



ESmartlz



Space settlers on Orion

Agenda

- Theory
 - Computer-aided design (CAD)
 - Presentation: Solar sail

Agenda

- **Lego Mindstorms Technology**
 - Lego Mindstorms EV3 Programming
 - Sensors: IR Sensor
 - Lego Digital Designer, LDD
 - Introduction

Agenda

- **ESMartlz**
 - Chapter 1: The mine
 - Chapter 2: The oleoduct
 - Chapter 3: The Orkatu Defense

Agenda

- Team organization
- Homework
- How to get more points?

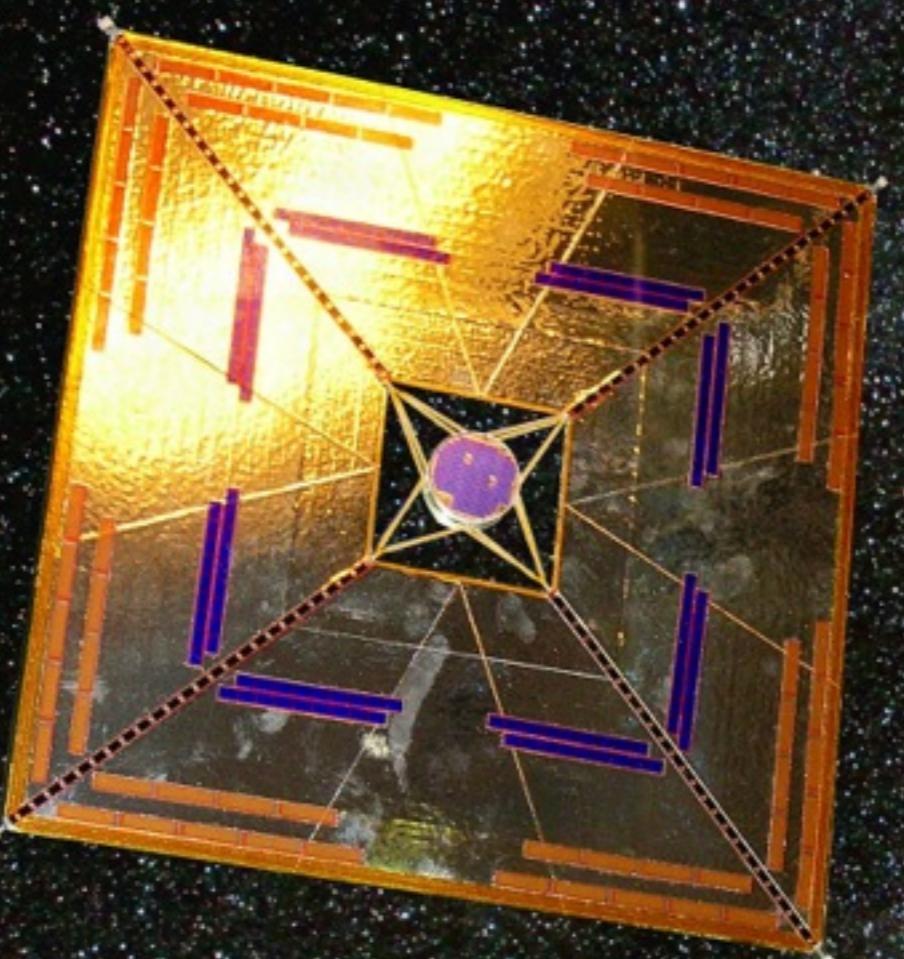


Example designed with SolidWorks

Computer-aided design

- **Computer-aided design (CAD)** is the use of computer systems to assist in the creation, modification, analysis, or optimization of a design. CAD software is used to increase the productivity of the designer, improve the quality of design, improve communications through documentation, and to create a database for manufacturing. CAD output is often in the form of electronic files for print, machining, or other manufacturing operations.
- http://en.wikipedia.org/wiki/Computer-aided_design

Solar sail (+100)



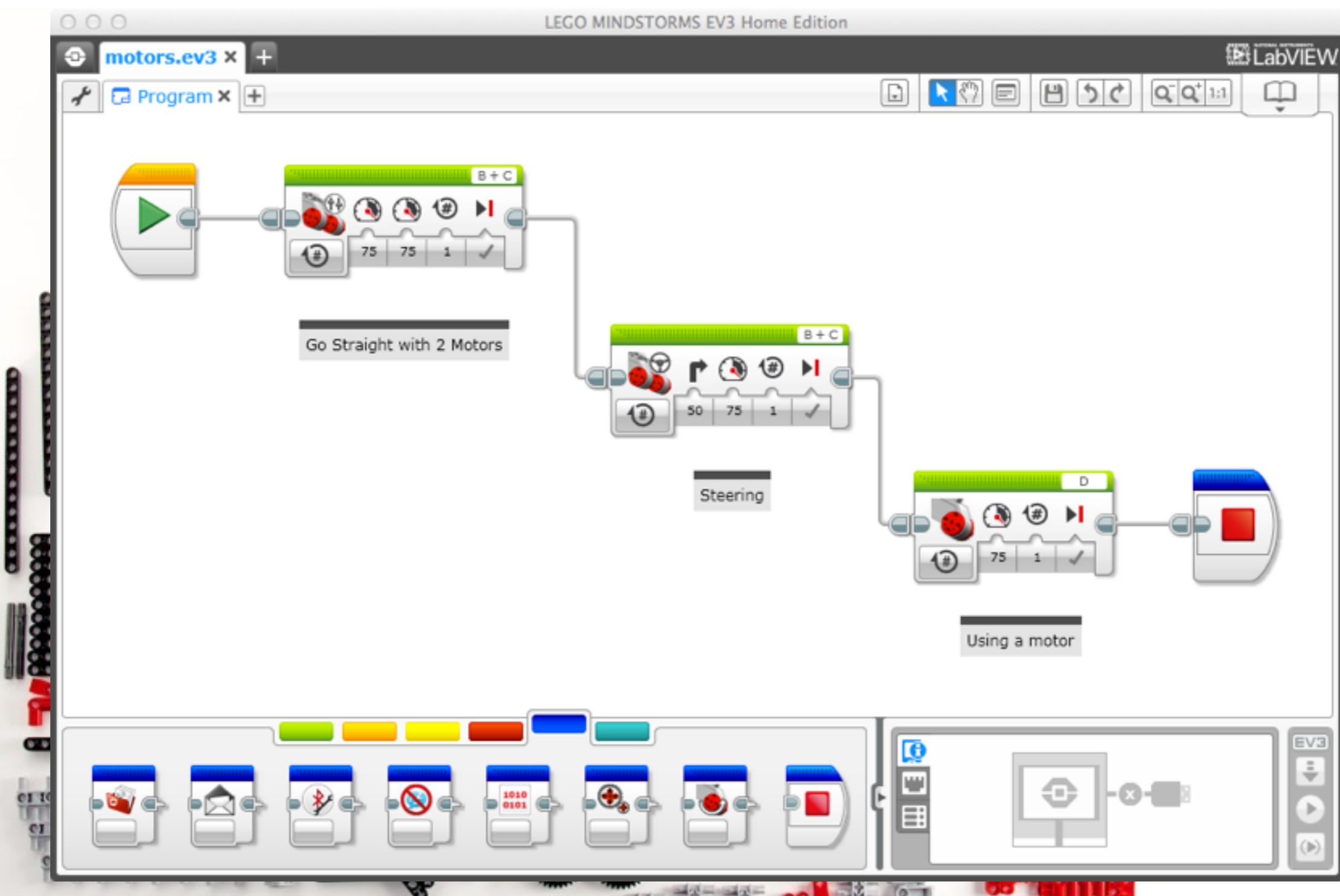
http://en.wikipedia.org/wiki/Solar_sail



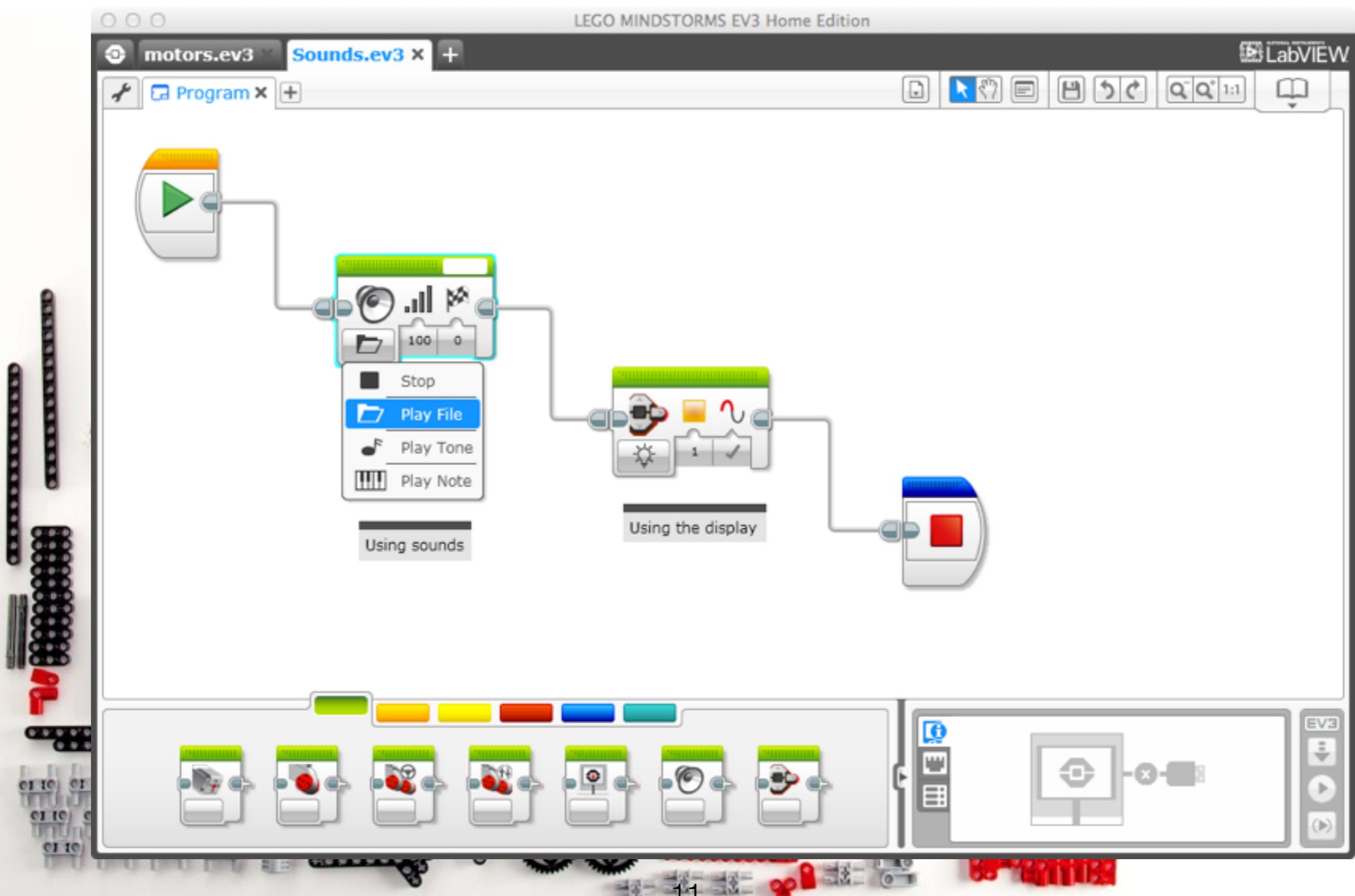
A complete
NXT-G Course.



Basics - Motors



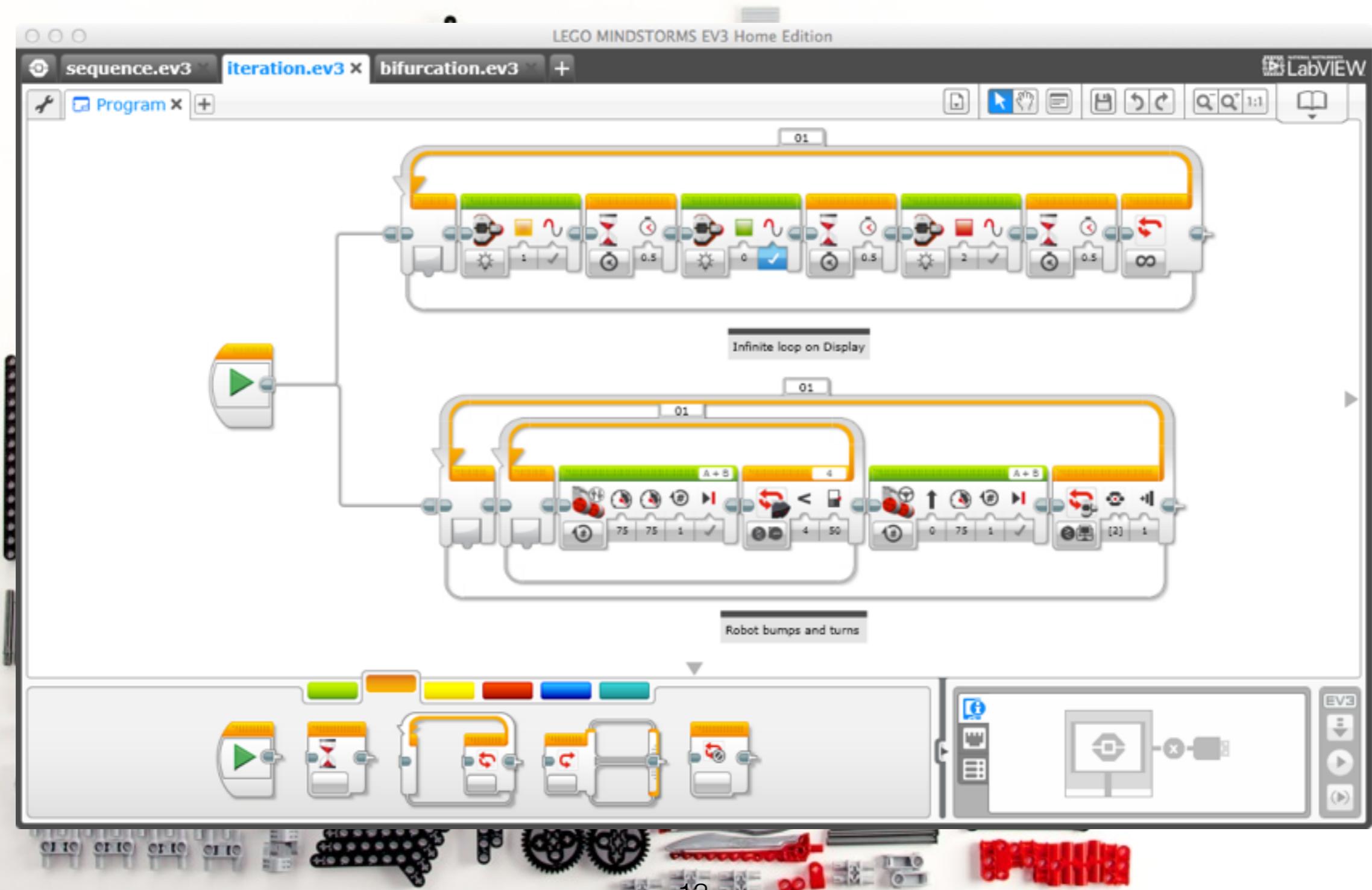
Basics - Sounds



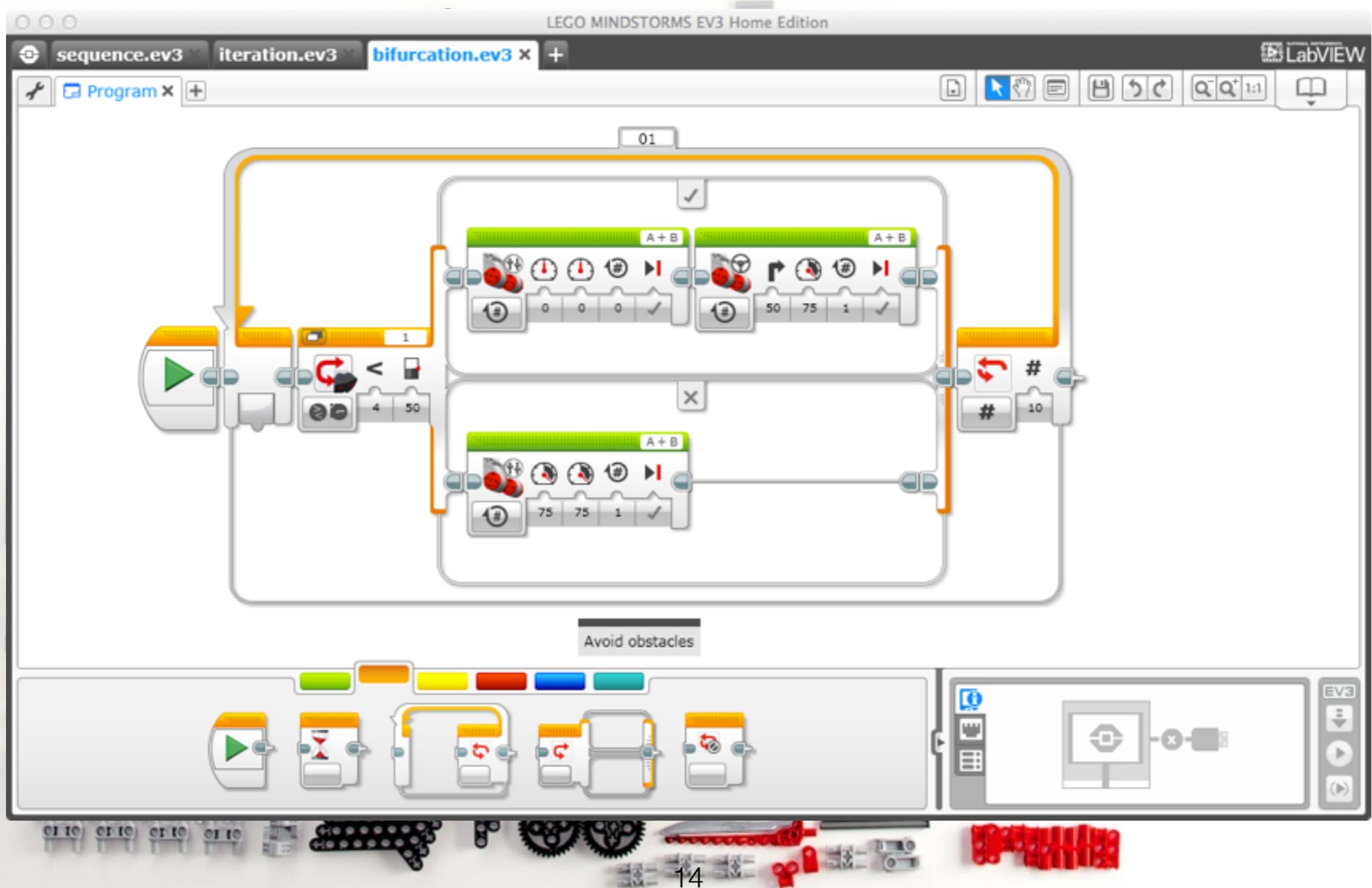
Concepts - Sequence



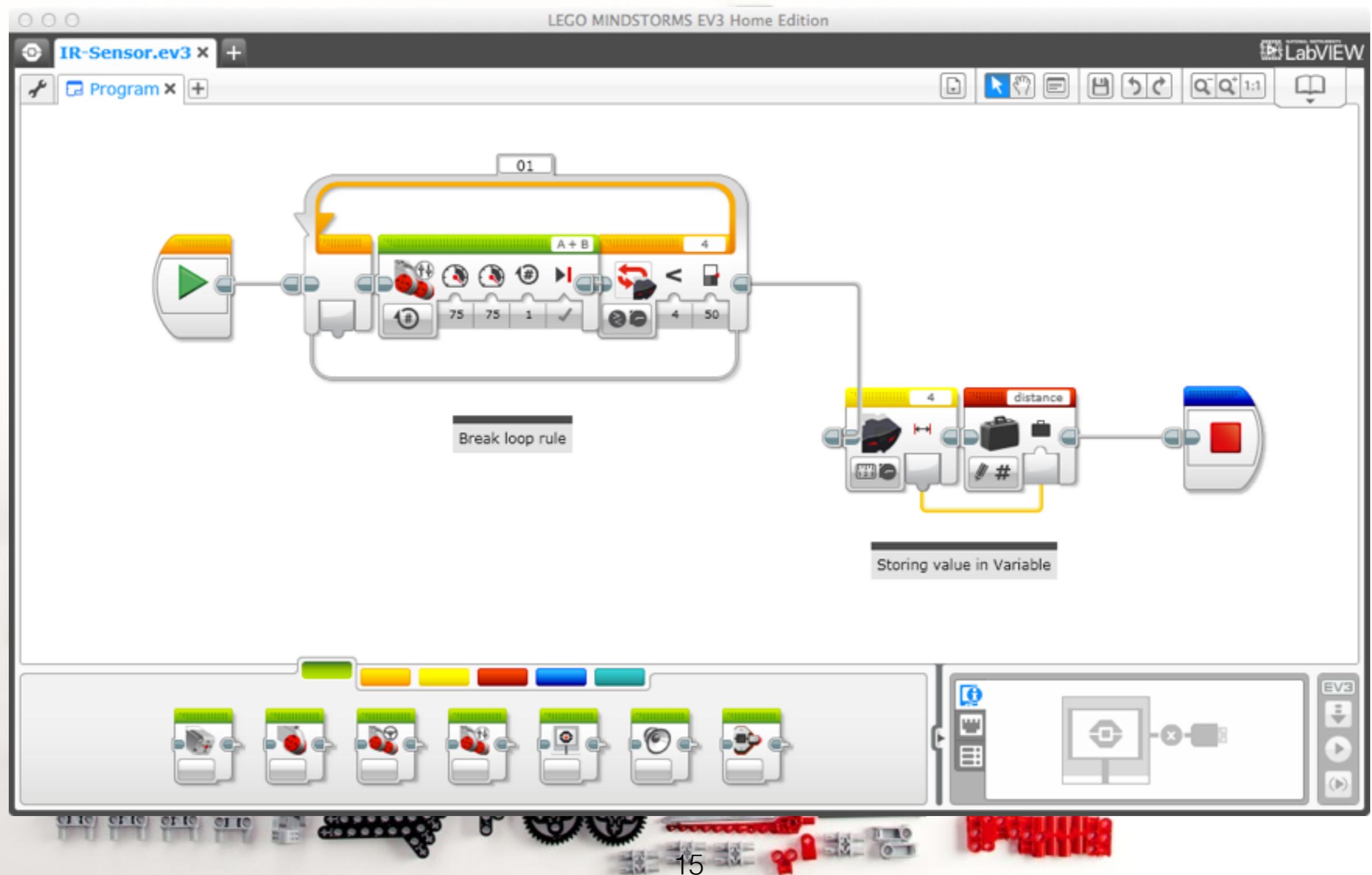
Concepts - Iteration



Concepts - Bifurcation

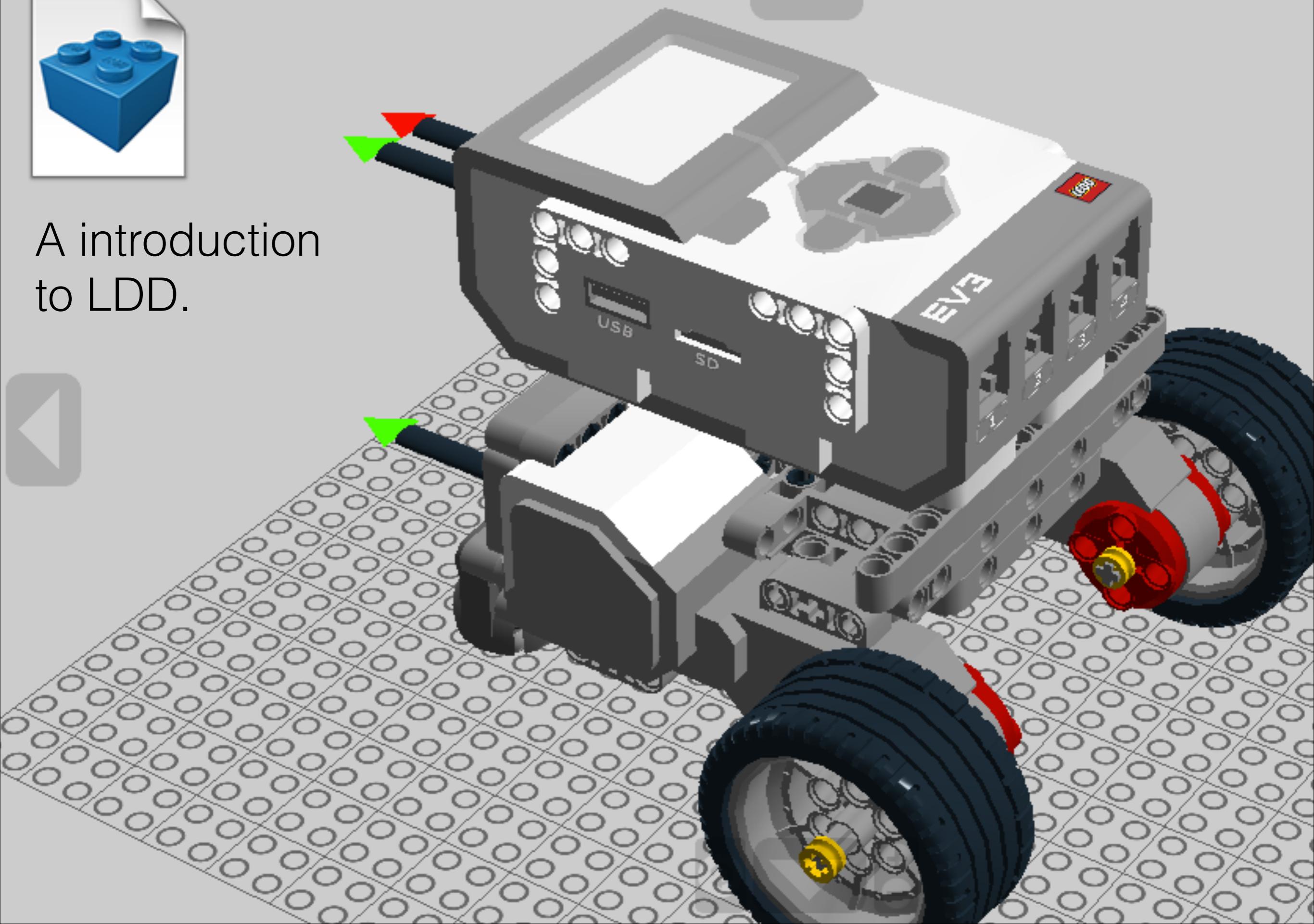


Sensors - IR Sensor





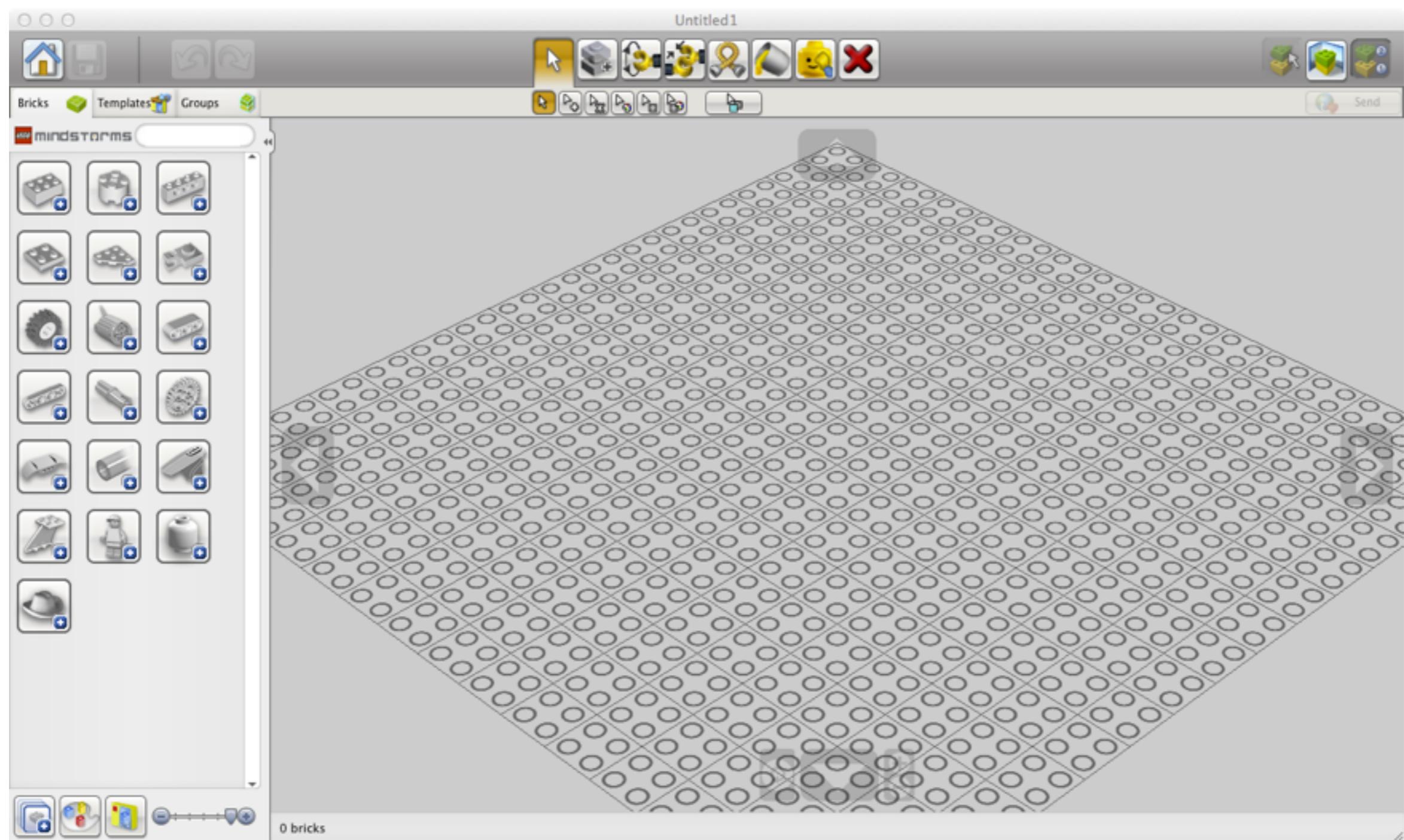
A introduction
to LDD.



Lego Digital Design

- **LEGO Digital Designer, or LDD,** is a free computer program produced by the LEGO Group. The program allows users to build models using virtual LEGO bricks, in a computer-aided design like manner.
- <http://ldd.lego.com/>

New project



ESmartlz



ESmartlz - Mission 1

- Team 1:
 - Create a Robot Explorer
 - Navigation: 2 Motors
 - Design the map to explore the area
 - Develop a program to move your vehicle from Space colony to the mine. Add the program to return home

ESmartlz - Mission 1

- Team 2:
 - Create a Mineral mine
 - Develop a program for the mine
 - Sounds? Lights?

ESmartlz - Mission 2

- Team 1: (Rover)
 - Send your program using basic commands. +5
 - Pendrive / Email
 - Design a Robot claw with 2 motors: + 10
 - Design a program to open/close the claw: +15
 - Build a robust platform: +50
 - Design a oleoduct from Colony to Mine + 15

ESmartlz - Mission 2

- Team 2: (Mine // Urtaku)
 - Send (Pendrive / Email) your program using basic commands. +5
 - Deploy your Mine program in the mine +5
 - Develop a natural behavior for a Space mine. +30
(Imitate the nature)
 - Develop a mobile Urtaku robot +20
 - Develop a program to protect the Mine +20

ESmartlz - Urtaku



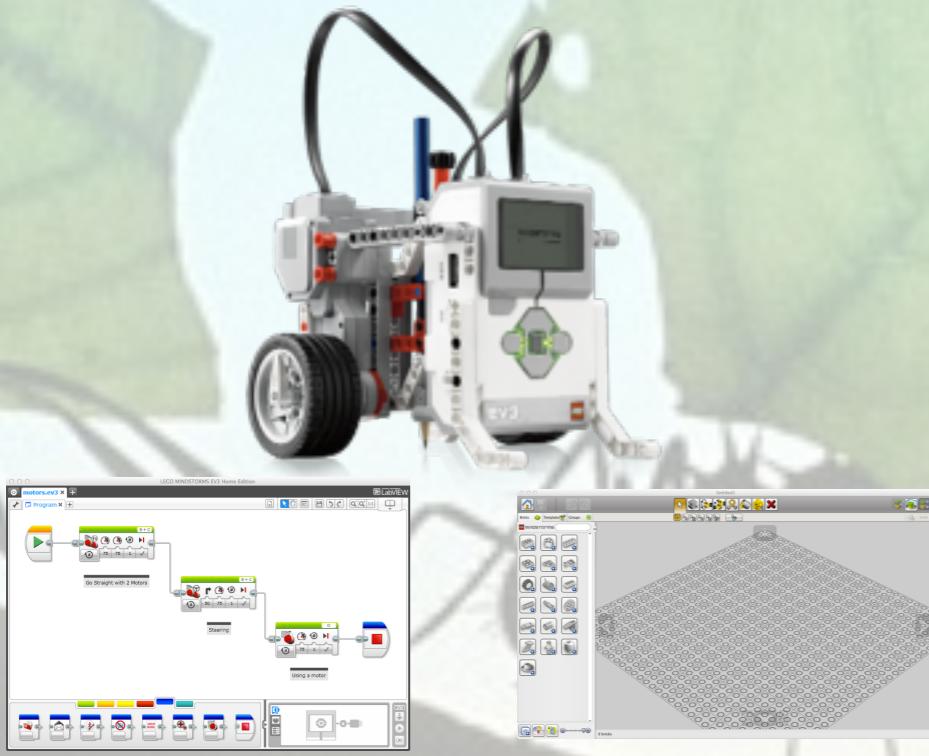
ESmartlz - Urtaku





Idea from the book:
The LEGO MINDSTORMS NXT 2.0 Discovery Book

Team organization

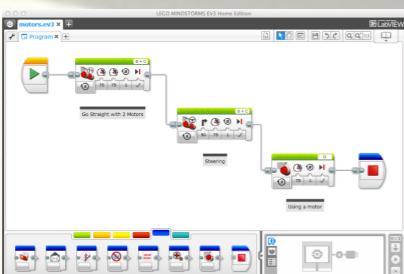


**Daniel, Team 1
Build a Rover**

**Diego, Team 2
Develop a Mission & Design**



**Rodrigo, Team 1
Develop a mission**



**Francisco, Team 2
Develop a mission**

Homework

- **Theory**
 - In Formula one, what is the usage of CAD software? +20
 - Send an email with examples about Engineering design in your environment. +20

Homework

- **Technology**

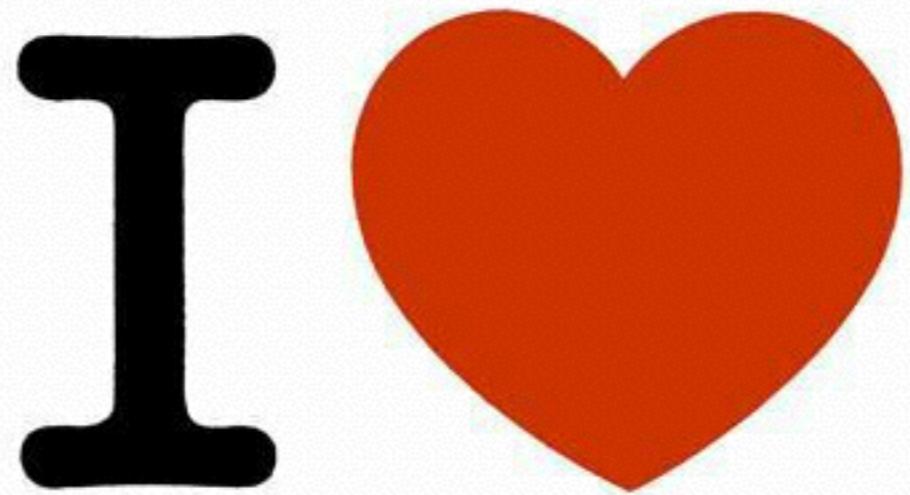
- Try to model in LDD:
 - Mine: + 20
 - Oleoduct (In scale): + 25
 - The rover: +50
 - A Orkatu alternative model: +60 (Creativity bonus)
- Send your model/program by email (ask for help from your parents) +10

How to get more points?

- **Social**
 - Inappropriate behavior: -20
 - Team work: +25
 - Speak in english: + 20
 - Participate in class: + 15

How to get more points?

- **Technology**
 - Innovate: +30
 - Build your Robot / Mine: +10
 - Program your Robot / Mine: +15
 - Design your Robots / Infrastructure in LDD: +25



NEUTRINOS

for Kids

<http://www.iloveneutrinos.com/>