Abstract
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XML is an undying technique designed for data representation and data exchange. One great feature of XML is its ability to handle XML related matters using XML itself. XQuery is such a technique that is created in order to query XML documents using XML itself.

The purpose of this project proposal is to implement a XQuery editor plug-in for Eclipse that will be very helpful for web developers; specially for people that are dealing with querying XML data. Even with current somewhat limited capabilities of XQuery, it is largely used to query XMLDBs such as eXist or Qexo. But with the next suggested version of XQuery which is 1.1, XQuery could be the favourite for querying not only XMLDBs but also other XML based office documents and relational DBs.

Because of the importance of XQuery, I'm expecting to implement a XQuery plug-in that will be managed under Eclipse web tools project and under EPL.Therefore at the end of this project, we will have a fully functional editor (as-you-type syntax validating, error tips, syntax highlighting, outlining, content assistance, Ctrl+Space assistance & preference page) for XQuery.

Synopsis
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If there's one thing that will be persistent for a foreseeable future in IT world, it will be XML in my opinion. As long as there will be a need for representation of data or exchange of data between computers, XML will somehow find its way to fulfil these needs. Among many positives characteristics in XML, one thing we explore most strongly is that its ability to evolve and the flexibility to find solutions for XML related data handling matters using XML itself; XQuery is a good example for this.

XQuery was designed by XML Query working group of the W3C [1] in order to present a convenient way to query largely (but not limited to) XML data collections and became a W3C recommendation on January 23, 2007 [2]. Following statement very clearly states what XQuery is and its uses.

   The mission of the XML Query project is to provide flexible query facilities to extract data from real and virtual documents on the World Wide Web, therefore finally providing the needed interaction between the Web world and the database world. Ultimately, collections of XML files will be accessed like databases   [3]

Even though several proprietary XQuery Eclipse plug-ins exist currently such as XQIDE[4] , oXygen XML editor[5] or ALTOVA editor[6] it will be quite useful to have Eclipse's own XQuery editor under EPL and the purpose of this proposal is to suggest creating such a XQuery editor that will be managed by Eclipse community and will be placed under Eclipse Webtools umbrella.

Project Description
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The aim of this project is to create a plug-in for Eclipse that will work as a syntax editor for XQuery within Eclipse which will be beneficial for web developers to write queries for XML documents and XML based data management systems such as eXist [7] using XQuery. Since Eclipse web platform

seems to be quite popular with web developers[8], the support for XQuery will be surely appreciated by them and with enhancements to XQuery such as dynamic namespace binding in next version of XQuery which is 1.1 [9], my guess is that XQuery will be a favourite among web developers not only for querying XMLDBs but also to query other XML supported office documents and even relational databases, in which case this plug-in will be quite a hit among web developers.

Main objectives of this project are as following and I will use this as a guideline to determine the success of this project at the end.

1)Syntax colouring
2)Content outlining
3)Syntax Validation and highlighting errors
4)Error tips (Reason for errors and may be some guide to undo it)
5)Content assistance
   *. Ctrl + Space to show the content support
   *. Code snippets
6)Preference page to control the overall behaviour of the plug-in including syntax highlighting and defining the output

As for the implementation, I'm hoping to extend Structured Source Editor (SSE)[10] in Eclipse and use it to handle syntax colouring, error highlighting, error tips and content assistance using extension points in SSE and other features such as validation framework[11]. As a starting point to text editor plug-in development through SSE, I find EclipseCon presentations on the matter immensely useful[12][13].

However for effective handling of tasks such as real-time validation we need a good mechanism from the back end to effectively match typed words with the valid syntax within shortest possible time. To achieve this ability I'm thinking of using ANTLR[14] to create a syntax tree using XQuery grammar files and matching the generated syntax tree against typed text to achieve high performance in real-time tasks like as-you-type validation.

By the end of GSoC time period I'm planning on achieving above mentioned basic objectives and with the time I hope to make this the primary XQuery editor for Eclipse. Also if I get the fortune of going ahead of the time line, I'm hoping of implementing some debugging features but because of the uncertainty they will be described as future works in "The Future" section below.

As a last wish regarding the project, I'm hoping this will be another one of my successful contributions to FOSS world and will be useful to Eclipse community in the future.

Project Schedule
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I have identified six phases for the project and have come up with a schedule that will help me to guide myself and will give a way for others to determine the effectiveness of my contribution to the project. Also this self enforced deadlines will help to keep me right on the track with the time line and will make sure I complete my project successfully.

The dates are based on 2008 GSoC time line.

Interim period and Community bonding period
Duration: From now to 25th May

I will use this time mainly for the purpose of researching on XQuery. Even though I'm very familiar with XQuery and XPath, this project requires me to be an expert on the subject. Therefore I would like to dedicate most of my time for researching on the matter; reading on XQuery specifications, user cases, data model and other related documents that can be found at W3C and writing some initial codes to get used to SSE. Also I will use this time to get used to Eclipse community and explore other Eclipse branches

Duration: 2 weeks (26th May   8th June)

I have dedicated the first week of this phase to prepare grammar files for ANTLR and prepare the syntax tree that will be imperative in next steps of the development process. Then the other week will be dedicated for defining a XQuery region and partition within the XQuery editor which will enable using XML Editor to handle XML syntax in a mixed content. This way the editor will be able to handle XML data without re-inventing the wheel. However for the success of this phase, my researches in the interim and bonding period will be invaluable.

Duration: 2 weeks (9th June   22nd June)

This time period will be used to implement syntax colouring and content outlining features with some additional, simple support features. However since there won't be a preference page implemented for the module at this time, I will use hard coded colours for syntax colouring and will give the ability to configure syntax highlighting through a preference page when I'm creating the preference page at a later point of the time line. By the end of this phase we will have a editor that can be tested against XQuery syntax but without any dynamic features.

Duration: 4 weeks (23rd June   20th July)

I'm planning on using this time period to add dynamic behaviours to our new text editor. I'm expecting mainly to implement as-you-type syntax validation and content assistance in the editor. By the time around mid term evolution we should have partially finished editor that will have most of basic features and some advanced features such as dynamic validation.

Duration: 2 weeks (21st July   3rd August)

This final phase of the development process will be used to implement the preference page to give users an interface for controlling the overall behaviour of the plug-in, manage syntax highlighting settings and to define the output. Also I'm thinking of giving some support for multiple XMLDB configurations within this phase. By the end of this phase we should have a fully functional plug-in with may be some unfixed bugs and some unsupported XMLDBs.

Duration: 2 weeks (4th August 18th August)

This phase will be dedicated to fix remaining bugs and for documenting the project. I'm hoping to create two documents for the sake of future users of this plug-in.

1)Short user manual for end users (with instruction to install the plug-in and how to use it)
2)Developer's guideline explaining the structure of the project

About me
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I m Buddhika Laknath [15], a third year student studying for my Bachelor of Science in Information Technology at the University of Moratuwa [16]. I'm also a returning student from last year GSoC after finishing my project successfully[17] where I worked with Gnome on creating a new document editor using python. Also I have been working with Java for more than 8 years and have been using PHP and Python for several years.

For few years I had been working as a freelancer where I got the chance to work on projects related to software development with Java/C++ and professional web development with PHP and related frameworks/CMSs .I m also a GNU/Linux enthusiast who uses Ubuntu Linux destro with Gnome.

For nearly last one and half years I have been working in Vesess [18], a pioneering web development firm in Sri Lanka which firmly supports the FOSS community and where web standards takes priority in its projects. Through Vesess I got the chance to experience how a project could be done in collaboration with a distributed team and how to properly manage a project.

Why may I be selected for this project?
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I m a hacker; I love learning new things, creating new things and being innovative, coding and facing new challenges where I can prove myself and enjoy them. I also have the ability to adjust to new technologies and environments quickly so I can work fast in a new environment. I also have all required requirements for this project.

Technology wise, I have been using Java for longest of my programming life, have been using Eclipse for my Python developments through PyDev[19] and for web developments using Web Tools, aware of many XML technologies and have used some of them such as XQuery, XPATH, SOAP, WSDL and DocBook for my day today activities either at Vesess or for my other Free and Open Source contributions.

Experience and attitude wise, I have experiences of working individually and with a team, and have the ability and confidence to successfully finish a project. Also I have been involved with FOSS activities for a considerable amount of time where I have worked as a module developer[20] and a maintainer for Drupal community and as an active member for Gnome. Therefore I'm quite familiar with FOSS way of life so I'm sure I will feel very comfortable in Eclipse community.

The Future
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As I mentioned above, I expect to add debugging support for this plug-in. However not all XMLDBs provide an API which we will need if we are to support debugging features for that DB and therefore we will have to start from where there are APIs defined and work with what we have. For example eXist doesn't have an API yet but Qexo XMLDB provides some support for debugging.

I have put this feature out of the scope of GSoC time period because I wanted to give enough time for other features and finish them successfully and comprehensively. I'm planning to keep in touch with Eclipse community even after the GSoC time period and incrementally add more features to this plug-in and the top item of the agenda after GSoC is to add a debugger for XQuery plug-in.

I also think we should do a quick revamp of this plug-in as soon as possible after the release of XQuery 1.1 and this plug-in could be what web developers are looking for in that situation. I'm ready to do the necessary work in order to get to that position and work I do within the GSoC period will be the first step for that.

References:
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[1] http://www.w3.org/XML/Query
[2] http://en.wikipedia.org/wiki/XQuery
[3] http://lists.w3.org/Archives/Public/www-tag/2003Oct/0115.html
[4] http://xqide.org/eclipse/plugin-page.php
[5] http://www.oxygenxml.com/download.html
[6] http://www.altova.com/products/xmlspy/xquery_editor.html
[7] http://www.exist-db.org
[8] http://dev.eclipse.org/blogs/wayne/2008/03/20/lots-of-web-developers
[9] http://www.w3.org/TR/xquery-11-requirements
[10] http://www.eclipse.org/webtools/wst/components/sse/overview.html
[11] http://www.eclipse.org/webtools/wst/components/sse/tutorials/source-validation.html
[12] http://www.eclipsecon.org/2008/index.php?page=sub/&id=280
[13] http://www.eclipsecon.org/2008/index.php?page=sub/&id=456
[14] http://www.antlr.org
[15] http://luckycala.wordpress.com
[16] http://www.mrt.ac.lk
[17] http://code.google.com/soc/2007/gnome/appinfo.html?csaid=80FB0FA809768E72
[18] http://www.vesess.com
[19] http://pydev.sourceforge.net
[20] http://drupal.org/project/requestinvitation