

# Getting to Know the ZR IDE







In this tutorial you will learn about various features of the ZR IDE (Integrated Development Environment) to:

- Create a project
- Compile a code (check it for errors)
- Simulate (run the code in a simulation)





website:

- Log In ☆ = C 🗋 zerorobotics.mit.edu 8 Sign in with Google **Zero Robotics** About ZR -IDE -Tournaments -Resources -Go to the Zero Robotics Welcome to Zero Robotics www.zerorobotics.mit.edu Google Sign in with your Google Account Email Password Sign in Stay signed in Need help?
- Log into your account with your • email and password















# Create a New Project



Select light blue "ZR IDE" ٠ 🗋 zerorobotics.mit.edu C SPHERES icon on top ribbon Zero Robotics IDE -8 Sig Tournaments -4.CS) About ZR -Resources -New Project Select "New Project" **Open Project** Welcome to Zero Rob Open Simulation Enter • - Project Name **New Project** × • Type: Project 1 **Project Name**  Select "Text Editor" Project 1 Select "FreeMode" Text Editor Graphical Editor Game Free Mode Click "New Project" New Project Cancel



CASIS









## **Text Editor IDE**



- The Text Editor version of the ZR IDE is shown here
- On the next pages, you will:
  - Learn where to declare variables, compile and simulate without entering any code

File- Edit- Simulate-	test - Free Mode
Pages	1 //Declare any variables shared between functions here
main	<pre>3- void init(){ 4     //This function is called once when your code is first loaded.</pre>
+ -	6 //IMPORTANT: make sure to set any variables that need an initial value. 7 //Do not assume variables will be set to 0 automatically!
Log	8 } 9
	<pre>10 void loop(){ 11     //This function is called once per second. Use it to control the satellite. 12 } 13</pre>







-Variables are always declared right above "*void init*".

Once a variable is declared you need to assign a value to the variable. This is done right below *"void init"*, by typing the variable name followed by an equal sign and then the desired value.

Another way to assign a value to the variable is at the start of the "void loop" (we will get to this in a later tutorial).

 Examples of declaring and assigning variables are provided in later tutorials

1	//Declare any variables shared
3 · 4	<pre>void init(){     //This function is called</pre>
	<pre>//IMPORTANT: make sure to //Do not assume variables</pre>
8 - 9 10	<pre>} void loop(){</pre>
, 11 12 13	<pre>//This function is called }</pre>





# **Quick Compile**



- Compile (Test this feature without entering code):
  - Click on "Simulate" (top menu, third from the left)
  - On the pull down menu, click on "Compile"
- A "Running" window will pop up while the program is being compiled
- After compiling:
  - The log will open with a compilation succeeded or failed message.
  - If compilation failed check your code and try again





















Click on **Zero Robotics** About ZR-Tournam "Simulate" (top menu, Edit-Simulate -Help-File -3rd item from left) Compile SPHE Pages The Simulation • Debug Simulate Variab window will open Log Simulate Profile Logic Math Change "Maximum Submit ulletType here and pre \_OODS Simulate As Satellite 1 (Blue) 
 Satellite 2 (Re Time" setting to 60 Opponent No Opponent Select Click "Simulate" ٠ Maximum 60 Time (s) a "Running" window • х Υ Ζ Initial AttX AttY AttZ pop up while the Position simulation is being Satellite 1 0 0.5 0 0 0 1 constructed Running... Satellite 2 0 -0.5 0 0 -1 0 Reset All Cancel Simulate EDC Learning transforms lives, 14117 ΜΔΡ DARP/ [TOPCODER] **Aurora** 8 CASIS



### Simulate (cont.)



- When complete:
  - The log will open with a simulation succeeded or failed message.
  - Click on "View Results"
  - A new browser window should pop up with background picture.

Pages	
Log	
Type here and	press Enter
Your Name	May 3, 2014
10:11:15 AM Simulation suc	ceeded.
View Results	3
	_





## **View Simulation**



10

- The initial view shows y and z axis
  - horizontal line (the y-axis)
  - vertical line (the z-axis)
- To see the x axis:
  - Click and hold the left mouse button anywhere on the background and move the mouse until x, y and z axis are visible
- Click the "Play" arrow at the bottom left of the screen and wait a few seconds.
  - Two SPHERES satellites will appear
    - Satellites start from y=0.5 and y=-0.5
    - Hash marks are 0.25 units apart
  - The blue satellite will not move at this point unless you have entered a code.











[TOP**CODER**]







- Replay the simulation by clicking the red stop button and then the green play button.
- Experiment with your views by clicking on and moving the screen
- Watch the scoring box (top-left corner of the screen with blue label) which provides information about the blue SPHERES satellite:
  - where the satellite is (X, Y and Z)
  - how fast it's moving (Vx, Vy, Vz)
  - We'll explain the other labels later (they tell you which way the satellite is pointing and how fast it's rotating).





SPH1			
X: 0.00	Y: 1.51	Z: -0.00	
Vx: 0.001	Vy: -0.001	Vz: -0.000	
Nx: -0.00	Ny: 1.00	Nz: 0.01	
ωx: 0.06	ωy: 0.14	ωz: 0.02	
Fuel Remaining: 100%			













#### ZER ROBETICS Modify Program, Compile & Simulate (cont.)



12

- Experiment with the simulation buttons and views at the bottom to:
- Experiment with the simulation buttons and views at the bottom to:
  - change simulation speeds (see the "1x, 2x, 3x, 4x, 10x" buttons)
  - Zoom buttons



 On the bottom menu select "Back to Project" to return to the Graphical Editor page













- Congratulations!
- You have learned about various features in the ZR IDE
- You learned how to compile code and check for errors
- You learned how to run the code in simulation

