

2024학년도 1학기
JAVA 프로그래밍 I

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2024년 봄학기
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박경신

과제 Lab5 (Collections)

□ BlockType 열거형 구현

- NONE(Color.BLACK, new int[][] { { 0, 0 }, { 0, 0 }, { 0, 0 }, { 0, 0 } })
- TEAL_BLOCK(new Color(54, 117, 136), new int[][] { { 0, -1 }, { 0, 0 }, { 0, 1 }, { 0, 2 } })
- RED_BLOCK(new Color(204, 102, 102), new int[][] { { 0, 0 }, { 1, 0 }, { 0, 1 }, { 1, 1 } })
- DOGERS_BLUE_BLOCK(new Color(0, 90, 156), new int[][] { { -1, -1 }, { 0, -1 }, { 0, 0 }, { 0, 1 } })
- YELLOW_BLOCK(new Color(255, 204, 51), new int[][] { { -1, 0 }, { 0, 0 }, { 1, 0 }, { 0, 1 } })
- PURPLE_BLOCK(new Color(102, 0, 153), new int[][] { { 0, -1 }, { 0, 0 }, { -1, 0 }, { -1, 1 } })
- ORANGE_BLOCK(new Color(255, 102, 0), new int[][] { { 0, -1 }, { 0, 0 }, { 1, 0 }, { 1, 1 } })
- GREEN_BLOCK(new Color(55, 153, 34), new int[][] { { 1, -1 }, { 0, -1 }, { 0, 0 }, { 0, 1 } })
- **private Color color;**
- **private int[][] coords;**
- **Constructor 내부 구현 필요함**
- **Getter 내부 구현 필요함**
- **public static BlockType getRandom() 내부 구현 필요함**

과제 Lab4 (Collections)

□ Block 클래스 제공

- private BlockType type;
- private int[][] coords = new Rectangle2D[4];
- public Block() { setType(BlockType.NONE); }
- **public void setType(BlockType type)**
- public BlockType getType()
- public void setX(int index, int x)
- public int getX(int index)
- public void setY(int index, int y)
- public int getY(int index)
- public int minX()
- public int minY()
- **public Block rotateLeft()**
- **public Block rotateRight()**

과제 Lab5 (Collections)

□ Lab5MainFrame 클래스 제공

```
public class Lab5MainFrame extends JFrame {
    private JLabel statusBar;
    public Lab5MainFrame() {
        statusBar = new JLabel(" 0");
        add(statusBar, BorderLayout.SOUTH);
        var board = new BlockManager(this);
        add(board);
        board.start();
        setTitle("Tetris");
        setSize(510, 1000);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        setLocationRelativeTo(null);
    }
    public JLabel getStatusBar() {
        return statusBar;
    }
}
```

```
public static void main(String[] args) {
    EventQueue.invokeLater(() -> {
        var game = new Lab5MainFrame();
        game.setVisible(true);
    });
}
```

과제 Lab5 (Collections)

□ BlockEvent 클래스 구현

- private String name;
- private BlockType type;
- private List<String> actions;
- Constructor 내부 구현 필요함
- Getter/Setter 내부 구현 필요함
- public String toString() 내부 구현 필요함
 - type=null 또는 actions=null인 경우 "null" 출력

과제 Lab5 (Collections)

□ BlockManager 클래스 수정

```
class BlockManager extends JPanel implements ActionListener, KeyListener {  
    ...  
    private Block curPiece;  
    private BlockType[] board;  
    private JLabel statusbar;  
    // BlockEvent 관련 멤버 추가  
    private ArrayList<BlockEvent> playBlockLogs;  
    private BlockEvent curPieceLog;  
    private ArrayList<String> curPieceLogActions;  
}
```

과제 Lab5 (Collections)

□ BlockManager 클래스 수정

- 생성자에서 `playBlockLogs` 생성
- `newPiece()`에서 `curPieceLog = BlockEvent("NEW_PIECE", curPiece.getType(), curPieceLogActions)` 생성하여 `playBlockLogs`에 추가
- `VK_LEFT/RIGHT/DOWN/UP/SPACE`시 `"MOVE_LEFT", "MOVE_RIGHT", "ROTATE_LEFT", "ROTATE_RIGHT", "DROP_DOWN"`을 `curPieceLogActions`에 추가
- `removeFullLine`시 `BlockEvent("REMOVE_FULL_LINE", null, null)` 생성하여 `playBlockLogs`에 추가
- `Game over`시 `playBlockLogs` 전체 출력

과제 Lab5 (Collections)

Game Over - Print piece of played blocks

```
{ name='NEW_PIECE' type='TEAL_BLOCK', actions='ROTATE_LEFT, MOVE_RIGHT, MOVE_RIGHT'}
{ name='NEW_PIECE' type='TEAL_BLOCK', actions='MOVE_DOWN, ROTATE_LEFT, MOVE_LEFT, MOVE_LEFT'}
{ name='NEW_PIECE' type='YELLOW_BLOCK', actions='MOVE_DOWN, ROTATE_LEFT, ROTATE_LEFT, MOVE_RIGHT, MOVE_RIGHT'}
{ name='NEW_PIECE' type='RED_BLOCK', actions='MOVE_DOWN, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_DOWN'}
{ name='REMOVE_FULL_LINES' type='null', actions='null'}
{ name='NEW_PIECE' type='RED_BLOCK', actions='MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT'}
{ name='NEW_PIECE' type='DOGERS_BLUE_BLOCK', actions='MOVE_DOWN, ROTATE_LEFT, MOVE_LEFT, MOVE_DOWN'}
{ name='REMOVE_FULL_LINES' type='null', actions='null'}
{ name='NEW_PIECE' type='PURPLE_BLOCK', actions='MOVE_RIGHT, MOVE_RIGHT'}
{ name='NEW_PIECE' type='PURPLE_BLOCK', actions='MOVE_DOWN, ROTATE_LEFT, MOVE_LEFT, MOVE_LEFT'}
{ name='NEW_PIECE' type='YELLOW_BLOCK', actions='MOVE_DOWN, ROTATE_LEFT, MOVE_LEFT'}
{ name='NEW_PIECE' type='DOGERS_BLUE_BLOCK', actions='MOVE_DOWN, ROTATE_LEFT, ROTATE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT'}
{ name='NEW_PIECE' type='GREEN_BLOCK', actions='MOVE_DOWN, ROTATE_LEFT, ROTATE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT'}
{ name='NEW_PIECE' type='GREEN_BLOCK', actions='MOVE_DOWN, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT'}
{ name='NEW_PIECE' type='TEAL_BLOCK', actions='MOVE_DOWN, MOVE_RIGHT, MOVE_RIGHT, MOVE_RIGHT, MOVE_RIGHT, MOVE_DOWN'}
{ name='REMOVE_FULL_LINES' type='null', actions='null'}
```


과제 Lab5 (Collections)

```
{ name='NEW_PIECE' type='YELLOW_BLOCK', actions='ROTATE_LEFT, ROTATE_LEFT, ROTATE_LEFT, MOVE_DOWN'}
{ name='REMOVE_FULL_LINES' type='null', actions='null'}
{ name='NEW_PIECE' type='TEAL_BLOCK', actions='MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_DOWN'}
{ name='REMOVE_FULL_LINES' type='null', actions='null'}
{ name='NEW_PIECE' type='YELLOW_BLOCK', actions='ROTATE_LEFT, ROTATE_LEFT, ROTATE_LEFT, MOVE_LEFT, MOVE_LEFT'}
{ name='NEW_PIECE' type='DOGERS_BLUE_BLOCK', actions='MOVE_DOWN, ROTATE_LEFT, ROTATE_LEFT, MOVE_RIGHT'}
{ name='NEW_PIECE' type='PURPLE_BLOCK', actions='MOVE_DOWN, ROTATE_LEFT, ROTATE_LEFT, MOVE_LEFT, MOVE_LEFT,
MOVE_LEFT, MOVE_LEFT'}
{ name='NEW_PIECE' type='ORANGE_BLOCK', actions='MOVE_DOWN, MOVE_LEFT'}
{ name='NEW_PIECE' type='ORANGE_BLOCK', actions='MOVE_DOWN, MOVE_LEFT'}
{ name='NEW_PIECE' type='ORANGE_BLOCK', actions='MOVE_DOWN, MOVE_LEFT'}
{ name='NEW_PIECE' type='PURPLE_BLOCK', actions='MOVE_DOWN, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT'}
{ name='NEW_PIECE' type='ORANGE_BLOCK', actions='MOVE_DOWN'}
{ name='NEW_PIECE' type='GREEN_BLOCK', actions='MOVE_DOWN, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT,
MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_LEFT, MOVE_DOWN'}
{ name='REMOVE_FULL_LINES' type='null', actions='null'}
{ name='NEW_PIECE' type='PURPLE_BLOCK', actions='MOVE_LEFT, MOVE_LEFT, MOVE_LEFT'}
{ name='NEW_PIECE' type='GREEN_BLOCK', actions='MOVE_DOWN, ROTATE_LEFT, ROTATE_LEFT, MOVE_RIGHT, MOVE_RIGHT,
MOVE_RIGHT, MOVE_RIGHT, MOVE_DOWN'}
{ name='REMOVE_FULL_LINES' type='null', actions='null'}
{ name='NEW_PIECE' type='YELLOW_BLOCK', actions='MOVE_RIGHT, ROTATE_LEFT, ROTATE_LEFT, MOVE_LEFT, MOVE_LEFT'}
{ name='NEW_PIECE' type='GREEN_BLOCK', actions='MOVE_DOWN, MOVE_LEFT'}
```

과제 제출

- Lab5와 보고서 전체를 묶어서 e-learning에 과제 제출 (due by 6/5)
 - 본인이 원하는 코드 추가 구현 및 테스트
 - 보고서에 전체 코드 분석 및 구현 내용 자세히 설명