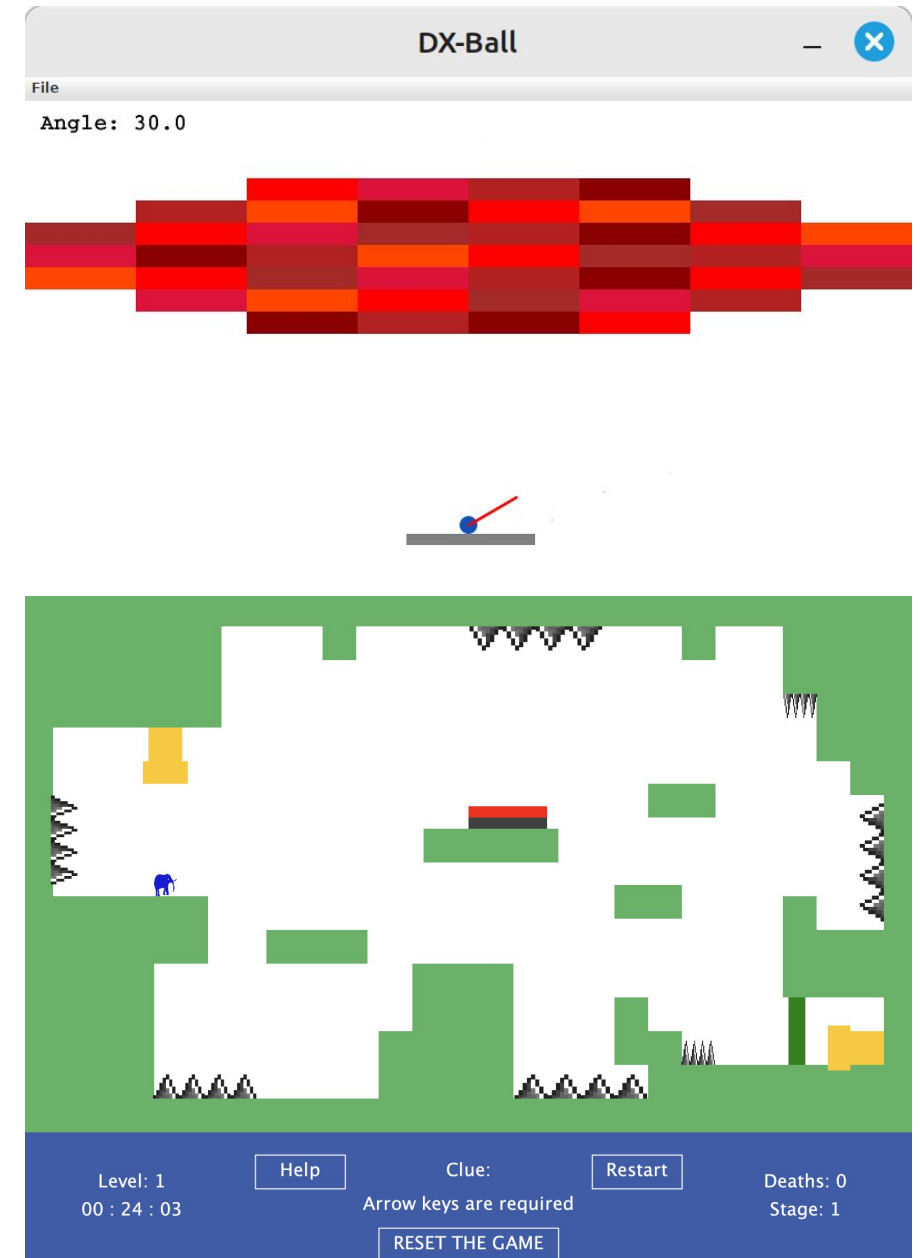# CMPE 160
Object-Oriented Programming
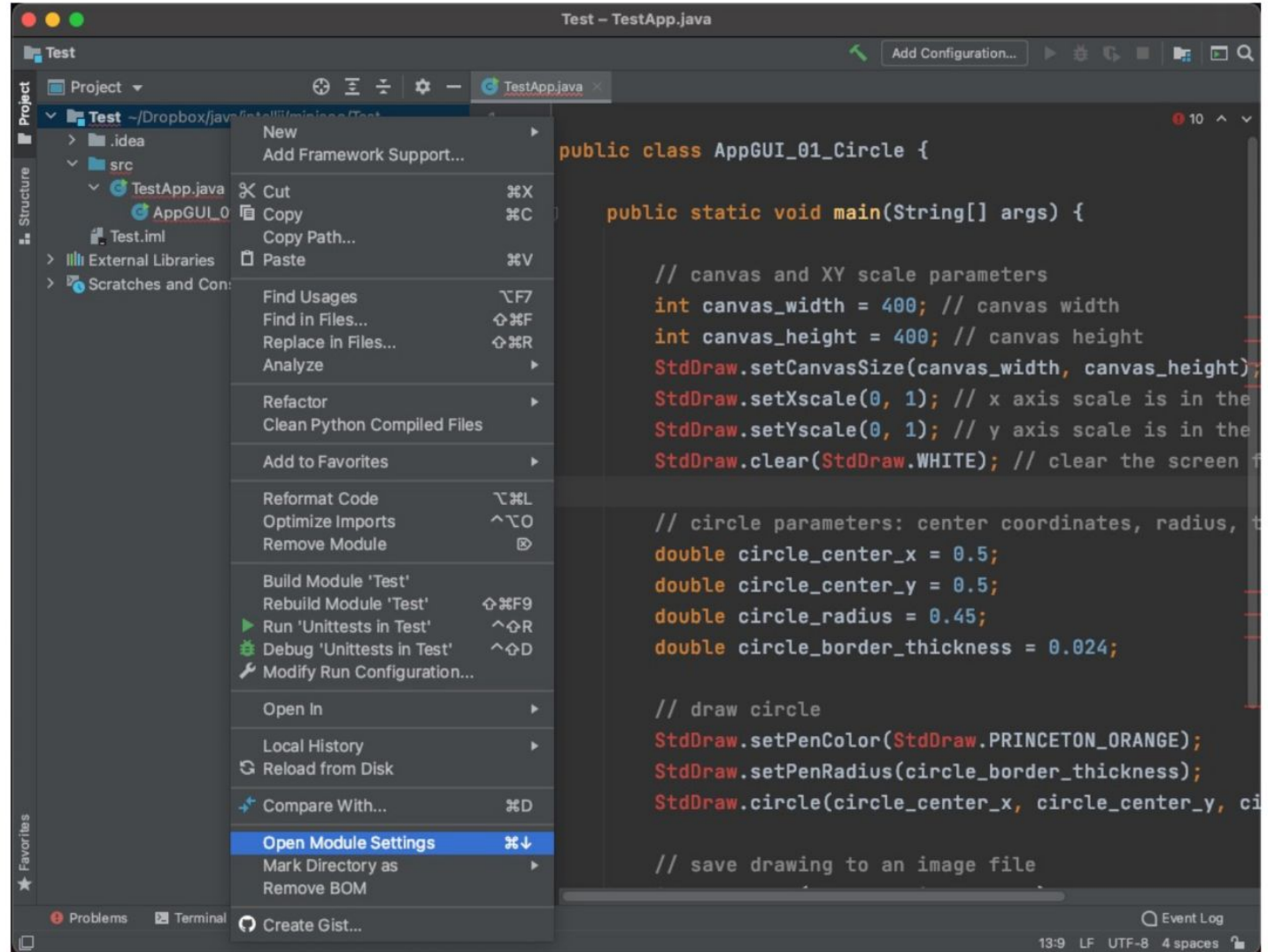
Lab 1

StdDraw

- StdDraw is a simple graphic library which provides static methods for creating drawings.

- It includes drawing:

    - lines

    - points

    - squares

- It can display text and pictures

- It also enables user interaction via keyboard and mouse

- Standart Library
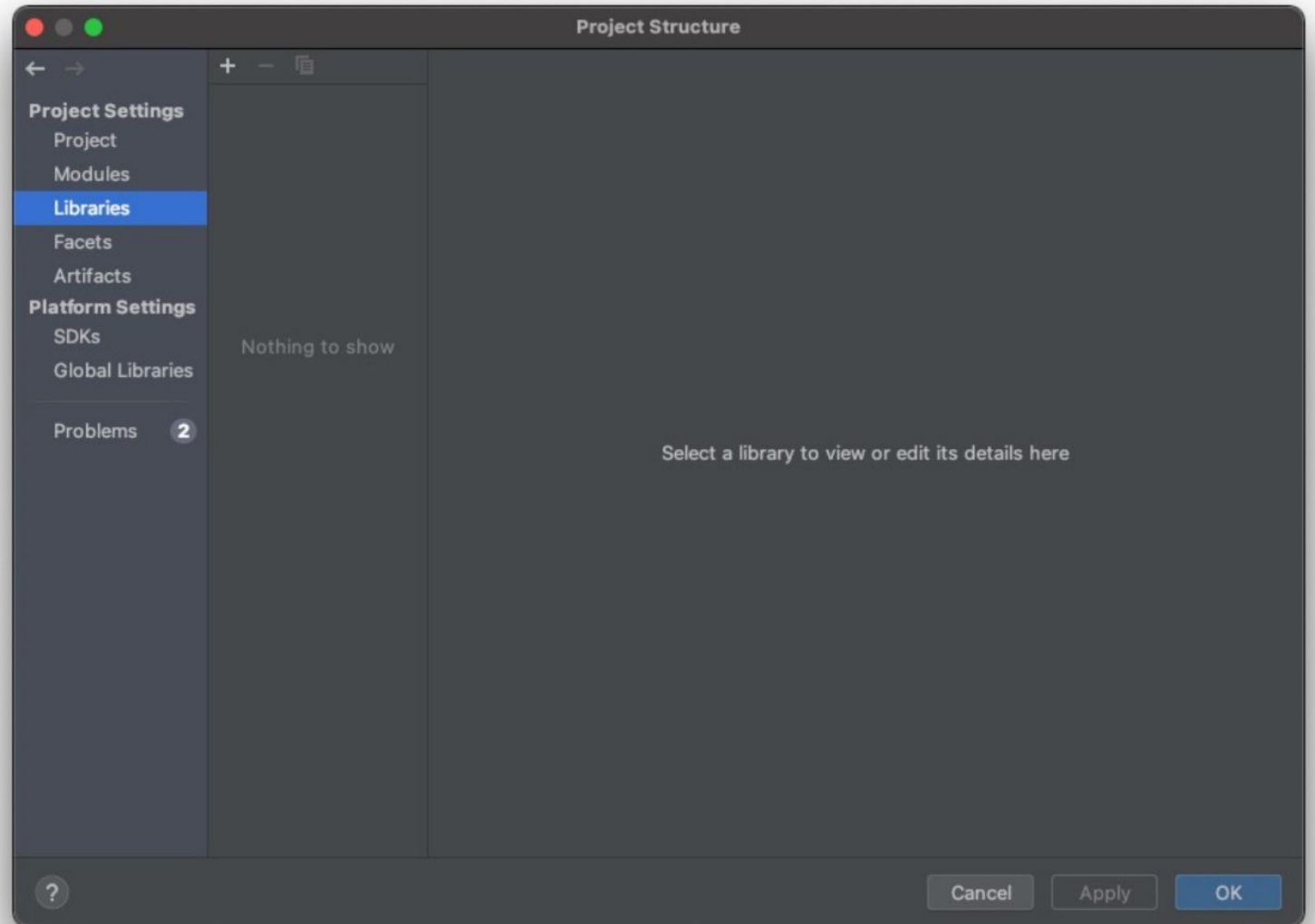
- StdDraw Intro

- StdDraw.java

Installation for IntelliJ

- Step 1:
Right click project and choose
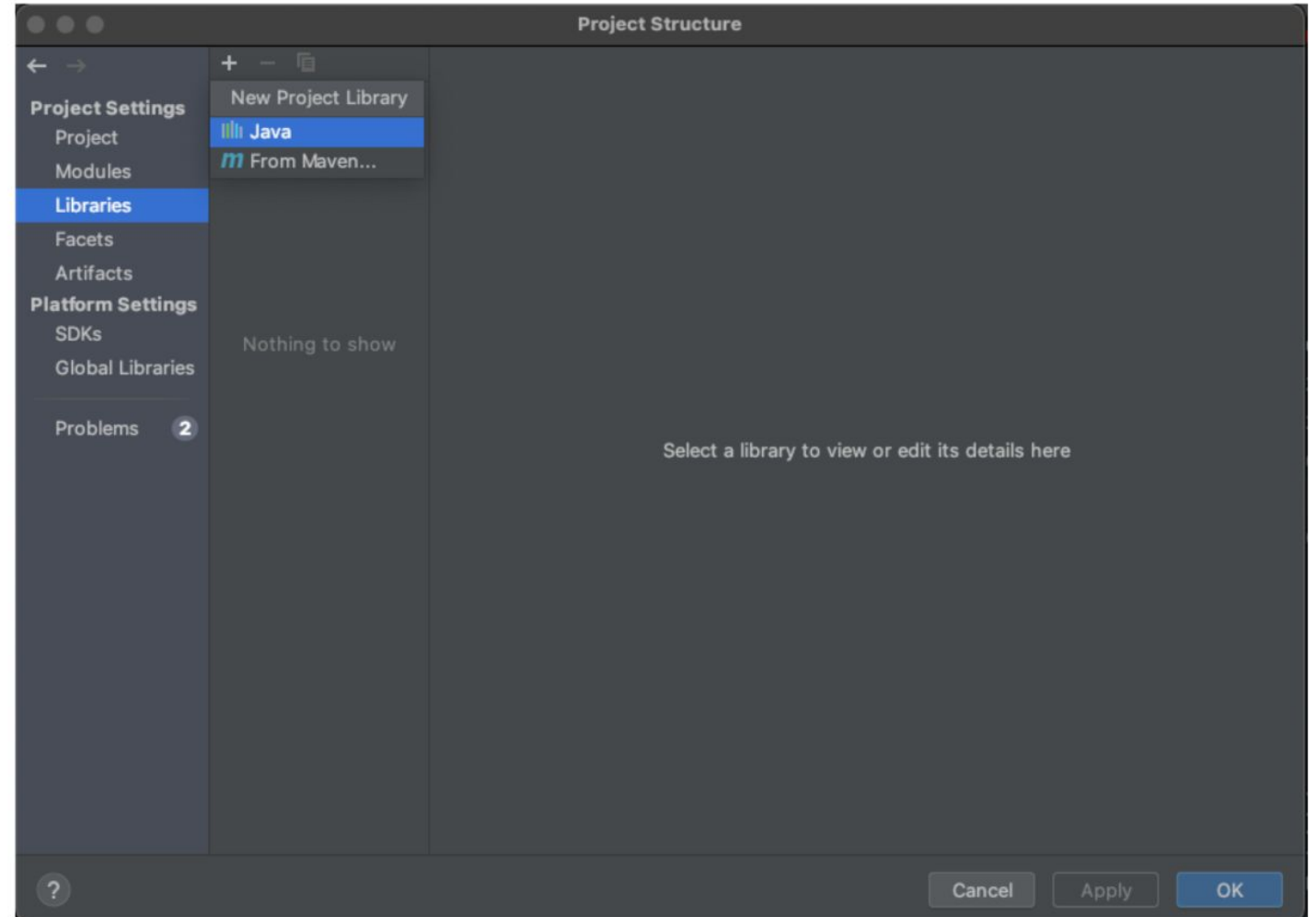"Open Module Settings"

Installation for IntelliJ

- Step 2:
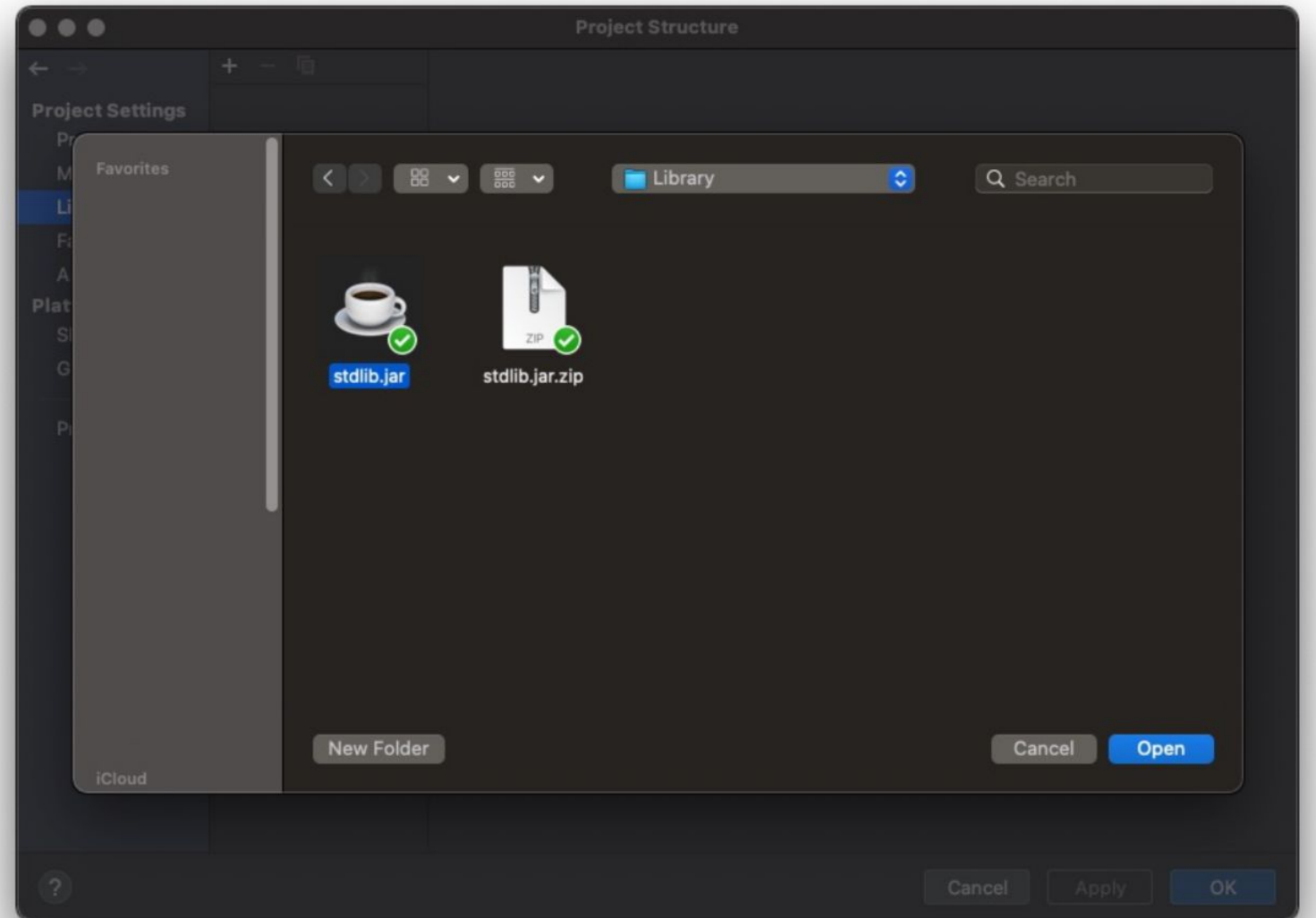 In the Project Structure screen,
  choose "Libraries"

Installation for IntelliJ

- Step 3:
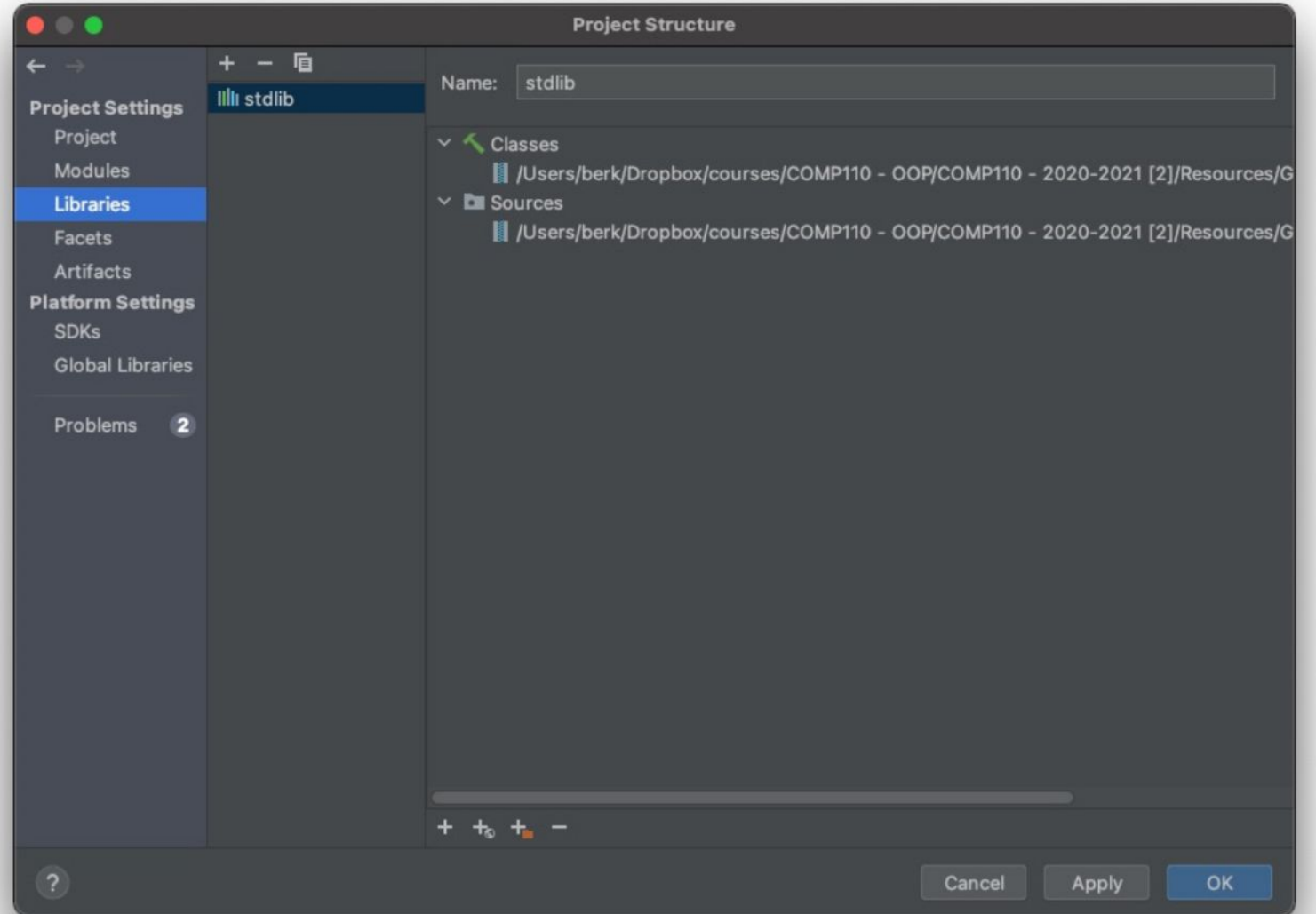 Choose "Java"

Installation for IntelliJ

- Step 4:
  Choose "stdlib.jar" file that you have downloaded

Installation for IntelliJ

- Step 5:
  Installation procedure is now finished. You can see the "stdlib" in the Libraries section.

- You can run your program now

Bouncing Ball

```
StdDraw.setCanvasSize() // set the size of the drawing canvas

StdDraw.setXscale(xMin, xMax) // set the x-scale

StdDraw.setYscale(yMin, yMax) // set the y-scale

StdDraw.enableDoubleBuffering() // for animation

StdDraw.clear() // clears the canvas

StdDraw.show() // shows the offscreen canvas

StdDraw.pause() // pauses the program

StdDraw.setPenColor(StdDraw.BLACK) // sets the pen color for drawing

StdDraw.filledCircle() // draws a filled circle with the pen color
```
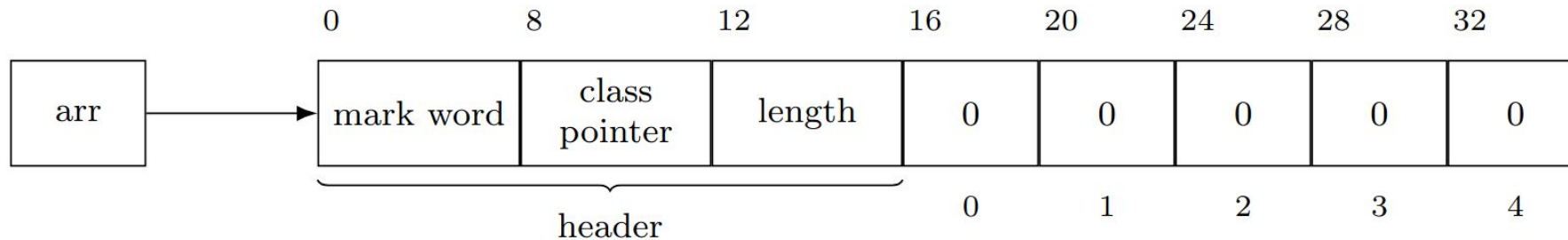
Bouncing Ball

File

Java Arrays

- An array is a **fixed-size** container that holds multiple values of the **same** data type

- Stored **contiguously** in memory for efficient access.

```java
int[] arr = new int[5];
```

Java Arrays

- An array is a **fixed-size** container that holds multiple values of the **same** data type

- Stored **contiguously** in memory for efficient access.

```java
int[] arr = new int[5];

int[2] arr = 2;
```
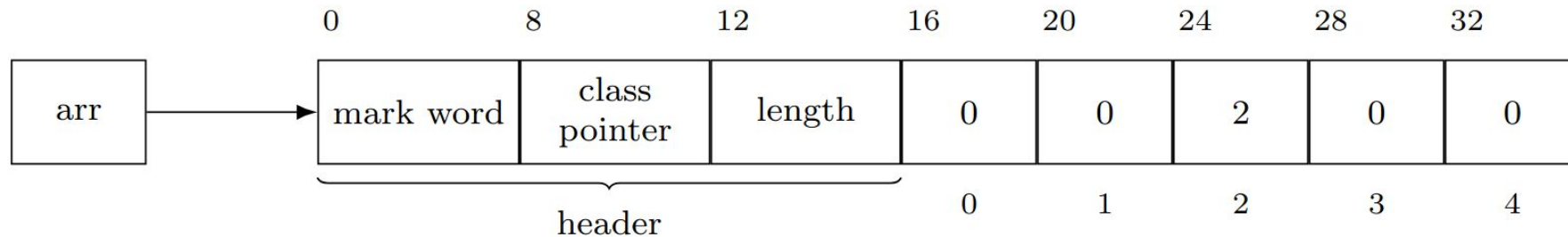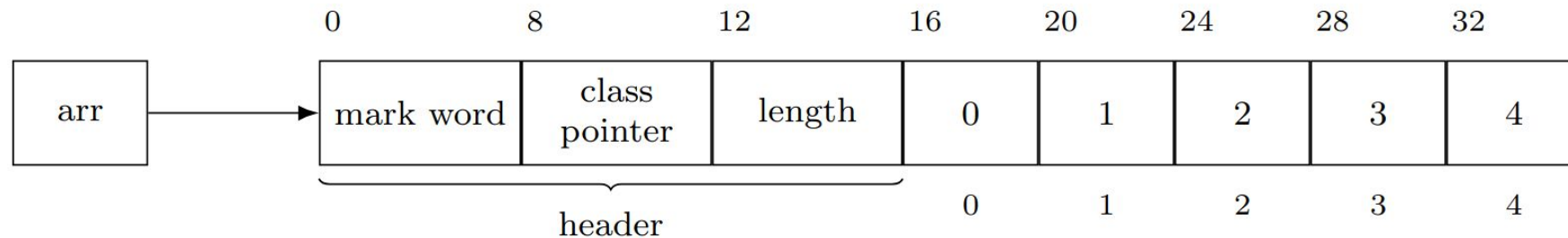
Java Arrays

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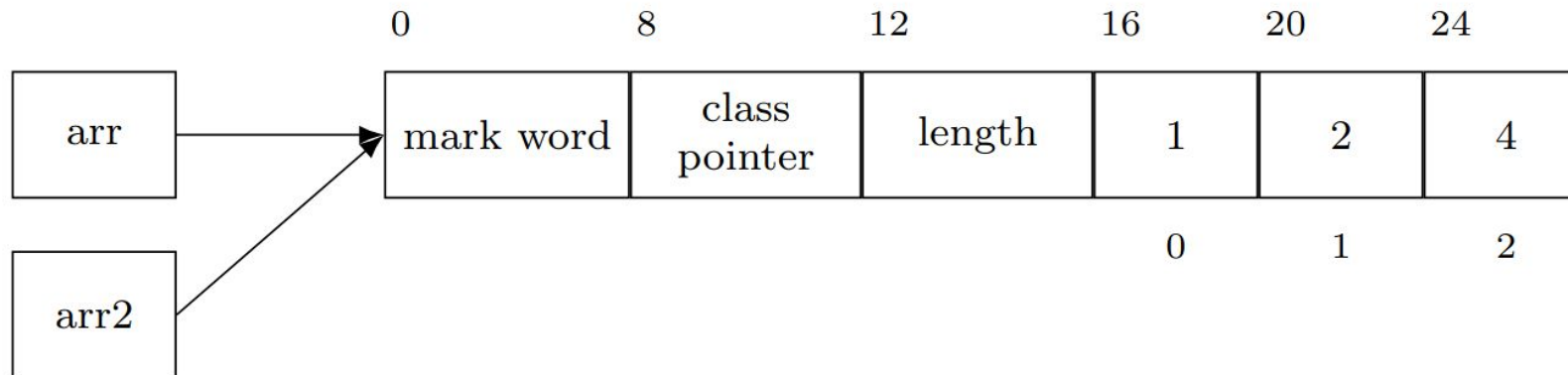
```
int[] arr = {0, 1, 2, 3, 4};
```

Java Arrays

- Copying arrays not work with **arr = arr2**

- Use **clone()**, **System.arraycopy()**, or **Arrays.copyOf()**

```java
int[] arr = {1, 2, 3};

int[] arr2 = arr;

arr[2] = 4;
```

Random Number Generation

```java
import java.util.Random;



Random random = new Random(); // Create a random number generator

System.out.println("Random numbers: ");

System.out.println(random.nextDouble()); // Generate a random number between 0.0 and 1.0

System.out.println(random.nextInt(10)); // Generate a random number between 0 and 9
```

Random numbers:

0.3230351709473297

6

Multiple Bouncing Balls


```java
import java.util.Random;

import java.awt.Color;

StdDraw.setCanvasSize() // set the size of the drawing canvas

StdDraw.setXscale(xMin, xMax) // set the x-scale

StdDraw.setYscale(yMin, yMax) // set the y-scale

StdDraw.enableDoubleBuffering() // for animation

StdDraw.clear() // clears the canvas

StdDraw.show() // shows the offscreen canvas

StdDraw.pause() // pauses the program

StdDraw.setPenColor(StdDraw.BLACK) // sets the pen color for drawing

StdDraw.filledCircle() // draws a filled circle with the pen color

int[] arr = new int[5]; // create array

Random random = new Random(); // Create a Random object to generate random values

Color[] ballColors = new Color[numberOfBalls] // for coloring
```