

# Отчёт по лабораторной работе №5

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## Презентация по лабораторной работе №5

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Таблицы в LaTeX: профессиональное оформление, выравнивание и расширенные приёмы

Изучить создание и оформление таблиц в LaTeX. Освоить пакеты `array`, `booktabs`, `tabularx`, `longtable`, `threeparttable`, `siunitx` и приёмы, позволяющие делать таблицы профессионального уровня.

1. Освоить базовый синтаксис окружения `tabular`.
2. Проработать типы выравнивания колонок: `l`, `c`, `r`, `p{}`.
3. Оформлять таблицы с помощью `booktabs` и частичных правил `\cmidrule`.
4. Уметь объединять ячейки через `\multicolumn`.
5. Применять числовое выравнивание с `siunitx` (S-колонки).
6. Управлять шириной и переносом: `tabular*`, `tabularx`.
7. Создавать многостраничные таблицы (`longtable`).
8. Добавлять сноски в таблицах (`threeparttable`).

- Базовое окружение `tabular`, выравнивание `l l l`.

```
\begin{tabular}{lll}  
Animal & Food & Size \\  
dog & meat & medium \\  
horse & hay & large \\  
frog & flies & small \\  
\end{tabular}
```

Animal	Food	Size
dog	meat	medium
horse	hay	large
frog	flies	small

- Перенос длинных описаний внутри ячейки.

```
\begin{tabular}{cp{9cm}}
```

```
Animal & Description \\\
```

```
dog & The dog is a member of the genus Canis, ...
```

```
\\
```

```
cat & The cat is a domestic species of small carnivorous mammal, ...
```

```
\end{tabular}
```



Animal	Description
dog	The dog is a member of the genus <i>Canis</i> , which forms part of the wolf-like canids, and is the most widely abundant terrestrial carnivore.
cat	The cat is a domestic species of small carnivorous mammal. It is the only domesticated species in the family <i>Felidae</i> and is often referred to as the domestic cat to distinguish it from the wild members of the family.

- Типографские линии: `\toprule`, `\midrule`, `\bottomrule`.

```
\begin{tabular}{lll}  
  \toprule  
  Animal & Food & Size \\  
  \midrule  
  dog & meat & medium \\  
  horse & hay & large \\  
  frog & flies & small \\  
  \bottomrule  
\end{tabular}
```

Animal	Food	Size
dog	meat	medium
horse	hay	large
frog	flies	small

- Группировка и акцентирование колонок.

```
\begin{tabular}{lll}  
\toprule  
Animal & Food & Size \\  
\midrule  
dog & meat & medium \\  
\cmidrule{1-2}  
horse & hay & large \\  
\cmidrule(r){1-1}\cmidrule(rl){2-2}\cmidrule(l){3-3}  
frog & flies & small \\  
\bottomrule  
\end{tabular}
```

Animal	Food	Size
dog	meat	medium
horse	hay	large
frog	flies	small

- Повышение читаемости.

```
\begin{tabular}{cp{9cm}}
```

```
\toprule
```

```
Animal & Description \\
```

```
\midrule
```

```
dog & The dog is a member of the genus Canis, ... \\
```

```
\addlinespace
```

```
cat & The cat is a domestic species of small carnivorous mammal, ... \\
```

```
\bottomrule
```

```
\end{tabular}
```

Animal	Description
dog	The dog is a member of the genus <i>Canis</i> , which forms part of the wolf-like canids, and is the most widely abundant terrestrial carnivore.
cat	The cat is a domestic species of small carnivorous mammal. It is the only domesticated species in the family <i>Felidae</i> and is often referred to as the domestic cat to distinguish it from the wild members of the family.

- Центрирование заголовков, объединение «Food+Size».

```
\begin{tabular}{lll}
```

```
\toprule
```

```
\multicolumn{1}{c}{Animal} & \multicolumn{1}{c}{Food} & \multicolumn{1}{c}{Si
```

```
\midrule
```

```
dog    & meat    & medium \\\
```

```
horse & hay      & large  \\\
```

```
frog   & flies   & small  \\\
```

```
fuath & \multicolumn{2}{c}{unknown} \\\
```

```
\bottomrule
```

```
\end{tabular}
```



Animal	Food	Size
dog	meat	medium
horse	hay	large
frog	flies	small
fuath	unknown	

- Визуальное объединение сущностей по категориям.

```
\begin{tabular}{lll}  
\toprule  
Group & Animal & Size \\  
\midrule  
herbivore & horse & large \\  
          & deer  & medium \\  
          & rabbit& small  \\  
\addlinespace  
carnivore & dog    & medium \\  
          & cat    & small  \\  
          & lion   & large  \\  
\addlinespace  
omnivore  & crow   & small  \\  

```

Group	Animal	Size
herbivore	horse	large
	deer	medium
	rabbit	small
carnivore	dog	medium
	cat	small
	lion	large
omnivore	crow	small
	bear	large
	pig	medium

- Автоформат для всей колонки (курсив + двоеточие).

```
\begin{tabular}{>{\itshape}l<{:} *{2}{l}}
```

```
\toprule
```

```
Animal & Food & Size \\\
```

```
\midrule
```

```
dog & meat & medium \\\
```

```
horse & hay & large \\\
```

```
frog & flies & small \\\
```

```
\bottomrule
```

```
\end{tabular}
```

<i>Animal:</i>	Food	Size
<i>dog:</i>	meat	medium
<i>horse:</i>	hay	large
<i>frog:</i>	flies	small

- Межколоночные вставки `\@{...}` и внутренние разделители.

```
\begin{tabular}{l@{ : }l@{\hspace{2cm}}l}
```

```
Animal & Food & Size \\\
```

```
dog & meat & medium \\\
```

```
horse & hay & large \\\
```

```
frog & flies & small \\\
```

```
\end{tabular}
```

```
\begin{tabular}{l!{:}ll}
```

```
Animal & Food & Size \\\
```

```
dog & meat & medium \\\
```

```
horse & hay & large \\\
```

```
frog & flies & small \\\
```

```
\end{tabular}
```

Animal	: Food	Size
dog	: meat	medium
horse	: hay	large
frog	: flies	small

Animal	: Food	Size
dog	: meat	medium
horse	: hay	large
frog	: flies	small

Animal	Food	Size
dog	meat	medium
horse	hay	large
frog	flies	small

- Точный контроль визуального веса линий.

```
\begin{tabular}{@{} lll@{}} \toprule[2pt]  
Animal & Food & Size \\ \midrule[1pt]  
dog & meat & medium \\ \cmidrule[0.5pt](r{1pt}l{1cm}){1-2}  
horse & hay & large \\ frog & flies & small \\ \bottomrule[2pt]  
\end{tabular}
```



Animal	Food	Size
dog	meat	medium
horse	hay	large
frog	flies	small

- Выравнивание по десятичной точке (S-колонки).

```
\begin{tabular}{SS}  
\toprule  
{Values} & {More Values} \\  
\midrule  
1      & 2.3456 \\  
1.2    & 34.2345 \\  
-2.3   & 90.473  \\  
40     & 5642.5  \\  
5.3    & 1.2e3   \\  
0.2    & 1e4     \\  
\bottomrule  
\end{tabular}
```

Values	More Values
1	2.3456
1.2	34.2345
-2.3	90.473
40	5642.5
5.3	$1.2 \times 10^3$
0.2	$1 \times 10^4$

- **tabular\*** (растяжение по ширине), **tabularx** (автоширина колонки X).

```
\begin{center}
\begin{tabular*}{.5\textwidth}{@{\extracolsep{\fill}}cc@{}}
\hline
A & B\\
C & D\\
\hline
\end{tabular*}
\end{center}
```

```
\begin{center}
\begin{tabularx}{.5\textwidth}{lX}
\hline
```

A & B \

A	B
C	D

A	B
C	D

- Автоматический перенос с сохранением заголовка.

```
\begin{longtable}{cc}  
\multicolumn{2}{c}{A Long Table}\\  
Left Side & Right Side\\  
\hline  
\endhead  
\hline  
\endfoot  
aa & bb\\  
Entry & b\\  
% ... ДЛИННЫЙ СПИСОК ...  
A Wider Entry & b\\  
\end{longtable}
```

A Long Table	
Left Side	Right Side
aa	bb
Entry	b
a	b
a	b
a	b
a	b
a	bbb
a	b

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A Long Table	
Left Side	Right Side
a	b
a	b
a	b
a	b
a	b
a	b b b b b b
a	b b b b b
a	b b
A Wider Entry	b

- Комментирование значений в подпояснениях.

```
\begin{table}
\begin{threeparttable}
\caption{An Example}
\begin{tabular}{ll}
An entry & 42\tnote{1}\\
Another entry & 24\tnote{2}\\
\end{tabular}
\begin{tablenotes}
\item [1] the first note.
\item [2] the second note.
\end{tablenotes}
\end{threeparttable}
\end{table}
```



## Table 2: An Example

An entry	$42^1$
----------	--------

Another entry	$24^2$
---------------	--------

<sup>1</sup> the first note.

<sup>2</sup> the second note.

- Сравнение `p{}`, `\raggedright`, `\RaggedRight`.

```
\begin{table}
```

```
\begin{tabular}[t]{lp{3cm}}
```

```
One & A long text set in a narrow paragraph...\
```

```
Two & A different long text set in a narrow paragraph...\
```

```
\end{tabular}%
```

```
\begin{tabular}[t]{l>{\raggedright\arraybackslash}p{3cm}}
```

```
One & A long text set in a narrow paragraph...\
```

```
Two & A different long text set in a narrow paragraph...\
```

```
\end{tabular}%
```

```
\begin{tabular}[t]{l>{\RaggedRight}p{3cm}}
```

```
One & A long text set in a narrow paragraph...\
```

```
Two & A different long text set in a narrow paragraph...\
```

```
\end{tabular}
```

One A long text set in a narrow paragraph, with some more example text.

Two A different long text set in a narrow paragraph, with some more hard to hyphenate words.

One A long text set in a narrow paragraph, with some more example text.

Two A different long text set in a narrow paragraph, with some more hard to hyphenate words.

One A long text set in a narrow paragraph, with some more example text.

Two A different long text set in a narrow paragraph, with some more hard to hyphenate words.

- Совмещение подписи и значения.

```
\begin{tabular}{lcc}
```

```
\toprule
```

```
Test & \begin{tabular}{@{}c@{}}A\\a\end{tabular} & \begin{tabular}{@{}c@{}}B\\
```

```
\midrule
```

```
Content & is & here \\\
```

```
Content & is & here \\\
```

```
Content & is & here \\\
```

```
\bottomrule
```

```
\end{tabular}
```

Test	A	B
	a	b
Content	is	here
Content	is	here
Content	is	here

- Контроль читабельности.

```
\setlength\extrarowheight{2pt}  
\begin{tabular}{cc}  
\hline  
Square &  $x^2$  \\  
\hline  
Cube &  $x^3$  \\  
\hline  
\end{tabular}
```

---

Square	$x^2$
--------	-------

---

Cube	$x^3$
------	-------

---

---

Square	$x^2$
--------	-------

---

Cube	$x^3$
------	-------

---

1. Создание простой таблицы (базовый синтаксис `tabular`, разделение `&`, конец строки `\\`)

```
\begin{tabular}{lll}  
Animal & Food & Size \\  
dog & meat & medium \\  
horse & hay & large \\  
frog & flies & small \\  
\end{tabular}
```



Use the simple table example to start experimenting with tables.

Animal	Food	Size
dog	meat	medium
horse	hay	large
frog	flies	small

Animal	Food
dog	meat
horse	hay
frog	flies

Animal	Food	Size
dog	meat	medium
horse	hay	large

2. Разные выравнивания (**l**, **c**, **r**) (сравнение трёх вариантов на одной таблице)

```
\begin{tabular}{lll} ... \end{tabular}
```

```
\begin{tabular}{lll} ... \end{tabular}
```

```
\begin{tabular}{rrr} ... \end{tabular}
```

Try out different alignments using the l, c and r column types.

Animal	Food	Size
dog	meat	medium
horse	hay	large
frog	flies	small

Animal	Food	Size
dog	meat	medium
horse	hay	large
frog	flies	small

Animal	Food	Size
dog	meat	medium
horse	hay	large
frog	flies	small

(последняя ячейка остаётся пустой; ошибки нет)

```
\begin{tabular}{lll}
```

```
A & B & C \\\
```

```
1 & 2 \\\
```

```
\end{tabular}
```

What happens if you have too few items in a table row?

A	B	C
1	2	

4. Избыток элементов в строке (предупреждение “Extra alignment tab has been changed to `\cr`” — исправление: добавить колонку)

```
\begin{tabular}{lllll}
```

```
A & B & C & D \\\
```

```
1 & 2 & 3 & 4 \\\
```

```
\end{tabular}
```

What happens if you have too many items in a table row?

A	B	C
1	2	3 4

(заголовок на 3 колонки; объединение последних двух)

```
\begin{tabular}{lll}  
\toprule  
\multicolumn{3}{c}{Animal Information}\\  
\midrule  
dog & meat & medium \\  
fuath & \multicolumn{2}{c}{unknown} \\  
\bottomrule  
\end{tabular}
```



Experiment with the multicolumn command to span across columns.

Animal	Food	Size
dog	meat	medium
horse	hay	large
frog	flies	small
fuath	unknown	

Animal Information		
Animal	Food	Size
dog	meat	medium
horse	hay	large
frog	flies	small
fuath	unknown	

Animal	Food	Size
dog	meat	medium
horse	hay	large
	unknown	
fuath	unknown	

- Освоены: `tabular`, `p{}`, `booktabs`, `\cmidrule`, `\multicolumn`.
- Выполнено числовое выравнивание `siunitx` (S-колонки).
- Показан контроль ширины (`tabular*`, `tabularx`) и перенос (`longtable`).
- Продемонстрированы сноски в таблицах (`threeparttable`).
- Отработаны типичные ошибки выравнивания и их исправление.

В результате работы получены практические навыки профессионального оформления таблиц в LaTeX: аккуратные правила, корректное выравнивание текста и чисел, гибкое управление шириной и высотой строк, многостраничные таблицы и сноски. **Все задачи выполнены, цель достигнута.**

1. Львовский С.М. *Набор и вёрстка в системе LaTeX*. Москва: МЦНМО, 2014. 400 с.

Спасибо за внимание!