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SIES GRADUATE SCHOOL OF TECHNOLOGY

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OOPM MINI PROJECT REPORT

on

"DIGITAL CLOCK USING JAVA"

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ABSTRACT:

In this project we were assigned to build a Digital Clock using JAVA as our base coding language and Swing for GUI.

INTRODUCTION:

In this project, we have created a digital clock GUI using Java and Swing. To make a digital clock we made use of the Thread and Graphics classes of Java. Threads are used to change the seconds, minutes, and hours of the clock and the Graphics class is used for the design of the clock. In this project, we have built a digital clock with 12-hour count time. The clock runs from 00:00 to 11:59 and then back to 00:00. Our display has four digits, two digits for minutes and two for hour. The specialty of this clock is that it has very low power consumption and condensed layout.

BACKGROUND:

For millennia, humans have been measuring time in numerous ways, some include tracking the movements of the sun with sundials, the use of water clocks, candle clocks, and hourglasses. Our modern-day system of using a 60-minute and 60-second increment clock dates to 2,000 B.C. from ancient Sumeria. The first mechanical clocks (with a Clock Face) were invented in Europe around the start of the 14th century and where the standard timekeeping device until the pendulum clock was invented in 1656. There were many components that came together over time to give us the modern-day timekeeping pieces of today.

Clocks can be broadly classified into two categories: I) Analog and II) Digital. Analogue clocks date back to the 1500s and how they work has not changed much since that time. They have become increasingly accurate over the centuries, but the principle and engineering that makes them work is still the same. Each of these analogue clocks will need three fundamental parts to make it work: A mechanism, an energy source, and a display. All clocks used to be what you call analogue devices before digital clocks were invented. An analogue clock contains two (or three) "hands" that go around in circles to show you the current hour and minute (and second). Each of these hands can point anywhere along the circle. That means that the minute hand can point to every numerical value that exists between 0 and 60. Digital clock is an alternative to a traditional analogue clock. This type of clock shows numbers to display the time in a digital format, such as on a watch, phone, or an alarm clock. This can be in both 12 and 24-hour formats. Digital clocks are not a lot different than analog clocks except that they handle the basic time keeping functions using all electronic components instead of mechanically. For instance, digital clocks use an electronic power supply, either AC power from an outlet in the wall or from a battery. It also has a time base that is electronic and "ticks" at an accurate rate. And a digital clock has an electronic "gear mechanism" usually called a counter. And for the display the digital clock typically uses one of two kinds of lights. It will use either Light Emitting Diodes (LED) or a Liquid Crystal Display (LCD) to display the lighted time.

SYSTEM DESIGN:

The major requirement in coding this program is Swing because it is used to create the Graphical User Interface (GUI) of the program. The Swing framework of Java has several components that give developers the freedom and flexibility to make eye-catching interfaces for windows-based applications. The best part about using Swing to create components like tables, scroll panes, buttons, and the like is that the framework is platform independent. The program can essentially be divided into objectives that we want to achieve. The first one is to create a user interface involving some graphics and the second objective is to implement the digital clock such that it shows the correct time always. The GUI of this digital watch program is the least interactive as it will just have one button that will display the current time. Therefore, creating the button and setting it inside the JFrame is all that is needed.

To find the current time, the following steps are taken:

1. To get the current time, the Calendar class of Java is used. It is an abstract class containing methods that will return the time, date, year, and month.

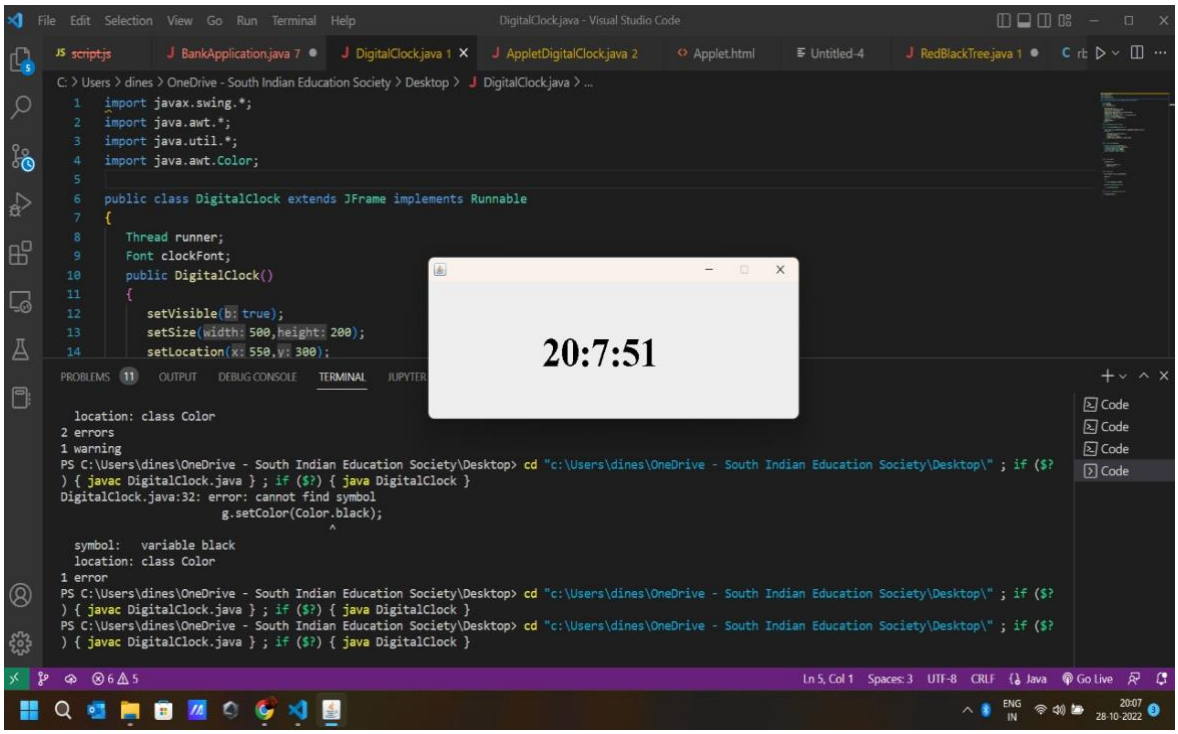
2. Once an object of the Calendar class is created, the current time is retrieved using the getDate() method. This clock is designed to be in the 12-hour format.

3. Finally, what is left is formatting the time int hrs:mm:ss. For this, an object of the SimpleDataFormat class is instantiated. The date obtained in the step above is then formatted according to the layout of hrs:mm:ss.

4. The printTime() function simply sets the text of the button to the current time every time it is called. It is called every second, besides which the thread sleeps.

5. The whole body of the code is placed in an Exception Handler in the unforeseen event of failure.

SNAPSHOTS:


File Edit Selection View Go Run Terminal Help
DigitalClock.java - Visual Studio Code
scriptjs
BankApplication.java 7
DigitalClock.java 1
AppletDigitalClock.java 2
Applet.html
Untitled-4
RedBlackTree.java 1
C: > Users > dines > OneDrive - South Indian Education Society > Desktop > DigitalClock.java > ...
import javax.swing.*;
import java.awt.*;
import java.util.*;
import java.awt.Color;
public class DigitalClock extends JFrame implements Runnable
{
Thread runner;
Font clockFont;
public DigitalClock()
{
setVisible(b: true);
setSize(width: 500,height: 200);
setLocation(x: 550,y: 300);
20:7:51
PROBLEMS 11
OUTPUT
DEBUG CONSOLE
TERMINAL
JUPYTER
location: class Color
2 errors
1 warning
PS C:\Users\dines\OneDrive - South Indian Education Society\Desktop> cd "c:\Users\dines\OneDrive - South Indian Education Society\Desktop\" ; if ($?
) { javac DigitalClock.java } ; if ($?) { java DigitalClock }
DigitalClock.java:32: error: cannot find symbol
g.setColor(Color.black);
^
symbol: variable black
location: class Color
1 error
PS C:\Users\dines\OneDrive - South Indian Education Society\Desktop> cd "c:\Users\dines\OneDrive - South Indian Education Society\Desktop\" ; if ($?
) { javac DigitalClock.java } ; if ($?) { java DigitalClock }
PS C:\Users\dines\OneDrive - South Indian Education Society\Desktop> cd "c:\Users\dines\OneDrive - South Indian Education Society\Desktop\" ; if ($?
) { javac DigitalClock.java } ; if ($?) { java DigitalClock }
Code
Code
Code
Code
Ln 5, Col 1
Spaces: 3
UTF-8
CRLF
Java
Go Live
ENG
IN
20:07
28-10-2022


20:16:13

FUTURE SCOPE:

The future scope of our project aims to build a programmable wake up alarm and a stopwatch system which would also display the present date to the user with the help of Java and Swing.

CONCLUSION:

Hence, this project was a simple Digital Clock GUI using Java and Swing.

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- **https://www.twinkl.co.in/teaching-wiki/analogue-clock#:~:text=An%20analog%20clock%20is%20a,at%20to%20indicate%20the%20time.**
- **https://modern-electronics.weebly.com/digital-clock.html**
- **https://myprojectideas.com/java-program-to-create-a-digital-watch-using-swing-java-project/**
- **https://github.com/tarun2791/Java/blob/master/Language%20Basics/GUI/digital%20clock/DigitalClock.java**