מחלקות החבילה Elements

```
1. מבנה הממשק LightSource
public abstract Color getIntensity(Point3D point);
public abstract Vector getL(Point3D point); // light to point vector
                                                2. מבנה המחלקה Light (מופשטת):
protected Color color;
// *************** Constructors ****************** //
public Light();
public Light (Color color);
// ********* Getters/Setters ********************** //
public Color getIntensity();
                                                 3. מבנה המחלקה AmbientLight:
private final double _Ka = 0.1;
// *************** Constructors *******************************//
public AmbientLight();
public AmbientLight(AmbientLight aLight);
public AmbientLight(int r, int g, int b);
public AmbientLight(Map<String, String> attributes);
// ********* Getters/Setters *********************** //
public Color getColor();
public void setColor(Color color);
public double getKa();
public Color getIntensity();
```

4. מבנה המחלקה DirectionalLight

```
private Vector _direction;
public DirectionalLight(Color color, Vector direction);
// ********* Getters/Setters ********************** //
public Color getIntensity(Point3D point);
public Vector getDirection();
public void setDirection(Vector _direction);
public Vector getL(Point3D point);
                                                5. מבנה המחלקה PointLight
Point3D _position;
double _Kc, _Kl, _Kq;
// *************** Constructors *****************************//
public PointLight(Color color, Point3D position,
                double kc, double kl, double kq);
// ********** Getters/Setters ****************************//
public Color getIntensity(Point3D point);
public Vector getL(Point3D point);
                                                 6. מבנה המחלקה SpotLight:
private Vector _direction;
// **********************************//
public SpotLight(Color color, Point3D position, Vector direction,
                          double kc, double kl, double kq);
// ********* Getters/Setters ********************** //
public Color getIntensity(Point3D point);
```

7. מבנה המחלקה Camera:

```
//Eye point of the camera
private Point3D _P0;
private Vector vUp;
private Vector _vTo;
//Should be calculated as the cross product if vUp and vTo
private Vector _vRight;
// *********** Constructors *******************************//
public Camera(); ;
public Camera (Camera camera);
public Camera (Point3D P0, Vector vUp, Vector vTo);
public Camera (Map<String, String> attributes);
// ************* Getters/Setters ****************************//
public Vector get_vUp();
public void set vUp(Vector vUp);
public Vector get_vTo();
public void set_vTo(Vector vTo);
public Point3D getP0();
public void setP0(Point3D P0);
public Vector get_vRight();
// ********* Administration *********************** //
public String toString();
// *************** Operations *************** //
public Ray constructRayThroughPixel (int Nx, int Ny,
                                     double x, double y,
                                     double screenDist,
                                     double screenWidth,
                                    double screenHeight);
```

היחסים בין המחלקות

