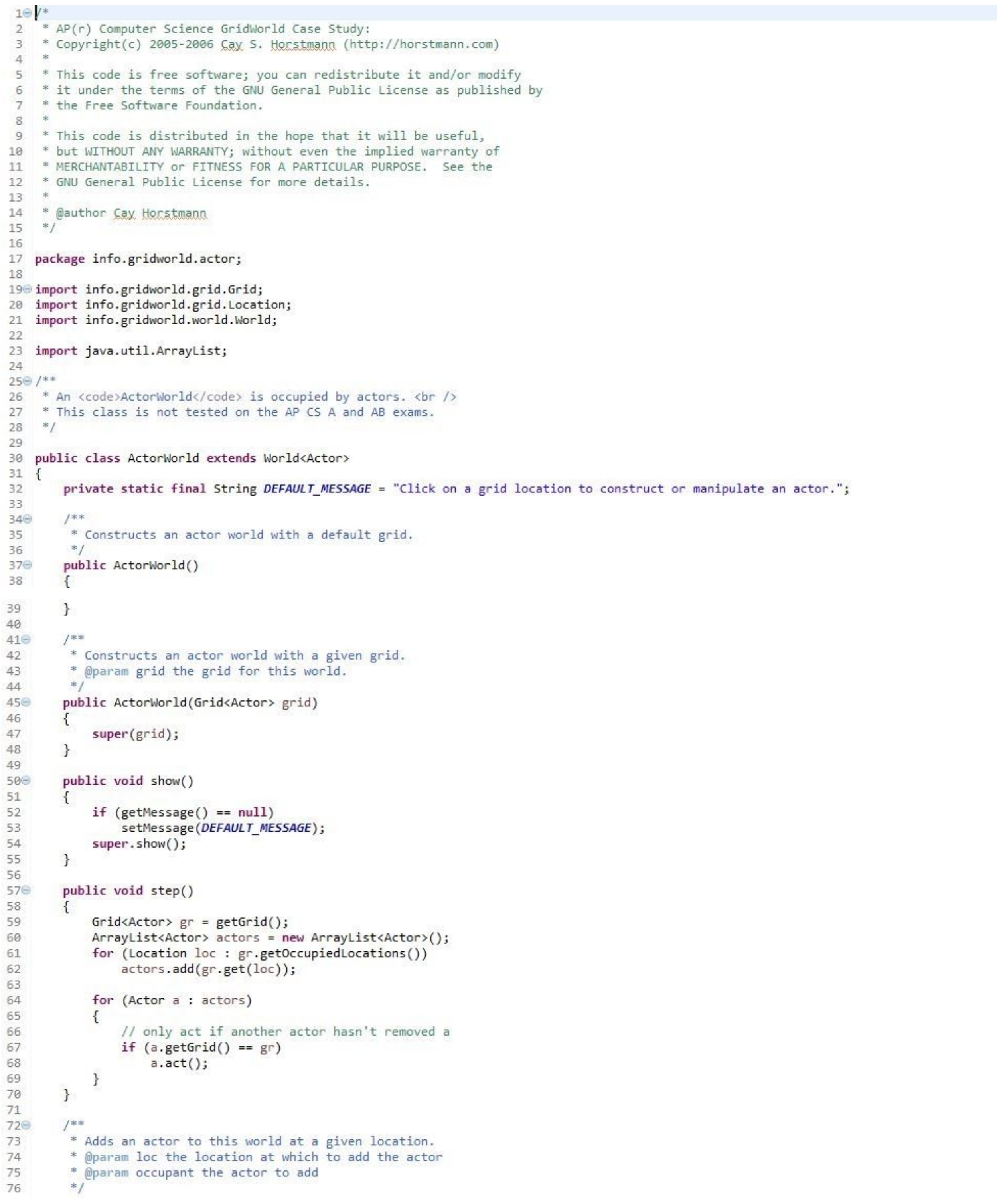

```java
/*
 * AP(r) Computer Science GridWorld Case Study:
 * Copyright(c) 2005-2006 Cay S. Horstmann (http://horstmann.com)
 *
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 *
 * @author Cay Horstmann
 */

package info.gridworld.actor;

import info.gridworld.grid.Grid;
import info.gridworld.grid.Location;
import info.gridworld.world.World;

import java.util.ArrayList;

/**
 * An <code>ActorWorld</code> is occupied by actors. <br />
 * This class is not tested on the AP CS A and AB exams.
 */

public class ActorWorld extends World<Actor>
{
    private static final String DEFAULT_MESSAGE = "Click on a grid location to construct or manipulate an actor.";

    /**
     * Constructs an actor world with a default grid.
     */
    public ActorWorld()
    {
    }

    /**
     * Constructs an actor world with a given grid.
     * @param grid the grid for this world.
     */
    public ActorWorld(Grid<Actor> grid)
    {
        super(grid);
    }

    public void show()
    {
        if (getMessage() == null)
            setMessage(DEFAULT_MESSAGE);
        super.show();
    }

    public void step()
    {
        Grid<Actor> gr = getGrid();
        ArrayList<Actor> actors = new ArrayList<Actor>();
        for (Location loc : gr.getOccupiedLocations())
            actors.add(gr.get(loc));

        for (Actor a : actors)
        {
            // only act if another actor hasn't removed a
            if (a.getGrid() == gr)
                a.act();
        }
    }

    /**
     * Adds an actor to this world at a given location.
     * @param loc the location at which to add the actor
     * @param occupant the actor to add
     */
```

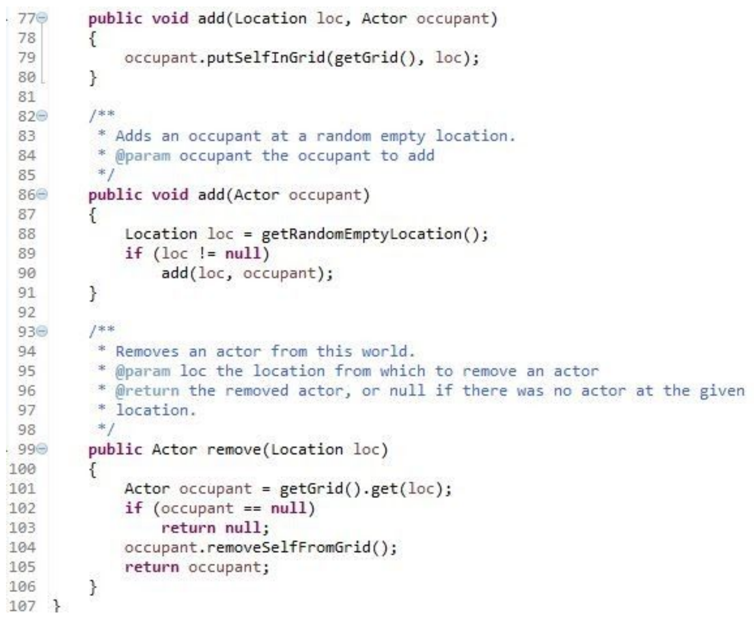

```java
    public void add(Location loc, Actor occupant)
    {
        occupant.putSelfInGrid(getGrid(), loc);
    }

    /**
     * Adds an occupant at a random empty location.
     * @param occupant the occupant to add
     */
    public void add(Actor occupant)
    {
        Location loc = getRandomEmptyLocation();
        if (loc != null)
            add(loc, occupant);
    }

    /**
     * Removes an actor from this world.
     * @param loc the location from which to remove an actor
     * @return the removed actor, or null if there was no actor at the given
     * location.
     */
    public Actor remove(Location loc)
    {
        Actor occupant = getGrid().get(loc);
        if (occupant == null)
            return null;
        occupant.removeSelfFromGrid();
        return occupant;
    }
}
```