

XSLT

**XSLT is . . .**

**XML**

**XSLT**

**XSL-FO**

**XPath**

**XSLT is . . .**

XML

**XSLT**

XSL-FO

**XPath**

# Аналогия

XML  
+  
XSLT

~

HTML  
+  
CSS

# Аналогия

XML

+

XSLT

XPath

~

HTML

+

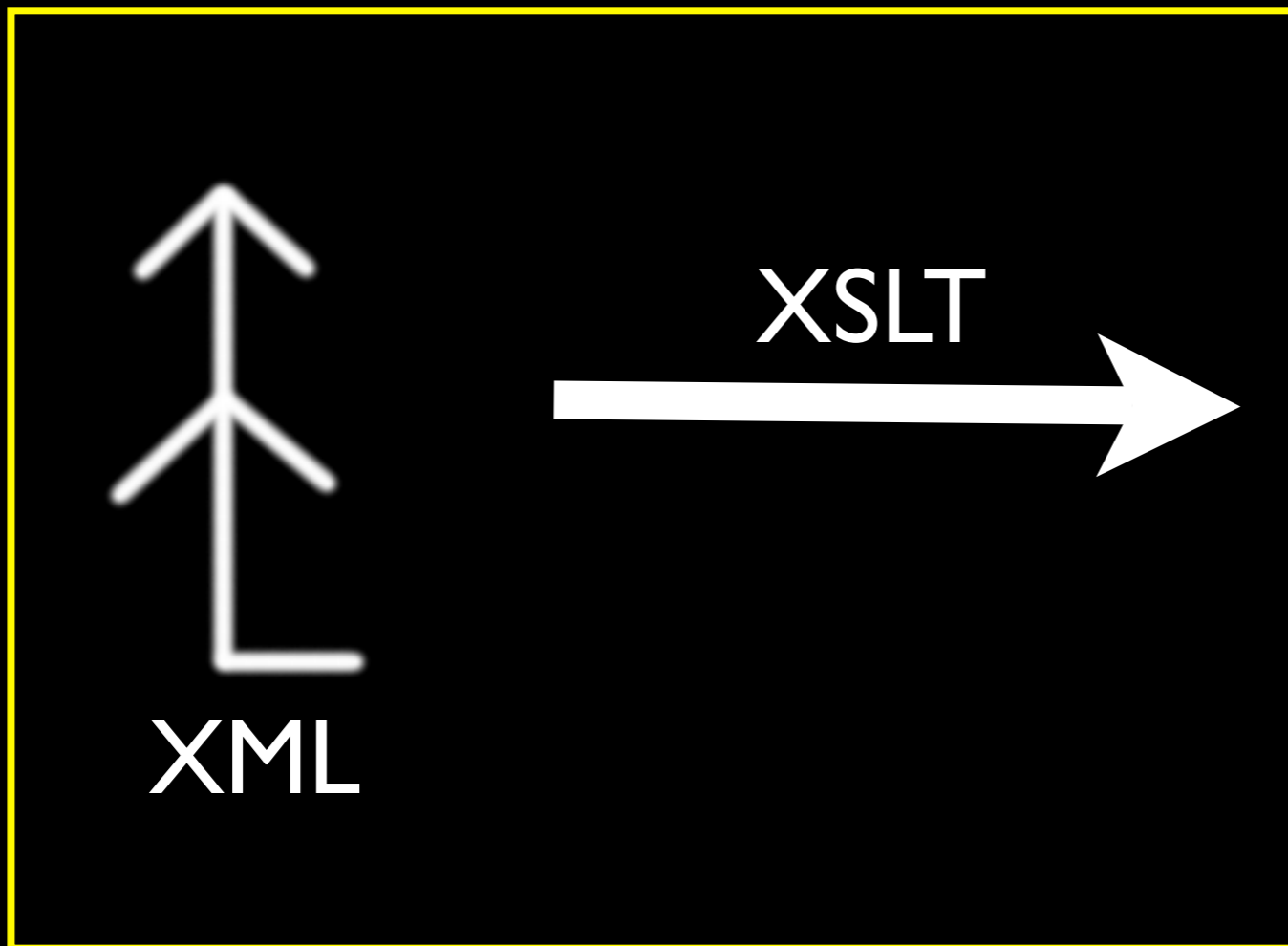
CSS

Selector

# Назначение



# Назначение



Сервер



Браузер

# Назначение



Сервер



Браузер

# Declaration

```
<xsl:stylesheet  
  version="1.0"  
  xmlns:xsl=  
    "http://www.w3.org/  
    XSL/Transform">  
  . . .  
</xsl:stylesheet>
```

# Declaration

```
<?xml version="1.0"?>  
<xsl:stylesheet  
  version="1.0"  
  xmlns:xsl=  
    "http://www.w3.org/  
    XSL/Transform">  
  . . .  
</xsl:stylesheet>
```

# Рабочий пример

```
<?xml version="1.0"?>  
<page>  
  <sections>  
    <item href="politics">Политика</item>  
    <item href="world">В мире</item>  
    <item href="economy">Экономика</item>  
    <item href="society">Общество</item>  
  </sections>  
</page>
```

# Рабочий пример

```
<?xml version="1.0"?>
<page>
  <sections>
    <item href="politics">
      <name>Политика</name>
      <item href="russia">В России</item>
      <item href="foreign">Внешняя...</item>
      <item href="senate">Совет...</item>
    </item>
    <item href="world">В мире</item>
    <item href="economy">Экономика</item>
    <item href="society">Общество</item>
  </sections>
</page>
```

# Рабочий пример

```
<?xml version="1.0"?>
<page>
  <sections>
    <item href="politics">
      <name>Политика</name>
    <item href="russia">
      <name>В России</name>
    </item>
    <item href="foreign">
      <name>Внешняя политика</name>
    </item>
    <item href="senate">
      <name>Совет Федерации</name>
    </item>
  </item>
  . . .
</sections>
</page>
```

# Рабочий пример. Вариант I

```
<?xml version="1.0"?>
<page>
  <sections>
    <item href="politics" name="Политика">
      <item href="russia" name="В России"/>
      <item href="foreign" name="Внешняя..."/>
      <item href="senate" name="Совет..."/>
    </item>
    <item href="world" name="В мире"/>
    <item href="economy" name="Экономика"/>
    <item href="society" name="Общество"/>
  </sections>
</page>
```

# Ожидаемый результат

```
<ul>
  <li>
    <a href="/politics/">Политика</a>
    <ul>
      <li><a href="/politics/russia/">В России</a></li>
      <li><a href="/politics/foreign/">Внешняя...</a></li>
      <li><a href="/politics/senate/">В России</a></li>
    </ul>
  </li>
  <li>
    <a href="/world/">В мире</a>
  </li>
  <li>
    <a href="/society/">Общество</a>
  </li>
</ul>
```

# XSLT

```
<?xml version="1.0" encoding="UTF-8"?>  
<xsl:stylesheet version="1.0"  
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform">  
  
  <xsl:output  
    encoding="UTF-8"  
    indent="yes"/>  
  
</xsl:stylesheet>
```

# XSLT

```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet version="1.0"
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform">

  <xsl:output
    encoding="UTF-8"
    indent="yes"/>

  <xsl:template match="/page">
    <div>
      <xsl:for-each select="sections/item">
        <a href="{@href}">
          <xsl:value-of select="@name"/>
        </a>
      </xsl:for-each>
    </div>
  </xsl:template>

</xsl:stylesheet>
```

# XSLT

```
<xsl:template match="/page">
  <div>
    <xsl:for-each select="sections/item">
      <a href="{@href}">
        <xsl:value-of select="@name"/>
      </a>
    </xsl:for-each>
  </div>
</xsl:template>
```

# XSLT и XPath

XPath

```
<xsl:template match="/page">  
  <div>  
    <xsl:for-each select="sections/item">  
      <a href="{@href}">  
        <xsl:value-of select="@name"/>  
      </a>  
    </xsl:for-each>  
  </div>  
</xsl:template>
```

# XML + XSLT

```
<page>
  <sections>
    <item href="politics" name="Политика">
      <item href="russia" name="В России"/>
      <item href="foreign" name="Внешняя..."/>
      <item href="senate" name="Совет..."/>
    </item>
    <item href="world" name="В мире"/>
    <item href="economy" name="Экономика"/>
    <item href="society" name="Общество"/>
  </sections>
</page>
```

```
<xsl:template match="/page">
  <div>
    <xsl:for-each select="sections/item">
      <a href="{@href}">
        <xsl:value-of select="@name"/>
      </a>
    </xsl:for-each>
  </div>
</xsl:template>
```

# XML + XSLT

```
<page>
  <sections>
    <item href="politics" name="Политика">
      <item href="russia" name="В России"/>
      <item href="foreign" name="Внешняя..."/>
      <item href="senate" name="Совет..."/>
    </item>
    <item href="world" name="В мире"/>
    <item href="economy" name="Экономика"/>
    <item href="society" name="Общество"/>
  </sections>
</page>
```

```
<xsl:template match="/page">
  <div>
    <xsl:for-each select="sections/item">
      <a href="{@href}">
        <xsl:value-of select="@name"/>
      </a>
    </xsl:for-each>
  </div>
</xsl:template>
```

# XML + XSLT

```
<page>
  <sections>
    <item href="politics" name="Политика">
      <item href="russia" name="В России"/>
      <item href="foreign" name="Внешняя..."/>
      <item href="senate" name="Совет..."/>
    </item>
    <item href="world" name="В мире"/>
    <item href="economy" name="Экономика"/>
    <item href="society" name="Общество"/>
  </sections>
</page>
```

```
<xsl:template match="/page">
  <div>
    <xsl:for-each select="sections/item">
      <a href="{@href}">
        <xsl:value-of select="@name"/>
      </a>
    </xsl:for-each>
  </div>
</xsl:template>
```

# XML + XSLT

```
<page>
  <sections>
    <item href="politics" name="Политика">
      <item href="russia" name="В России"/>
      <item href="foreign" name="Внешняя..."/>
      <item href="senate" name="Совет..."/>
    </item>
    <item href="world" name="В мире"/>
    <item href="economy" name="Экономика"/>
    <item href="society" name="Общество"/>
  </sections>
</page>
```

```
<xsl:template match="/page">
  <div>
    <xsl:for-each select="sections/item">
      <a href="{@href}">
        <xsl:value-of select="@name"/>
      </a>
    </xsl:for-each>
  </div>
</xsl:template>
```

# XML + XSLT

```
<page>
  <sections>
    <item href="politics" name="Политика">
      <item href="russia" name="В России"/>
      <item href="foreign" name="Внешняя..."/>
      <item href="senate" name="Совет..."/>
    </item>
    <item href="world" name="В мире"/>
    <item href="economy" name="Экономика"/>
    <item href="society" name="Общество"/>
  </sections>
</page>
```

```
<xsl:template match="/page">
  <div>
    <xsl:for-each select="sections/item">
      <a href="{@href}">
        <xsl:value-of select="@name"/>
      </a>
    </xsl:for-each>
  </div>
</xsl:template>
```

# HTML

```
<?xml version="1.0" encoding="UTF-8"?>  
<div>  
  <a href="politics">Политика</a>  
  <a href="world">В мире</a>  
  <a href="economy">Экономика</a>  
  <a href="society">Общество</a>  
</div>
```

# XML + XSLT

```
<page>
  <sections>
    <item href="politics" name="Политика">
      <item href="russia" name="В России"/>
      <item href="foreign" name="Внешняя..."/>
      <item href="senate" name="Совет..."/>
    </item>
    <item href="world" name="В мире"/>
    <item href="economy" name="Экономика"/>
    <item href="society" name="Общество"/>
  </sections>
</page>
```

```
<xsl:template match="/page">
  <div>
    <xsl:for-each select="sections/item">
      <a href="{@href}">
        <xsl:value-of select="@name"/>
      </a>
      ? <xsl:for-each select="item"> ?
    </xsl:for-each>
  </div>
</xsl:template>
```

# XSLT

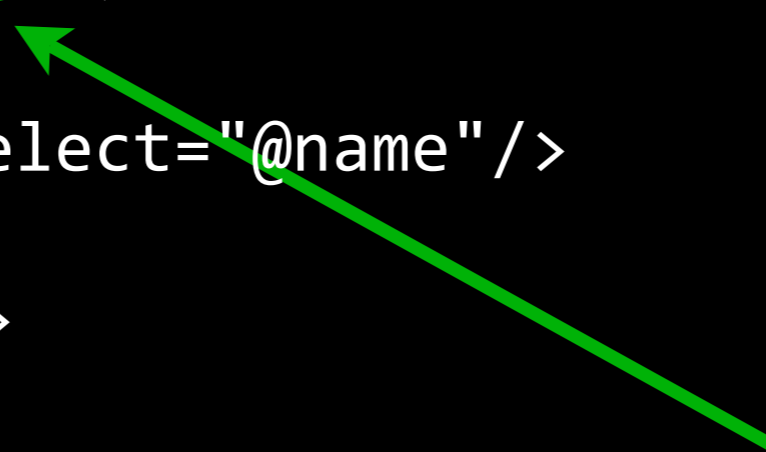
```
<xsl:template match="/page">
  <div>
    <xsl:apply-templates select="sections/item"/>
  </div>
</xsl:template>
```

```
<xsl:template match="item">
  <a href="{@href}">
    <xsl:value-of select="@name"/>
  </a>
  <xsl:if test="item">
    <div>
      <xsl:apply-templates select="item"/>
    </div>
  </xsl:if>
</xsl:template>
```

# XML + XSLT

```
<xsl:template match="/page">
  <div>
    <xsl:apply-templates select="sections/item"/>
  </div>
</xsl:template>
```

```
<xsl:template match="item">
  <a href="{@href}">
    <xsl:value-of select="@name"/>
  </a>
  <xsl:if test="item">
    <div>
      <xsl:apply-templates select="item"/>
    </div>
  </xsl:if>
</xsl:template>
```



# XML + XSLT = HTML

```
<?xml version="1.0" encoding="UTF-8"?>
<div>
  <a href="politics">Политика</a>
  <div>
    <a href="russia">В России</a>
    <a href="foreign">Внешняя политика</a>
    <a href="senate">Совет Федерации</a>
  </div>
  <a href="world">В мире</a>
  <a href="economy">Экономика</a>
  <a href="society">Общество</a>
</div>
```

# XML + XSLT = HTML

```
<?xml version="1.0" encoding="UTF-8"?>
<div>
  <a href="/politics/">Политика</a>
  <div>
    <a href="/politics/russia/">В России</a>
    <a href="/politics/foreign/">Внешняя политика</a>
    <a href="/politics/senate/">Совет Федерации</a>
  </div>
  <a href="/world/">В мире</a>
  <a href="/economy/">Экономика</a>
  <a href="/society/">Общество</a>
</div>
```

# XSLT

```
<xsl:template match="item">
  <a href="/{@href}/">
    <xsl:value-of select="@name"/>
  </a>
  . . .
</xsl:template>
```

# XSLT

```
<xsl:template match="item">
  <a href="{@href}"/>
    <xsl:if test="parent::item">
      <xsl:attribute name="href">
        <xsl:text>/</xsl:text>
        <xsl:value-of select="../item/@href"/>
        <xsl:text>/</xsl:text>
        <xsl:value-of select="@href"/>
        <xsl:text>/</xsl:text>
      </xsl:attribute>
    </xsl:if>
    <xsl:value-of select="@name"/>
  </a>
  . . .
</xsl:template>
```

# Рабочий пример. Вариант 2

```
<?xml version="1.0"?>
<page>
  <sections>
    <item href="politics" name="Политика"/>
    <item href="world" name="В мире"/>
    <item href="economy" name="Экономика"/>
    <item href="society" name="Общество"/>
    <item href="russia" name="В России"
      parent="politics"/>
    <item href="foreign" name="Внешняя..."
      parent="politics"/>
    <item href="senate" name="Совет..."
      parent="politics"/>
  </sections>
</page>
```

# Рабочий пример. Вариант 2

```
<?xml version="1.0"?>
<page>
  <sections>
    <item href="politics" name="Политика"/>
    <item href="world" name="В мире"/>
    <item href="economy" name="Экономика"/>
    <item href="society" name="Общество"/>
    <item href="russia" name="В России"
      parent="politics"/>
    <item href="foreign" name="Внешняя..."
      parent="politics"/>
    <item href="senate" name="Совет..."
      parent="politics"/>
  </sections>
</page>
```

# XSLT

```
<xsl:template match="/page">  
  <div>  
    <xsl:apply-templates  
      select="sections/item[not (@parent)]"/>  
  </div>  
</xsl:template>
```

# XSLT

```
<xsl:template match="item">
  <a href="{@href}/">
    <xsl:if test="@parent">
      <xsl:attribute name="href">
        <xsl:text>/</xsl:text>
        <xsl:value-of select="@parent"/>
        <xsl:text>/</xsl:text>
        <xsl:value-of select="@href"/>
        <xsl:text>/</xsl:text>
      </xsl:attribute>
    </xsl:if>
    <xsl:value-of select="@name"/>
  </a>
  <xsl:if test="../item[@parent = current()/@href]">
    <div>
      <xsl:apply-templates
        select="../item[@parent = current()/@href]"/>
    </div>
  </xsl:if>
</xsl:template>
```

# XSLT

```
<xsl:template match="item">
  <a href="{@parent}/{@href}/">
    <xsl:value-of select="@name"/>
  </a>
  <xsl:if test="../item[@parent = current()/@href]">
    <div>
      <xsl:apply-templates
        select="../item[@parent = current()/@href]"/>
    </div>
  </xsl:if>
</xsl:template>
```

# Примеры XPath-выражений

a	a[last()]
*	a[position() = 2]
a[1]	a[position() = last()]
a[b]	
a[@c]	a[@title = "xxx"]
/a	a[count (b) = 3]
//a	
a/b	a[@title = @title2 and count (b) != 0]
a//b	a[@title = @title2][count (b) != 0]
.	
..	a/*[name() = "unknown"]
./a	a/*/b[@name or @surname]
@c	
./@c	../..../a[d]//b[not (@title)]/text()
@*	
*   text()	tr[position() mod 2 = 1]

# Оси XPath (axis)

self::b

parent::b

child::b

descendant::b

ancestor::b

descendant-or-self::b

ancestor-or-self::b

following-sibling::b

preceding-sibling::b

attribute::c

namespace::ns

# Оси XPath (axis)

<code>self::b</code>	<code>.</code>
<code>parent::b</code>	<code>../b</code>
<code>child::b</code>	<code>b</code>
<code>descendant::b</code>	<code>./b</code>
<code>ancestor::b</code>	
<code>descendant-or-self::b</code>	<code>./b   .</code>
<code>ancestor-or-self::b</code>	
<code>following-sibling::b</code>	<code>../*[position() &lt;</code>
<code>preceding-sibling::b</code>	<code>current()/position()]</code>
<code>attribute::c</code>	<code>@c</code>
<code>namespace::ns</code>	

# Арифметические операции в XPath

```
<xsl:value-of select="3"/>
```

```
<xsl:value-of select="1 + 2"/>
```

```
<xsl:value-of select="@price + @tax"/>
```

```
<xsl:value-of select="@salary * 0.87"/>
```

```
<xsl:value-of select="@visitors div 365"/>
```

```
<xsl:value-of select="@days mod 7"/>
```

# Строковые функции в XPath

```
string (123)
```

```
concat ("alpha", "beta")
```

```
concat (node/@attr, ", ", @value)
```

```
starts-with (name(), "item")
```

**ends-width**

```
contains (text(), "Tiananmen")
```

```
substring ("20070102", 5, 2)
```

```
substring-before ("2007-01-02", "-");
```

```
substring-after ("Aug 2007", " ");
```

```
string-length (text())
```



# Элементы XSLT

```
<xsl:import href="another.xslt"/>
```

```
<xsl:include href="more.xslt"/>
```

```
<xsl:output
```

```
  method="html" | "xml" | "text"
```

```
  encoding="KOI8-R"
```

```
  indent="yes" | "no"
```

```
/>
```

# Элементы XSLT

```
<xsl:import href="another.xslt"/>
```

```
<xsl:include href="more.xslt"/>
```

```
<xsl:output
```

```
  method="html" | "xml" | "text"
```

```
  encoding="KOI8-R"
```

```
  indent="yes" | "no"
```

```
/>
```

```
<xsl:template match="para">
```

```
</xsl:template>
```

```
<xsl:template name="template-name">
```

```
</xsl:template>
```

# Последовательность обхода XSLT

```
<xsl:template match="/">
```

```
</xsl:template>
```

```
<xsl:template match="/page">
```

```
</xsl:template>
```

```
<xsl:template match="/page/sections">
```

```
</xsl:template>
```

```
<xsl:template name="sections/item">
```

```
</xsl:template>
```

```
<xsl:template name="item">
```

```
</xsl:template>
```

```
<xsl:template match="item[item]"/>
```

# Обработка узлов (создание дерева)

```
<xsl:template match="/">
  <html>
    <head>
      <xsl:apply-templates select="css"/>
      <xsl:apply-templates select="js"/>
    </head>
    <body>
      <xsl:apply-templates select="content"/>
    </body>
  </html>
</xsl:template>
```

# Обработка узлов

```
<xsl:template match="/">
  <html>
    <head>
      <xsl:apply-templates select="css"/>
      <xsl:apply-templates select="js"/>
    </head>
    <body>
      <xsl:apply-templates select="content"/>
    </body>
  </html>
</xsl:template>
```

```
<xsl:template match="page">
  <xsl:apply-templates select="."/>
</xsl:template>
```

# Обработка узлов

```
<css>
```

```
  <item>default.css</item>
```

```
  <item>weather.css</item>
```

```
</css>
```

```
<xsl:apply-templates select="css"/>
```

```
<xsl:template match="css">
```

```
  <xsl:for-each select="item">
```

```
    <link
```

```
      rel="stylesheet"
```

```
      type="text/css"
```

```
      href="text()"
```

```
    />
```

```
  </xsl:for-each>
```

```
</xsl:template>
```

# Обработка узлов

```
<js>
```

```
  <item>default.js</item>
```

```
  <item>gwt.js</item>
```

```
</js>
```

```
<xsl:apply-templates select="js"/>
```

```
<xsl:template match="js">
```

```
  <xsl:apply-templates select="item"/>
```

```
</xsl:template>
```

```
<xsl:template match="js/item">
```

```
  <script type="text/javascript" src="text()">
```

```
  </script>
```

```
</xsl:template>
```

# mode

```
<xsl:template match="css" mode="header">
  <xsl:for-each select="item">
    <link rel="stylesheet" type="text/css"
      href="{text()}" />
  </xsl:for-each>
</xsl:template>
```

```
<xsl:template match="css" mode="debug">
  <ul>
    <xsl:for-each select="item">
      <li>
        <xsl:value-of select="text()"/>
      </li>
    </xsl:for-each>
  </ul>
</xsl:template>
```

# mode

```
<xsl:template match="/">
  <html>
    <head>
      <xsl:apply-templates
        select="css"
        mode="header"
      />
    </head>
    <body>
      <xsl:apply-templates
        select="css"
        mode="debug"
      />
    </body>
  </html>
</xsl:template>
```

# Шаблон с именем

```
<xsl:template name="copyright">
  <div id="Copyright">
    <xsl:text>© </xsl:text>
    <xsl:value-of select="/page/manifest/date/@year"/>
  </div>
</xsl:template>
```

```
<xsl:template match="/">
  . . .
  <body>
    <xsl:apply-templates select="content"/>
    <xsl:call-template name="copyright"/>
  </body>
  . . .
</xsl:template>
```

# Создание элементов

```
<xsl:element name="body">  
  <xsl:copy-of  
    select="/page/content/* | /page/content/text()" />  
</xsl:element>
```

# Создание элементов и атрибутов

```
<xsl:element name="body">  
  <xsl:attribute name="style">  
    <xsl:text>background: white</xsl:text>  
  </xsl:attribute>  
  <xsl:copy-of  
    select="/page/content/* | /page/content/text()"/>  
</xsl:element>
```

# Создание элементов и атрибутов

```
<xsl:element name="body">  
  <xsl:attribute name="style">  
    <xsl:text>background: white</xsl:text>  
  </xsl:attribute>  
  <xsl:copy-of  
    select="/page/content/* | /page/content/text()"/>  
</xsl:element>
```



```
<body style="background: white">  
  <xsl:apply-templates select="/page/content"/>  
</body>
```

# Комментарии

```
<!-- xml comment -->
```

```
<xsl:text disable-output-escaping="yes">  
    &lt;!-- strange comment --&gt;  
</xsl:text>
```

```
<xsl:comment>  
    xslt comment  
</xsl:comment>
```

# Нумерация

```
<xsl:number  
  level="single" | "multiple" | "any"  
  from="sections"  
  count="item"  
  format="A" | "=1:2="  
>
```

# Нумерация

```
<xsl:template match="item">
  <xsl:number format="multiple"/>
  <a href="{@href}">
    <xsl:value-of select="{text()}" />
  </a>
  . . .
</xsl:template>

<div>
  1<a href="/politics/">Политика</a>
  <div>
    1.1<a href="/russia/">В России</a>
    1.2<a href="/foreign/">Внешняя политика</a>
    1.3<a href="/senate/">Совет Федерации</a>
  </div>
  . . .
```

# УСЛОВИЯ

```
<xsl:if test="@colour = 'white'">  
  <xsl:apply-templates/>  
</xsl:if>
```

# УСЛОВИЯ

```
<xsl:if test="@colour = 'white'">  
  <xsl:apply-templates/>  
</xsl:if>
```

```
<xsl:choose>  
  <xsl:when test="@size < 10">  
    . . .  
  </xsl:when>  
  <xsl:when test="@size = 10">  
    . . .  
  </xsl:when>  
  <xsl:otherwise>  
    . . .  
  </xsl:otherwise>  
</xsl:choose>
```

# УСЛОВИЯ

```
<xsl:if test="@colour = 'white'">  
  <xsl:apply-templates/>  
</xsl:if>
```

```
<xsl:choose>  
  <xsl:when test="@size < 10">  
    . . .  
  </xsl:when>  
  <xsl:when test="@size = 10">  
    . . .  
  </xsl:when>  
  <xsl:otherwise>  
    . . .  
  </xsl:otherwise>  
</xsl:choose>
```

# Сортировка

```
<xsl:sort
  select="@href"
  order="ascending" | "descending"
  case-order="upper-first" | "lower-first"
/>
```

```
<xsl:for-each select="item">
  <xsl:sort select="text()"/>
  <a href="{@href}">
    <xsl:value-of select="text()"/>
  </a>
</xsl:for-each>
```

# Переменные

```
<xsl:variable name="year" select="2007"/>
```

```
<xsl:value-of select="$year"/>
```

# Переменные

```
<xsl:variable name="year" select="2007"/>
```

```
<xsl:value-of select="$year"/>
```

```
<xsl:variable name="copyright">
```

```
  <p>
```

```
    <xsl:value-of select="$year"/>
```

```
  </p>
```

```
  <ul>
```

```
    <xsl:for-each select="authors/item">
```

```
      <li>
```

```
        <xsl:value-of select="@name"/>
```

```
      </li>
```

```
    </xsl:for-each>
```

```
  </ul>
```

```
</xsl:variable>
```

# Переменные

```
<xsl:template match="item">  
  <xsl:param name="class"/>  
  <div class="$class">  
    ...  
  </div>  
</xsl:template>
```

```
<xsl:apply-templates select="item">  
  <xsl:with-param name="class" select="'front'"/>  
</xsl:apply-templates>
```

# Переменные

```
<xsl:template match="item">  
  <xsl:param name="class"/>  
  <div class="$class">  
    ...  
  </div>  
</xsl:template>
```

```
<xsl:apply-templates select="item">  
  <xsl:with-param name="class">front</xsl:with-param>  
</xsl:apply-templates>
```

# Переменные

```
<xsl:variable  
  name="list"  
  select="document ('site-structure.xml')"  
>
```

```
<xsl:template name="site-menu">  
  <xsl:for-each select="$list/sections/item">  
    <a href="{@href}">  
      <xsl:value-of select="text()"/>  
    </a>  
  </xsl:for-each>  
</xsl:template>
```

# Переменные

```
<xsl:variable  
  name="list"  
  select="document ('http://example.com/structure.xml')"  
>
```

```
<xsl:template name="site-menu">  
  <xsl:for-each select="$list/sections/item">  
    <a href="{@href}">  
      <xsl:value-of select="text()"/>  
    </a>  
  </xsl:for-each>  
</xsl:template>
```

# Ключи

```
<xsl:key
  name="children"
  match="/page/sections/item"
  use="@parent"/>

<xsl:template match="/page/sections">
  <xsl:for-each select="item[not (@parent)]">
    <a href="{@href}">
      <xsl:value-of select="@name"/>
    </a>
    <xsl:for-each select="key ('children', @href)">
      <xsl:value-of select="@name"/>
      <xsl:if test="position() != last()">, </xsl:if>
    </xsl:for-each>
  </xsl:for-each>
</xsl:template>
```

# Часть 2