Worksheet 2 (Solution)

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All required data for this worksheet is supplied in week-02.zip.

All solution files can be found in week-02-sol.zip.

Problem 2.1. (Reconstructing markups)

Modify the supplied `problem-2-1-stub.tex` so it builds without errors and renders like the supplied `problem-2-1-sol.pdf`, with the exception of your names and matriculation number, which should be replaced by your actual data.

Solution.

The following modifications are required:

- The "and" in the section title needs to be replaced by `\&`.
- Where a new paragraph is supposed to start, we need an empty line separating the paragraphs in the source file.
- The section needs to be labeled with the label being referenced and the `\ref` call should be `\zcref`.
- The word "something" needs to be passed to `\emph` as an argument.
- The first LaTeX command needs an additional `\` and the actual `\LaTeX` call needs empty braces `\{\}`, i. e., an empty argument for correct spacing, as the whitespace otherwise is gobbled as the argument.
- Finally, the itemize environment needs to be added and a `\footnote` added.

Problem 2.2. (Debugging a .tex-file)

Modify the supplied `problem-2-2-stub.tex` so it builds without errors and renders like the supplied `problem-2-2-sol.pdf`, with the exception of your names and matriculation number, which should be replaced by your actual data.

Record the modifications you had to do and what error type they produced in the log. Note how long it took you to debug the file manually. Then post the original `problem-2-2-stub.tex` to an AI tool of your choice, ask it to debug the file and compare your time against the tool's.

Solution.

The following modifications are required:

- The line

  ```
  \newcommand{\coursename}{Introduction to \LaTeX{}}
  ```

  tries to define a command that is already defined in `latex-course.sty`, so even though it is being defined exactly the same way, this will not build cleanly. It throws the error

  ```
  ./004-stub.tex:4: LaTeX Error: Command \coursename already defined.
         Or name \end... illegal, see p.192 of the manual.
  ```

  The line simply needs to be removed.

- The **`\maketitle`** call needs to be moved inside the document body. It throws the error

  ```
  ./004-stub.tex:10: LaTeX Error: Missing \begin{document}.
  ```

- The line

  ```
  for all u \in U and $v \in V$.
  ```

  is missing two dollar signs around the statement for U that need to be added as that triggers the error

  ```
  ./004-stub.tex:31: Missing $ inserted.
  <inserted text>
                  $
  l.31 for all u \in
                     U and $v \in V$.
  I've inserted a begin-math/end-math symbol since I think
  you left one out. Proceed, with fingers crossed.

  ./004-stub.tex:31: Missing $ inserted.
  <inserted text>
                  $
  l.31 for all u \in U and $v \in
                                  V$.
  I've inserted a begin-math/end-math symbol since I think
  you left one out. Proceed, with fingers crossed.
  ```

- The command **\label** was misspelled in the line

  ```
  \lable{subsec:tensors}
  ```

  It throws the error:

  ```
  ./004-stub.tex:41: Undefined control sequence.
          l.40 \lable
                  {subsec:tensors}
  ```

  The spelling needs to be corrected.

- Additionally, the enumerate environment is closed by the itemize environment which throws the error:

  ```
  ./004-stub.tex:64: LaTeX Error: \begin{enumerate} on input line 56 ended by \end{itemize}.
  ```

  The **\end**{itemize} needs to be replaced with **\end**{enumerate}.

- The curly braces of the **\footnote** call were not closed, which throws the error

  ```
  Runaway argument?
  {Even when $U = V$, one usually has $u \otimes v \neq v \otimes u$, s\ETC.
  ! File ended while scanning use of \@footnotetext.
  <inserted text>
                  \par
  <*> 004-stub.tex

  I suspect you have forgotten a `}', causing me
  to read past where you wanted me to stop.
  I'll try to recover; but if the error is serious,
  you'd better type `E' or `X' now and fix your file.
  ```

  The closing brace needs to be added.

- The reference in the line

  ```
  This can be described by the so-called \emph{universal property}, which we will discuss in the
  ↪  following \zcref{subsec:univrsal}.
  ```

  is missing an “e”, which needs to be added for the pdf to render like the one provided in the problem discription, otherwise you get the warning that the reference label is undefined.

  I can not reasonably offer a time comparison, as I intentionally added the bugs to identify. Quite clearly, AI tools are extremely powerful in debugging (and any other LaTeX application for that matter) but as always, in order to understand what is going on and to effectively communicate with these models, one needs to at least understand the basics.