Exercises (October 15, 2018):

1. Exercise: Typeset this by changing the default “bullet” symbol twice.

   > The first entry here
   > Then the second
   > etc

   • The first entry here
   • Then the second
   • etc

   *Hint:* Use \textgreater for “>” and \$\bullet\$ for “•”.

2. Make a tripple nested list.

3. How do you get this default:

   > First level
   * Second level
   • Third level

   Check that it works by typesetting the tripple ensted list of the pervious exercise.

   *Hint:* Symbols used: \textgreater, \$\star\$, \$\bullet\$.

4. Typeset this:

   **First** The first entry here
   **Second** Then the second
   **Last** Then the last

   with the descriptors “First” in red color, “Second” in blue and “Last” in black.

   *Hint: \usepackage{color}*
Solutions

Exercise 1: \renewcommand{\labelitemi}{\textgreater}

\begin{itemize}
  \item The first entry here
  \item Then the second
  \item etc
\end{itemize}

\renewcommand{\labelitemi}{$\bullet$}

\begin{itemize}
  \item The first entry here
  \item Then the second
  \item etc
\end{itemize}

Exercise 2: Here is an example of a triple nested list:

\begin{itemize}
  \item The first entry here
  \begin{itemize}
    \item The first sub-entry here
    \item Then the second sub-entry
    \begin{itemize}
      \item The first sub-sub-entry here
      \item Then the second sub-sub-entry
    \end{itemize}
  \end{itemize}
  \item Return to original list, etc
\end{itemize}

Exercise 3: \renewcommand{\labelitemi}{\textgreater} \renewcommand{\labelitemii}{$\star$} \renewcommand{\labelitemiii}{$\bullet$}

Exercise 4: Per the hint place \usepackage{color} in the preamble. Then

\begin{description}
  \item[\color{red}First] The first entry here
  \item[\color{blue}Second] Then the second
  \item[\color{black}Last] Then the last
\end{description}
Exercise (November 5, 2018):

1. Typeset
   \[ a = b \quad c = d \quad e = f \]
   \[ g = b \quad h = d \quad k = f \]

2. Typeset
   \[ a^2 = b^2 + c^2 \]

3. Typeset two of these: \( \varphi, \sigma, \wp, \Xi, \vartheta \)

4. Typeset
   \[ F = G_N \frac{m_1 m_2}{r^2} \]

5. Typeset
   \[ n_\pm(E, T) = \frac{1}{e^{\frac{E}{k_B T}} \pm 1} = \frac{1}{e^{\hbar \omega / k_B T} \pm 1} \]
   Note: This uses the greek letter \( \omega \) and the symbol \( \hbar \).

6. Typeset
   \[ F_{\mu \nu} = [D_\mu, D_\nu] = \partial_\mu A_\nu - \partial_\nu A_\mu = \partial_\mu \partial_\nu A_\nu \]
   Note: This uses the greek letters \( \mu \) and \( \nu \), and the symbol \( \partial \).

7. Typeset these (the first is inline, the next two are separate displayed equations):
   “Taylor expansion \( e^x = \sum_{n=0}^{\infty} \frac{1}{n!} x^n \).”
   \[ \int_0^1 \frac{df}{dx} dx = f(1) - f(0) \]
   \[ e^{\zeta(n)} = \prod_{n=1}^{\infty} e^{1/n^s} \]
   (This uses the greek letter zeta).
Exercise 1: \begin{align*}
a &= b & c &= d & e &= f \\
g &= b & h &= d & k &= f
\end{align*}

Note: the star in \texttt{align*} is used in order to omit equation numbering.

Exercise 2: \item Typeset

\[
a^2 = b^2 + c^2
\]

Exercise 3: Use package \texttt{wasysym} for \texttt{female}, \texttt{male}, \texttt{taurus}, \texttt{amssymb} for $\texttt{boxminus}$, and \texttt{tipa} for \texttt{textscha}.

Exercise 4: \[
F = G_N \frac{m_1 m_2}{r^2}
\]

Exercise 5: \[
n_{\pm}(E,T) = \frac{1}{e^{\frac{E}{k_B T}} \pm 1} = \frac{1}{e^{\frac{\hbar \omega}{k_B T}} \pm 1}
\]

Exercise 6: \[
F_{\mu\nu} = \{D_\mu , D_\nu\} = \partial_\mu A_\nu - \partial_\nu A_\mu = \partial_{[\mu} A_{\nu]} \]

Exercise 7: ‘‘Taylor expansion $e^x = \sum_{n=0}^{\infty} \frac{1}{n!} x^n$.’’

\[
\int_0^1 \frac{df}{dx} dx = f(1) - f(0)
\]
\[
e^{\zeta(s)} = \prod_{n=1}^{\infty} e^{1/n^s}
\]
Exercises (November 19, 2018):

1. Typeset

\[ F = G_N \frac{m_1 m_2}{r^2} \]

2. Typeset

\[ n_\pm(E, T) = \frac{1}{e^{\frac{E}{k_B T}} \pm 1} = \frac{1}{e^{\hbar \omega / k_B T} \pm 1} \]

*Note: This uses the greek letter \( \omega \) and the symbol \( \hbar \).*

3. Typeset

\[ F_{\mu \nu} = [D_\mu, D_\nu] = \partial_\mu A_\nu - \partial_\nu A_\mu = \partial_{[\mu} A_{\nu]} \]

*Note: This uses the greek letters \( \mu \) and \( \nu \), and the symbol \( \partial \).*

4. Typeset these (the first is inline, the next two are separate displayed equations):

"Taylor expansion \( e^x = \sum_{n=0}^{\infty} \frac{1}{n!} x^n \)."

\[ \int_0^1 \frac{df}{dx} \, dx = f(1) - f(0) \]

\[ e^{\zeta(s)} = \prod_{n=1}^{\infty} e^{1/n^s} \]

(This uses the greek letter zeta).

5. Typeset these two expressions as separate displayed equations:

\[ 2 \left[ 3 \frac{a}{z} + 2 \left( \frac{a}{d} + 7 \right) \right] \quad \quad x^2 \left( \sum_n A_n + 3 \left( b + \frac{1}{c} \right) \right) \]

6. Typeset this, using the \texttt{ multiline*} environment:

\[ 2 \left( 1 + \frac{1}{2} + \frac{1}{2^2} + \frac{1}{2^3} + \frac{1}{2^4} + \frac{1}{2^5} + \frac{1}{2^6} + \frac{1}{2^7} + \frac{1}{2^8} + \frac{1}{2^9} + \frac{1}{2^{10}} + \frac{1}{2^{11}} \right) = \frac{4095}{1024} \]

7. Make the first entry of Exercise 5 look like this:

\[ 2 \left[ 3 \frac{a}{z} + 2 \left( \frac{a}{d} + 7 \right) \right] \]
Exercise 1:
\[
F = G_N \frac{m_1 m_2}{r^2}
\]

Exercise 2:
\[
n_{\pm}(E,T) = \frac{1}{e^{\frac{E}{k_BT}} \pm 1} = \frac{1}{e^{\frac{\hbar \omega}{k_BT}} \pm 1}
\]

Exercise 3:
\[
F_{\mu\nu} = [D_\mu, D_\nu] = \partial_\mu A_\nu - \partial_\nu A_\mu = \partial_{[\mu} A_{\nu]}.
\]

Exercise 4: ‘‘Taylor expansion $e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!}$.’’
\[
\int_0^1 \frac{df}{dx} dx = f(1) - f(0)
\]
\[
e^{\zeta(s)} = \prod_{n=1}^{\infty} e^{1/n^s}
\]

Exercise 5:
\[
2 \left[ 3 \frac{a}{z} + 2 \left( \frac{a}{d} + 7 \right) \right]
\]
and
\[
\left[ \frac{1}{2} - \frac{1}{2} \left( \sum_{n=1}^{\infty} b + \frac{1}{c} \right) \right]_0
\]

Exercise 6:
\[
\begin{multline*}
2 \left( 1 + \frac{1}{2} + \frac{1}{2^2} + \frac{1}{2^3} + \frac{1}{2^4} + \frac{1}{2^5} + \frac{1}{2^6} + \frac{1}{2^7} + \frac{1}{2^8} + \frac{1}{2^9} \right) = \frac{4095}{1024}
\end{multline*}
\]

Exercise 7:
\[
2 \Bigg[ 3 \frac{a}{z} + 2 \bigg( \frac{a}{d} + 7 \bigg) \Bigg]
\]