**JAVA MINI PROJECT**

**PROBLEM STATEMENT**: Rock, Paper, Scissors Game

**THEORY:**

Java Concepts used in the Project:

**1. AWT:**

AWT stands for **A**bstract **W**indow **T**oolkit. It is a platform dependent API for creating Graphical User Interface (GUI) for java programs. The **java.awt** package provides classes for AWT API such asTextField, Label, Button, Checkbox, ChoiceList, etc.

**WHERE IT IS USED?**

In our project we have used the Components of AWT like Textfields, Labels and Buttons(Rock,Paper,Scissor,Result,PlayAgain,Exit). Other functions used are-

* **setBounds()**-Helps to set the position of the Components.
* **setSize(500,500)-**To set the frame size of width and height to 500.
* **setLayout(null)-**The function sets the screen Layout .
* **setVisible(true)-**This function helps to set the visibility of the Frame.
* **setBackground(Color.orange)**-The function sets the background colour of the Frame to orange.
* **setEditable(false)-**This function does not allow you to change the content of the TextField.
* **ActionListener-**

The Java **ActionListener** is notified whenever you click on a button or menu option. The ActionListener is found in the java.awt.event package. It has only one method -actionPerformed().

We have added **ActionListener** on the following buttons**-ROCK, PAPER, SCISSOR, RESULT,** **PLAYAGAIN, EXIT.**The actionPerformed() function gives the desired responses on the press of any of the above buttons.

* **WindowListener-**

The listener interface for receiving window events is called WindowListener.We have used the **windowClosing ()** method of the WindowListener interface in order to close the window by incorporating **System.exit(0)** in the function body.

**2.APPLET:**

Applet like any application program,can perform arithmetic operations,display graphics,play sounds,accept user input,create animation and play interactive games.

**WHERE IT IS USED?**

In our program we have used **Applet** for **playing sound** .We have imported **java.applet.AudioClip** package in our code .**AudioInputStream** constructs an audio stream that reads its data from the target data line indicated.The **Clip** interface represents a special kind of a data line whose audio data can be loaded prior to playback,instead of being streamed in real time.**The AudioSystem** class acts as the entry point to the sampled audio system resources.**clip.open()** opens the clip nwith the format and audio data present in the provided audio input stream.**clip.start()** plays the sound clip.

**3. RANDOM CLASS:**

Java provides support to generate random numbers primarily through the **java.**lang.Math

And **java.util.Random** classes. You can use the Random class to generate random numbers of different types such as int,float,long and boolean.

**WHERE IT IS USED?**

We have used **Random class** in our project for computer’s choice out of the three options. The computer selects any of the three options Rock, Paper or Scissor through the random method incorporated.

The **rand.setSeed(System.currentTimeMillis());** function is used to generate pseudo random numbers.

**4.EXCEPTION HANDLING:**

Exception Handling is a mechanism of handling abnormal conditions with the help of some exception handling code and display a user friendly message for taking corrective actions.

* **try-catch block-**

The try block contains the program statement that are to be monitored for an exception.

The catch block contains the exception handling code.Every try block is followed by a catch block or finally block.

**WHERE IT IS USED?**

Exception Handling concept is used in the **playSound()** method of our code**.** It searches for the wav File in the mentioned location and returns an exception if the wav file is not found.

**printStackTrace ()** helps the programmer to understand where the actual problem occurred.

It is a method of class Throwable of java.lang package.

**5. INHERITANCE AND INTERFACE:**

**Inheritance** is the mechanism of deriving new class from old one, old class is known as super class and new class is known as subclass. The subclass inherits all of its instance variables and methods defined by the super class and it also adds its own unique elements.

An **interface** is a collection of abstract methods and final static data members. It is used to achieve full abstraction

**WHERE IT IS USED?**

In our project the class ‘**Game’** **extends the Frame class** which enables the Game class to acquire the methods of the Frame class i.ethe methods declared in the Frame class in Game class can be overridden**. implements** keyword is used for implementing the interfaces ActionListener and WindowListener.

**6. CONSTRUCTOR:**

A **constructor** is a special member function,which is called automatically(implicitly) whenever an object is created.Its sole purpose is to create objects which includes memory allocation and member initialization.Constructors are of two types-

* **Default**(No argument constructor)
* **Parameterized**

**WHERE IT IS USED?**

The **default constructor** called ‘**Game’** is used in our case. The byte code always calls a constructor, whether you provide or not. When you compile code which uses default constructor it cannot assume the constructor doesn’t do anything useful as you can add something to it later to do something useful.

**7.SWING:**

Java provides a rich set of libraries to create Graphical User Interface in a platform independent way.Inorder to use swing components we have to import javax.swing package.JFrame,Jlabel,JButton,etc are some of the components of swing.

**WHERE IT IS USED?**

In java Swing ,the layer that is used to hold objects is called the **content pane**.The **getContentPane()** method retrieves the content pane layer so that you can add an object to it.We have used **JFrame** class which works like the main window where the components like labels,buttons textfields are added to create GUI.We have also added the **GIF’S** i.e The **WINNER** and **LOSER** gif using swing.Other functions such as **dispose()** which helps to destroy the current window and **pack()** method which sizes the frame so that all its contents are at or above their preferred sizes are used.

**8.METHODS:**

A method is a collection of statements that perform specific task. Methods are time savers that help us to reuse the code without retyping it.

**WHERE IT IS USED?**

Several methods such as **camera, playSound** and **clear** are used which helps in reusability of the code without retyping the statements in it.