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Modelos y bases de datos

MBDA LAB

Laboratorio #6 XML y SQL

16/05/2025

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MODELOS Y BASES DE DATOS
XML y SQL
2025-01
Laboratorio 6/6 [:)]

OBJETIVOS
Evaluar el logro de las competencias adquiridas para:
Definir un archivo XML que cumplan con especificaciones.
1. Validar que un archivo XML está bien formado.
2. Visualizar la estructura de un archivo XML en forma de árbol.
3. Proponer e implementar consultas en XPath
4. Definir el esquema emergente de datos XML usando el estándar DTD
5. Verificar que los datos de un archivo XML cumplen lo definido en un esquema.
6. Integrar información en XML a una base de datos relacional

ENTREGA
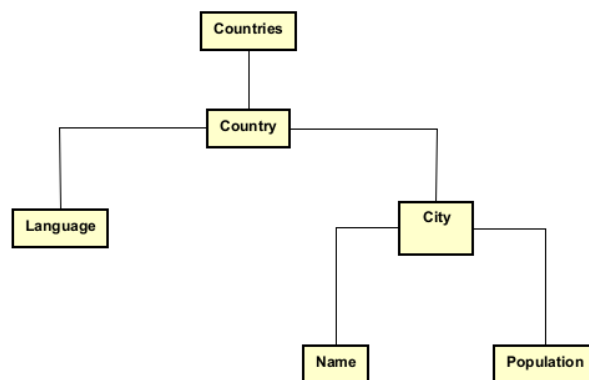Publiquen los resultados en un archivo .zip , el nombre de este archivo debe ser la concatenación en orden alfabético de los primeros apellidos de cada uno de los miembros.

PUNTO UNO. Sólo XML. CATALOGO DE PAISES (countries.xml)
El caso es uno de los propuestos en el curso de bases de datos de **Stanford**.

A. Explorando
1. Explore el archivo usando un navegador y un editor.
   ¿Cuáles son las ventajas de uno u otro?

   - El navegador web muestra el XML con sangrías y una estructura más clara, lo que facilita la lectura.
   - Permiten colapsar y expandir nodos en el XML, lo que facilita la navegación por archivos.
   - No requiere instalación de software adicional si ya tienes un navegador web.
   - Con editor se puede modificar directamente el contenido del XML.
   - Los editores de texto tienen herramientas avanzadas de búsqueda y reemplazo que facilitan la localización y modificación de información específica.

2. Describa la información del archivo mediante un diagrama conceptual (sin atributos).

B. Consultas iniciales

Implemente las siguientes consultas:

Para evaluar use la herramienta que aparece en Moodle

1. **¿De cuáles países se tiene información?**
   [a. Nombre con etiqueta]
   //country/name

   No Match!

   [b. Nombre sin etiqueta]
   //country/name/text()

   No Match!

   [c. Nombre con atributo]
   //country/@name

Attribute='name=Afghanistan'
Attribute='name=Albania'
Attribute='name=Algeria'
Attribute='name=American Samoa'
Attribute='name=Andorra'
Attribute='name=Angola'
Attribute='name=Anguilla'
Attribute='name=Antigua and Barbuda'
Attribute='name=Argentina'
Attribute='name=Armenia'
Attribute='name=Aruba'
Attribute='name=Australia'
Attribute='name=Austria'
Attribute='name=Azerbaijan'
Attribute='name=Bahamas'
Attribute='name=Bahrain'
Attribute='name=Bangladesh'
Attribute='name=Barbados'
Attribute='name=Belarus'
Attribute='name=Belgium'
Attribute='name=Belize'
Attribute='name=Benin'
Attribute='name=Bermuda'
Attribute='name=Bhutan'
Attribute='name=Bolivia'
Attribute='name=Bosnia and Herzegovina'
Attribute='name=Botswana'
Attribute='name=Brazil'
Attribute='name=British Virgin Islands'
Attribute='name=Brunei'
Attribute='name=Bulgaria'
Attribute='name=Burkina Faso'
Attribute='name=Burma'
Attribute='name=Burundi'
Attribute='name=Cambodia'
Attribute='name=Cameroon'
Attribute='name=Canada'
Attribute='name=Cape Verde'
Attribute='name=Cayman Islands'
Attribute='name=Central African Republic'
Attribute='name=Chad'
Attribute='name=Chile'
Attribute='name=China'
Attribute='name=Christmas Island'
Attribute='name=Cocos Islands'
Attribute='name=Colombia'
Attribute='name=Comoros'
Attribute='name=Congo'
Attribute='name=Cook Islands'

Attribute='name=Costa Rica'
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Attribute='name=Croatia'
Attribute='name=Cuba'
Attribute='name=Cyprus'
Attribute='name=Czech Republic'
Attribute='name=Denmark'
Attribute='name=Djibouti'
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Attribute='name=Ethiopia'
Attribute='name=Falkland Islands'
Attribute='name=Faroe Islands'
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Attribute='name=Finland'
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Attribute='name=Guatemala'
Attribute='name=Guernsey'
Attribute='name=Guinea'
Attribute='name=Guinea-Bissau'
Attribute='name=Guyana'
Attribute='name=Haiti'
Attribute='name=Holy See'
Attribute='name=Honduras'
Attribute='name=Hungary'
Attribute='name=Iceland'
Attribute='name=India'
Attribute='name=Indonesia'
Attribute='name=Iran'
Attribute='name=Iraq'
Attribute='name=Ireland'

Attribute='name=Israel'
Attribute='name=Italy'
Attribute='name=Jamaica'
Attribute='name=Japan'
Attribute='name=Jersey'
Attribute='name=Jordan'
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Attribute='name=Laos'
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Attribute='name=Lebanon'
Attribute='name=Lesotho'
Attribute='name=Liberia'
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Attribute='name=Montserrat'
Attribute='name=Morocco'
Attribute='name=Mozambique'
Attribute='name=Namibia'
Attribute='name=Nauru'
Attribute='name=Nepal'
Attribute='name=Netherlands'
Attribute='name=Netherlands Antilles'
Attribute='name=New Caledonia'
Attribute='name=New Zealand'
Attribute='name=Nicaragua'
Attribute='name=Niger'
Attribute='name=Nigeria'

Attribute='name=Niue'
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Attribute='name=North Korea'
Attribute='name=Northern Mariana Islands'
Attribute='name=Norway'
Attribute='name=Oman'
Attribute='name=Pakistan'
Attribute='name=Palau'
Attribute='name=Panama'
Attribute='name=Papua New Guinea'
Attribute='name=Paraguay'
Attribute='name=Peru'
Attribute='name=Philippines'
Attribute='name=Pitcairn Islands'
Attribute='name=Poland'
Attribute='name=Portugal'
Attribute='name=Puerto Rico'
Attribute='name=Qatar'
Attribute='name=Reunion'
Attribute='name=Romania'
Attribute='name=Russia'
Attribute='name=Rwanda'
Attribute='name=Saint Helena'
Attribute='name=Saint Kitts and Nevis'
Attribute='name=Saint Lucia'
Attribute='name=Saint Pierre and Miquelon'
Attribute='name=Saint Vincent and the Grenadines'

Attribute='name=San Marino'
Attribute='name=Sao Tome and Principe'
Attribute='name=Saudi Arabia'
Attribute='name=Senegal'
Attribute='name=Serbia and Montenegro'
Attribute='name=Seychelles'
Attribute='name=Sierra Leone'
Attribute='name=Singapore'
Attribute='name=Slovakia'
Attribute='name=Slovenia'
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Attribute='name=Sudan'
Attribute='name=Suriname'
Attribute='name=Svalbard'
Attribute='name=Swaziland'
Attribute='name=Sweden'
Attribute='name=Switzerland'
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Attribute='name=Taiwan'
Attribute='name=Tajikistan'
Attribute='name=Tanzania'
Attribute='name=Thailand'
Attribute='name=Togo'
Attribute='name=Tonga'
Attribute='name=Trinidad and Tobago'

Attribute='name=Tunisia'
Attribute='name=Turkey'
Attribute='name=Turkmenistan'
Attribute='name=Turks and Caicos Islands'
Attribute='name=Tuvalu'

Attribute='name=Uganda'
Attribute='name=Ukraine'
Attribute='name=United Arab Emirates'
Attribute='name=United Kingdom'
Attribute='name=United States'
Attribute='name=Uruguay'
Attribute='name=Uzbekistan'
Attribute='name=Vanuatu'
Attribute='name=Venezuela'
Attribute='name=Vietnam'
Attribute='name=Virgin Islands'
Attribute='name=Wallis and Futuna'
Attribute='name=Western Sahara'
Attribute='name=Western Samoa'
Attribute='name=Yemen'
Attribute='name=Zaire'
Attribute='name=Zambia'
Attribute='name=Zimbabwe'

[d. Nombre sin atributo]
//country/@name/data()

UntypedAtomic='Afghanistan'
UntypedAtomic='Albania'
UntypedAtomic='Algeria'
UntypedAtomic='American Samoa'
UntypedAtomic='Andorra'
UntypedAtomic='Angola'
UntypedAtomic='Anguilla'
UntypedAtomic='Antigua and Barbuda'
UntypedAtomic='Argentina'
UntypedAtomic='Armenia'
UntypedAtomic='Aruba'
UntypedAtomic='Australia'
UntypedAtomic='Austria'
UntypedAtomic='Azerbaijan'
UntypedAtomic='Bahamas'
UntypedAtomic='Bahrain'
UntypedAtomic='Bangladesh'
UntypedAtomic='Barbados'
UntypedAtomic='Belarus'
UntypedAtomic='Belgium'
UntypedAtomic='Belize'
UntypedAtomic='Benin'
UntypedAtomic='Bermuda'
UntypedAtomic='Bhutan'
UntypedAtomic='Bolivia'
UntypedAtomic='Bosnia and Herzegovina'
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UntypedAtomic='British Virgin Islands'
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UntypedAtomic='Bulgaria'
UntypedAtomic='Burkina Faso'
UntypedAtomic='Burma'
UntypedAtomic='Burundi'
UntypedAtomic='Cambodia'
UntypedAtomic='Cameroon'
UntypedAtomic='Canada'
UntypedAtomic='Cape Verde'
UntypedAtomic='Cayman Islands'
UntypedAtomic='Central African Republic'
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UntypedAtomic='Eritrea'
UntypedAtomic='Estonia'
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UntypedAtomic='Falkland Islands'
UntypedAtomic='Faroe Islands'
UntypedAtomic='Fiji'
UntypedAtomic='Finland'
UntypedAtomic='France'
UntypedAtomic='French Guiana'
UntypedAtomic='French Polynesia'
UntypedAtomic='Gabon'
UntypedAtomic='Gambia'
UntypedAtomic='Georgia'
UntypedAtomic='Germany'

UntypedAtomic='Ghana'
UntypedAtomic='Gibraltar'
UntypedAtomic='Greece'
UntypedAtomic='Greenland'
UntypedAtomic='Grenada'
UntypedAtomic='Guadeloupe'
UntypedAtomic='Guam'
UntypedAtomic='Guatemala'
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UntypedAtomic='Guyana'
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UntypedAtomic='Holy See'
UntypedAtomic='Honduras'
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UntypedAtomic='Iceland'
UntypedAtomic='India'
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UntypedAtomic='Iran'
UntypedAtomic='Iraq'
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UntypedAtomic='Italy'
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UntypedAtomic='Jersey'
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UntypedAtomic='Kenya'
UntypedAtomic='Kiribati'
UntypedAtomic='Kuwait'
UntypedAtomic='Kyrgyzstan'
UntypedAtomic='Laos'
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UntypedAtomic='Lebanon'
UntypedAtomic='Lesotho'
UntypedAtomic='Liberia'
UntypedAtomic='Libya'
UntypedAtomic='Liechtenstein'
UntypedAtomic='Lithuania'
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UntypedAtomic='Macau'
UntypedAtomic='Macedonia'
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UntypedAtomic='Malta'
UntypedAtomic='Man'
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UntypedAtomic='Mauritania'
UntypedAtomic='Mauritius'
UntypedAtomic='Mayotte'
UntypedAtomic='Mexico'
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UntypedAtomic='Monaco'
UntypedAtomic='Mongolia'
UntypedAtomic='Montserrat'
UntypedAtomic='Morocco'
UntypedAtomic='Mozambique'
UntypedAtomic='Namibia'
UntypedAtomic='Nauru'
UntypedAtomic='Nepal'
UntypedAtomic='Netherlands'
UntypedAtomic='Netherlands Antilles'
UntypedAtomic='New Caledonia'
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UntypedAtomic='Nigeria'
UntypedAtomic='Niue'
UntypedAtomic='Norfolk Island'
UntypedAtomic='North Korea'
UntypedAtomic='Northern Mariana Islands'
UntypedAtomic='Norway'
UntypedAtomic='Oman'
UntypedAtomic='Pakistan'

UntypedAtomic='Palau'
UntypedAtomic='Panama'
UntypedAtomic='Papua New Guinea'
UntypedAtomic='Paraguay'
UntypedAtomic='Peru'
UntypedAtomic='Philippines'
UntypedAtomic='Pitcairn Islands'
UntypedAtomic='Poland'
UntypedAtomic='Portugal'
UntypedAtomic='Puerto Rico'
UntypedAtomic='Qatar'
UntypedAtomic='Reunion'
UntypedAtomic='Romania'
UntypedAtomic='Russia'
UntypedAtomic='Rwanda'
UntypedAtomic='Saint Helena'
UntypedAtomic='Saint Kitts and Nevis'
UntypedAtomic='Saint Lucia'
UntypedAtomic='Saint Pierre and Miquelon'
UntypedAtomic='Saint Vincent and the Grenadines'
UntypedAtomic='San Marino'
UntypedAtomic='Sao Tome and Principe'
UntypedAtomic='Saudi Arabia'
UntypedAtomic='Senegal'
UntypedAtomic='Serbia and Montenegro'
UntypedAtomic='Seychelles'
UntypedAtomic='Sierra Leone'
UntypedAtomic='Singapore'
UntypedAtomic='Slovakia'
UntypedAtomic='Slovenia'
UntypedAtomic='Solomon Islands'
UntypedAtomic='Somalia'
UntypedAtomic='South Africa'
UntypedAtomic='South Korea'
UntypedAtomic='Spain'
UntypedAtomic='Sri Lanka'
UntypedAtomic='Sudan'
UntypedAtomic='Suriname'
UntypedAtomic='Svalbard'
UntypedAtomic='Swaziland'
UntypedAtomic='Sweden'
UntypedAtomic='Switzerland'
UntypedAtomic='Syria'
UntypedAtomic='Taiwan'
UntypedAtomic='Tajikistan'
UntypedAtomic='Tanzania'
UntypedAtomic='Thailand'
UntypedAtomic='Togo'
UntypedAtomic='Tonga'
UntypedAtomic='Trinidad and Tobago'
UntypedAtomic='Tunisia'
UntypedAtomic='Turkey'
UntypedAtomic='Turkmenistan'
UntypedAtomic='Turks and Caicos Islands'
UntypedAtomic='Tuvalu'
UntypedAtomic='Uganda'
UntypedAtomic='Ukraine'
UntypedAtomic='United Arab Emirates'
UntypedAtomic='United Kingdom'
UntypedAtomic='United States'
UntypedAtomic='Uruguay'
UntypedAtomic='Uzbekistan'
UntypedAtomic='Vanuatu'
UntypedAtomic='Venezuela'
UntypedAtomic='Vietnam'
UntypedAtomic='Virgin Islands'
UntypedAtomic='Wallis and Futuna'
UntypedAtomic='Western Sahara'
UntypedAtomic='Western Samoa'
UntypedAtomic='Yemen'
UntypedAtomic='Zaire'
UntypedAtomic='Zambia'
UntypedAtomic='Zimbabwe'

[e. Número de países]
count(//country)

Int64='231'

2. **¿Cuáles países tienen toda la información? [Nombre]**
//country[city and language]/@name

Attribute='name=Armenia'
Attribute='name=Australia'
Attribute='name=Austria'
Attribute='name=Azerbaijan'
Attribute='name=Bulgaria'
Attribute='name=Burma'
Attribute='name=Chile'
Attribute='name=Colombia'
Attribute='name=Cuba'
Attribute='name=Dominican Republic'
Attribute='name=France'
Attribute='name=Georgia'
Attribute='name=Germany'
Attribute='name=Hungary'
Attribute='name=India'
Attribute='name=Iran'
Attribute='name=Japan'
Attribute='name=Kazakhstan'
Attribute='name=Netherlands'
Attribute='name=Nicaragua'
Attribute='name=North Korea'
Attribute='name=Pakistan'
Attribute='name=Poland'
Attribute='name=Russia'
Attribute='name=Saudi Arabia'
Attribute='name=Serbia and Montenegro'
Attribute='name=Spain'
Attribute='name=Uzbekistan'

3. ¿De qué países se conocen sus ciudades?[Nombre]
//country[city]/@name

Attribute='name=Algeria'
Attribute='name=Argentina'
Attribute='name=Armenia'
Attribute='name=Australia'
Attribute='name=Austria'
Attribute='name=Azerbaijan'
Attribute='name=Bangladesh'
Attribute='name=Belarus'
Attribute='name=Brazil'
Attribute='name=Bulgaria'
Attribute='name=Burma'
Attribute='name=Canada'
Attribute='name=Chile'
Attribute='name=China'
Attribute='name=Colombia'
Attribute='name=Cuba'
Attribute='name=Czech Republic'
Attribute='name=Denmark'
Attribute='name=Dominican Republic'
Attribute='name=Ecuador'
Attribute='name=Egypt'
Attribute='name=Ethiopia'
Attribute='name=France'
Attribute='name=Georgia'
Attribute='name=Germany'
Attribute='name=Hungary'
Attribute='name=India'
Attribute='name=Indonesia'
Attribute='name=Iran'
Attribute='name=Iraq'
Attribute='name=Italy'
Attribute='name=Japan'
Attribute='name=Kazakstan'
Attribute='name=Kenya'

Attribute='name=Madagascar'
Attribute='name=Malaysia'
Attribute='name=Mexico'
Attribute='name=Morocco'
Attribute='name=Netherlands'
Attribute='name=Nicaragua'
Attribute='name=Nigeria'
Attribute='name=North Korea'
Attribute='name=Pakistan'
Attribute='name=Peru'
Attribute='name=Philippines'
Attribute='name=Poland'
Attribute='name=Romania'
Attribute='name=Russia'
Attribute='name=Saudi Arabia'
Attribute='name=Senegal'
Attribute='name=Serbia and Montenegro'
Attribute='name=Singapore'
Attribute='name=South Korea'
Attribute='name=Spain'
Attribute='name=Sudan'
Attribute='name=Syria'
Attribute='name=Taiwan'
Attribute='name=Tanzania'
Attribute='name=Thailand'
Attribute='name=Turkey'
Attribute='name=Ukraine'
Attribute='name=United Kingdom'
Attribute='name=United States'
Attribute='name=Uruguay'
Attribute='name=Uzbekistan'
Attribute='name=Venezuela'
Attribute='name=Vietnam'
Attribute='name=Zaire'

4. ¿De qué países sólo se conocen sus datos básicos (nombre, área y población)? [Nombre, área y población]
//country[not (city or language)]/@name

Attribute='area=28750'
Attribute='name=Albania'
Attribute='population=3249136'
Attribute='area=199'
Attribute='name=American Samoa'
Attribute='population=59566'
Attribute='area=450'
Attribute='name=Andorra'
Attribute='population=72766'
Attribute='area=1246700'
Attribute='name=Angola'
Attribute='population=10342899'
Attribute='area=193'
Attribute='name=Aruba'
Attribute='population=67794'
Attribute='area=13940'
Attribute='name=Bahamas'
Attribute='population=259367'
Attribute='area=620'
Attribute='name=Bahrain'
Attribute='population=590042'
Attribute='area=22960'
Attribute='name=Belize'
Attribute='population=219296'
Attribute='area=112620'
Attribute='name=Benin'
Attribute='population=5709529'
Attribute='area=47000'
Attribute='name=Bhutan'
Attribute='population=1822625'
Attribute='area=1098580'
Attribute='name=Bolivia'
Attribute='population=7165257'
Attribute='area=600370'
Attribute='name=Botswana'
Attribute='population=1477630'
Attribute='area=5770'
Attribute='name=Brunei'
Attribute='population=299939'
Attribute='area=274200'
Attribute='name=Burkina Faso'
Attribute='population=10623323'
Attribute='area=27830'
Attribute='name=Burundi'
Attribute='population=5943057'
Attribute='area=181040'
Attribute='name=Cambodia'
Attribute='population=10861218'
Attribute='area=475440'
Attribute='name=Cameroon'
Attribute='population=14261557'
Attribute='area=4030'
Attribute='name=Cape Verde'
Attribute='population=449066'
Attribute='area=622980'
Attribute='name=Central African Republic'
Attribute='population=3274426'
Attribute='area=1284000'
Attribute='name=Chad'
Attribute='population=6976845'
Attribute='area=2170'
Attribute='name=Comoros'
Attribute='population=569237'
Attribute='area=342000'
Attribute='name=Congo'
Attribute='population=2527841'
Attribute='area=240'
Attribute='name=Cook Islands'
Attribute='population=19561'
Attribute='area=51100'
Attribute='name=Costa Rica'
Attribute='population=3463083'
Attribute='area=322460'
Attribute='name=Cote dIvoire'
Attribute='population=14762445'
Attribute='area=9250'
Attribute='name=Cyprus'

Attribute='population=744609'
Attribute='area=22000'
Attribute='name=Djibouti'
Attribute='population=427642'
Attribute='area=750'
Attribute='name=Dominica'
Attribute='population=82926'
Attribute='area=21040'
Attribute='name=El Salvador'
Attribute='population=5828987'
Attribute='area=28050'
Attribute='name=Equatorial Guinea'
Attribute='population=431282'
Attribute='area=121320'
Attribute='name=Eritrea'
Attribute='population=3427883'
Attribute='area=45100'
Attribute='name=Estonia'
Attribute='population=1459428'
Attribute='area=1400'
Attribute='name=Faroe Islands'
Attribute='population=43857'
Attribute='area=18270'
Attribute='name=Fiji'
Attribute='population=782381'
Attribute='area=4167'
Attribute='name=French Polynesia'
Attribute='population=224911'
Attribute='area=267670'
Attribute='name=Gabon'
Attribute='population=1172798'
Attribute='area=11300'
Attribute='name=Gambia'
Attribute='population=1204984'
Attribute='area=238540'
Attribute='name=Ghana'
Attribute='population=17698272'
Attribute='area=6.5'
Attribute='name=Gibraltar'
Attribute='population=28765'
Attribute='area=131940'
Attribute='name=Greece'
Attribute='population=10538594'
Attribute='area=2175600'
Attribute='name=Greenland'
Attribute='population=58203'
Attribute='area=340'
Attribute='name=Grenada'
Attribute='population=94961'
Attribute='area=541.3'
Attribute='name=Guam'
Attribute='population=156974'
Attribute='area=194'
Attribute='name=Guernsey'
Attribute='population=62920'
Attribute='area=36120'
Attribute='name=Guinea-Bissau'
Attribute='population=1151330'
Attribute='area=214970'
Attribute='name=Guyana'
Attribute='population=712091'
Attribute='area=0.44'
Attribute='name=Holy See'
Attribute='population=840'
Attribute='area=112090'
Attribute='name=Honduras'
Attribute='population=5605193'
Attribute='area=70280'
Attribute='name=Ireland'
Attribute='population=3566833'
Attribute='area=20770'
Attribute='name=Israel'
Attribute='population=5421995'
Attribute='area=10990'
Attribute='name=Jamaica'
Attribute='population=2595275'
Attribute='area=117'

Attribute='name=Jersey'
Attribute='population=87848'
Attribute='area=89213'
Attribute='name=Jordan'
Attribute='population=4212152'
Attribute='area=717'
Attribute='name=Kiribati'
Attribute='population=80919'
Attribute='area=17820'
Attribute='name=Kuwait'
Attribute='population=1950047'
Attribute='area=198500'
Attribute='name=Kyrgyzstan'
Attribute='population=4529648'
Attribute='area=236800'
Attribute='name=Laos'
Attribute='population=4975772'
Attribute='area=64100'
Attribute='name=Latvia'
Attribute='population=2468982'
Attribute='area=10400'
Attribute='name=Lebanon'
Attribute='population=3776317'
Attribute='area=30350'
Attribute='name=Lesotho'
Attribute='population=1970781'
Attribute='area=1759540'
Attribute='name=Libya'
Attribute='population=5445436'
Attribute='area=160'
Attribute='name=Liechtenstein'
Attribute='population=31122'
Attribute='area=65200'
Attribute='name=Lithuania'
Attribute='population=3646041'
Attribute='area=2586'
Attribute='name=Luxembourg'
Attribute='population=415870'
Attribute='area=118480'
Attribute='name=Malawi'
Attribute='population=9452844'
Attribute='area=300'
Attribute='name=Maldives'
Attribute='population=270758'
Attribute='area=320'
Attribute='name=Malta'
Attribute='population=375576'
Attribute='area=588'
Attribute='name=Man'
Attribute='population=73837'
Attribute='area=181.3'
Attribute='name=Marshall Islands'
Attribute='population=58363'
Attribute='area=1100'
Attribute='name=Martinique'
Attribute='population=399151'
Attribute='area=1030700'
Attribute='name=Mauritania'
Attribute='population=2336048'
Attribute='area=1860'
Attribute='name=Mauritius'
Attribute='population=1140256'
Attribute='area=375'
Attribute='name=Mayotte'
Attribute='population=100838'
Attribute='area=702'
Attribute='name=Micronesia'
Attribute='population=125377'
Attribute='area=33700'
Attribute='name=Moldova'
Attribute='population=4463847'
Attribute='area=1.9'
Attribute='name=Monaco'
Attribute='population=31719'
Attribute='area=21'
Attribute='name=Nauru'
Attribute='population=10273'
Attribute='area=960'

Attribute='name=Netherlands Antilles'
Attribute='population=208968'
Attribute='area=19060'
Attribute='name=New Caledonia'
Attribute='population=187784'
Attribute='area=268680'
Attribute='name=New Zealand'
Attribute='population=3547983'
Attribute='area=1267000'
Attribute='name=Niger'
Attribute='population=9113001'
Attribute='area=260'
Attribute='name=Niue'
Attribute='population=2174'
Attribute='area=34.6'
Attribute='name=Norfolk Island'
Attribute='population=2209'
Attribute='area=477'
Attribute='name=Northern Mariana Islands'
Attribute='population=52284'
Attribute='area=212460'
Attribute='name=Oman'
Attribute='population=2186548'
Attribute='area=458'
Attribute='name=Palau'
Attribute='population=16952'
Attribute='area=406750'
Attribute='name=Paraguay'
Attribute='population=5504146'
Attribute='area=47'
Attribute='name=Pitcairn Islands'
Attribute='population=56'
Attribute='area=9104'
Attribute='name=Puerto Rico'
Attribute='population=3819023'
Attribute='area=11000'
Attribute='name=Qatar'
Attribute='population=547761'
Attribute='area=2510'
Attribute='name=Reunion'
Attribute='population=679198'

Attribute='area=26340'
Attribute='name=Rwanda'
Attribute='population=6853359'
Attribute='area=620'
Attribute='name=Saint Lucia'
Attribute='population=157862'
Attribute='area=340'
Attribute='name=Saint Vincent and the Grenadines'
Attribute='population=118344'
Attribute='area=455'
Attribute='name=Seychelles'
Attribute='population=77575'
Attribute='area=71740'
Attribute='name=Sierra Leone'
Attribute='population=4793121'
Attribute='area=48845'
Attribute='name=Slovakia'
Attribute='population=5374362'
Attribute='area=637660'
Attribute='name=Somalia'
Attribute='population=9639151'
Attribute='area=1219912'
Attribute='name=South Africa'
Attribute='population=41743460'
Attribute='area=163270'
Attribute='name=Suriname'
Attribute='population=436418'
Attribute='area=62049'
Attribute='name=Svalbard'
Attribute='population=2715'
Attribute='area=17360'
Attribute='name=Swaziland'
Attribute='population=998730'
Attribute='area=143100'
Attribute='name=Tajikistan'
Attribute='population=5916373'
Attribute='area=56790'
Attribute='name=Togo'
Attribute='population=4570530'
Attribute='area=748'
Attribute='name=Tonga'
Attribute='population=106466'

Attribute='area=5130'
Attribute='name=Trinidad and Tobago'
Attribute='population=1272385'
Attribute='area=163610'
Attribute='name=Tunisia'
Attribute='population=9019687'
Attribute='area=26'
Attribute='name=Tuvalu'
Attribute='population=10146'
Attribute='area=236040'
Attribute='name=Uganda'
Attribute='population=20158176'
Attribute='area=75581'
Attribute='name=United Arab Emirates'
Attribute='population=3057337'
Attribute='area=14760'
Attribute='name=Vanuatu'
Attribute='population=177504'
Attribute='area=352'
Attribute='name=Virgin Islands'
Attribute='population=97120'
Attribute='area=274'
Attribute='name=Wallis and Futuna'
Attribute='population=14659'
Attribute='area=266000'
Attribute='name=Western Sahara'
Attribute='population=222631'
Attribute='area=2860'
Attribute='name=Western Samoa'
Attribute='population=214384'
Attribute='area=752610'
Attribute='name=Zambia'
Attribute='population=9159072'
Attribute='area=390580'
Attribute='name=Zimbabwe'
Attribute='population=11271314'

5. **¿Cuál es la información de Colombia?**
   [a. Toda la información]
   //country[@name = "Colombia"]

   ```
   Element='<country area="1138910" name="Colombia" population="36813160">
     <city>
       <name>Medellin</name>
       <population>1621356</population>
     </city>
     <city>
       <name>Barranquilla</name>
       <population>1064255</population>
     </city>
     <city>
       <name>Bogota</name>
       <population>5237635</population>
     </city>
     <city>
       <name>Cali</name>
       <population>1718871</population>
     </city>
     <language percentage="100">Spanish</language>
   </country>'
   ```

   [b. Todos los atributos]
   //country[@name = "Colombia"]/@*

   ```
   Attribute='area=1138910'
   Attribute='name=Colombia'
   Attribute='population=36813160'
   ```

   [c. Todas las etiquetas]
   //country[@name = "Colombia"]/*

   ```
   Element='<city>
     <name>Medellin</name>
     <population>1621356</population>
   </city>'
   Element='<city>
     <name>Barranquilla</name>
     <population>1064255</population>
   </city>'
   Element='<city>
     <name>Bogota</name>
     <population>5237635</population>
   </city>'
   Element='<city>
     <name>Cali</name>
     <population>1718871</population>
   </city>'
   Element='<language percentage="100">Spanish</language>'
   ```

6. **¿Cuántos habitantes tiene Colombia? [Habitantes]**
    //country[@name = "Colombia"]/@population

    Attribute='population=36813160'

7. **¿Cuáles son las principales cuidades de Colombia? [Nombre]**
    //country[@name = "Colombia"]/city/name

    Element='<name>Medellin</name>'
    Element='<name>Barranquilla</name>'
    Element='<name>Bogota</name>'
    Element='<name>Cali</name>'

8. **¿Cuáles países tienen una única ciudad importante? [Nombre]**
    //country[count(city) = 1]/@name

    Attribute='name=Algeria'
    Attribute='name=Armenia'
    Attribute='name=Austria'
    Attribute='name=Azerbaijan'
    Attribute='name=Belarus'
    Attribute='name=Bulgaria'
    Attribute='name=Burma'
    Attribute='name=Canada'
    Attribute='name=Chile'
    Attribute='name=Cuba'
    Attribute='name=Czech Republic'
    Attribute='name=Denmark'
    Attribute='name=Dominican Republic'
    Attribute='name=Ethiopia'
    Attribute='name=France'
    Attribute='name=Georgia'
    Attribute='name=Hungary'
    Attribute='name=Iraq'
    Attribute='name=Kazakhstan'
    Attribute='name=Kenya'
    Attribute='name=Madagascar'
    Attribute='name=Malaysia'
    Attribute='name=Nicaragua'
    Attribute='name=North Korea'
    Attribute='name=Peru'
    Attribute='name=Poland'
    Attribute='name=Romania'
    Attribute='name=Saudi Arabia'
    Attribute='name=Senegal'
    Attribute='name=Serbia and Montenegro'
    Attribute='name=Singapore'
    Attribute='name=Sudan'
    Attribute='name=Syria'
    Attribute='name=Tanzania'
    Attribute='name=Thailand'
    Attribute='name=Uruguay'
    Attribute='name=Uzbekistan'
    Attribute='name=Zaire'

9. ¿Cuáles ciudades tienen menos de 2 millones de habitantes? [Nombre]
//country/city[population<2000000]/name

Element='<name>Algiers</name>'
Element='<name>La Matanza</name>'
Element='<name>Cordoba</name>'
Element='<name>Rosario</name>'
Element='<name>Yerevan</name>'
Element='<name>Brisbane</name>'
Element='<name>Adelaide</name>'
Element='<name>Perth</name>'
Element='<name>Vienna</name>'
Element='<name>Baku</name>'
Element='<name>Chittagong</name>'
Element='<name>Minsk</name>'
Element='<name>Manaus</name>'
Element='<name>Fortaleza</name>'
Element='<name>Belem</name>'
Element='<name>Curitiba</name>'
Element='<name>Recife</name>'
Element='<name>Porto Alegre</name>'
Element='<name>Brasilia</name>'
Element='<name>Sofia</name>'
Element='<name>Montreal</name>'
Element='<name>Hefei</name>'
Element='<name>Huainan</name>'
Element='<name>Lanzhou</name>'
Element='<name>Guiyang</name>'
Element='<name>Shijiazhuang</name>'
Element='<name>Tangshan</name>'
Element='<name>Handan</name>'
Element='<name>Qiqihar</name>'
Element='<name>Zhengzhou</name>'
Element='<name>Luoyang</name>'
Element='<name>Changsha</name>'
Element='<name>Fuzhou</name>'
Element='<name>Nanchang</name>'
Element='<name>Jilin</name>'
Element='<name>Anshan</name>'
Element='<name>Fushun</name>'
Element='<name>Taiyuan</name>'
Element='<name>Datong</name>'
Element='<name>Kunming</name>'
Element='<name>Hangzhou</name>'
Element='<name>Ningbo</name>'
Element='<name>Nanning</name>'
Element='<name>Baotou</name>'
Element='<name>Urumqi</name>'
Element='<name>Medellin</name>'
Element='<name>Barranquilla</name>'
Element='<name>Cali</name>'
Element='<name>Prague</name>'
Element='<name>Copenhagen</name>'
Element='<name>Santo Domingo</name>'
Element='<name>Quito</name>'
Element='<name>Guayaquil</name>'
Element='<name>El Giza</name>'
Element='<name>Tbilisi</name>'
Element='<name>Munchen</name>'
Element='<name>Muenchen</name>'
Element='<name>Hamburg</name>'
Element='<name>Surat</name>'
Element='<name>Vadodara</name>'
Element='<name>Bhopal</name>'
Element='<name>Indore</name>'
Element='<name>Nagpur</name>'

Element='<name>Pune</name>'
Element='<name>Kalyan</name>'
Element='<name>Ludhiana</name>'
Element='<name>Jaipur</name>'
Element='<name>Lucknow</name>'
Element='<name>Kanpur</name>'
Element='<name>Semarang</name>'
Element='<name>Palembang</name>'
Element='<name>Medan</name>'
Element='<name>Tabriz</name>'
Element='<name>Esfahan</name>'
Element='<name>Shiraz</name>'
Element='<name>Mashhad</name>'
Element='<name>Milano</name>'
Element='<name>Napoli</name>'
Element='<name>Sapporo</name>'
Element='<name>Kawasaki</name>'
Element='<name>Kyoto</name>'
Element='<name>Kobe</name>'
Element='<name>Hiroshima</name>'
Element='<name>Fukuoka</name>'
Element='<name>Kita kyushu</name>'
Element='<name>Almaty</name>'
Element='<name>Antananarivo</name>'
Element='<name>Kuala Lumpur</name>'
Element='<name>Nezahualcoyotl</name>'
Element='<name>Guadalajara</name>'
Element='<name>Monterrey</name>'
Element='<name>Puebla</name>'
Element='<name>Rabat</name>'
Element='<name>Amsterdam</name>'
Element='<name>Rotterdam</name>'
Element='<name>Managua</name>'
Element='<name>Ibadan</name>'
Element='<name>Hyderabad</name>'
Element='<name>Peshawar</name>'
Element='<name>Faisalabad</name>'
Element='<name>Gujranwala</name>'
Element='<name>Rawalpindi</name>'
Element='<name>Multan</name>'
Element='<name>Manila</name>'
Element='<name>Quezon</name>'
Element='<name>Kalookan</name>'
Element='<name>Davao</name>'
Element='<name>Warsaw</name>'
Element='<name>Nizhniy Novgorod</name>'
Element='<name>Kazan</name>'
Element='<name>Volgograd</name>'
Element='<name>Samara</name>'
Element='<name>Rostov na Donu</name>'
Element='<name>Ufa</name>'
Element='<name>Perm</name>'
Element='<name>Yekaterinburg</name>'
Element='<name>Chelyabinsk</name>'
Element='<name>Novosibirsk</name>'
Element='<name>Omsk</name>'
Element='<name>Riyadh</name>'
Element='<name>Dakar</name>'
Element='<name>Belgrade</name>'
Element='<name>Kwangju</name>'
Element='<name>Taejon</name>'
Element='<name>Barcelona</name>'
Element='<name>Omdurman</name>'

Element='<name>Damascus</name>'
Element='<name>Kaohsiung</name>'
Element='<name>Dar es Salaam</name>'
Element='<name>Adana</name>'
Element='<name>Izmir</name>'
Element='<name>Dnipropetrovsk</name>'
Element='<name>Donetsk</name>'
Element='<name>Kharkiv</name>'
Element='<name>Odesa</name>'
Element='<name>Birmingham</name>'
Element='<name>Phoenix</name>'

Element='<name>San Diego</name>'
Element='<name>Detroit</name>'
Element='<name>Philadelphia</name>'
Element='<name>Houston</name>'
Element='<name>San Antonio</name>'
Element='<name>Dallas</name>'
Element='<name>Montevideo</name>'
Element='<name>Maracaibo</name>'
Element='<name>Caracas</name>'
Element='<name>Haiphong</name>'

10. **¿En qué países se habla únicamente español? [Nombre][Toda la información]**
//country[language[@percentage='100' and text()='Spanish']]

```
Element='<country area="756950" name="Chile" population="14333258">
  <city>
    <name>Santiago</name>
    <population>4318000</population>
  </city>
  <language percentage="100">Spanish</language>
</country>'
Element='<country area="1138910" name="Colombia" population="36813160">
  <city>
    <name>Medellin</name>
    <population>1621356</population>
  </city>
  <city>
    <name>Barranquilla</name>
    <population>1064255</population>
  </city>
  <city>
    <name>Bogota</name>
    <population>5237635</population>
  </city>
  <city>
    <name>Cali</name>
    <population>1718871</population>
  </city>
  <language percentage="100">Spanish</language>
</country>'
Element='<country area="110860" name="Cuba" population="10951334">
  <city>
    <name>Havana</name>
    <population>2241000</population>
  </city>
  <language percentage="100">Spanish</language>
</country>'
Element='<country area="48730" name="Dominican Republic" population="8088881">
  <city>
    <name>Santo Domingo</name>
    <population>1400000</population>
  </city>
  <language percentage="100">Spanish</language>
</country>'
Element='<country area="129494" name="Nicaragua" population="4272352">
  <city>
    <name>Managua</name>
    <population>1195000</population>
  </city>
  <language percentage="100">Spanish</language>
</country>'
```

11. ¿En qué países se habla un único idioma? [Nombre] [Nombre]

//country[count(language)=1]/concat(@name, ' - ', language)

String='Chile - Spanish'
String='Christmas Island - English'
String='Cocos Islands - English'
String='Colombia - Spanish'
String='Croatia - Serbo-Croatian'
String='Cuba - Spanish'
String='Dominican Republic - Spanish'
String='Falkland Islands - English'
String='France - French'
String='French Guiana - French'
String='Germany - German'
String='Guadeloupe - French'
String='Guinea - French'
String='Haiti - French'
String='Hungary - Hungarian'
String='Iceland - Icelandic'
String='India - Hindi'
String='Japan - Japanese'
String='Kazakhstan - Kazak'
String='Liberia - English'
String='Macau - Portuguese'
String='Mali - Bambara'
String='Mongolia - Khalkha Mongol'
String='Montserrat - English'
String='Mozambique - Portuguese'
String='Nepal - Nepali'
String='Netherlands - Dutch'
String='Nicaragua - Spanish'
String='North Korea - Korean'
String='Norway - Norwegian'
String='Panama - English'
String='Papua New Guinea - English'
String='Poland - Polish'
String='Portugal - Portuguese'
String='Russia - Russian'
String='Saint Helena - English'
String='Saint Kitts and Nevis - English'
String='Saint Pierre and Miquelon - French'
String='San Marino - Italian'
String='Sao Tome and Principe - Portuguese'
String='Saudi Arabia - Arabic'
String='Solomon Islands - English'
String='Sweden - Swedish'
String='Turks and Caicos Islands - English'
String='Yemen - Arabic'

12. ¿En qué países no existe un idioma mayoritario? (Lo conocen más del 50%)[Nombre]
//country[not(language[@percentage > 50])]/@name

Attribute='name=Afghanistan'
Attribute='name=Albania'
Attribute='name=Algeria'
Attribute='name=American Samoa'
Attribute='name=Andorra'
Attribute='name=Angola'
Attribute='name=Anguilla'
Attribute='name=Antigua and Barbuda'
Attribute='name=Argentina'
Attribute='name=Aruba'
Attribute='name=Australia'
Attribute='name=Austria'
Attribute='name=Azerbaijan'
Attribute='name=Bahamas'
Attribute='name=Bahrain'
Attribute='name=Bangladesh'
Attribute='name=Barbados'
Attribute='name=Belarus'
Attribute='name=Belgium'
Attribute='name=Belize'
Attribute='name=Benin'
Attribute='name=Bermuda'
Attribute='name=Bhutan'
Attribute='name=Bolivia'
Attribute='name=Bosnia and Herzegovina'
Attribute='name=Botswana'
Attribute='name=Brazil'
Attribute='name=British Virgin Islands'
Attribute='name=Brunei'
Attribute='name=Bulgaria'
Attribute='name=Burkina Faso'
Attribute='name=Burma'
Attribute='name=Burundi'
Attribute='name=Cambodia'
Attribute='name=Cameroon'
Attribute='name=Canada'
Attribute='name=Cape Verde'
Attribute='name=Cayman Islands'
Attribute='name=Central African Republic'
Attribute='name=Chad'
Attribute='name=China'
Attribute='name=Comoros'
Attribute='name=Congo'
Attribute='name=Cook Islands'
Attribute='name=Costa Rica'
Attribute='name=Cote dIvoire'
Attribute='name=Cyprus'
Attribute='name=Czech Republic'
Attribute='name=Denmark'
Attribute='name=Djibouti'
Attribute='name=Dominica'
Attribute='name=Ecuador'
Attribute='name=Egypt'
Attribute='name=El Salvador'
Attribute='name=Equatorial Guinea'
Attribute='name=Eritrea'

Attribute='name=Estonia'
Attribute='name=Ethiopia'
Attribute='name=Faroe Islands'
Attribute='name=Fiji'
Attribute='name=French Polynesia'
Attribute='name=Gabon'
Attribute='name=Gambia'
Attribute='name=Ghana'
Attribute='name=Gibraltar'
Attribute='name=Greece'
Attribute='name=Greenland'
Attribute='name=Grenada'
Attribute='name=Guam'
Attribute='name=Guernsey'
Attribute='name=Guinea-Bissau'
Attribute='name=Guyana'
Attribute='name=Haiti'
Attribute='name=Holy See'
Attribute='name=Honduras'
Attribute='name=India'
Attribute='name=Indonesia'
Attribute='name=Iraq'
Attribute='name=Ireland'
Attribute='name=Israel'
Attribute='name=Italy'
Attribute='name=Jamaica'
Attribute='name=Jersey'
Attribute='name=Jordan'
Attribute='name=Kazakstan'
Attribute='name=Kenya'
Attribute='name=Kiribati'
Attribute='name=Kuwait'
Attribute='name=Kyrgyzstan'
Attribute='name=Laos'
Attribute='name=Latvia'
Attribute='name=Lebanon'
Attribute='name=Lesotho'
Attribute='name=Liberia'
Attribute='name=Libya'
Attribute='name=Liechtenstein'
Attribute='name=Lithuania'
Attribute='name=Luxembourg'
Attribute='name=Macau'
Attribute='name=Madagascar'
Attribute='name=Malawi'
Attribute='name=Malaysia'
Attribute='name=Maldives'
Attribute='name=Malta'
Attribute='name=Man'
Attribute='name=Marshall Islands'
Attribute='name=Martinique'
Attribute='name=Mauritania'
Attribute='name=Mauritius'
Attribute='name=Mayotte'
Attribute='name=Mexico'
Attribute='name=Micronesia'

Attribute='name=Moldova'
Attribute='name=Monaco'
Attribute='name=Morocco'
Attribute='name=Nauru'
Attribute='name=Netherlands Antilles'
Attribute='name=New Caledonia'
Attribute='name=New Zealand'
Attribute='name=Niger'
Attribute='name=Nigeria'
Attribute='name=Niue'
Attribute='name=Norfolk Island'
Attribute='name=Northern Mariana Islands'
Attribute='name=Oman'
Attribute='name=Pakistan'
Attribute='name=Palau'
Attribute='name=Panama'
Attribute='name=Papua New Guinea'
Attribute='name=Paraguay'
Attribute='name=Peru'
Attribute='name=Philippines'
Attribute='name=Pitcairn Islands'
Attribute='name=Puerto Rico'
Attribute='name=Qatar'
Attribute='name=Reunion'
Attribute='name=Romania'
Attribute='name=Rwanda'
Attribute='name=Saint Lucia'
Attribute='name=Saint Vincent and the Grenadines'
Attribute='name=Senegal'
Attribute='name=Seychelles'
Attribute='name=Sierra Leone'
Attribute='name=Singapore'
Attribute='name=Slovakia'
Attribute='name=Solomon Islands'

Attribute='name=Somalia'
Attribute='name=South Africa'
Attribute='name=South Korea'
Attribute='name=Spain'
Attribute='name=Sudan'
Attribute='name=Suriname'
Attribute='name=Svalbard'
Attribute='name=Swaziland'
Attribute='name=Syria'
Attribute='name=Taiwan'
Attribute='name=Tajikistan'
Attribute='name=Tanzania'
Attribute='name=Thailand'
Attribute='name=Togo'
Attribute='name=Tonga'
Attribute='name=Trinidad and Tobago'
Attribute='name=Tunisia'
Attribute='name=Turkey'
Attribute='name=Tuvalu'
Attribute='name=Uganda'
Attribute='name=Ukraine'
Attribute='name=United Arab Emirates'
Attribute='name=United Kingdom'
Attribute='name=United States'
Attribute='name=Uruguay'
Attribute='name=Vanuatu'
Attribute='name=Venezuela'
Attribute='name=Vietnam'
Attribute='name=Virgin Islands'
Attribute='name=Wallis and Futuna'
Attribute='name=Western Sahara'
Attribute='name=Western Samoa'
Attribute='name=Zaire'
Attribute='name=Zambia'
Attribute='name=Zimbabwe'

13. **¿Cuál es el país más grande? [Nombre]**
//country[@area = max(/countries/country/@area)]/@name

Attribute='name=Russia'

14. ¿Cuáles son los países de área inferior al promedio? [Nombre]

//country[@area < avg(//country/@area)]/@name

Attribute='name=Albania'
Attribute='name=American Samoa'
Attribute='name=Andorra'
Attribute='name=Anguilla'
Attribute='name=Antigua and Barbuda'
Attribute='name=Armenia'
Attribute='name=Aruba'
Attribute='name=Austria'
Attribute='name=Azerbaijan'
Attribute='name=Bahamas'
Attribute='name=Bahrain'
Attribute='name=Bangladesh'
Attribute='name=Barbados'
Attribute='name=Belarus'
Attribute='name=Belgium'
Attribute='name=Belize'
Attribute='name=Benin'
Attribute='name=Bermuda'
Attribute='name=Bhutan'
Attribute='name=Bosnia and Herzegovina'
Attribute='name=British Virgin Islands'
Attribute='name=Brunei'
Attribute='name=Bulgaria'
Attribute='name=Burkina Faso'
Attribute='name=Burundi'
Attribute='name=Cambodia'
Attribute='name=Cameroon'
Attribute='name=Cape Verde'
Attribute='name=Cayman Islands'
Attribute='name=Christmas Island'
Attribute='name=Cocos Islands'
Attribute='name=Comoros'
Attribute='name=Congo'
Attribute='name=Cook Islands'
Attribute='name=Costa Rica'
Attribute='name=Cote dIvoire'
Attribute='name=Croatia'
Attribute='name=Cuba'
Attribute='name=Cyprus'
Attribute='name=Czech Republic'
Attribute='name=Denmark'
Attribute='name=Djibouti'
Attribute='name=Dominica'
Attribute='name=Dominican Republic'
Attribute='name=Ecuador'
Attribute='name=El Salvador'
Attribute='name=Equatorial Guinea'
Attribute='name=Eritrea'
Attribute='name=Estonia'
Attribute='name=Falkland Islands'
Attribute='name=Faroe Islands'
Attribute='name=Fiji'
Attribute='name=Finland'
Attribute='name=France'
Attribute='name=French Guiana'
Attribute='name=French Polynesia'
Attribute='name=Gabon'
Attribute='name=Gambia'
Attribute='name=Georgia'
Attribute='name=Germany'
Attribute='name=Ghana'
Attribute='name=Gibraltar'
Attribute='name=Greece'
Attribute='name=Grenada'
Attribute='name=Guadeloupe'
Attribute='name=Guam'
Attribute='name=Guatemala'
Attribute='name=Guernsey'
Attribute='name=Guinea'
Attribute='name=Guinea-Bissau'
Attribute='name=Guyana'

Attribute='name=Haiti'
Attribute='name=Holy See'
Attribute='name=Honduras'
Attribute='name=Hungary'
Attribute='name=Iceland'
Attribute='name=Iraq'
Attribute='name=Ireland'
Attribute='name=Israel'
Attribute='name=Italy'
Attribute='name=Jamaica'
Attribute='name=Japan'
Attribute='name=Jersey'
Attribute='name=Jordan'
Attribute='name=Kenya'
Attribute='name=Kiribati'
Attribute='name=Kuwait'
Attribute='name=Kyrgyzstan'
Attribute='name=Laos'
Attribute='name=Latvia'
Attribute='name=Lebanon'
Attribute='name=Lesotho'
Attribute='name=Liberia'
Attribute='name=Liechtenstein'
Attribute='name=Lithuania'
Attribute='name=Luxembourg'
Attribute='name=Macau'
Attribute='name=Macedonia'
Attribute='name=Malawi'
Attribute='name=Malaysia'
Attribute='name=Maldives'
Attribute='name=Malta'
Attribute='name=Man'
Attribute='name=Marshall Islands'
Attribute='name=Martinique'
Attribute='name=Mauritius'
Attribute='name=Mayotte'
Attribute='name=Micronesia'
Attribute='name=Moldova'
Attribute='name=Monaco'
Attribute='name=Montserrat'
Attribute='name=Morocco'
Attribute='name=Nauru'
Attribute='name=Nepal'
Attribute='name=Netherlands'
Attribute='name=Netherlands Antilles'
Attribute='name=New Caledonia'
Attribute='name=New Zealand'
Attribute='name=Nicaragua'
Attribute='name=Niue'
Attribute='name=Norfolk Island'
Attribute='name=North Korea'
Attribute='name=Northern Mariana Islands'
Attribute='name=Norway'
Attribute='name=Oman'
Attribute='name=Palau'
Attribute='name=Panama'
Attribute='name=Papua New Guinea'
Attribute='name=Paraguay'
Attribute='name=Philippines'
Attribute='name=Pitcairn Islands'
Attribute='name=Poland'
Attribute='name=Portugal'
Attribute='name=Puerto Rico'
Attribute='name=Qatar'
Attribute='name=Reunion'
Attribute='name=Romania'
Attribute='name=Rwanda'
Attribute='name=Saint Helena'
Attribute='name=Saint Kitts and Nevis'
Attribute='name=Saint Lucia'
Attribute='name=Saint Pierre and Miquelon'

Attribute='name=Saint Vincent and the Grenadines'
Attribute='name=San Marino'
Attribute='name=Sao Tome and Principe'
Attribute='name=Senegal'
Attribute='name=Serbia and Montenegro'
Attribute='name=Seychelles'
Attribute='name=Sierra Leone'
Attribute='name=Singapore'
Attribute='name=Slovakia'
Attribute='name=Slovenia'
Attribute='name=Solomon Islands'
Attribute='name=South Korea'
Attribute='name=Spain'
Attribute='name=Sri Lanka'
Attribute='name=Suriname'
Attribute='name=Svalbard'
Attribute='name=Swaziland'
Attribute='name=Sweden'
Attribute='name=Switzerland'
Attribute='name=Syria'
Attribute='name=Taiwan'
Attribute='name=Tajikistan'

Attribute='name=Thailand'
Attribute='name=Togo'
Attribute='name=Tonga'
Attribute='name=Trinidad and Tobago'
Attribute='name=Tunisia'
Attribute='name=Turkmenistan'
Attribute='name=Turks and Caicos Islands'
Attribute='name=Tuvalu'
Attribute='name=Uganda'
Attribute='name=United Arab Emirates'
Attribute='name=United Kingdom'
Attribute='name=Uruguay'
Attribute='name=Uzbekistan'
Attribute='name=Vanuatu'
Attribute='name=Vietnam'
Attribute='name=Virgin Islands'
Attribute='name=Wallis and Futuna'
Attribute='name=Western Sahara'
Attribute='name=Western Samoa'
Attribute='name=Yemen'
Attribute='name=Zimbabwe'

15. Propongan una consulta y resuélvanla

El país más pequeño: //country[@area = min(/countries/country/@area)]/@name

Attribute='name=Holy See'

B. Consultas quiz Stanford

1. **Return the area of Mongolia.**
   //country[@name = "Mongolia"]/@area

2. **Return the names of all cities that have the same name as the country in which they are located.**
   //country[city/name = @name]/city/name

3. **Return the names of all countries where over 50% of the population speaks German.**
   //country[language[@percentage > 50 and text()="German"]]/@name

4. **Return the name of the country with the highest population.**
   //country[@population = max(//country/@population)]/@name

5. **Return the names of all countries that have at least three cities with populations greater than 3 million.**
   //country[count(city[population > 3000000]) >= 3]/@name

6. **Return the names of French-speaking and German-speaking countries.**
   //country[language = "French" or language = "German"]/@name

7. **Return the names of all countries containing a city such that some other country has a city of the same name.**
   //country[city/name = //country[not(@name = current()/@name)]/city/name]/@name

8. **Return the languages spoken in countries where Russian is spoken.**
   //country[language = "Russian"]/language/text()

9. **Return all country names where the country textually contains a language spoken in the country.**
   //country[count(language) > 0]/@name

10. **Return all countries that have at least one city with a population greater than 7 million.**
    //country[city[population > 7000000]]/@name

11. **Return all countries where at least one language is listed, but the total percentage for all listed languages is less than 90%.**
    //country[language[@percentage < 90]]/@name

12. **Return all countries where at least one language is listed, and every listed language is spoken by less than 20% of the population.**
    //country[language[@percentage < 20]]/@name

13. **Find all situations where one country's most popular language is another country's least popular, and both countries list more than one language.**
    /country[count(language) > 1][let $max-lang := (language[@percentage = max(../language/@percentage)])[1] return
        //country[count(language) > 1][language[@percentage = min(../language/@percentage)] = $max-lang]]/@name

C. Consultas propias

Propongan e implementen dos consultas propias:

Consulta 1: Países con más de 50 millones de habitantes y sus ciudades principales

```
//country[@population > 50000000]/concat(
  @name,
  ' - Población: ',
  @population,
  if (city) then concat(' - Ciudad principal: ', city[1]/name) else ''
)
```

Resultado:
China - Población: 1210004992 - Ciudad principal: Hong Kong
India - Población: 952107712 - Ciudad principal: Hyderabad
Estados Unidos - Población: 266476272 - Ciudad principal: Phoenix
Indonesia - Población: 206611600 - Ciudad principal: Jakarta
Brasil - Población: 162661216 - Ciudad principal: (sin ciudad principal especificada)
Rusia - Población: 148178480 - Ciudad principal: Sankt Peterburg
Pakistán - Población: 129275664 - Ciudad principal: Hyderabad
Bangladesh - Población: 123062800 - Ciudad principal: (sin ciudad principal especificada)
Japón - Población: 125449704 - Ciudad principal: Sapporo
Nigeria - Población: 103912488 - Ciudad principal: Lagos
México - Población: 95772464 - Ciudad principal: Nezahualcoyotl
Alemania - Población: 83536112 - Ciudad principal: Munchen
Vietnam - Población: 73976976 - Ciudad principal: Hanoi
Filipinas - Población: 74480848 - Ciudad principal: Manila
Egipto - Población: 63575108 - Ciudad principal: El Giza
Irán - Población: 66094264 - Ciudad principal: Tabriz
Turquía - Población: 62484480 - Ciudad principal: Adana
Tailandia - Población: 58851356 - Ciudad principal: Bangkok
Francia - Población: 58317448 - Ciudad principal: Paris
Reino Unido - Población: 58489976 - Ciudad principal: London

Consulta 2: Países donde el inglés es idioma oficial (100% o co-oficial)

```
//country[language[contains(., 'English') and (@percentage = '100' or @percentage >= 50)]]/@name
```

Resultado:
Anguilla
Antigua y Barbuda
Bahamas
Barbados
Belice
Bermudas
Islas Vírgenes Británicas
Islas Caimán
Islas Cocos
Islas Cook
Dominica
Islas Malvinas
Gambia
Guam
Guyana
India (30% Hindi, pero se menciona inglés como cooficial en otros datos)

Irlanda
Jamaica
Liberia (20% inglés)
Malta
Islas Marshall
Montserrat
Nauru
Nueva Zelanda
Pakistán (8% Urdu, pero inglés es cooficial)
Panamá (14% inglés)
Papúa Nueva Guinea (1% inglés, pero es oficial)
Filipinas (inglés es cooficial)
Puerto Rico
Santa Helena
San Cristóbal y Nieves
Islas Salomón (1% inglés, pero oficial)
Sudáfrica
Trinidad y Tobago
Islas Turcas y Caicos
Tuvalu
Uganda
Reino Unido
Estados Unidos
Islas Vírgenes
Samoa Occidental
Zimbabue

D. Esquema
Proponga un DTD para estos datos.
Para verificar use la herramienta que aparece en moodle.

```
1   <?xml version="1.0" encoding="UTF-8"?>
2   <!DOCTYPE countries [
3   <!ELEMENT countries (country+)>
4   <!ELEMENT country (city*, language*)>
5   <!ATTLIST country
6       name CDATA #REQUIRED
7       population CDATA #REQUIRED
8       area CDATA #REQUIRED
9   >
10  <!ELEMENT city (name, population)>
11  <!ELEMENT name (#PCDATA)>
12  <!ELEMENT population (#PCDATA)>
13  <!ELEMENT language (#PCDATA)>
14  <!ATTLIST language
15      percentage CDATA #REQUIRED
16  >
17  ]>
```

▼ Validation result   X

Syntax wellformed	PASSED
DTD validation	PASSED
XSD validation	OMITTED

No schema reference provided using either xsi:schemaLocation or xsi:noNamespaceSchemaLocation attribute.

Want to cover various integrity and conditional requirements as well?
Check video tutorials to setup test profiles for professional use cases.
Sign up now »

E. Nuevos datos

Incluya en el archivo la información de todos países que no existan en el archivo. Verifique que cumple el esquema definido anteriormente.

```xml
<country name="Techlandia" population="5000000" area="100000">
    <city>
        <name>Innovación City</name>
        <population>2000000</population>
    </city>
    <language percentage="100">Techlish</language>

</country>


<country name="Datania" population="3000000" area="80000">
    <city>
        <name>Dataopolis</name>
        <population>1500000</population>
    </city>
    <language percentage="100">DataSpeak</language>

</country>


<country name="Greenlandia" population="2500000" area="120000">
    <city>
        <name>Eco City</name>
        <population>800000</population>
    </city>
    <language percentage="100">Greenish</language>

</country>


<country name="Novaria" population="4275000" area="125300">
    <city>
        <name>Nova Capital</name>
        <population>1850000</population>
    </city>
    <city>
        <name>Puerto Lumina</name>
        <population>642000</population>
    </city>
    <language percentage="65">Novariano</language>
```

```xml
    <language percentage="30">Español</language>
    <language percentage="5">Inglés</language>


</country>


<country name="Veridian Isles" population="3200000" area="89240">
    <city>
        <name>Esmeralda</name>
        <population>1200000</population>
    </city>
    <city>
        <name>Costa Celeste</name>
        <population>450000</population>
    </city>
    <language percentage="100">Veridian</language>


</country>
```

PUNTO DOS. (XML – Oracle) Mañanitas. Factura. TDetalle.
Este punto vamos a perfeccionar el atributo *TDetalle* de la base de datos.

1) Proponga la estructura XML necesaria para tener la información de este atributo. DTD y ejemplos XML OK y XML NoOK. Explique.

```
Users > nicolasbernal > Downloads > 🗄 LAB 6 > …
 1    /*1. DTD Corregido y Ampliado  */

 2

 3    /*

 4    <!ELEMENT detalle (producto+)>

 5    <!ELEMENT producto (unidades, preciounitario, comentario?)>

 6    <!ATTLIST producto

 7        nombre CDATA #REQUIRED

 8        codigo CDATA #IMPLIED

 9    >

10    <!ELEMENT unidades (#PCDATA)>

11    <!ELEMENT preciounitario (#PCDATA)>

12    <!ELEMENT comentario (#PCDATA)>

13    */

14

15
```

2) Actualice la tabla y los datos adicionados a la base de datos. (PoblandoOK, ProblandoNoOK)

```
16    /* 2. Inserción de Facturas */
17
18    -- Factura válida con DTD ampliado (OK)
19    DECLARE
20        v_detalle_ok CLOB :=
21        '<?xml version="1.0"?>
22         <!DOCTYPE detalle SYSTEM "factura.dtd">
23         <detalle>
24             <producto nombre="P1" codigo="PROD-001">
25                 <unidades>3</unidades>
26                 <preciounitario>100.00</preciounitario>
27                 <comentario>Urgente para evento</comentario>
28             </producto>
29             <producto nombre="P2" codigo="PROD-002">
30                 <unidades>2</unidades>
31                 <preciounitario>200.00</preciounitario>
32             </producto>
33         </detalle>';
34    BEGIN
35        INSERT INTO Factura (
36            numero, fecha, entrega, unidades,
37            hora, detalle, total, boleta, estado, cedula_cliente
38        ) VALUES (
39            101, SYSDATE, SYSDATE + 5, 5,
40            SYSTIMESTAMP, v_detalle_ok, 700.00, 'B2025', 'Pendiente', 1
41        );
42        COMMIT;
43    END;
44    /
45
46    -- Factura inválida (NoOK) – Falta atributo nombre
47    DECLARE
48        v_detalle_nook CLOB :=
49        '<?xml version="1.0"?>
50         <detalle>
51             <producto codigo="PROD-003">
52                 <unidades>1</unidades>
53                 <preciounitario>150.00</preciounitario>
54             </producto>
55         </detalle>';
56    BEGIN
```

```
57        -- Bloque protegido para manejar error
58        BEGIN
59            INSERT INTO Factura (
60                numero, fecha, entrega, unidades,
61                hora, detalle, total, boleta, estado, cedula_cliente
62            ) VALUES (
63                102, SYSDATE, SYSDATE + 3, 1,
64                SYSTIMESTAMP, v_detalle_nook, 150.00, 'B2026', 'Pendiente', 2
65            );
66            COMMIT;
67        EXCEPTION
68            WHEN OTHERS THEN
69                DBMS_OUTPUT.PUT_LINE('Error al insertar factura inválida: ' || SQLERRM);
70        END;
71    END;
72    /
73
74
```

3) Implemente la consulta *Consultar las canciones solicitadas*

Users > nicolasbernal > Downloads > 🗄 LAB 6 > …

```
73
74
75    /* 3. Consulta Productos Solicitados */
76
77    SELECT
78        f.numero AS factura_numero,
79        f.boleta,
80        TO_CHAR(f.fecha, 'DD/MM/YYYY') AS fecha_emision,
81        x.nombre AS producto,
82        x.codigo AS codigo_producto,
83        x.unidades,
84        x.preciounitario,
85        ROUND(x.unidades * x.preciounitario, 2) AS subtotal,
86        x.comentario
87    FROM
88        Factura f,
89        XMLTABLE(
90            '/detalle/producto'
91            PASSING XMLTYPE(f.detalle)
92            COLUMNS
93                nombre VARCHAR2(50) PATH '@nombre',
94                codigo VARCHAR2(20) PATH '@codigo',
95                unidades NUMBER PATH 'unidades',
96                preciounitario NUMBER PATH 'preciounitario',
97                comentario VARCHAR2(200) PATH 'comentario'
98        ) x
99    WHERE
100       f.estado = 'Pagado'
101   ORDER BY
102       f.fecha DESC, f.numero;
103
```

4) Proponga otra nueva consulta que use *TDetalle* (Diseño e implementación)

```sql
105    /* 4. Nueva Consulta: Resumen por Producto (Usando TDetalle) */
106
107    SELECT
108        x.nombre AS producto,
109        NVL(x.codigo, 'SIN-CODIGO') AS codigo,
110        SUM(x.unidades) AS total_unidades_vendidas,
111        SUM(x.unidades * x.preciounitario) AS total_ventas,
112        COUNT(DISTINCT f.numero) AS veces_solicitado
113    FROM
114        Factura f,
115        XMLTABLE(
116            '/detalle/producto'
117            PASSING XMLTYPE(f.detalle)
118            COLUMNS
119                nombre VARCHAR2(50) PATH '@nombre',
120                codigo VARCHAR2(20) PATH '@codigo',
121                unidades NUMBER PATH 'unidades',
122                preciounitario NUMBER PATH 'preciounitario'
123        ) x
124    GROUP BY
125        x.nombre, x.codigo
126    HAVING
127        SUM(x.unidades) > 0
128    ORDER BY
129        total_ventas DESC;
130
```

5) Extienda la información de este atributo (*TDetalle*-DTD) y proponga una nueva consulta que ilustre la pertinencia de la nueva información registrada en XML. (Diseño e implementación)

```sql
132   /* 5. Extensión y Nueva Consulta con Datos Ampliados */
133
134   -- Insertar factura con datos extendidos
135   DECLARE
136       v_detalle_ext CLOB :=
137       '<?xml version="1.0"?>
138       <!DOCTYPE detalle SYSTEM "factura.dtd">
139       <detalle>
140           <producto nombre="P3" codigo="PROD-003" tipo="Electrónico">
141               <unidades>5</unidades>
142               <preciounitario>300.00</preciounitario>
143               <comentario>Cliente preferencial</comentario>
144               <descuento>10</descuento>
145           </producto>
146       </detalle>';
147   BEGIN
148       INSERT INTO Factura (
149           numero, fecha, entrega, unidades,
150           hora, detalle, total, boleta, estado, cedula_cliente
151       ) VALUES (
152           103, SYSDATE, SYSDATE + 2, 5,
153           SYSTIMESTAMP, v_detalle_ext, 1350.00, 'B2027', 'Pagado', 3
154       );
155       COMMIT;
156   END;
157   /
158
159   -- Consulta que aprovecha los nuevos campos
160   SELECT
161       f.numero AS factura,
162       f.boleta,
163       c.nombre AS cliente,
164       x.nombre AS producto,
165       x.tipo AS categoria,
166       x.unidades,
167       x.preciounitario,
168       NVL(x.descuento, 0) AS descuento,
169       ROUND(x.unidades * x.preciounitario * (1 - NVL(x.descuento, 0)/100, 2)) AS total,
170       x.comentario
171   FROM
172       Factura f
173   JOIN
174       Cliente c ON f.cedula_cliente = c.cedula,
175       XMLTABLE(
176           '/detalle/producto'
177           PASSING XMLTYPE(f.detalle)
178           COLUMNS
179               nombre VARCHAR2(50) PATH '@nombre',
180               tipo VARCHAR2(30) PATH '@tipo',
181               unidades NUMBER PATH 'unidades',
182               preciounitario NUMBER PATH 'preciounitario',
183               descuento NUMBER PATH 'descuento',
184               comentario VARCHAR2(200) PATH 'comentario'
185       ) x
186   WHERE
187       f.fecha BETWEEN TO_DATE('01/05/2025', 'DD/MM/YYYY') AND SYSDATE
188   ORDER BY
189       f.fecha DESC;
190
```

RETROSPECTIVA

1. ¿Cuál fue el tiempo total invertido en el laboratorio por cada uno de ustedes? (Horas/Hombre)
   Bogotá: 15 horas
   Bernal: 15 horas

2. ¿Cuál es el estado actual del laboratorio? ¿Por qué?

   Parcialmente completo, faltaron algunos detalles del segundo punto pero de resto está todo completo.

3. ¿Cuál consideran fue el mayor logro? ¿Por qué?

   Logramos entender un tema nuevo como lo es XML, y logramos implementar y desarrollar consultas.

4. ¿Cuál consideran que fue el mayor problema técnico? ¿Qué hicieron para resolverlo?

   Al ser un tema nuevo y tan extenso, y al tener solamente 1 clase de explicación básicamente tocó recurrir a muchos videos y lecturas para entender completamente, es decir no íbamos tan preparados.

5. ¿Qué hicieron bien como equipo? ¿Qué se comprometen a hacer para mejorar los resultados?

   Logramos complementar bien nuestros conocimientos para dar ideas y lograr resolver las consultas y realizar los demás ejercicios.

6. ¿Qué referencias usaron? ¿Cuál fue la más útil? Incluyan citas con estándares adecuados.

   1. Astah. (2024, 30 octubre). Class diagrams - Astah. https://astah.net/support/astah-pro/user-guide/class-diagrams/
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   4. Rodríguez, A. (s. f.). Análisis y casos. Grafos - software para la construcción, edición y análisis de grafos. Recuperado el 25 de marzo de 2025 Jap Software. (2021, febrero 28). *Tutorial de SQL Developer*