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STUDY OF DEVELOPMENT OF JAVA APPLICATIONS IN ECLIPSE ENVIRONMENT AND JAVA BASED CALENDAR APPLICATION WITH EMAIL NOTIFICATIONS

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ABSTRACT

Eclipse is one of the most commonly used programmes in the technical development of software solutions and programming applications. It is open source software and offers free libraries with comprehensive availability.

Eclipse was studied for the development of Java applications in this thesis paper. An application was built using the Java programming language to enhance the analysis and to get hands on experience through Eclipse IDE. A software application that can be used on all current operating systems is the proposed application. Using Java SE (standard edition) version 1.7, which is the most recent version available from Oracle Corporation, the application was developed.

Java Swing API has been used for creating GUI (graphical user interface) of the application. The MySQL database management system has developed a database for event credentials. The connection between the application and the database was created through JDBC Java database connectivity. Some additional Java APIs have been loaded into the workspace of the Eclipse project, and a detailed description of how to use external libraries in the Eclipse environment has been given.

Keywords: Java, Eclipse, Framework Administration of Java Databases, JavaMail, MySQL, Web Applications

INTRODUCTION

To classify days, months and years, calendars are primarily used. It tells us about social cultural, religious, academic and professional events and activities that are significant. A calendar, for example shows the days that are religious, cultural, and national holidays. The beginning and closing of business accounting records are decided by calendars. We need a timetable in our everyday lives to define the deadlines for sending jobs, assignments

and paying utility bills, etc. The value of calendars in everyday life can not be denied, as these are used for appointments, deadlines, meetings and anniversary dates.

Today, with their growing value and use in our everyday lives, calendars need to be personalised and updated in the era of the World Wide Web. For an event i.e. a meeting, appointment or some other significant date, one must be notified. In this period, communication by email becomes so prevalent that a calendar application must be developed through which one can be notified by email.

This demonstrates deep Java programming language experience and awareness of linking database applications. There was a step-by-step demonstration of how to do the Java project in Eclipse.

The work was broken down into various parts.

It was important to create a calendar Interface that would allow the user to create a warning event for one day. To set the alert and the event information, the user will be prompted to enter the following event details.

- Name of the incident
- Event venue
- Tel. no. of the customer
- Email address of the person to whom the alert is sent

The following steps were prescribed by the creation protocol for the application:

1. User Interface Style
2. Coding for the submission
3. Database development for the application
4. Linking the database to the software
5. Adding email features to the application

INTRODUCTION TO JAVA

Java, originally developed by James Gosling at Sun Microsystems, is a computing platform and a high-level programming language. In 1991, a team called the "green team" at Sun Microsystems began working on the Java language project, which was eventually published in 1995. Java has syntax similar to the languages C, C++ and derived from them. In Java, we have to compile and interpret code to run it, except for other languages in which one has to either compile or interpret the code before using it. The following machines will run a Java programme if they have a Java virtual machine (JVM) enabled.

- OS Windows
- Linux
- The Solaris
- MacOS

GRAPHICAL GUI FOR THE USER INTERFACE IN JAVA

A Graphical User Interface (GUI) is a human-friendly way of communicating with software for computers. A GUI gives a certain 'look and feel' to an application. A Interface is constructed from components and these are the components with which the application is interacted with, run and managed by the user displays a GUI portion. Buttons, the combo box, menus, the title bar are some of these elements. These are all governed by the Jbutton, JcomboBox, and Jmenu etc. of the Java Swing API. To use the programme, the user interacts with these components.

SWING API

It is a graphical user interface toolkit for Java. Swing, which is part of Oracle's JFC (Java Foundation Class), is an API that provides Java programmes with a graphical user interface. The Swing API has been successfully developed for the Abstract Window Toolkit (AWT) and offers an improved set of GUI components. In comparison to the abstract window toolkit, it also has more advanced 'look and feel' and versatile elements.

Swing API must be learned to construct a Java application with a graphical user interface. Swing helps programmers to create a personalised look and feel. This involves a wider collection of elements such as keys, marks, panels and controls for the list, etc.

The list of characteristics that distinguish and make Swing more powerful than AWT is below.

- The basic Swing components can be adjusted and tailored to the features that one actually requires.
- If you need to add pictures, figures, drop shadows, or animations to the GUI, the Java 2D API is required. This facility is given by Swing; the explanation is that Swing is constructed from a 2D box.

Inside a Java programme or inside Java and other device programmes, Swing offers data transfer, such as copying, pasting, cutting, drag and drop.

- Swings API also provide an undo and redo facility to developers.
- Swing apps can be run on both web browsers (as applets) and as normal desktop apps.

- One can build swing applications that can be used and communicate in their own languages with users worldwide.

INTRODUCTION MYSQL

MySQL is the most common and most commonly used framework for database management in the world. It is an RDBMS (relational database management system) open source and a common option for use in both web and desktop applications.

The term SQL stands for structured query language. Tables are the most important thing in SQL, as the data is stored in the form of tables, making it easy to view, retrieve and change the data.

THE MOST RECENT VERSIONS OF MYSQL

- MySQL is the most current edition of MySQL in operation. The features that have been added to MySQL
- MySQL provides a plugin for thread management, allowing several clients to connect to the server and execute statements.
- It offers new features such as pluggable authentication and proxy users.
- On multi-core processing units, MySQL has more reliability to maintain. Since the trend in today's hardware production is to increase the number of cores instead of rising clock speeds. This feature increases the value to be taken from MySQL
- Multiple CPUs gain. In traditional processors, rather than waiting for the CPU to get faster.

CONNECTIVITY OF JAVA DATABASES (JDBC)

What does JDBC do?

It is a programming interface (API) for a Java application that enables programmers to access the database management system from inside the Java programme. JBDC has been developed by JavaSoft, Sun Microsystems.

JDBC enables Java programmers to use a collection of APIs and classes written in the Java programming language to execute SQL statements, and to access tabular type data in Java code. By using JDBC, the SQL database is able to INSERT, DELETE and UPDATE data by accessing it from the Java program.

JDBCC OPERATIONS

The JDBC operation consists of three basic steps:

- The relationship with a database is created.

- To give the SQL statements.
- Outcomes are processed.

Introduction to Eclipse IDE

Eclipse is a multi-lingual platform for software development, consisting of an integrated development environment (IDE) and an external plug-in framework. An IDE offers many different tools on one unified platform, such as code writing, compiling, running, debugging, file management, and documentation.

Eclipse is one of the IDEs which are often used to create applications and technical solutions professionally. A benefit of Eclipse over other professional IDEs is that Eclipse is an open source platform, and new libraries and tools can therefore be added easily. It is written mainly in the Java programming language.

There are a range of languages whose applications can be built through extensible plug-in systems in Eclipse. JAVA, C, C++, COBOL, Perl, Android, Python, Ruby, Groovy and Scheme are some of the most commonly programmed languages in Eclipse.

Eclipse can be downloaded from the Internet at no cost. You can quickly find a rundown of how to download instal and customise them for use.

There are primarily two forms of edits available for the MySQL server. One is an edition of MySQL Culture and the other is an edition of MySQL Enterprise. The distinction between them is that for a particular business or technological necessity, the Enterprise version has more versatility to choose from many MySQL versions and is available for a 30-day trial. But we will use the group version, because to download and fulfil the specifications, it is freely available, which is also available free of charge from the MySQL website, is the newest version of the JDBC connector available.

THE DESIGN

There are several different methods that rely on the developer/designer to design the application. In this case, good programming knowledge is needed in Java; in particular, Only if you have Java Swing API commands and manage the events in the graphical user interface can things be simpler. In addition to this it is easier to find and repair the bugs by familiarisation with Eclipse.

CREATE ECLIPSE PROJECT

- Double-click the eclipse.exe file on windows and eclipse to open Eclipse apps.
- On Mac/Unix, in the directory where Eclipse was installed. Click File > New > Java Project to launch a project

IMPLEMENTATION

Until Java coding was introduced, the application's graphical view was first sketched out how it would look and which components would need to be added. For the application, there are two graphical windows that are required. First is the primary graphical user interface that occurs when the programme is run by the user. When the user clicks the Add Warning button to add a case, a second graphical window appears.

CODING FOR GRAPHICAL USER INTERFACE

After developing the Eclipse project, the next step is to encode the application. For the application, five separate classes were developed. There was a key class involving the graphical user interface and the handling of the necessary functions for events. To create the relation between the primary application and the database, the other class was written. The third class was written in the form of strings to obtain the data. In Java, the fourth class was written to provide methods for adding, deleting and searching data. There is also a class used to send emails from inside the programme using the Java mail API.

CREATION OF DATABASE IN MYSQL

The MySQL database management system was used to build the database for the application. The event information can be generated, accessed and updated from within the application within the MySQL database management system. This database contains one table that contains four columns for the event name, event location, phone contacts, and email recipients.

CONNECTING APPLICATION TO DATABASE

Finally, the JDBC connector links the database and the programme. You need a J-connector to do this, which connects to the MySQL database and Java applications. The connector jar file was imported into the project's CLASSPATH file.

API JAVAMAIL

JavaMail is an application programming interface used for electronic mail messages to be read/composed, submitted and received. Sun Microsystems is responsible for designing this API. The JavaMail API offers an independent protocol and platform-independent structure for the transport of electronic mail.

Javax.mail and Javax.mail.activation packages comprise the key classes of the JavaMail API. The JavaMail API can be used for various purposes, such as sending a notification at the time of registration, sending a message "Thank you for your interest in my article" or sending notifications of important updates, etc.

For the following major protocols, the JavaMail API may be used.

SMTP-Simple Protocol for Mail Transfer

- It offers electronic mail sending/delivery mechanisms.
- IMAP-Protocol of Internet Mail Access:
- Internet Mail Access Protocol is an advanced electronic mail reception protocol with several mail boxes for a single person.

POP3-Protocol of the Post Office 3

- It offers methods for receiving messages. But only a single mail box for each user is supported.

MIME-Internet Mail Extensions for Multipurpose

- It is used by the mail programme and not the transport protocol, directly. This tells the browser what is being sent, such as the message and attachment format.

PACKAGES AND CLASSES OF JAVAMAIL API

Two main JavaMail API packages, Javax.mail and Javax.mail.activation, are available. Many classes used for Java mail are included in these packages. The following are some of the key groups used in the proposed application:

- Javax.mail.Message
- Javax.mail.Session session
- Javax.mail.Transportation
- Javax.mail.domain.InternetAddress of the Internet
- Javax.mail.internet.internet.mimemessage

EMAIL SENDING USING THE JAVAMAIL API

There are several different ways of sending an email, so you have to have an SMTP server responsible for sending emails. One may use the following techniques in order to use an SMTP server. Installation and use of any SMTP server, such as Database for Apache James, Poscast server, cmail server, etc

- Using other companies' SMTP servers, such as Gmail, Yahoo, etc.
- Using the SMTP server that every host offers.

The SMTP server supported by Gmail was used in this application, since the purpose was to send emails from within the application.

STEPS FOR UPLOADING AN EMAIL

Sending an email takes three steps.

- Session Object Receiving Session Object
- Message composition
- To send a message

TO COMPOSE THE MESSAGE

You need to use a class called Javax.mail.Message to compose a message. As this is an abstract class, the class 'Javax.mail.internet.MimeMessage' was used since it is used most often to compose a message.

To construct a message, you need to transfer a session object into the MimeMessage class creator. The following is the syntax for this.

MimeMessage message = new (session) MimeMessage

The message object was generated by this. To store information in this object, several methods are provided by the MimeMessage class. Such approaches are as follows.

- SetFrom the Public Void (Adress 28address)
- AddRecipients to public vacuum (Message.recipientType type, String addresses)
- public void setSubjectSetSubject (String subject)
- SetText Public Void (String textmessage)

GIVE A MESSAGE

A method for sending messages is provided in the Javax.mail.Transport class. Such strategies are as follows:

- Sending a public static void (Message message)
- Sending a public static void (Message message, Address[] address)
- An instance of sending a message is:
- The transportations end (message)

To submit emails using the JavaMail API, two jar files need to be imported from the project. These files for Jar are:

- Mail.jar.jar. o
- Activation.jar

Sun Microsystems offers these files and one can download them free of charge from the Oracle website. 1.4.5 Is the latest version of the JavaMail API.

CONCLUSION

The creation of applications in the Eclipse environment was clarified and the experiment to build the Java desktop application was carried out. The duties covered in the research are as follows:

- Step-wise clarification of how Eclipse IDE Java applications can be created.
- Desktop calendar application creation with Eclipse IDE email updates.

As a professional-grade development platform, Eclipse IDE has one greater benefit over other IDEs, i.e. it is open source, so it is easy to add new free libraries into it. In the Eclipse project, an experiment to load external libraries was performed successfully. To make the development simple, the proposed Java application needed to add external Java archive (jar) files; in the case of jar files, packages containing the required classes were used in the project.

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