

LaTeXを使用する準備/Preparation

- In the university
 - Nothing special
 - **Highly recommended** if you use LaTeX
- In your computer
 - ~~Good luck~~
TeX Wiki
 - Constructing environment for LaTeX is very complex, so I recommend the following 2 ways.
 1. Using Docker image
 2. Using Web service
Overleaf
- Why not use MS Word?
 - You are right.

- LaTeXを使用する準備
/Preparation
- レポート用テンプレート
/Template for Report
 - コンパイル方法/How to
compile
 - テンプレートファイル

レポート用テンプレート/Template for Report

コンパイル方法/How to compile

```
latexmk -pdfdvi -latex=uplatex -e '$dvi-pdf=q/dvipdfmx %0 %S/;' report.tex
```

Terminal

注意/Remark

- Latexmk がインストールされていること/To install Latexmk tool
- \documentclass のオプションに dvipdfmx を指定すること/To write 'dvipdfmx' in option of \documentclass
- UNIX/Linux を使用していること/To use UNIX/Linux system

テンプレートファイル/Template

```
report.tex

% Document type
\documentclass[11pt, a4paper, uplatex, dvipdfmx]{scrartcl}

% Package
\usepackage{amssymb, amsmath, latexsym} % For mathematics [Before hyperref]
\usepackage[setpagesize=false]{hyperref} % For inserting hyperlink [Before graphicx]
\usepackage{graphicx} % For inserting figure
\usepackage{subcaption} % For caption of figures and tables
\usepackage[svgnames, x11names]{xcolor} % For coloring
\usepackage[shortlabels]{enumitem} % For useful enumerate and itemize environment
\usepackage{comment} % For commenting multiline
\usepackage{cite} % For citing references [After hyperref]
\usepackage{url} % For inserting URL
\usepackage{datetime} % For date style of title
\usepackage[autolanguage]{numprint} % For formatting number
\usepackage{listings} % For inserting programming code

% Configuration for hyperlink
\hypersetup{
    breaklinks=true,
    colorlinks=true,
    urlcolor=blue,
}

% Configuration for listings
% If you change colors, refer to a manual (p. 38 -- 39) of 'xcolor'
% after typing 'texdoc xcolor' in your terminal
\lstset{
    language=c,
    basicstyle={\ttfamily\small},
    keywordstyle={\color{OliveDrab}},
    stringstyle={\color{CadetBlue}},
    commentstyle={\color{Brown}},
    tabsize=2,
```

```
showstringspaces=false,
numbers=left,
numberstyle={\ttfamily\footnotesize},
breaklines=true,
captionpos=b,
}

% Set title and author
\title{Parallel Computer System: Exercise 1}
\author{Student ID, Your Name}
\date{\usdate\today}

% %
% Body
% %
\begin{document}
% Make title page
\maketitle

\section{Execution Environments}
Describe execution environments of a program.
Recommend using table.

\section{Problem 1}
\subsection{Implementation}
Describe your work, if any.

\subsection{Result}
Describe your result.
Recommend using table and figure.

\subsection{Discussion}
Describe your consideration and explanation of the result.

\appendix
```

```
\section{Source Codes}\label{sec:code}
Insert your source code, if any.

\end{document}
```

TIPS

- 日本語で書きたい場合/In case of writing in Japanese
 - `\documentclass` を以下のように変更/Modify `\documentclass` like the following
 - プリアンブルを以下のように変更/Make a change to preamble like the following

```
% Document type
\documentclass[11pt, a4paper, uplatex, dvipdfmx]{jsarticle}

\usepackage[setpagesize=false]{hyperref} % For inserting hyperlink [Before graphicx]
% % % Beginning of a change
\usepackage{pxjahyper}                  % For preventing Japanese bookmarks
                                         % in pdf file from corrupting

% % % End of a change
\usepackage{graphicx}                  % For inserting figure
```

- 箇条書き/How to itemize using bullets

```
\begin{itemize}
\item Hoge
\item Fuga
\end{itemize}
```

- 段落番号を使った箇条書き/How to itemize using numbers
 - enumitem パッケージが必要/Required 'enumitem' package

```
\begin{enumerate}[1.]
\item First
\item Second
\end{enumerate}
```

LaTeX

- 表の挿入・参照/How to insert and refer a table

Environments to measure computation time is presented in Table `\ref{table:exeEnv}`.

```
\begin{table}[ht]
\centering
\caption{Execution Environments}
\label{table:exeEnv}
\begin{tabular}{cc}
Machine & solsvXXX \\
Compiler & gcc 4.X.X
\end{tabular}
\end{table}
```

LaTeX

- 数値を整形した表の挿入/How to insert a table containing formatted numbers
 - numprint パッケージが必要/Required 'numprint' package
 - `n{整数部の桁数}{小数部の桁数}/`
`n{# of digits before the decimal point}{# of digits after the decimal point}`

LaTeX

```
\begin{table}[ht]
  \centering
  \caption{Measurement result of computation time}
  \label{table:result}
  \begin{tabular}{n{10}{0}n{2}{5}}
    {\# of partitions} & {Computation time/second}\\
    \hline
    1048576 & 0.02 \\
    16777216 & 0.304
  \end{tabular}
\end{table}
```

- 図の挿入・参照/How to insert and refer a figure
 - graphicx パッケージが必要/Required 'graphicx' package

Figure \ref{figure:result} shows measurement result of computation time.

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```
\begin{figure}[ht]
  \centering
  \includegraphics[scale=0.45]{./path/filename.png}
  \caption{Measurement result of computation time of my program}
  \label{fig:result}
\end{figure}
```

- 複数の図の挿入・参照/How to insert and refer some figures
 - graphicx パッケージが必要/Required 'graphicx' package
 - subcaption パッケージが必要/Required 'subcaption' package

Measurement results of computation time when changing a compile option are shown in ^{LaTeX} Figure \ref{fig:results}. Figures \ref{fig:01} and \ref{fig:02} correspond to compile option -O1 and -O2, respectively.

```
\begin{figure}[ht]
  \begin{minipage}{0.48\hsize}
    \centering
    \includegraphics[scale=0.3]{./path/filename1.png}
    \subcaption{Compile option: -O1}
    \label{fig:01}
  \end{minipage}
  \hfill
  \begin{minipage}{0.48\hsize}
    \centering
    \includegraphics[scale=0.3]{./path/filename2.png}
    \subcaption{Compile option: -O2}
    \label{fig:02}
  \end{minipage}
  \caption{Measurement results of computation time when changing a compile option}
  \label{fig:results}
\end{figure}
```

- コードの挿入・参照/How to insert and refer a code
 - listings パッケージが必要/Required 'listings' package
 - ソースコード中に日本語を含まないこと/Do not include Japanese in your code

LaTeX

```
\subsection{Implementation}
```

Source code used to measure is shown in Listing \ref{code:code1} in Appendix \ref{sec:code}.

```
\subsection{Result}
```

```
\subsection{Discussion}
```

```
\appendix
```

```
\section{Source Code}\label{sec:code}
```

```
\lstinputlisting[caption={C Code for Something}, label=code:code1]{./path/filename.c}
```

- 複数行のコメントアウト/How to comment out through multi lines
 - comment パッケージが必要/Required 'comment' package

LaTeX

```
\begin{comment}
```

```
Commented out line
```

```
\end{comment}
```