PHYS 87

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 tripple 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}
\item etc
\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}
```

PHYS 87

Exercises (November 5, 2018):

1. Typeset

$$\begin{array}{ccc} a = b & c = d & e = f \\ g = b & h = d & k = f \end{array}$$

2. Typeset

$$a^2 = b^2 + c^2$$

3. Typeset two of these: ♀, ♂, ♉, $\boxminus$, ə

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

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

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 $e^x = \sum_{n=0}^{\infty} \frac{1}{n!} x^n$.”

$$\int_0^1 \frac{df}{dx} dx = f(1) - f(0)$$

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

(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 `align*` is used in order to omit equation numbering.

Exercise 2:
```
\item Typeset
\[
a^2=b^2+c^2
\]
\bigskip
```

Exercise 3: Use package *wasysym* for `\female, \male, \taurus`, *amssymb* for `$\boxminus$`, and *tipa* for `\textschwa`

Exercise 4:
```
\[
F = G_N\frac{m_1m_2}{r^2}
\]
\bigskip
```

Exercise 5:
```
\[
n_{\pm}(E,T)=\frac1{e^{\frac{E}{k_BT}}\pm1}
           =\frac1{e^{{\hbar\omega}/{k_BT}}\pm1}
\]
\bigskip
```

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 $e^x=\sum_{n=0}^\infty \frac1{n!}x^n$.''
\[\int_{0}^1 \frac{df}{dx}dx= f(1)-f(0)\]
\[e^{\zeta(s)}=\prod_{n=1}^\infty e^{1/n^s}\]
```

PHYS 87

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*:

$$2\left[3\frac{a}{z} + 2\left(\frac{a}{d} + 7\right)\right] \qquad x^2\left(\sum_n A_n + 3\left(b + \frac{1}{c}\right)\right)\Bigg]_0$$

6. Typeset this, using the `multline*` environment:

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

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

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

Exercise 1:
```
\[
F = G_N\frac{m_1m_2}{r^2}
\]
\bigskip
```

Exercise 2:
```
\[
n_{\pm}(E,T)=\frac1{e^{\frac{E}{k_BT}}\pm1}
           =\frac1{e^{{\hbar\omega}/{k_BT}}\pm1}
\]
\bigskip
```

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 $e^x=\sum_{n=0}^\infty \frac1{n!}x^n$.''
\[\int_{0}^1 \frac{df}{dx}dx= f(1)-f(0)\]
\[e^{\zeta(s)}=\prod_{n=1}^\infty e^{1/n^s}\]
```

Exercise 5:
```
\[ 2\left[3\frac{a}{z}+2\left(\frac{a}{d}+7\right)\right] \]
```

and

```
\[ \left.x^2\left(\sum_nA_n+3\left(b+\frac1c\right)\right)\right]_0 \]
```

Exercise 6:
```
\begin{multline*}
2\left(1+\frac12+\frac1{2^2}+\frac1{2^3}+\frac1{2^4}
       +\frac1{2^5}+\frac1{2^6}+\frac1{2^7}
               +\frac1{2^8}+\frac1{2^9}\right.\\
\left.+\frac1{2^{10}}+\frac1{2^{11}}\right)=\frac{4095}{1024}
\end{multline*}
```

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