Experiment No. 10

Aim: To develop programs for making animations such as

Objective:
Draw an object and apply various transformation techniques to this object. Translation, scaling and rotation is applied to object to perform animation.

Theory:

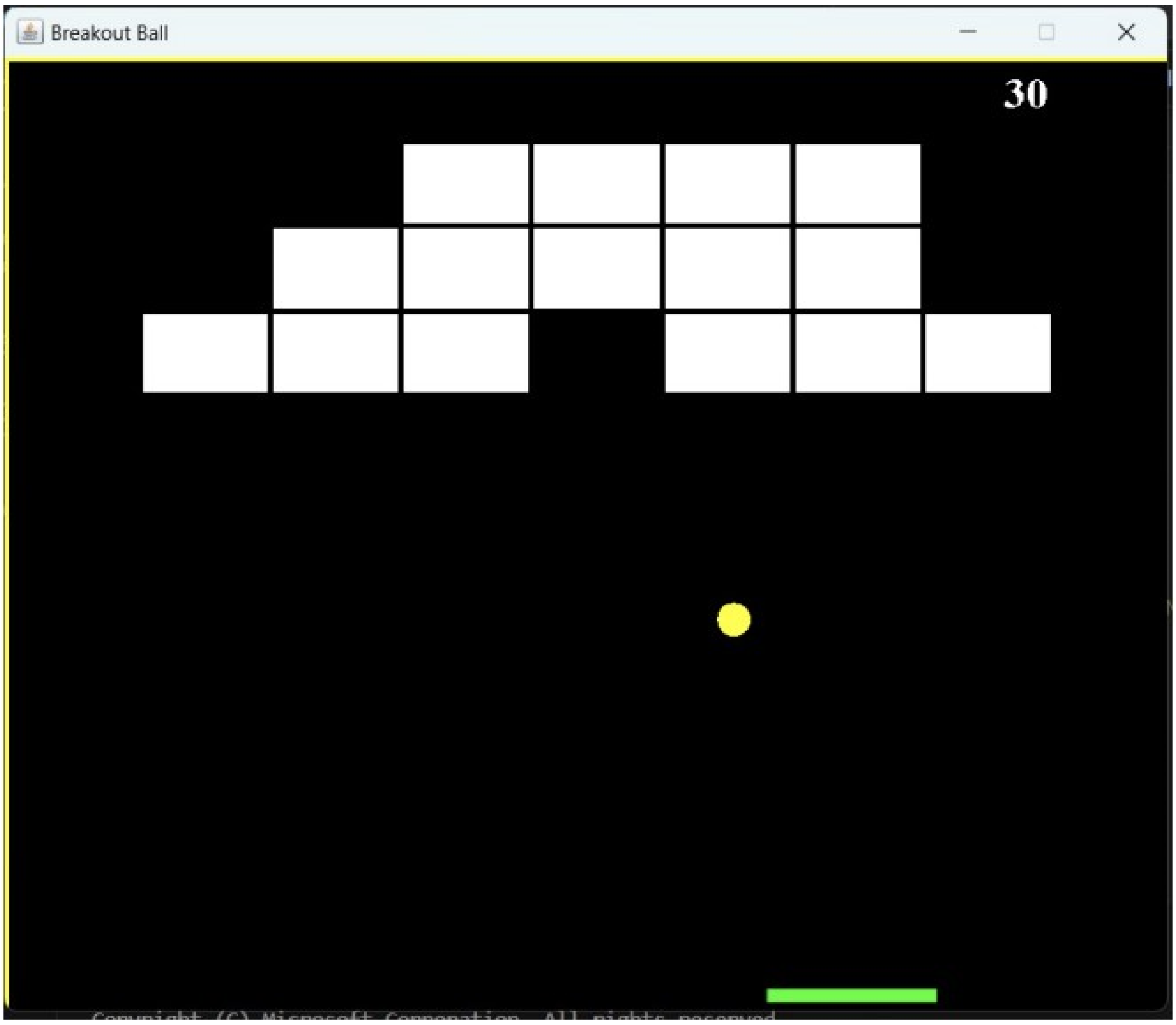
- For moving any object, we incrementally calculate the object coordinates and redraw the picture to give a feel of animation by using for loop.
- Suppose if we want to move a circle from left to right means, we have to shift the position of circle along x-direction continuously in regular intervals.
- The below programs illustrate the movement of objects by using for loop and also using transformations like rotation, translation etc.
- For windmill rotation, we use 2D rotation concept and formulas.

Program:

```
package brickBracker;
import javax.swing.JFrame;
 public class Main {
public static void main(String[] args) {
 JFrame obj = new JFrame();
 Gameplay gamePlay = new Gameplay();
 obj.setBounds(10, 10, 700, 600);
 obj.setTitle("Breakout Ball");
 obj.setResizable(false);
 obj.setVisible(true);
 obj.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
 obj.add(gamePlay);
}
 }
 package brickBracker;
 import java.awt.Color;
 import java.awt.Font;
 import java.awt.Graphics;
 import java.awt.Graphics2D;
 import java.awt.Rectangle;
 import java.awt.event.ActionEvent;
 import java.awt.event.ActionListener;
 import java.awt.event.KeyEvent;
import java.awt.event.KeyListener;
 import javax.swing.JPanel;
 import javax.swing.Timer;
 public class Gameplay extends JPanel implements KeyListener, ActionListener {
 private boolean play = false;
 private int score = 0;
 private int totalBricks = 21;
 private Timer timer;
private int delay = 15;
private int playerX = 310;
 private int ballposX = 120;
 private int ballposY = 350;
 private int ballXdir = -2;
 private int ballYdir = -1;
 private MapGenerator map;
 public Gameplay() {
 map = new MapGenerator(3, 7);
 addKeyListener(this);
 setFocusable(true);
 setFocusTraversalKeysEnabled(false);
 timer = new Timer(delay, this);
 timer.start();
 } public void paint(Graphics g) {
super.paint(g);
 Background g.setColor(Color.black);
 g.fillRect(1, 1, 692, 592);
 Drawing map map.draw((Graphics2D) g);
  Borders g.setColor(Color.yellow);
 g.fillRect(0, 0, 3, 592);
g.fillRect(0, 0, 692, 3);
g.fillRect(691, 0, 3, 592);
  g.setColor(Color.white);
 g.setFont(new Font("serif", Font.BOLD, 25));
 g.drawString("" + score, 590, 30);
 g.setColor(Color.green);
 g.fillRect(playerX, 550, 100, 8);
 g.setColor(Color.yellow);
 g.fillOval(ballposX, ballposY, 20, 20);
if (totalBricks <= 0) {
play = false;
 ballXdir = 0;
ballYdir = 0;
g.setColor(Color.RED);
 g.setFont(new Font("serif", Font.BOLD, 30));
 g.drawString("YOU WON", 260, 300); }
 if (ballposY > 570) {
play = false;
 ballXdir = 0;
 ballYdir = 0;
 g.setColor(Color.RED);
 g.setFont(new Font("serif", Font.BOLD, 30));
 g.drawString("Game over, Scores: " + score, 190, 300);
 g.setFont(new Font("serif", Font.BOLD, 20));
 g.drawString("Press Enter to Restart", 230, 350);
}
}
 public void actionPerformed(ActionEvent e) {
timer.start();
 if (play) {
 if (new Rectangle(ballposX, ballposY, 20, 20).intersects(new Rectangle(playerX, 550, 100,
8))){
 ballYdir = -ballYdir;
}
. for (int i = 0; i < map.map.length; i++) {
 for (int j = 0; j < map.map[0].length; j++) {
 if (map.map[i][j] > 0) {
int brickX = j * map.brickWidth + 80;
int brickY = i * map.brickHeight + 50;
 int brickWidth = map.brickWidth;
int brickHeight = map.brickHeight;
 Rectangle rect = new Rectangle(brickX, brickY, brickWidth, brickHeight);
 Rectangle ballRect = new Rectangle(ballposX, ballposY, 20, 20);
 Rectangle brickRect = rect;
 if (ballRect.intersects(brickRect)) {
```

```
 map.setBrickValue(0, i, j);
 totalBricks--;
score += 5;
if (ballposX + 19 <= brickRect.x || ballposX + 1 >= brickRect.x + brickRect.width) {
ballXdir = -ballXdir;
} else {
ballYdir = -ballYdir;
}
 break A;
 }
 }
 }
 }
 ballposX += ballXdir;
 ballposY += ballYdir;
 if (ballposX < 0) {
 ballXdir = -ballXdir;
 } if (ballposY < 0) {
 ballYdir = -ballYdir;
 } if (ballposX > 670) {
ballXdir = -ballXdir;
 }
 }  repaint();
} public void keyTyped(KeyEvent e) {
} public void keyReleased(KeyEvent e) {
} public void keyPressed(KeyEvent e) {
 if (e.getKeyCode() == KeyEvent.VK_RIGHT) {
 if (playerX >= 600) { playerX = 600;
 }
 else {
 moveRight();
 }
 }
 if (e.getKeyCode() == KeyEvent.VK_LEFT) {
if (playerX < 10) {
playerX = 10;
 }
 else {
 moveLeft();
 }
 }
 if (e.getKeyCode() == KeyEvent.VK_ENTER) {
if (!play) {
 play = true;
 ballposX = 120;
 ballposY = 350;
ballXdir = -1;
ballYdir = -2;
 playerX = 310;
 score = 0;
totalBricks = 21;
map = new MapGenerator(3, 7);
 repaint();
 }
 }
 }
 public void moveRight() {
play = true;
 playerX += 20;
}
 public void moveLeft() {
 play = true;
 playerX -= 20;
 }
 }
package brickBracker;
 import java.awt.BasicStroke;
 import java.awt.Color;
 import java.awt.Graphics2D;
 public class MapGenerator {
 public int map[][];
 public int brickWidth;
public int brickHeight;
 public MapGenerator(int row, int col) {
map = new int[row][col];
 for (int i = 0; i < map.length; i++) {
 for (int j = 0; j < map[0].length; j++) {
 map[i][j] = 1;
}
 }
 brickWidth = 540 / col;
 brickHeight = 150 / row;
 }
public void draw(Graphics2D g) {
 for (int i = 0; i < map.length; i++) {
 for (int j = 0; j < map[0].length; j++) {
if (map[i][j] > 0) {
g.setColor(Color.white);
  g.fillRect(j * brickWidth + 80, i * brickHeight + 50, brickWidth, brickHeight);
g.setStroke(new BasicStroke(3));
 g.setColor(Color.black);
 g.drawRect(j * brickWidth + 80, i * brickHeight + 50, brickWidth, brickHeight);
 }
 }
 }
 }
 public void setBrickValue(int value, int row, int col) {
map[row][col] = value;
}
}
```

Output:



Conclusion - Comment on :

1. Importance of story building
2. Defining the basic character of story
3. Apply techniques to these characters

1. Importance of Story Building:

- Story building is a fundamental step in creating compelling narratives, whether in literature, film, or any form of storytelling.

- It establishes the foundation of the plot, characters, and the world in which the story unfolds.

- Story building helps authors and creators map out the journey of the narrative, ensuring coherence and engagement.

2. Defining the Basic Character of the Story:

- The basic character of the story includes the central theme, the protagonist, and the primary conflict.

- Defining these elements sets the tone and direction of the narrative, giving it a clear purpose and focus.

- It helps convey the message or moral of the story to the audience.

3. Applying Techniques to These Characters:

- Techniques are essential for developing characters and plotlines effectively.

- Techniques can include character development, foreshadowing, conflict resolution, and more.

- Applying techniques to the basic character of the story adds depth and complexity, making the narrative more engaging and relatable.

In summary, story building is the first step in crafting a compelling narrative, defining the central elements and setting the stage for the application of storytelling techniques. It's a critical phase in the creative process, ensuring that the story captures the audience's imagination and interest.

Experiment No. 10 Mini Project