Introduction to DDR

- Foot – eye coordination
- Hit arrows when they match up on screen
- We use IR sensors
- One song, 3 difficulty levels

*Image source: http://www.explorekorea.de/reise/bilder/ddr.jpg
Game Overview

- IR Sensor Info
determines location of user’s feet

- Control Unit
controls game flow

- Audio
handles song representation as arrows and audio playback

- Video
produces display viewed by user
Data Flow

Video → Control Unit → Audio → IR Sensor Info

Audio → Control Unit → Video

Info → Control Unit → IR Sensor
Video ~ Menu Screen

MIT Dance Dance Revolution!

Song: Mr. Roboto, Styx

Difficulty Level:
Easy
Medium
Hard
Video ~ In-Game Mode

Difficulty Level

Accuracy Level
Game Over!

Your Rating: A+
Great Job!
Infrared Sensors

- Setup:
  - 3x3 grid of sensors allows location of foot to be found

- Hardware:
  - Sharp GP2Y0D02YK IR Sensor - 31" Trigger (hobbyengineering.com)
  - Produces digital output indicating if beam is interrupted

- Considerations:
  - Delay due to wires and the IR trigger device
Control Unit

- Two main functions:
  - Game mode
  - Scoring
- Game mode:
  - Sends a 2-bit signal to determine mode
- Scoring:
  - Calculates score based on how close arrows are when position is reached
  - Accuracy level displayed during game, overall score given at end.
Audio

Audio Playback
- Song stored in ZBT memory
- Played through speakers using AC’97 codec

Representation of song as arrows
- Row of arrows represented as a 4-bit number
- Each row corresponds to a beat of the song
- [left arrow, up arrow, down arrow, right arrow]
- If arrow represented by a 1, then it will appear in the row

<table>
<thead>
<tr>
<th>beat</th>
<th>row</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0101</td>
</tr>
<tr>
<td>2</td>
<td>1000</td>
</tr>
<tr>
<td>n</td>
<td>1001</td>
</tr>
</tbody>
</table>
The End!

- Any questions??