

```
// This method takes an array of Bag objects and a filename as input parameters
static void save(Bag[] bags, String filename) {
    try {
        // Create a FileWriter object to write to the file specified by the filename
        // parameter
        FileWriter file = new FileWriter(filename);

        // Write the number of Bag objects in the array to the file
        file.write(bags.length + "\n");

        // Create an ExecutorService to execute each Bag object's write operation in a
        // separate thread to improve performance
        ExecutorService ex = Executors.newFixedThreadPool(5);

        // Create a Lock object to ensure that only one thread can write to the file at
        // a time
        Lock lock = new ReentrantLock();

        // Loop over each Bag object in the array
        for (Bag bag : bags) {
            // Submit a new Runnable to the ExecutorService to write the Bag object to the
            // file
            ex.submit(
                () -> {
                    // Lock the Lock object to ensure that only one thread can write to the file at
                    // a time
                    lock.lock();
                    try {
                        // Write the Bag object's width, height, depth, hasWheels attribute, and color
                        // as a RGB integer value to the file
                        file.write(bag.width + " " + bag.height + " " + bag.depth + " " + bag.hasWheels + " "
                            + bag.color.getRGB() + "\n");
                    } catch (Exception e) {
                        System.err.println(e);
                    } finally {
                        // Unlock the Lock object to allow other threads to write to the file
                        lock.unlock();
                    }
                }
            );
        }
    }
}
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        }
    });
}

// Shut down the ExecutorService and wait for all threads to finish writing to
// the file
ex.shutdown();
while (!ex.isTerminated())
    ;

// Close the FileWriter object
file.close();
} catch (Exception e) {
    System.err.println(e);
}
}

// This method takes a filename as an input parameter
static Bag[] open(String filename) {
    try {
        // Check that the filename has a valid extension (.txt or .bag)
        if (!filename.endsWith(".txt") && !filename.endsWith(".bag")) {
            throw new InvalidExtension(filename + " is not a valid name.");
        }

        // Create a FileReader object to read from the file specified by the filename
        // parameter
        FileReader file = new FileReader(filename);

        // Create a Scanner object to read from the FileReader object
        Scanner input = new Scanner(file);

        // Read the number of Bag objects in the file
        int nBags = Integer.valueOf(input.nextLine());

        // Create an array of Bag objects of size nBags
        Bag[] bags = new Bag[nBags];
    }
}

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        // Loop over each Bag object in the file
        for (int i = 0; i < nBags; i++) {
            // Read the Bag object's width, height, depth, hasWheels attribute, and color as
            // a RGB integer value from the file
            float width = input.nextFloat();
            float height = input.nextFloat();
            float depth = input.nextFloat();
            Boolean hasWheels = input.nextBoolean();
            Color color = new Color(Integer.valueOf(input.nextLine().trim()));

            // Create a new Bag object with the read attributes and add it to the array
            bags[i] = new Bag(width, height, depth, color, hasWheels);
        }

        // Close the FileReader and Scanner objects
        file.close();
        input.close();

        // Return the array of Bag objects read from the file
        return bags;
    } catch (Exception e) {
        System.err.println(e);

        // Return an empty array if an exception occurs
        return new Bag[0];
    }
}

public static void main(String[] args) {
    Bag.save(new Bag[] {
        new Bag(10, 10, 10, Color.black, false),
        new Bag(5, 10.5f, 10, Color.white, false),
        new Bag(18, 8, 164, Color.blue, true),
    }, "output.txt");
    Bag[] bags = Bag.open("output.test");// this will print an error
    bags = Bag.open("output.txt");
}

```

// it will have the data but id doesn't have to be the same order because we wrote using threads not normal procedural code.

```
for (Bag bag : bags) {  
    System.out.println(bag);  
}  
//Bag [width=10.0, height=10.0, depth=10.0, color=java.awt.Color[r=0,g=0,b=0], hasWheels=false]  
//Bag [width=18.0, height=8.0, depth=164.0, color=java.awt.Color[r=0,g=0,b=255], hasWheels=true]  
//Bag [width=5.0, height=10.5, depth=10.0, color=java.awt.Color[r=255,g=255,b=255], hasWheels=false]  
}
```