

Aufgabe 1

```
public class Abprallen
```

```
{
    private GameWindow window;
    private GameImage[] imageList;
    private Sprite[] spriteList;
    int maxSprites = 20;

    public Abprallen()
    {
        int i, imgIndex;

        imageList = new GameImage[7];
        imageList[0] = new GameImage("images/ghost red 100x100.png");
        imageList[1] = new GameImage("images/ghost pink 100x100.png");
        ... usw ...

        spriteList = new Sprite[maxSprites];
        for (i = 0; i < spriteList.length; i++)
        {
            imgIndex = (int)(Math.random() * imageList.length);
            spriteList[i] = new Sprite(imageList[imgIndex]);
        }

        window = new GameWindow(50, 50, 640, 480, "Abprallen");
    }

    public void main()
    {
        int i;

        // Anfangspositionen
        for (i = 0; i < spriteList.length; i++)
        {
            spriteList[i].setPosition(Math.random() * (window.getWidth() -
                spriteList[i].getWidth()), Math.random() *
                (window.getHeight() - spriteList[i].getHeight()));
            spriteList[i].setRichtung(Math.random() * 360.0);
            spriteList[i].setSpeed(Math.random() * 10.0 + 5.0);
        }

        // Ablauf
        while (true)
        {
            // Sprites bewegen
            for (i = 0; i < spriteList.length; i++)
            {
                spriteList[i].bewege();

                if (spriteList[i].berührtOben(window) ||
                    spriteList[i].berührtUnten(window))
                {
                    spriteList[i].pralleAbHorizontal();
                }
            }
        }
    }
}
```

```
        if (spriteList[i].berührtLinks(window) ||
            spriteList[i].berührtRechts(window))
        {
            spriteList[i].pralleAbVertikal();
        }
    }

    // Zeichnen
    window.clear();
    for (i = 0; i < spriteList.length; i++)
    {
        spriteList[i].draw(window);
    }
    window.paintFrame();
}
}
```

Aufgabe 2

public class Drehen

```
{
    private GameWindow window;
    private GameImage[] imageList;
    private Sprite[][] spriteList;
    int zeilen = 7, spalten = 7; // Anzahl Zeilen / Spalten des 2D-Arrays

    public Drehen()
    {
        int i, x, y, imgIndex;

        imageList = new GameImage[5];
        imageList[0] = new GameImage("images/ghost red 100x100.png");
        imageList[1] = new GameImage("images/ghost pink 100x100.png");
        imageList[2] = new GameImage("images/ghost cyan 100x100.png");
        imageList[3] = new GameImage("images/ghost yellow 100x100.png");
        imageList[4] = new GameImage("images/ghost blue 100x100.png");

        for (i = 0; i < imageList.length; i++)
        {
            imageList[i].setScale(0.4);
        }

        spriteList = new Sprite[spalten][zeilen];
        imgIndex = 0;
        for (x = 0; x < spalten; x++)
        {
            for (y = 0; y < zeilen; y++)
            {
                imgIndex = (imgIndex + 1) % imageList.length;
                spriteList[x][y] = new Sprite(imageList[imgIndex]);
            }
        }

        window = new GameWindow(50, 50, 810, 810, "Abprallen");
    }
}
```

```
public void main()
{
    int x, y;

    // Anfangspositionen
    for (x = 0; x < spalten; x++)
    {
        for (y = 0; y < zeilen; y++)
        {
            spriteList[x][y].setPosition(75 + 100 * x, 50 + 100 * y);
            spriteList[x][y].setRichtung(0);
            spriteList[x][y].setSpeed(5);
        }
    }

    // Ablauf
    while (true)
    {
        window.clear();
        for (x = 0; x < spalten; x++)
        {
            for (y = 0; y < zeilen; y++)
            {
                spriteList[x][y].bewege();
                spriteList[x][y].dreheRechts(15);
                spriteList[x][y].draw(window);
            }
        }
        window.paintFrame();
    }
}
```

Aufgabe 3

public class Schlange

```
{
    private GameWindow window;
    private GameImage img;
    private Sprite[] schlange;
    private int schlangenLaenge = 100;
    private double abstandSoll = 8.0;

    public Schlange()
    {
        int i;
        img = new GameImage("images/bubble-100x100.png");
        img.setScale(0.3);
        schlange = new Sprite[schlängenLaenge];
        for (i = 0; i < schlange.length; i++)
        {
            schlange[i] = new Sprite(img);
        }

        window = new GameWindow(100, 100, 1000, 750, "Schlange");
    }
}
```

```
public void main()
{
    int i;

    // Anfangsposition für alle in der Mitte
    schlange[0].setSpeed(5.0);
    for (i = 0; i < schlange.length; i++)
    {
        schlange[i].setPosition((window.getWidth() -
            schlange[i].getWidth()) / 2, (window.getHeight() -
            schlange[i].getHeight()) / 2);
    }

    // Ablauf
    while (true)
    {
        double abstand;

        // Kopf bewegen
        schlange[0].dreheZu(window.getMouseX(), window.getMouseY());
        schlange[0].bewege();

        // restl. Glieder folgen
        for (i = 1; i < schlange.length; i++)
        {
            schlange[i].dreheZu(schlange[i-1].getX(),
                                schlange[i-1].getY());
            abstand = schlange[i-1].getAbstand(schlange[i]);
            if (abstand - abstandSoll > 0)
            {
                schlange[i].setSpeed(abstand - abstandSoll);
            }
            else
            {
                schlange[i].setSpeed(0);
            }
            schlange[i].bewege();
        }

        // Zeichne Schlange vom Ende bis zum Kopf
        window.clear();
        for (i = schlange.length - 1; i >= 0; i--)
        {
            schlange[i].draw(window);
        }
        window.paintFrame();
    }
}
```