

Laboratory Report No. 1

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1 Work Objective

The objective of this laboratory work is the installation of TeX Live.

2 Theoretical Introduction

2.1 Installing TeX Live

- TeX Live — the most complete LaTeX distribution, supported by the TeX community.
- Supports a large number of operating systems.
- Developed since 1996.
- Based on the teTeX distribution.
- MacTeX — version for MacOS.
- Main page: <https://www.tug.org/texlive/>.
- TeX Live — distribution with continuous updates within the annual distribution version.

2.1.1 Installation from system packages [1]

- Ubuntu: `apt install texlive-full`
- Windows: Use the Chocolatey package manager: `choco install texlive`

2.1.2 Manual installation

- Links on the website lead to mirrors. The mirror is selected automatically.
- Download the installer:
 - Unix: `https://mirror.ctan.org/systems/texlive/tlnet/install-tl-unx.tar.gz`

```
cd /tmp/  
wget https://mirror.ctan.org/systems/texlive/tlnet/install-tl-unx.tar.gz
```
 - Windows: `https://mirror.ctan.org/systems/texlive/tlnet/install-tl-windows.exe`
- For Windows: run the executable file and install.
- For Linux:
 - Extract the downloaded file: `tar xzvf install-tl-unx.tar.gz`
 - Go to the extracted directory and run the installer:

```
cd install-tl-[0-9]*  
sudo ./install-tl
```
- It is recommended to create links to executables in the `/usr/local/bin` directory. To do this, in the console version of the utility, select option O, then L. To return to the previous menu, use R.

2.1.3 Updating to the next TeX Live version

It is recommended to install the new TeX Live version separately.

- But you can perform a manual update using the existing installation.
- Suppose our architecture is `x86_64-linux`.
- If you created symbolic links in system directories (through the installer option or `tlmgr path add`), remove them:

```
tlmgr path remove
```

- Move the entire TeX Live directory according to the new version, for example:

```
mv /usr/local/texlive/2024/ /usr/local/texlive/2025
```

- Remove package backups:

```
rm /usr/local/texlive/2025/tlpkg/backups/*
```

- Create links to executables:

```
/usr/local/texlive/2025/bin/x86_64-linux/tlmgr path add
```

- Download the latest version of the `update-tlmgr-latest.sh` script:

```
wget https://mirror.ctan.org/systems/texlive/tlnet/update-tlmgr-latest.sh \
-O /tmp/update-tlmgr-latest.sh
```

- Run the script:

```
sh /tmp/update-tlmgr-latest.sh --upgrade
```

- If you don't want to use the default repository to download new files, replace it:

```
tlmgr option repository <reponame>
```

- Update the TeX Live package manager:

```
tlmgr update --self
```

- Update TeX Live packages:

```
tlmgr update --all
```

- Install symbolic links to executables in system directories (`/usr/local/bin`):

```
tlmgr path add
```

2.2 LaTeX Basics

- You can recreate the luatex cache under the user:

```
mv ~/.texlive2024 ~/.texlive2025  
luaotfload-tool -fu
```

- If you don't do this, the cache will be recreated on the first run of luatex.

3 Laboratory Work Execution

3.1 Installing and Configuring TeX Live

Figures 1 and 2 show the TeX Live installation steps.

3.2 Compilation Results and Files Created by TeX Live

Figures 3 and 4 show the compilation results and created files.

4 Conclusions

Thus, the objective was achieved — TeX Live has been installed.

5 Bibliography

1. Zhdanov O., Ushakov Yu. Cryptographic methods of information protection. Lecture 2: Primality testing and factorization algorithms. NOU "INTUIT" <https://intuit.ru/studies/courses/13837/1234/lecture/31191>, 2014.

```
Administrateur : Windows PowerShell

PS C:\WINDOWS\system32> Test-Path "C:\ProgramData\chocolatey\bin"
True
PS C:\WINDOWS\system32> choco install texlive
chocolatey v2.5.1
Installing the following packages:
texlive
By installing, you accept licenses for the packages.
Downloading package from source 'https://community.chocolatey.org/api/v2/'
Progress: Downloading texlive 2025.20250902.0... 100%

texlive v2025.20250902.0 [Approved]
texlive package files install completed. Performing other installation steps.
The package texlive wants to run 'chocolateyinstall.ps1'.
Note: If you don't run this script, the installation will fail.
Note: To confirm automatically next time, use '-y' or consider:
choco feature enable -n allowGlobalConfirmation
Do you want to run the script?([Y]es/[A]ll scripts/[N]o/[P]rint): y

Additional parameters for installer:
Writing Profile
Writing Profile using Passed Parameters.
TeX Live Profile will be written to C:\tools\texlive.profile
Extracting C:\ProgramData\chocolatey\lib\texlive\tools\install-tl.zip to C:\tools\install-tl-27092518...
C:\tools\install-tl-27092518
Automated TeX Live installation using profile: C:\tools\texlive.profile
Loading https://mirror.truenetwork.ru/CTAN/systems/texlive/tlnet/tlpkg/texlive.tlpdb
Installing TeX Live 2025 from: https://mirror.truenetwork.ru/CTAN/systems/texlive/tlnet (not verified)
Platform: windows => 'Windows (64-bit)'
Distribution: net (downloading)
Using URL: https://mirror.truenetwork.ru/CTAN/systems/texlive/tlnet
Directory for temporary files: C:\Users\ousma\AppData\Local\Temp\TXMcyii2bT
Installing to: C:\texlive\2025
Installing [1/6, time/total: ??:???:??:?]: hyphen-base [23k]
Installing [2/6, time/total: 00:02/24:23]: kpahsea [1042k]
Installing [3/6, time/total: 00:04/01:00]: luatex [1957k]
Installing [4/6, time/total: 00:07/00:37]: texlive-scripts [556k]
Installing [5/6, time/total: 00:09/00:40]: texlive.infra [610k]
Installing [6/6, time/total: 00:13/00:50]: tlppl.windows [11991k]
Time used for installing the packages: 00:30
Installing [001/131, time/total: ??:???:??:?]: ae [84k]
Installing [002/131, time/total: 00:02/01:02:52]: amscls [1437k]
Installing [003/131, time/total: 00:06/10:18]: amsfonts [4725k]
Installing [004/131, time/total: 00:13/05:26]: amsmath [2427k]
Installing [005/131, time/total: 00:17/05:07]: atbegshi [409k]
Installing [006/131, time/total: 00:20/05:45]: atveryend [281k]
Installing [007/131, time/total: 00:22/06:08]: auxhook [286k]
Installing [008/131, time/total: 00:25/06:46]: babel [2289k]
Installing [009/131, time/total: 00:30/06:33]: babel-english [137k]
Installing [010/131, time/total: 00:32/06:55]: babelbib [1251k]
Installing [011/131, time/total: 00:34/06:39]: bibtex [405k]
Installing [012/131, time/total: 00:35/06:39]: bibtex.windows [49k]
Installing [013/131, time/total: 00:36/06:49]: bigintcalc [467k]
```

Figure 1: First stage of TeX Live installation

```
Pre-generating all format files, be patient...
[18:08:17] running fctutil.sys - no error-if no engine-luatex,luajittex,luajittex,mflua,luajit --no-strict --all ...done
Running path adjustment actions
Finished with path adjustment actions
[18:08:44] running package-specific postactions
[18:08:45] finished with package-specific postactions

logfile: C:\texlive\2025\install-tl.log
Environment vars (like PATH) have changed. Close/reopen your shell to
see the changes (or in powershell/cmd.exe just type "refreshenv").
The install of texlive was successful.
Deployed to 'C:\tools\install-tl-27092518'

Chocolatey installed 1/1 packages.
See the log for details (C:\ProgramData\chocolatey\logs\chocolatey.log).
PS C:\WINDOWS\system32> refreshenv
RefreshEnv.cmd does not work when run from this process. If you're in PowerShell, please 'Import-Module $env:ChocolateyInstall\helpers\chocolateyProfile.ps1' and try again.
PS C:\WINDOWS\system32>
```

Figure 2: Second stage of TeX Live installation

```

Administrateur : Windows PowerShell
Ok [25] [26] [28] [27] [29] [30] [31])
(c:/texlive/2025/texmf-dist/fonts/source/jknappen/ec/exromp.mf
Ok [38] [63] [190])
(c:/texlive/2025/texmf-dist/fonts/source/jknappen/ec/exrulett.mf
Ok [65] [66] [67] [68] [69] [70] [71] [72] [73] [74] [75] [76] [77] [78]
[79] [80] [81] [82] [83] [84] [85] [86] [87] [88] [89] [90])
(c:/texlive/2025/texmf-dist/fonts/source/jknappen/ec/exrllett.mf
Ok [97] [98] [99] [100] [101] [102] [103] [104] [105] [106] [107] [108]
[109] [110] [111] [112] [113] [114] [115] [116] [117] [118] [119] [120]
[121] [122]) (c:/texlive/2025/texmf-dist/fonts/source/jknappen/ec/exrdigit.mf
Ok [48] [49] [50] [51] [52] [53] [54] [55] [56] [57])
(c:/texlive/2025/texmf-dist/fonts/source/jknappen/ec/exrligbt.mf
Ok) ) )
(some charht values had to be adjusted by as much as 0.13197pt)
Font metrics written on ecbx1728.tfm.
Output written on ecbx1728.600gf (256 characters, 84848 bytes).
Transcript written on ecbx1728.log.
gftopk.exe ecbx1728.600gf ecbx1728.600pk
<c:/Users/ousma/.texlive2025/texmf-var/fonts/pk/ljff
our/jknappen/ec/ecbx1728.600pk>
Output written on step17-custom.pdf (1 page, 9960 bytes).
Transcript written on step17-custom.log.
PS C:\LaTeX-Projet> # Vérifier tous les fichiers créés
>> dir step*.tex
>> dir step*.pdf

Répertoire : C:\LaTeX-Projet

Mode                LastWriteTime         Length Name
----                -
-a----          27/09/2025   19:39             254 step10-citations.tex
-a----          27/09/2025   19:49             474 step11-advanced.tex
-a----          27/09/2025   20:29             281 step13-classes.tex
-a----          27/09/2025   20:30             286 step14-packages.tex
-a----          27/09/2025   20:31             524 step15-complete.tex
-a----          27/09/2025   20:31             155 step16-errors.tex
-a----          27/09/2025   20:32             182 step17-custom.tex
-a----          27/09/2025   19:35             652 step8-references.tex
-a----          27/09/2025   19:37             411 step9-toc.tex
-a----          27/09/2025   19:41          23455 step10-citations.pdf
-a----          27/09/2025   19:49          79370 step11-advanced.pdf
-a----          27/09/2025   20:32          30061 step13-classes.pdf
-a----          27/09/2025   20:32          62754 step14-packages.pdf
-a----          27/09/2025   20:32          58597 step15-complete.pdf
-a----          27/09/2025   20:32           6599 step16-errors.pdf
-a----          27/09/2025   20:32           9960 step17-custom.pdf
-a----          27/09/2025   19:35          41698 step8-references.pdf
-a----          27/09/2025   19:37          31457 step9-toc.pdf

PS C:\LaTeX-Projet>

```

Figure 3: Compilation results

```
Hey world!  
This is a first document.
```

1

Figure 4: Created files