

```

import com.sun.image.codec.jpeg.*;
import java.awt.*;
import java.awt.image.*;
import java.io.*;

/**
 * Thumbnail.java (requires Java 1.2+)
 * Load an image, scale it down and save it as a JPEG file.
 * @author Marco Schmidt
 */
public class Thumbnail {
    public static void main(String[] args) throws Exception {
        if (args.length != 5) {
            System.err.println("Usage: java Thumbnail INFILE " +
                "OUTFILE WIDTH HEIGHT QUALITY");
            System.exit(1);
        }
        // load image from INFILE
        Image image = Toolkit.getDefaultToolkit().getImage(args[0]);
        MediaTracker mediaTracker = new MediaTracker(new Container());
        mediaTracker.addImage(image, 0);
        mediaTracker.waitForID(0);
        // determine thumbnail size from WIDTH and HEIGHT
        int thumbWidth = Integer.parseInt(args[2]);
        int thumbHeight = Integer.parseInt(args[3]);
        double thumbRatio = (double)thumbWidth / (double)thumbHeight;
        int imageWidth = image.getWidth(null);
        int imageHeight = image.getHeight(null);
        double imageRatio = (double)imageWidth / (double)imageHeight;
        if (thumbRatio < imageRatio) {
            thumbHeight = (int)(thumbWidth / imageRatio);
        } else {
            thumbWidth = (int)(thumbHeight * imageRatio);
        }
        // draw original image to thumbnail image object and
        // scale it to the new size on-the-fly
        BufferedImage thumbImage = new BufferedImage(thumbWidth,
            thumbHeight, BufferedImage.TYPE_INT_RGB);
        Graphics2D graphics2D = thumbImage.createGraphics();
        graphics2D.setRenderingHint(RenderingHints.KEY_INTERPOLATION,
            RenderingHints.VALUE_INTERPOLATION_BILINEAR);
        graphics2D.drawImage(image, 0, 0, thumbWidth, thumbHeight, null);
        // save thumbnail image to OUTFILE
        BufferedOutputStream out = new BufferedOutputStream(new
            FileOutputStream(args[1]));
        JPEGImageEncoder encoder = JPEGCodec.createJPEGEncoder(out);
        JPEGEncodeParam param = encoder.
            getDefaultJPEGEncodeParam(thumbImage);
        int quality = Integer.parseInt(args[4]);
        quality = Math.max(0, Math.min(quality, 100));
        param.setQuality((float)quality / 100.0f, false);
        encoder.setJPEGEncodeParam(param);
        encoder.encode(thumbImage);
    }
}

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out.close();  
System.out.println("Done.");  
System.exit(0);  
}  
}
```