Lab # 3. Markdown

3.1. Purpose of the work

Learn how to create reports using the lightweight markup language Markdown.

3.2. Preliminary information

3.2.1. Basic information about Markdown

To create a title, use the sign (
#
), for example:

```
# This is heading 1
```

```
## This is heading 2
```

```
### This is heading 3
```

```
#### This is heading 4
```

To set the text to bold, enclose it in double asterisks:

```
This text is **bold**.
```

To set the text in italics, enclose it in single asterisks:

```
This text is *italic*.
```

To set the text to bold and italic, enclose it in triples
asterisks:

```
This is text is both ***bold and italic***.
```

Quote blocks are created using the >symbol:

```
>
The drought had lasted now for ten million years, and the reign of
the terrible lizards had long since ended. Here on the Equator, in
the continent which would one day be known as Africa, the battle
for existence had reached a new climax of ferocity, and the victor
was not yet in sight. In this barren and desiccated land, only the
small or the swift or the fierce could flourish, or even hope to
survive.
↪
↪
↪
↪
↪
↪
```

An unordered (bulleted) list can be formatted with a star.
placemarks or dashes:

```
-
List item 1
```

```
-
List item 2
```

```
-
List item 3
```

To nest one list in another, add an indent for the elements of the child list:


```
-
List item 1
```

```
-
List item A
```

```
-
List item B
```

```
-
List item 2
```

You can format the ordered list using the appropriate numbers:

```
1.
First instruction
```

```
1.
Second instruction
```

```
1.
Third instruction
```

To nest one list in another, add an indent for the elements of the child list:

```
1.
First instruction
```

```
1.
Sub-instruction
```

```
1.
```

Sub-instruction
```
4
1.
```
Second instruction
The Markdown syntax for an embedded link consists of the following part
[link text]
, representing-
the hyperlink text, and parts of
(file-name.md)
- URL or file name,
which is referenced by:
```
1
[
link text
](
file-name.md
)
```
Markdown supports both embedding code snippets in a sentence and placing them between sentences as separate fenced blocks. Fenced code blocks are an easy way to highlight syntax for code snippets. General format of fenced code blocks:
```
1
``` language
2
your code goes in here
3
```
```
Upper and lower indexes:
$$H_2O$$
2
recorded as
```
1
H~2~O
```
$$2^{10}$$
10
recorded as
```
1
2^10^
```
In-text formulas are made in the same way as LaTeX formulas. For example, the formula
$$\sin^2(\varphi) + \cos^2(\varphi) = 1$$
it will be written as

```
1
$\sin^2 (x) + \cos^2 (x) = 1$
```
Alternative formulas:
$$\sin^2(\varphi) + \cos^2(\varphi) = 1$$
{#eq:eq:sin2+cos2} with a reference in the text "See formula ([- @eq:eq:sin2+cos2])."
it is written as
```
1
$$
2
\sin^2 (x) + \cos^2 (x) = 1
3
$$ {#eq:eq:sin2+cos2}
4
5
See the formula ([- @eq:eq:sin2+cos2]).
```
### 3.2.2. Processing files in Markdown format
To process files in Markdown format, we will use Pandoc
https://pandoc.org/
.
Specifically,
us
you will need
program
pandoc
,
pandoc-citeproc
https://github.com/jgm/pandoc/releases
,
pandoc-crossref
https://github.com/lierdakil/pandoc-crossref/releases
.
Convert a file
README.md

you can do the following:

```
pandoc README.md -o README.pdf
```

or so

```
pandoc README.md -o README.docx
```

You can use the following Makefile

```
FILES
```

```
=
$(
patsubst %.md, %.docx,
$(
wildcard *.md
))
2
FILES
+=
$(
patsubst %.md, %.pdf,
$(
wildcard *.md
))
3
4
LATEX_FORMAT
=
5
6
FILTER
=
--filter pandoc-crossref
7
8
%.docx
:
%.md
9
-pandoc
"
$
<"
$(
FILTER
)
-o
"
$@
"
10
11
%.pdf
:
%.md
12
-pandoc
"
$
<"
$(
LATEX_FORMAT
) $(
FILTER
)
-o
"
$@
"
13
14
all
:
$(
FILES
)
15
@echo
$(
FILES
)
16
17
clean
:
18
-rm
$(
FILES
)
*~
```


3.2.3. Making a report on laboratory work

Laboratory work is a small research project, which should be completed in accordance with all approved requirements. When preparing a report on laboratory work, you will master a number of important elements that will later be useful to you when writing your course and thesis.

3.2.3.1. Report structure

According to GOST 7.32-2001, any research work must be mandatory contain the following elements:

— title page;
- abstract;
- introduction;
- main part;
- conclusion.

GOST also recommends that you include the following elements in your work::
– list of performers
– - content;
- normative references
– - definitions;
- designations and abbreviations–
- list of sources used–
- appendices.

If you are doing complex work that is performed in several stages, you may need to include some or all of the elements in the second list.

3.2.3.2. Content of the main report elements

— Title page. The first sheet of work is drawn up strictly according to the sample, which is usually

It is given in the manuals for your subject. It not only requires
you to specify such elements as the name of the educational institution, type of work
and information about the performer, but also arrange them in strict accordance with the standards
.

— Report. An abstract is actually a summary of your entire report
it also contains a number of statistics. It should indicate the number of parts,
pages of the work, illustrations, appendices, tables, used literature
sources and appendices. Here you can also find a list of key words of the paper
and the actual text of the abstract. The latter implies the main elements of work
from the goals set to the results and recommendations for their implementation. In the practice
of universities, the abstract is usually not included in reports on laboratory work.

— Introduction. In the introduction of a typical laboratory work, goals are usually specified
research being conducted and tasks that will help you achieve
your goals. At the same time, there are works in which students become
real pioneers. Have you ever experienced at least once
a feeling of extreme curiosity and impatience when conducting laboratory work?
To feel that in just a couple of minutes you will find the answer to a question that
no one has ever found the answer to before? It is for such studies
that a detailed introduction is written with proof of the relevance and novelty of the topic under study. To
really conduct research in an area in which, as they say, no human has ever
set foot, in the introduction you will need to give an assessment of the current
state of the problem under consideration and justify the need to solve it.

— The main part. As in different universities and in different disciplines there are their own
the subtleties of laboratory work and the content of the main part
are described in detail in the relevant manuals. It is important that this section of the work
reflects its essence, describes the methodology and results of the work done.
In the main part, specify the following elements::

— objectives of the research being conducted

– **-** tasks that will help you achieve your goals;

— the progress of work, which describes the actions performed–

- other sections provided for by methodological materials on the subject under study.
discipline.

- Conclusion. In this part of the work, you will need to draw conclusions based on the results obtained in the course of
review of laboratory work results. To do this, evaluate how well
the tasks you set have been completed. Complex work may also contain other elements,
such as recommendations for further application of the results of the
work performed.

3.3. Task

— Make a report on your previous lab work in Markdown format.

– Please provide reports in 3 formats as a report:
pdf
,
docx
and
md
(in the archive,
because it should contain screenshots, makefiles, etc.)

3.4. Report content

The report should include:

1. Title page with the number of the laboratory work and full name of the student.
2. Job assignment statement.
3. Description of the task results:

— screenshots (screenshots) that capture the performance of laboratory work

– **-** answers to questions;

4. Conclusions that are consistent with the job assignment.