The source program SoundWin.java can be found here:
http://www.csie.nctu.edu.tw/~tsaiwn/course/java/examples/soundwin/

You can try this URL:
http://www.csie.nctu.edu.tw/~tsaiwn/course/java/examples/soundwin/testsw.html

This program demostrate:

(1) How to open another URL. Either from Applet or from Application.
(2) How to play Sound Files. Either from Applet or from Application)
(3) Plus, We also include an Image Button in this demo.
And, use a thread to act as a timer to perform the hint task.
It will show a message that rolling to left on the panel.
While another message is shown on a flash manner.
(會有一個跑馬燈 以及一列閃爍的提示訊息)
(4) 若當作 Application 來 Run, 會看到一大堆跑過各主要程式的訊息,
包括 main, init, start, repaint, update, paint 等
(5) 若當 Applet (由 Browser 中看), 則該些訊息在 Java Console(主控台),
可在 Browser 的 工具 ==> Java 主控台 把 Java 的 Consol 叫出來觀看.
(請check 你的 Browser 確認你是用 Sun 的 JVM 還是用 Microsoft VM ?)
(6) 為免太多訊息, 在第 58 次叫 paint()之前若是由 Hinter 引起的訊息則
不顯示; 第 59 次開始自動顯示, 但你可以按 STOP 按鈕使其不顯示或
切回要顯示 (toggle). 不過非 Hinter (負責跑馬燈和閃爍訊息) 所引起
的訊息時則一定會顯示.

```
//File: SoundWin.java --- @CopyLeft by tsaiwn@csie.nctu.edu.tw
///Test Open a URL window, playing Song in Applet and Application
/// Also show you how Applet works through tracing each function
/// More Files need in addition to the SoundWin.java :
/// howcome.au, laugh.au, welcome.wav  and gigi.jpg , gigib.jpg
/// All files for this example can be found here:
//  http://www.csie.nctu.edu.tw/~tsaiwn/course/java/examples/soundwin/
///
//To compile this program:
//  javac -encoding Big5 -target 1.1 SoundWin.java
//
// This Java program can be run both as Applet and as Application.
// To run as an Application: java SoundWin
//////////
/*****  When used as an Applet, embed it in an HTML file as following:
 <br>
 <applet code="SoundWin.class" WIDTH=380 HEIGHT=288>
 </applet>
 <! Note that More Files needed to be put in the same directory:
    howcome.au, laugh.au, welcome.wav  and gigi.jpg , gigib.jpg
   ----------------------------------------------------------->
 </body>
 </html>
************************/

import java.applet.*;
import java.awt.*;
import java.awt.event.*;
import java.net.*;
import java.text.*;
import javax.swing.ImageIcon;       // for ImageButton
import javax.swing.JButton;

public class SoundWin extends Applet implements ActionListener {
      static final int WIDTH=358, HEIGHT=288;
      final private static int SHOW_HINT_INTERVAL = 588;  // milli seconds
      static final String WELCOME_NAME = "welcome.wav";
      static final String SONG_NAME = "howcome.au";
      static final String SONG2_NAME = "howcome.wav";
      static final String SONG_BUTTON_CAPTION = "點唱 情字這條路";
      static final String LAUGH_AUDIO_NAME = "laugh.au";
      static final String LAUGH_BUTTON_CAPTION = "HaHa大笑";
      static final String GIGI_PIC_FILENAME = "gigi.jpg";
      static final String GIGI_PIC_FILENAME2 = "gigib.jpg";
      static final String WEB_BUTTON_CAPTION = "連到奇摩";
```

```
       static final String WEB_LOCATION = "http://tw.yahoo.com";
       String SONG_LOCATION = "http://www.csie.nctu.edu.tw/~tsaiwn/audir/";
       String flashLocation =     // may be changed to other at RUN Time
          "http://www.csie.nctu.edu.tw/~tsaiwn/flash/" +
             "movie%ad%ec%a9l%c0%c9/4-%af%ab%c0J%abL%abQ/4.swf";
    //Some funny flash links in my directory: NCTU_CSIE_WEB/~tsaiwn/flash/
    //We will use a Random number to choose one from these URLs (.swf)
       String swfAry[ ] = {  // array for .swf flash file
           "http://www.csie.nctu.edu.tw/~tsaiwn/flash/" +
               "movie%ad%ec%a9l%c0%c9/4-%af%ab%c0J%abL%abQ/4.swf",
           "http://www.csie.nctu.edu.tw/~tsaiwn/flash/" +
               "movie%ad%ec%a9l%c0%c9/2-%ad%b8%b5%be%a4%a7%b9%da/2.swf",
           "http://www.csie.nctu.edu.tw/~tsaiwn/flash/02-GGL-fun/GGL_02.swf",
           "http://www.csie.nctu.edu.tw/~tsaiwn/mouse/catch_cursor.htm",
           "http://www.csie.nctu.edu.tw/~tsaiwn/flash/" +
               "movie%ad%ec%a9l%c0%c9/3-%b1%a1%b8%d6/3.swf",
           "http://www.csie.nctu.edu.tw/~tsaiwn/flash/" +
               "effect%ad%ec%a9l%c0%c9/36-%b7%cf%a4%f5%a4@/36.swf",
           "http://www.csie.nctu.edu.tw/~tsaiwn/flash/" +
               "effect%ad%ec%a9l%c0%c9/25-3Dengine/25.swf",
           "http://www.csie.nctu.edu.tw/~tsaiwn/flash/" +
               "effect%ad%ec%a9l%c0%c9/61-%b7%c6%b9%ab%afS%ae%c4%a4Q/61.swf",
           "http://www.csie.nctu.edu.tw/~tsaiwn/flash/",
           "http://www.csie.nctu.edu.tw/~tsaiwn/mouse/catch_cursor.htm",
           "http://www.csie.nctu.edu.tw/~tsaiwn/course/introcs/ghost/" };

       static int visitCount = 0;  // control which swf in swfAry[] to show
       static final Font myFont = new Font("標楷體", Font.BOLD, 18);

       Toolkit toolkit;
       Frame f;
       Applet ap = null;
       TextField tSouth = null;    // so the Applet can see this
       AudioClip song;
       Image giGiImage, giGiImage2;
       ImageIcon giGiIcon;
       Button bWeb = new Button( WEB_BUTTON_CAPTION );
       Button bSong = new Button( SONG_BUTTON_CAPTION);
       Button bLaugh = new Button( LAUGH_BUTTON_CAPTION ); // replaced by bGiGi
       JButton bGiGi = new JButton( LAUGH_BUTTON_CAPTION );
   //// bGiGi will use ImageButton through ImageIcon giGiIcon
       Button bStop = new Button("STOP");
       Button bFlash = new Button("FLASH");
     ///
   ///// we need a thread act as timer to show hint msg periodically
       protected Hinter hinter;  // a thread to flash the hint message
       String status = "---";

    static void printMsg(String s) {
        System.err.println(s);    //  System.err.flush( );  // need flush?
    } // 方便使用

       static private boolean isApplication = false;  // Application or Applet

    public static void main( String s[ ]) {   // for Application only
       try{ printMsg("Run the main( ) program..." );}catch(Exception e){;}
       Frame f = new Frame("Window 2004");
       isApplication = true;   // to indicate that this is an Application
                // an Applet will NOT run this main( ) function
       SoundWin a = new SoundWin( );    // new the Applet (simulate Browser)
       a.ap = a;   // a.ap points to the Applet it self
       a.f = f;  // a.f points to the Frame f created in Application main()
       TextField t2 = new TextField("This is an Application." +
                                " Press Enter Here will Quit.");
       a.tSouth = t2;    // so the Applet can see this t2 as tSouth
              // Applet won't run main( ); tSouth will equales null
       a.init( ); a.start( );  // simulate Applet behavior
       f.add(a, BorderLayout.CENTER);  // put the Applet in the Frame f
       TextArea t = new TextArea("這\n是\n獨\n立\n應\n用\n程\n式",2,3);
       t.setEditable(false); t.setBackground(Color.green);
```

```
      t.setLocale(java.util.Locale.CHINESE);
      t.setComponentOrientation(ComponentOrientation.RIGHT_TO_LEFT);
      t.setFont( new Font("標楷體", Font.BOLD, 24) );
      f.add(t, BorderLayout.EAST);   // a text board on the Right Side
      t2.setFont( new Font("Ludica Console", Font.BOLD, 24) );
      t2.setEditable(false); t.setBackground(Color.blue);
      t2.setForeground(Color.red);  // 紅色字体
      f.add(t2, BorderLayout.SOUTH); // t 和 t2 只是秀出這是 Application
      a.sayHello(WELCOME_NAME);    // Application say Hello on Console
      int szW[ ] = {  999, 888, 88, 98, 108, 128, 138, 149, 58, 158 };
      int szH[ ] = {  999, 888,  8, 18, 28,  38,  49,  58,  16,  68 };
      for(int i=0; i< szW.length; ++i) {  // resize the window for fun
         try {
            try { Thread.sleep(368); } catch (InterruptedException e) {;}
            f.setSize(WIDTH+ szW[i], HEIGHT+ szH[i]);
            f.setVisible(true); f.validate( );
         } catch(Exception e2) {;}
      } // for
      try { printMsg("=== .. main( ) finish. ===" );
            printMsg("   ===================" );
            printMsg("      ==============" );
            printMsg("         ========\n" );
      }catch(Exception e){;} // forget any error
   } // main( ) ends here

   public SoundWin( ) {  // Constructor, remember SoundWin extends Applet
      if(ap==null) ap = this;   // Let ap points to myself first
   }

   private void decorateFrame( ) {  // some funny Layout
      Label b2a = new Label("假"); Label b2b = new Label("做");
      Label b2c = new Label("真"); Label b2d = new Label("時");
      b2a.setFont(new Font("標楷體", Font.BOLD, 18));
      b2b.setFont(myFont); b2c.setFont(myFont); b2d.setFont(myFont);
      Label bx = new Label("  "), by = new Label("  "), bz = new Label("  ");
      bx.setFont(myFont); by.setFont(myFont); bz.setFont(myFont);
      Panel pRight = new Panel(new GridLayout(5,2, 1,1));
      pRight.setLocale(java.util.Locale.CHINESE);
      pRight.setComponentOrientation(ComponentOrientation.RIGHT_TO_LEFT);
      Label ya = new Label("真"); Label yb = new Label("亦");
      Label yc = new Label("假");
      ya.setFont(myFont); yb.setFont(myFont); yc.setFont(myFont);

      pRight.add(b2a); pRight.add(bx); pRight.add(b2b); pRight.add(by);
      pRight.add(b2c); pRight.add(ya);
      pRight.add(b2d); pRight.add(yb);
      pRight.add(bz); pRight.add(yc);
      ap.add(pRight, BorderLayout.EAST);
     //
      Panel pSouth = new Panel();   // default LayoutManager is FlowLayout
      pSouth.add(bSong); pSouth.add(bWeb); pSouth.add(bFlash);
      ap.add(pSouth,"South");
     //
      Panel pLeft = new Panel(new GridLayout(2,1,5,28)); // 2 row, 1 column
      pLeft.add(bGiGi); pLeft.add(bStop);
      ap.add(pLeft, "West");    // 裝了兩個 Button 的 Panel 放左邊
   } // decorateFrame

   public void init( ) {
      toolkit = Toolkit.getDefaultToolkit();    // for later use
      try{ printMsg("Run the init( ) in Applet." );}catch(Exception e){;}
      bGiGi = new JButton( LAUGH_BUTTON_CAPTION );
      try {       // Application 中讀取 Image 方法與 Applet 中不同
         if(isApplication) {  // use my function newImage to load Image file
            giGiImage = newImage(GIGI_PIC_FILENAME);
         } else
            giGiImage = getImage(new URL( getCodeBase()+ GIGI_PIC_FILENAME));
         giGiIcon = new ImageIcon(giGiImage);
         bGiGi = new JButton(giGiIcon);    // wrap GiGI’s picture
         if(isApplication) {
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            giGiImage2 = newImage(GIGI_PIC_FILENAME2);
         } else
            giGiImage2 = getImage(new URL( getCodeBase()+ GIGI_PIC_FILENAME2));
          // giGiImage2 will be used to flip pic when mouse enters bGiGi
          // see the MouseEvent handler (class Amigo) below
      } catch (Exception e) { ; }
      bGiGi.setCursor( new Cursor(Cursor.HAND_CURSOR) );
      bStop.setCursor( new Cursor(Cursor.HAND_CURSOR) );
      //ap.setLayout(new BorderLayout( ) );
      setLayout(new BorderLayout( ) );  // change the Applet's LayoutManager
      decorateFrame( );  // decorate the window with some Chinese character
     ///
      bStop.setBackground(Color.red);
      bStop.setFont( new Font("Ludica Console", Font.BOLD, 20) );
      bSong.setBackground(Color.pink);
      bWeb.setBackground(Color.green);
     //// Register necessary Event Listener to handle events
      bWeb.addActionListener(this);  // register with ActionListener
      bFlash.addActionListener(this);
      bSong.addActionListener(this);
      bGiGi.addActionListener(this);
      bGiGi.addMouseListener(new Amigo( ));
      bStop.addMouseListener(new Amigo( ) );
      bStop.addActionListener(this);
      if(tSouth != null) tSouth.addActionListener(this);
      ap.setSize(WIDTH, HEIGHT);
      ap.setVisible(true);
     /// for Application only, for Applet the variable f is null
     /*** *** now we will do this resizing work in main( )
      if( f != null) {
         f.setSize(WIDTH+88, HEIGHT+58);   // resize the Frame
         f.setVisible(true); f.validate( );
      }
     *** ***/
      hinter = new Hinter(SHOW_HINT_INTERVAL); //a Thread acts as a timer
      hinter.start( );  // start the Timer thread to toggle hint message
      status = "...Press the Button to test ..";
      //repaint( );   // not necessary , 我們的 Hinter 內會叫 repaint
   } // init()

   public void start( ) {
      try{ printMsg("Run the start( ) in Applet." );}catch(Exception e){;}
      super.start( );   // 別忘了上層的 start( )
   }

   public void stop( ) {  // 離開 Applet 網頁時執行
      try{ printMsg(" - - -stop( ) called === " );}catch(Exception ex){;}
      super.stop( );
   }

   public void validate( ) {  // don NOT forget super class's validate
      try{ printMsg(" !  validate( ) called === " );}catch(Exception ex){;}
      super.validate( );
   }

   protected int nUpdate = 0;   // number of visit to the update( );
   public void update(Graphics g) {
      ++nUpdate;
      ////////////////
      try{
         if( ! hintMode) {
            printMsg(" update( ) called ::: "+ nUpdate +
               ",  Repaint :" + nRepaint +
               ",  Update: "+nUpdate + ",  Paint :" + nPaint);
         } else {  // special processing for hintMode
            if( nPaint > 58) {   // hide paint message if count <= 58
              if(showHintPaint)
                 printMsg(" update( ) called ::: "+ nUpdate +
                    ",  Repaint :" + nRepaint +
                    ",  Update: "+nUpdate + ",  Paint :" + nPaint +
```

```
                    " --- by Hinter. ");
            } // if nPaint>58
         } // if
      }catch(Exception ex){;}  // forget this Error
     //                 /// 上層的 update 會先把 Applet 清除 (clear)
      super.update(g);    // 別忘了上層的 update() , 它會叫用 paint( )
   }

   protected int nRepaint = 0;   // number of visit to the repaint( );
   public void repaint( ) {
      ++nRepaint;
      ///////////////
      try{
         if( ! hintMode) {
             printMsg(" repaint( ) called - -- --- ----- "+ nRepaint +
                ",  Update: "+nUpdate + ",  Paint :" + nPaint);
         } else {  // special processing for hintMode
            if( nPaint > 58) {   // hide paint message if count <= 58
              if(showHintPaint)
                 printMsg(" repaint( ) called - -- --- ----- "+ nRepaint +
                   ",  Update: "+nUpdate + ",  Paint :" + nPaint +
                   " by Hinter. ");
            } // if nPaint>58
         } // if
      }catch(Exception e){;}  // forget this Error
     //
      super.repaint();   // 別忘了上層的 repaint() , 它會叫 update( )
   }

   protected int nPaint = 0;   // number of visit to the paint( );
                 // we should NOT call paint directly

   public void paint(Graphics g) {
      ++nPaint;
      try{
         if( ! hintMode) { printMsg("  paint( ) is called: "+ nPaint +
                   ",  Repaint :" + nRepaint +
                   ",  Update: "+nUpdate + ",  Paint :" + nPaint);
         } else {  // special processing for hintMode
            if( nPaint > 58) {   // hide paint message if count <= 58
              if(showHintPaint)
                 printMsg("  paint( ) is called : "+ nPaint +
                  " by Hinter. Press STOP to toggle Hinter paint message.");
            } // if nPaint>58
         } // if
      }catch(Exception e){;}  // forget this Error
      g.setColor(Color.red);
      g.setFont( new Font("標楷體", Font.BOLD, 14) );
      g.drawString( status + "      ", 88, 128);
      if(hintMode) { // is in hintMode
         switch( (int)hinter.showFlag%8/2 ) {
            case 0:
               g.drawString( "/  ..按 FLASH 每次不同喔 !", 108, 228);
               bFlash.setBackground(Color.orange);
               break;
            case 1:
               g.drawString( "-                     !! ", 108, 228);
               bFlash.setBackground(Color.pink); break;
            case 2:
               g.drawString( "\\  ..按 FLASH 每次不同喔 !", 108, 228);
               bFlash.setBackground(Color.magenta); break;
            case 3:
               g.drawString( "|                     !! ", 108, 228);
               bFlash.setBackground(Color.white); break;
         } // switch
         if( hinter.showFlag <= 18 )   // 開始時都秀出
               g.drawString( "   ..按 FLASH 每次不同喔 !", 108, 228);
      }
      rollMessage(g);   // 太長了切出去另一個 function
   }
```

```java

    private void rollMessage(Graphics g) {
        int showLen = 18;
        int len = msgLength;
        int p = (int) (hinter.showFlag % msgLength);
        int pEnd = p + showLen -1;
        String s;
        if(pEnd < msgLength ){
          s = msg.substring(p, pEnd);    // 這種不斷改變 s 字串的方法不好
        }else{                   // 可改用 StringBuffer 比較不浪費資源
          int pLen  = msgLength - p;
          s = msg.substring(p, msgLength-1) + msg.substring(0, showLen-pLen);
        }
        g.drawString( s, 108, 58);
    }

    public void actionPerformed (ActionEvent evt){
       Object who = evt.getSource( );    // who fires the ActionEvent ?
       try{ printMsg("ActionEvent: " + who);}catch(Exception ex){;}
       if(who == bWeb) {                // bWeb Button was clicked
           bWeb.setBackground(Color.red); // Let user know he press me
           try { openWebWindow( ); } catch(Exception e) {;}
       }
       else if(who == bSong) playSong( ); //play song: 情字這條路
       else if(who == bGiGi) makeLaugh( ); //play laugh.au
       else if(who == bFlash) { openFlashURL( ); }
       else if(who == tSouth)  System.exit(0);   // special in Application
       else if(who == bStop) {  // try to Stop the Audio, including Laughing
           if(song != null) song.stop( );  // stop playing the song
           status = "...Press the Button to test ..";
           //repaint( );
           /// toggle the showHintPaint mode every time you press the STOP
           if(showHintPaint) showHintPaint=false;  else showHintPaint=true;
           //System.exit(0);  // enable this line if you want to Quit fot this
       } // else if
    } // actionPerformed()

    void openWebWindow( ) {    // note that different when in Application
        try{ printMsg("Try to open " + WEB_LOCATION);}catch(Exception e){}
        try {
           if(isApplication){  // utilize the Runtime exec function
              try {              // 注意格式, 因字串中含有 " 雙引號 "
                 Runtime.getRuntime().exec(
                   "cmd /c \"start " + WEB_LOCATION +"\" " );
              } catch (Exception e95){  // try Win 95/98
                 Runtime.getRuntime().exec(
                   "start " + WEB_LOCATION );   //Win95/98中 start 是內建
              }
           } else { // is Applet, we are in Browser, use showDocument( )
              URL url = new URL(WEB_LOCATION);
              getAppletContext().showDocument(url, "_blank");
           }   // see AppletContext
                        // _blank means in New Window
        } catch (Exception e) {; }
    }

    void openFlashURL( ) {    // URL address String in String swfAry[ ]
        int n = (int)(Math.random( ) * 100);     // 0..99
        n = n % swfAry.length;
        if( visitCount++ == 0 ) n = 0;   // first visit, show swfAry[0]
        if( visitCount == 2 ) n = 2;  // GGL, second visit, show swfAry[2]
        if( visitCount == 3 ) n = 3;  // [3] = play_hand_mouse on 3rd visit
        if( n == 0 &&  visitCount >  3 && visitCount <  8 )
            n = visitCount % swfAry.length; // 第8次前不再秀swfAry[0]神鵰俠侶
        try {
           flashLocation = swfAry[n];
        } catch (Exception e) { n=2; }  // 2 is GGL
        try{ printMsg("Try to open " + flashLocation);}catch(Exception ex){;}
        try {
           if(isApplication){
```

```
          try {  // XP, NT
             Runtime.getRuntime().exec(
                "cmd /c \"start " + flashLocation + "\" ");
          } catch (Exception e98) {   // try Win95/Win98
             Runtime.getRuntime().exec(
                "start " + flashLocation );
          }
       } else {
          URL url = new URL( flashLocation ); // a file in ~tsaiwn/...
          getAppletContext().showDocument(url, "_blank");
       } // if
    } catch (Exception e) {; }
}

void openSong( ) {   // use a Browser to open a Song URL
    try { printMsg("Try to open " +SONG_NAME + " in " + SONG_LOCATION);
    } catch(Exception ex){;}
    try {
       URL url = new URL( (SONG_LOCATION + SONG_NAME).trim() );
       if(isApplication){
          try {  // XP, NT
             Runtime.getRuntime().exec(
                "cmd /c \"start " + url.toString( ) + "\" ");
          } catch (Exception e98) {   // try Win95/Win98
             Runtime.getRuntime().exec(
                "start " + url.toString( ) );
          }
       } else { // Applet
           getAppletContext().showDocument(url, "_blank");
       } // if
    } catch (Exception e) {; }
}

void playSong( ) {    // play the AudioClip from a file or a URL
    try{ printMsg("Playing.." + SONG_NAME); }catch(Exception e){;}
    try {
       if(isApplication) {  // after JDK 1.2
          song = Applet.newAudioClip(new URL(newCodeBase( )+SONG_NAME));
       }else{
          song = getAudioClip(getCodeBase( ), SONG_NAME);
       } // if
     } catch ( Exception e ) {
        try{  // try-2, try tsaiwn URL
           try{ showStatus( ".. " + SONG_LOCATION + SONG_NAME);
           } catch ( Exception es ) {;}
           song = getAudioClip( new URL(SONG_LOCATION + SONG_NAME) );
           status = ".. " + SONG_LOCATION + SONG_NAME + "     ";
        } catch (Exception e2){
        //System.err.println("Fail : "+e);
           try{  // try-3
              song = getAudioClip(
                  new URL("./" + SONG2_NAME ) );
              status = " ..   ./" + SONG2_NAME + "== = =   ";
           } catch (Exception e3){
              try {  // try-4
                  song = Applet.newAudioClip(
                         new URL(newCodeBase( ) + SONG2_NAME ) );
              } catch ( Exception e4) {
                 if(song==null) { openSong(); return;  }  // try my best
              }  //  try-4
           } // try-3
        } // try-2
    } ; //
     // Play the sound if we got the AudioClip
    try {
       if(song != null) {
          song.play();
          status = "...Playing " + SONG_NAME;
       } // if
       try { showStatus(" " + status );
```

```
            } catch ( Exception es ) { ; } // on window’s status line  狀態列
            repaint( );  // draw message in the Applet Panel
        } catch ( Exception e ) { return; }
    } // playSong()

    void makeLaugh( ) {
        try {
            try{ showStatus(" :-)  Laughing ..." ); } catch ( Exception es ) {;}
            playFile(LAUGH_AUDIO_NAME );
        } catch ( Exception e ) {;}
    }
    void sayHello(String filename) {
        playFile(filename);
    }

    void playFile(String filename) {
        try {
            if(isApplication) {
               URL base = newCodeBase();
               song = Applet.newAudioClip(new URL(base+filename));
            } else
               song = getAudioClip(getCodeBase(), filename);  // Applet’s
            song.play( );
            status = "...Playing .." + filename;
            try{ showStatus(status); } catch ( Exception es ) {;}
            repaint( );   // show the status message on the Applet
        } catch (Exception e) {; }
    }

    public URL newCodeBase( ) {    // for Application to get CWD
        URL codeBase = null;        // assume we can not get it
        try{
            codeBase = new URL("file:" + System.getProperty("user.dir") + "/");
        } catch ( Exception e ) {
            codeBase = getCodeBase( );   // where the Applet in
            // maybe it is an Applet, use getCodeBase() or getDocumentBase()
        }
        return codeBase;
    }

  /// get Image from a local file --- for Application (not Applet)
    public Image newImage(String filename) {
        Image img = null;
        try{ Toolkit tkt = Toolkit.getDefaultToolkit( );
              img = tkt.getImage(filename);  //for application only
        } catch ( Exception e ) {
             try { img = getImage(getCodeBase( ), filename); //for Applet
             } catch (Exception e2) {;} // ignore any error now
        }
        return img;
    } // newImage(filename)
    public Image getMyImage(String filename) {
        return newImage(filename);
    } // getMyImage(filename)

    protected boolean hintMode = false;   // control toggle display hint
                        //////// paint( ) will check this variable

    protected boolean showHintPaint = true;   // toggle paint message

  // an inner class to act as a Timer to show hint message
 // The uint of SHOW_HINT_INTERVAL is in milli seconds
  class Hinter extends Thread {
     protected volatile boolean shouldDie = false;  // instead of stop( );
     protected long showFlag = 0;
     protected int showInterval;    // 記住傳來的 interval for hint message

     public Hinter(int interval) { showInterval = interval;} //Constructor
     //when new Hinter, please pass the interval to me as the argument.

```

```
   // the main part of a thread is the run( ) method
    public void run( ) {  // Thread should implements the run( ) method
       while( ! shouldDie) { // Loop forever till the Master wants me to die
          try { showFlag++; } catch (Exception e){;}
          hintMode = true;
          repaint( );    // call it every showInterval milli-seconds
          hintMode = false; // so that won't affect other's call to paint
          try {sleep(showInterval); } catch(InterruptedException e){;}
       } // while
    } // run
   ///注意我們叫用 repaint( ); repaint() 會去叫我們的 paint(Graphics);
   /// 但是不是只有我們會叫到 paint( ); 因此要讓 paint( ) 知道是誰叫的
   //  所以用一個 hintMode 這變數讓 paint( ) 檢查
 } // MyTimer

 // another inner class Amigo to handle Mouse events
 //這個 Amigo 有能力處理部份 Mouse event
 class Amigo extends MouseAdapter {
    public void mouseEntered(MouseEvent e) {
        Object who = e.getSource( );   /* 查哪零件觸發 Mouse event? */
        try{ printMsg("MouseEvent: Entered " + who);}catch(Exception ex){;}
     ///
        if(who == bGiGi) {
          status = "... 按我就會大笑喔:-)";
          giGiIcon.setImage(giGiImage2);  bGiGi.updateUI();
        }
        if(who == bStop) {
          status = "... 按 STOP 停止大笑或唱歌 ! ";
        }
        repaint( );      // it will call our paint( )
    }
    public void mouseExited(MouseEvent e) {
        Object who = e.getSource( );   /* 查哪零件觸發 Mouse event? */
        try{ printMsg("MouseEvent: Exited " + who);}catch(Exception ex){;}
     ///
        if(who == bGiGi) {
          giGiIcon.setImage(giGiImage); bGiGi.updateUI();
        }
        if(who == bGiGi || who == bStop) {
          status = " ... Press Buttons to Test";
        }
        repaint( );     // it will call our paint( )
    }
 } // class Amigo == means friend in spanish
 ///// end of inner class Amigo

     static int msgLength;   // msgLength is used for Length of msg
     static final String msg = " Dear ..  My Dear  . . " +
        "我答應妳再也不會  打擾妳的生活 .. " +
        "捨不得妳  所以才會騙了妳也騙自己 .. " +
        "捨不得妳  雖然明知我的愛妳不珍惜 .. " +
        " - - - . . .  每當我最需要你  最想念你" +
        " 你總是缺席 ...   " +
        "能不能讓我   陪著妳走  既然妳說   留不住妳  " +
        "回去的路   有些黑暗  擔心讓妳   一個人走" +
        " . . .   .  .    ..      " +
        "如果你要離開我  . .  我想我不會太難過 :-(" +
        " 也許會有一點點難過 ...  至少不會在你的面前難過 :-(" +
        " 也許會在你的面前難過 ..  至少不會在你的面前流淚 :-(" +
        " 也許會在你的面前流淚 . . 至少不會在你的面前哭出聲 :::-(" +
        " . . .       .  .    .   ..    ";
     static { msgLength = msg.length( ); }  // do this when class loaded
  /// Note that 注意 static Block 只在 class 被 Loaded 進 JVM 時 Run 一次
} // end of the whole class SoundWin
```