

DTD - Elements

[< Previous](#)[Next >](#)

In a DTD, elements are declared with an ELEMENT declaration.

Declaring Elements

In a DTD, XML elements are declared with the following syntax:

```
<!ELEMENT element-name category>  
or  
<!ELEMENT element-name (element-content)>
```

Empty Elements

Empty elements are declared with the category keyword EMPTY:

```
<!ELEMENT element-name EMPTY>
```

Example:

```
<!ELEMENT br EMPTY>
```

XML example:

Elements with Parsed Character Data

Elements with only parsed character data are declared with #PCDATA inside parentheses:

```
<!ELEMENT element-name (#PCDATA)>
```

Example:

```
<!ELEMENT from (#PCDATA)>
```

Elements with any Contents

Elements declared with the category keyword ANY, can contain any combination of parsable data:

```
<!ELEMENT element-name ANY>
```

Example:

```
<!ELEMENT note ANY>
```

Elements with Children (sequences)

Elements with one or more children are declared with the name of the children elements inside parentheses:

```
<!ELEMENT element-name (child1,child2,...)>
```

Example:

```
<!ELEMENT note (to,from,heading,body)>
```

When children are declared in a sequence separated by commas, the children must appear in the same sequence in the document. In a full declaration, the children must also be declared, and the children can also have children. The full declaration of the "note" element is:

```
<!ELEMENT note (to,from,heading,body)>
<!ELEMENT to (#PCDATA)>
<!ELEMENT from (#PCDATA)>
<!ELEMENT heading (#PCDATA)>
<!ELEMENT body (#PCDATA)>
```

Declaring Only One Occurrence of an Element

```
<!ELEMENT element-name (child-name)>
```

Example:

```
<!ELEMENT note (message)>
```

The example above declares that the child element "message" must occur once, and only once inside the "note" element.

Declaring Minimum One Occurrence of an Element

Example:

```
<!ELEMENT note (message+)>
```

The + sign in the example above declares that the child element "message" must occur one or more times inside the "note" element.

Declaring Zero or More Occurrences of an Element

```
<!ELEMENT element-name (child-name*)>
```

Example:

```
<!ELEMENT note (message*)>
```

The * sign in the example above declares that the child element "message" can occur zero or more times inside the "note" element.

Declaring Zero or One Occurrences of an Element

```
<!ELEMENT element-name (child-name?)>
```

Example:

```
<!ELEMENT note (message?)>
```

Declaring either/or Content

```
<!ELEMENT note (to,from,header,(message|body))>
```

The example above declares that the "note" element must contain a "to" element, a "from" element, a "header" element, and either a "message" or a "body" element.

Declaring Mixed Content

```
<!ELEMENT note (#PCDATA|to|from|header|message)*>
```

The example above declares that the "note" element can contain zero or more occurrences of parsed character data, "to", "from", "header", or "message" elements.

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