags and attribute values from an HTML document.

Sample text:

```
<html>
```

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

```
<body><p><a href="http://softuni.org">Software University</a>aims to provide free  
real-world practical training for young people who want to turn into skillful software  
engineers.
```

```
</p></body> </html>
```

Sample result:

News Software University aims to provide free real-world practical training for young people who want to turn into skillful software engineers.

- b) Write a program that extracts all e-mail addresses from a text. These are all substrings that are limited on both sides by text end or separator between words and match the shape
<sender>@<host>...<domain>.

Sample text:

Please contact us by phone (+001 222 222 222) or by email at example@gmail.com or at test.user@yahoo.co.uk. This is not email: test@test. This also: @gmail.com. Neither this: a@a.b.

Extracted e-mail addresses from the sample text:

Chapter 13. Strings and Text Processing 495

example@gmail.com test.user@yahoo.co.uk

- c) Write a program that extracts from a text all dates written in format DD.MM.YYYY and prints them on the console in the standard format for Canada.

Sample text:

I was born at 14.06.1980. My sister was born at 3.7.1984. In 5/1999 I graduated my high school. The law says (see section 7.3.12) that we are allowed to do this (section 7.4.2.9).

Extracted dates from the sample text:

14.06.1980 3.7.1984

4 option

A) Write a program that replaces all hyperlinks in a HTML document consisting of `...` and hyperlinks in "forum" style, which look like `[URL=...]...[/URL]`.

Sample text:

<p>Please visit our site to choose a training course. Also visit our forum to discuss the courses.</p>

Sample result:

<p>Please visit [URL=http://softuni.org]our site[/URL] to choose a training course. Also visit [URL=http://forum.softuni.org]our forum[/URL] to discuss the courses.</p>

b) Write a program that parses an URL in following format:

`[protocol]://[server]/[resource]`

It should extract from the URL the protocol, server and resource parts.

For example, when http://www.cnn.com/video is passed, the result is:

[protocol]="http" [server]="www.cnn.com" [resource]="/video"

c) A text is given. Write a program that modifies the casing of letters to uppercase at all places in the text surrounded by `<upcase>` and `</upcase>` tags. Tags cannot be nested.

Example:

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

Result:

We are living in a YELLOW SUBMARINE. We don't have ANYTHING else

EVERYWHERE YOU CAN GIVE OWN EXAMPLE