Here are the main links i used.

The @SuppressWarnings Annotation in Java - GeeksforGeeks

Throwable printStackTrace() method in Java with Examples - GeeksforGeeks

I used @SuppressWarnings("unchecked") because when loading my list of shapes from the file, Java gives an unchecked cast warning. I already know the file contains a List<MyShapes>, so this warning isn't actually a problem. The annotation just hides the warning to keep the code clean.

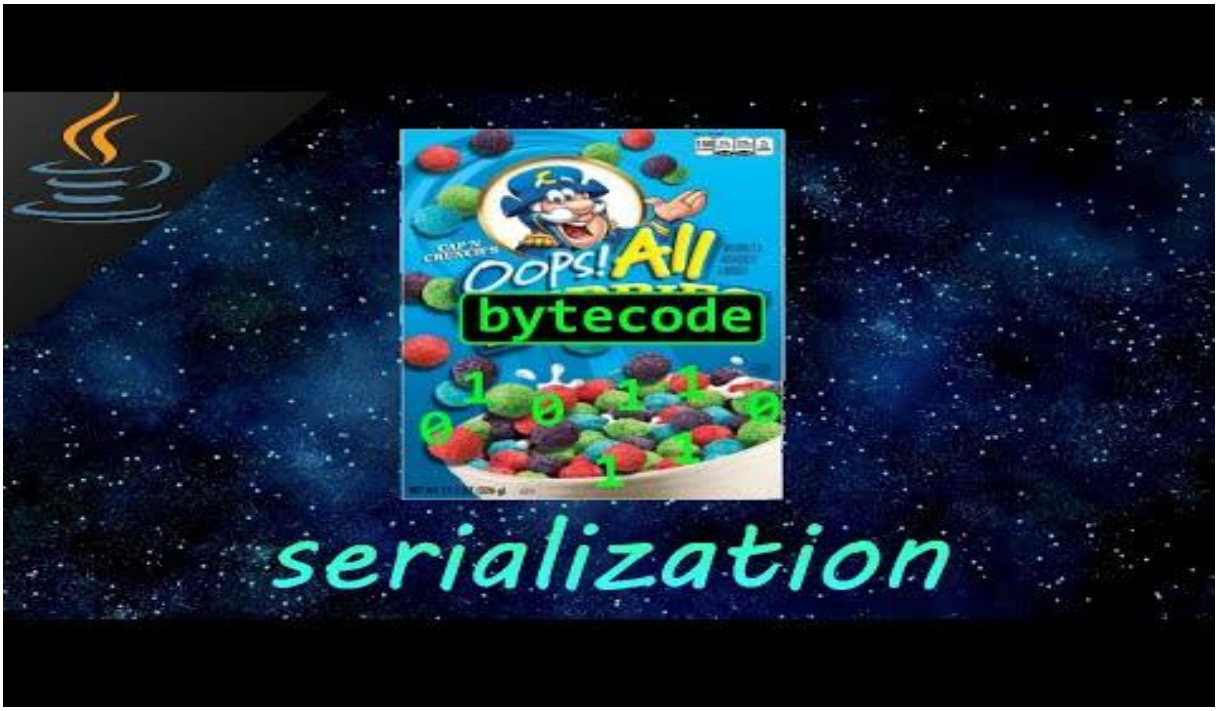
I used printStackTrace() while testing my code because it shows exactly where errors happen in the program. This helped me debug file issues during the save and load process. I learned about this method from an article explaining how Throwable.printStackTrace() works.

I chose to make MyShapes an abstract class because I never need to create a basic shape by itself. My program only uses real shapes like rectangles and ovals, and an abstract class lets me share common fields (x, y, width, height, color) while still forcing each shape to write its own draw(Graphics g) method. This prevents mistakes, because the compiler makes sure every subclass provides its own drawing code.

Using an abstract class also made the rest of my program simpler. I can store all shapes in one list and call shape.draw(g) without caring which type of shape it is, which is basic polymorphism. Since MyShapes implements Serializable, all subclasses automatically become serializable too, which matches the requirement to save and load the entire list with ObjectOutputStream and ObjectInputStream.

Abstract Classes and Methods in Java Explained in 7 Minutes - YouTube

Java serialization is easy! - YouTube



https://docs.oracle.com/javase/tutorial/uiswing/components/filechooser.html

Java custom exceptions

Checked vs. Unchecked Exceptions in Java Tutorial - What's The Difference?

Java KeyListener 🚀

Notes

- ObjectOutputStream takes a Java object (like my list of shapes) and writes it into a binary file. ObjectInputStream reads that file and rebuilds the original objects so the shapes can appear again. This lets me save the entire drawing in one step and load it back the same way. It's the main tool Java gives for serialization.

- I check `APPROVE_OPTION` to make sure the user didn't click Cancel in the file chooser. If the user cancels, there is no file to save or load, and trying to continue would cause errors. This check prevents crashes and makes the program behave safely. The rubric also requires checking the result of the dialog.

Ai prompts:

Examples to use the JFileChooser class from the Java Swing library

explain what an abstract class is in Java and when I should use one