PreTeXt Documents

For an article

```xml
<xml version="1.0" encoding="UTF-8"/>
<pretext>
<article>
<title>Hello World!</title>
<p>This is a PreTeXt document.</p>
</article>
</pretext>

or a book

```xml
<xml version="1.0" encoding="UTF-8"/>
<pretext>
<title>Hello World!</title>
<p>This is a PreTeXt document.</p>
</pretext>
```

Structure of a PreTeXt Document

PreTeXt documents are structured and may contain divisions such as `<chapter>` (for books), `<section>`, `<subsection>`, and `<p>` (paragraphs).

```xml
<section>
<title>Mandatory</title>
<p>First paragraph.</p>
<p>Second paragraph.</p>
</section>
```

Divisions may contain other divisions. Divisions require a `<title>`.

```xml
<section>
<title>Mandatory</title>
<p>Introduction text. (Optional.)</p>
</section>
```

Images, Figures, sidebyside

Images can be included using the `<image>` tag with the `@source`. The `width` attribute can be used to control the size of the image. Images can be wrapped inside a `<figure>`. A `<figure>` must have a `<caption>`, and the figure will be numbered. The `<sidebyside>` tag provides flexible options for placing several images together or combining figures with subcaptions. PreTeXt provides support for authoring with graphics languages such as Asymptote, TikZ, PGF, PSTricks, and xy-pic in addition to using Sage code to describe a plot or image. In most cases output can be obtained as smoothly-scalable SVG images, in addition to other formats like PDF or PNG. For accessibility, every `<image>` should either have a `<description>` child.

```xml
<figure xml:id="figure-spring-mass">
<description>mass on a table that is attached to a wall with a spring</description>
<later-image>
<latex-image parse="text"/>
</later-image>
</figure>
```
The tags `<assumption>`, `<axiom>`, `<conjecture>`, `<heuristic>`, `<hypothesis>`, and `<principle>` have the same structure in PreTeX.

```
<axiom>
  <title>Optional</title>
  <creator>Peano</creator>
  <statement>
    <p>Here's the statement of the axiom.</p>
  </statement>
</axiom>
```

Remark-Like Elements
The tags `<convention>`, `<insight>`, `<note>`, `<observation>`, `<remark>`, and `<warning>` have the same structure in PreTeX.

```
<remark>
  <title>A little remark</title>
  <p>This is a remark.</p>
</remark>
```

Project-Like Elements
The tags `<activity>`, `<exploration>`, `<investigation>`, and `<project>` have the same structure in PreTeX.

```
<project>
  <title>A structured project</title>
  <introduction>
    <p>Here is the introduction.</p>
  </introduction>

  <task>
    <statement>
      <p>The first step to do.</p>
    </statement>
  </task>

  <task>
    <statement>
      <p>The second step to do.</p>
    </statement>
  </task>

  <conclusion>
    <p>A little wrap up.</p>
  </conclusion>
</project>
```

Exercises
An `<exercise>` in the middle of a division, intermixed between theorems and paragraphs and figures. In this case, it is labeled as a “Checkpoint.” You can put several `<exercise>`s as part of an `<exercises>` element within a division, which is the typical way for creating a collection of exercises together at the end of a division such as a chapter or section. An `<exercisegroup>` can group together a collection of exercises that have a set of common instructions. A specialized division, `<reading-questions>`, can be used to house `<exercise>`s designed to test or guide a reader’s comprehension of the material in that division. It is possible to embed WeBWorK exercises into a PreTeX document.

An `<exercise>` has the following structure.

```
<exercise>
  <statement>
    <p>The `<statement>` is mandatory.</p>
  </statement>
  <optional-signal/>

  <hint>
    <p>Optional.</p>
  </hint>

  <answer>
    <p>Optional.</p>
  </answer>

  <solution>
    <p>Optional.</p>
  </solution>
</exercise>
```

An element we generically call a “signal” is an important component of an exercise if you want to add something that will be interactive in HTML and Runestone. Signals include `<choices>` for multiple choice questions, `<blocks>` for Parsons (mixed up blocks) problems, `<match>` for matching, `<areas>` for clickable area, `<response>` for short answer, and `<setup>` for fill-in-the-blank. A True/False question simply uses a `<correct>` attribute on `<statement>` as a signal. The signal element usually has further structure, see pretextbook.org for examples and source.

Worksheets
A `<worksheet>` is a specialized division that can be a child of most divisions and can contain most PreTeX tags.

Tables
Similar to LaTeX PreTeX provides a `<table>` tag and a `<tabular>` tag. The `<tabular>` tag is used for producing the array of data, while the `<table>` tag provides the number and title.

SageMath Content
A SageMath cell can be included in a PreTeX document.

```
<sage>
  <input>
    2+2
  </input>
  <output>
    4
  </output>
</sage>
```

SageMath can be used to created an image in a PreTeX document.

```
<figure xml:id="fig-sage-cubic" width="50%">
  <caption>A cubic plotted by SageMath on [-3,2]</caption>
  <sageplot>
    f(x) = (x-1)*(x+1)*(x-2) plot(f, (x, -3, 2), color='blue', thickness=3)
  </sageplot>
</figure>
```