经典Java IDE Eclipse的需求分析

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1. 实验思路
2. 确定开源IDE项目：Eclipse

2) 使用爬虫获取Eclipse官方网站的信息，存至本地

3) 对爬取的信息作分析，得到各类潜在需求

4) 对需求进行分类，总结得到文档

1. 爬虫设计

1) 布隆过滤器（排除重复网页），其中哈希函数采用了DJBHash算法

对应源代码中class BloomFilter部分

2) 添加了BlackList和WhiteList存储部分关键字，用以对网页作排查操作，加快有效爬取进程，一个例子如下：

BlackList = {'amazom.com', 'google.com', '.css', 'apple.com'}

WhiteList = {'FAQ', 'ECLIPSE'}//访问Eclipse FAQ板块的内容

3) 添加线程模式，统一管理爬取工作流程，使用了threading库的部分函数

对应源代码中class myThread部分

1. 网页源码分析使用beautifulSoup，从html源码中找到对应需要的模块

三、数据分析

获取的数据主要来自Eclipse官网内部的FAQ，我们将对这类FAQ进行分析获取潜在需求。部分分析结果如下：

1. 元数据为：Eclipse means a lot of different things to different people. To some Eclipse is a free, state-of-the-art Java development environment. To others, Eclipse is a flexible environment to experiment with new computer languages or extensions to existing languages. To yet others, Eclipse is a comprehensive framework that deploys many advanced and modern software design and implementation techniques.(FAQ: What is Eclipse)

分析可得需求：IDE免费，提供优质的Java编程环境；IDE可以便于尝试新的语言或在原有语言上进行扩展；IDE可以支持现代软件工程设计，提供各项支持技术

1. 元数据为：PDF documentation is only available for Eclipse 3.1, but is no longer available for new releases. When you download Eclipse code, documentation is provided in the form of HTML files, made accessible through a table of contents contained in a file called toc.xml. (FAQ: Can I get my documentation in PDF form)

分析可得需求：IDE应支持多种格式文本的输出，如pdf，方面使用者需要

1. 元数据为：Successful open source projects thrive because of the support of their community. The easiest way to contribute back to the community is to report bugs. If you encounter problems with Eclipse, or want to suggest a way to enhance it, make your way over to https://bugs.eclipse.org. You will need to create an account before entering a report, but anyone can browse the existing bug database without registering.(FAQ: How can I report a bug)

分析可得需求：IDE应支持bug上报，方便开发者维护自身代码，也方便发现IDE本身可能存在的问题

4) 元数据为：Eclipse makes a careful distinction between published APIs and internal implementation details. The APIs are designed to reduce coupling between plug-ins to a small, stable interface. This insulates clients of the interface from being affected by implementation changes, and it allows the plug-in that publishes the interface to continue to innovate and grow without breaking existing clients. If your plug-in uses only published API and carefully follows the API contracts defined in the API javadoc, your plug-in should continue to work after migrating to a new Eclipse release.

分析可得需求：在从Eclipse2.1升级到Eclipse3.0版本时，保证旧版本的插件如果只使用已发布的api，并严格遵循api javadoc中定义的协议，那么插件在迁移到新的eclipse版本后能够继续工作。

5) 元数据为：The Navigator provides a view of the workspace and shows resources available on the file system. From the Navigator, files can be opened in an editor.

When multiple editors are opened, it can be difficult to keep track of where the related resources are in the Navigator. For this reason, the Navigator has support to synchronize its tree view with the currently edited resource.

分析可得需求：导览器应当提供工作区的视图，并且显示文件系统上可用的资源，可以通过导览器，在编辑器中打开文件。在打开多个编辑器时，导览器应当保证树状图和当前编辑的资源是同步的。

1. 元数据为：Whenever it detects an error, the Java editor highlights the error using a wavy red line under the offending code and a marker in the left editor margin. Moving the mouse over the underlined code or the marker will indicate the error. The marker can be selected with the left mouse to activate the Quick Fix pop-up, indicating actions that can be undertaken to repair the error. Alternatively, pressing Ctrl+1 will activate Quick Fix from the keyboard.

分析可得需求：无论何时检测到错误，Java编辑器都会在有问题的代码下使用一条红色波浪线和编辑器左边空白处的一个标记来突出显示错误。将鼠标移到带下划线的代码或标记上将指示错误。可以使用鼠标左键选择标记以激活快速修复弹出窗口，指示可以采取的操作以修复错误。或者，按ctrl+1将从键盘激活快速修复。

7) 元数据为：If you know how to run your Java program, you can debug it.

Assuming that you just ran your Java program, press F11, and the most recently executed launch configuration will be launched under control of the Eclipse Java debugger. Breakpoints can be set in any Java editor by double-clicking in the left margin of the editor or by using the context menu in the left margin to toggle the breakpoint on this line.

分析可得需求：如果刚刚运行了Java程序，那么按下F11，Eclipse Java调试器会启动，启动配置采用最近一次的执行配置。断点可以通过双击编辑器左边距或者使用左边距的上下文菜单来设置。

1. 元数据为：A Progress view was introduced in Eclipse 3.0 to provide feedback for activities occurring in the background. This view also allows the user to cancel background activity and to find out details when errors occur in the background. The progress animation icon on the right-hand side of the status line is also associated with this view. The icon is animated whenever anything is running in the background.

分析可得需求：Eclipse3.0中引入了一个进度视图，为后台发生的活动提供反馈。此视图还允许用户取消后台活动，并在后台出现错误时查找详细信息。状态行右侧的进度动画图标也与此视图关联。每当有任何东西在后台运行时，图标都会设置动画。

1. 元数据为：Eclipse 3.0 lifts the restriction of allowing only a single instance of each view type. You can now open any number of copies of a given view.

分析可得需求：Eclipse3.0应该可以打开给定视图的任意数量的副本。

1. 元数据为：This chapter covers the remaining facilities of Eclipse Platform runtime: APIs for logging, tracing, storing preferences, and other such core functionality.

分析可得需求：提供用于记录，跟踪，存储首选项以及其他此类核心功能的API

1. 元数据为：The work value doesn't need to be very precise; your goal here is to give the user a rough estimate of how long it will take.

分析可得需求：为用户大致估计工作时间

1. 元数据为：Thus, an IProgressMonitor is an abstraction that allows for decoupling of UI and non-UI components.

分析可得需求：允许UI和非UI组件分离的抽象。

13) 元数据：The Eclipse runtime plug-in provides a simple set of APIs for logging exceptions, warnings, or other information useful in debugging or servicing a deployed Eclipse product.

分析可得需求：提供用于记录异常，警告或其他对调试或维修已部署的产品有用的信息的API

14) 元数据：Each dialog has its own particular attributes and uses, and supports varying degrees of customization based on your needs.

分析可得需求：支持不同程度的对于对话框的自定义

15) 元数据：The platform job mechanism uses a pool of threads, allowing it to run several jobs at the same time. If you have many jobs that you want to run in the background, you may want to prevent more than one from running at once.

分析可得需求：对同时运行多个作业的允许与禁止

16) 元数据：Its stated goal, according to the SWT home page, is to provide efficient, portable access to the user-interface features of the operating systems on which it is implemented; Its goal is not to provide a rich user-interface design framework but rather the thinnest possible user-interface API that can be implemented uniformly on the largest possible set of platforms while still providing sufficient functionality to build rich graphical user interface (GUI) applications.

分析可得需求：提供高效，便携式访问的UI，尽可能薄的用户界面API，而非丰富的用户界面设计框架

17) 元数据：SWT also makes minimal use of Java class libraries, thus allowing it to be run with older JDKs or restricted class libraries on handheld computers.

分析可得需求：与较旧JDK或者笔记本上的受限类库一起运行

18) 元数据：External tools allow an end user to achieve a basic level of integration for a non-Eclipse-aware tool without writing a plug-in.

分析可得需求：允许添加用户自己编写的外部工具

1. 需求分类

总结上述需求，可以分类如下：

1. 业务需求：

IDE免费，提供优质的Java编程环境；

IDE可以便于尝试新的语言或在原有语言上进行扩展；

IDE可以支持现代软件工程设计，提供各项支持技术；

允许添加用户自己编写的外部工具；

1. 功能需求：

IDE应支持多种格式文本的输出，如pdf，方面使用者需要；

IDE应支持bug上报，方便开发者维护自身代码，也方便发现IDE本身可能存在的问题；

允许与禁止同时运行多个作业；

作业进度侦测与取消；高级调度；记录跟踪与存储首选项；

在从Eclipse2.1升级到Eclipse3.0版本时，保证旧版本的插件如果只使用已发布的api，并严格遵循api javadoc中定义的协议，那么插件在迁移到新的eclipse版本后能够继续工作。

无论何时检测到错误，Java编辑器都会在有问题的代码下使用一条红色波浪线和编辑器左边空白处的一个标记来突出显示错误。将鼠标移到带下划线的代码或标记上将指示错误。可以使用鼠标左键选择标记以激活快速修复弹出窗口，指示可以采取的操作以修复错误。或者，按ctrl+1将从键盘激活快速修复。

如果刚刚运行了Java程序，那么按下F11，Eclipse Java调试器会启动，启动配置采用最近一次的执行配置。断点可以通过双击编辑器左边距或者使用左边距的上下文菜单来设置。

Eclipse3.0中引入了一个进度视图，为后台发生的活动提供反馈。此视图还允许用户取消后台活动，并在后台出现错误时查找详细信息。状态行右侧的进度动画图标也与此视图关联。每当有任何东西在后台运行时，图标都会设置动画。

IDE应该具有资源侦听器，资源更改侦听器将收到工作区中发生的大多数更改的通知，包括创建、删除或修改任何文件、文件夹或项目时的通知。

1. 非功能需求：

UI和非UI组件分离的抽象；

支持对话框的自定义；

支持旧版本JDK和受限类库；

简洁高效的UI；

估算工作时间；

事项优先与进程互斥；异常、警告以及其他有用信息的记录

导览器应当提供工作区的视图，并且显示文件系统上可用的资源，可以通过导览器，在编辑器中打开文件。在打开多个编辑器时，导览器应当保证树状图和当前编辑的资源是同步的。

Eclipse应该让插件的一部分成为可选项，允许它独立于插件的其余部分进行安装、卸载或更新。