AI Shipyard

Getting Started

AI Shipyard, as of now, does not need any installation and can run immediately thru a copy-and-paste method. Unzip the file to reveal to any folder and just open the .jar file included.

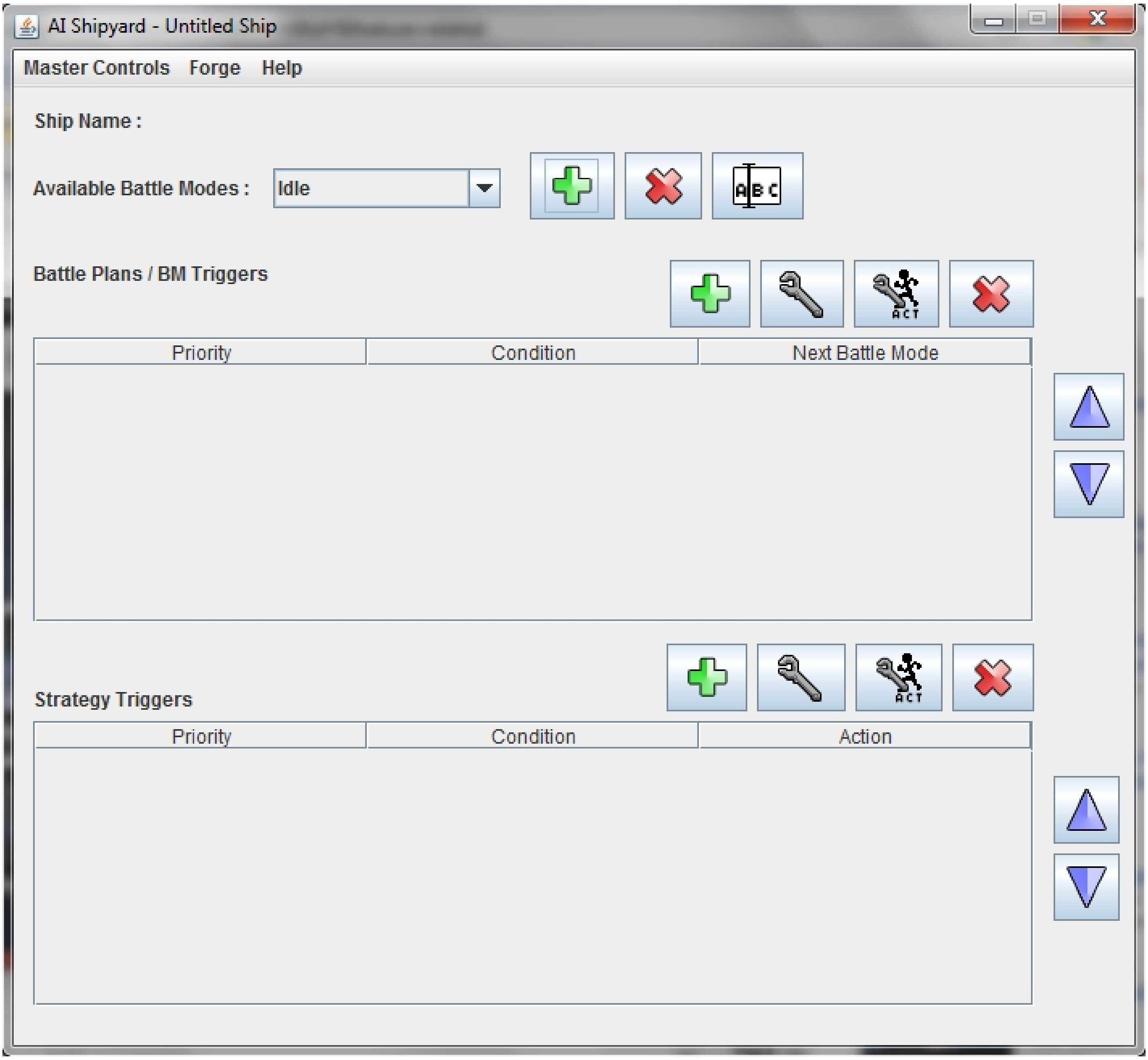
The program will run when all requirements of the system are met. It is important to note that the latest version of JAVA is required to run this program.

Making A Bot

STEP 1: Initializing the Program

A Finite State Machine-Based AI Generation Engine for AI Cap'n
Version 2010

Splash Screen



Ship Name :

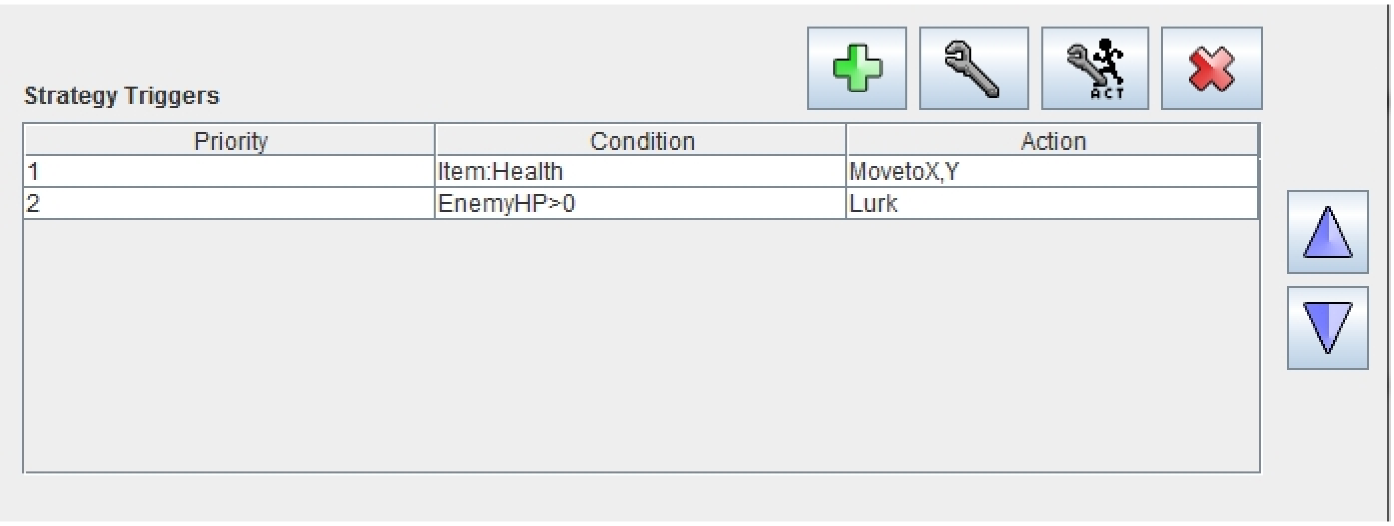
Available Battle Modes : Idle

Main Window

When you first open the program, you'll be greeted by the splash screen, followed by the main window.
At first, only one battle mode, **Idle**, is on the list. It is the first battle mode to be considered when the bot starts running.
If you start by pressing the **Master > New Blueprint**, then the Idle Battle Mode will not be there and you'll have to make a new one.

STEP 2: Adding Strategies

Having a bot that does nothing can be boring, so add Strategy Triggers to it.
Strategies are composed of conditions, a target, and a corresponding action and are the actions taken by the bot during gameplay.

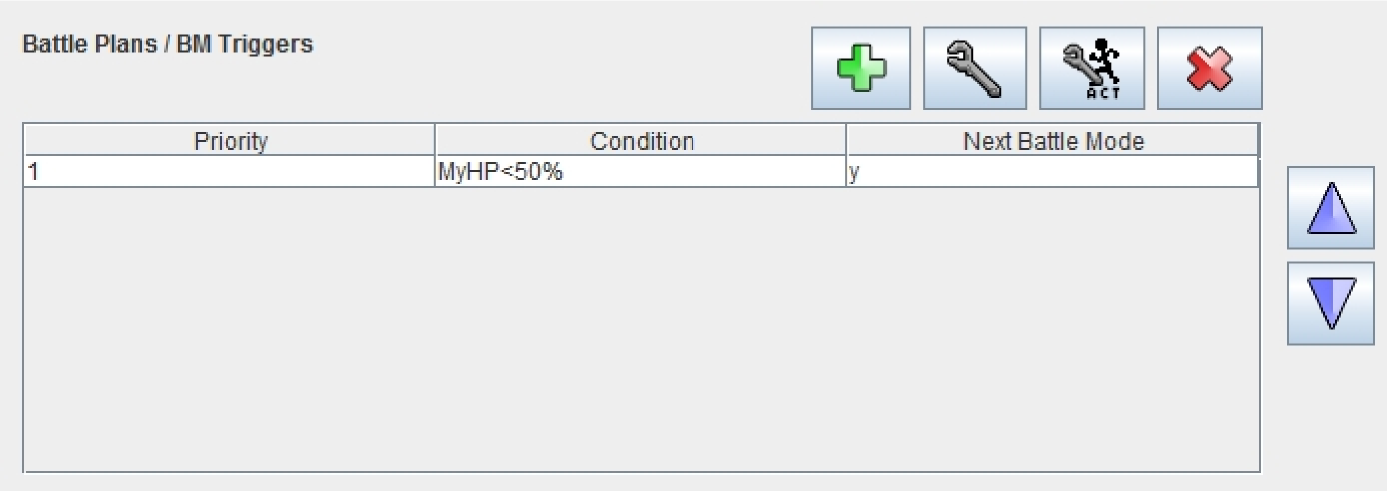


Strategy Triggers

Priority	Condition	Action
1	Item:Health	MovetoX,Y
2	EnemyHP>0	Lurk

STEP 3: Adding Battle Plans

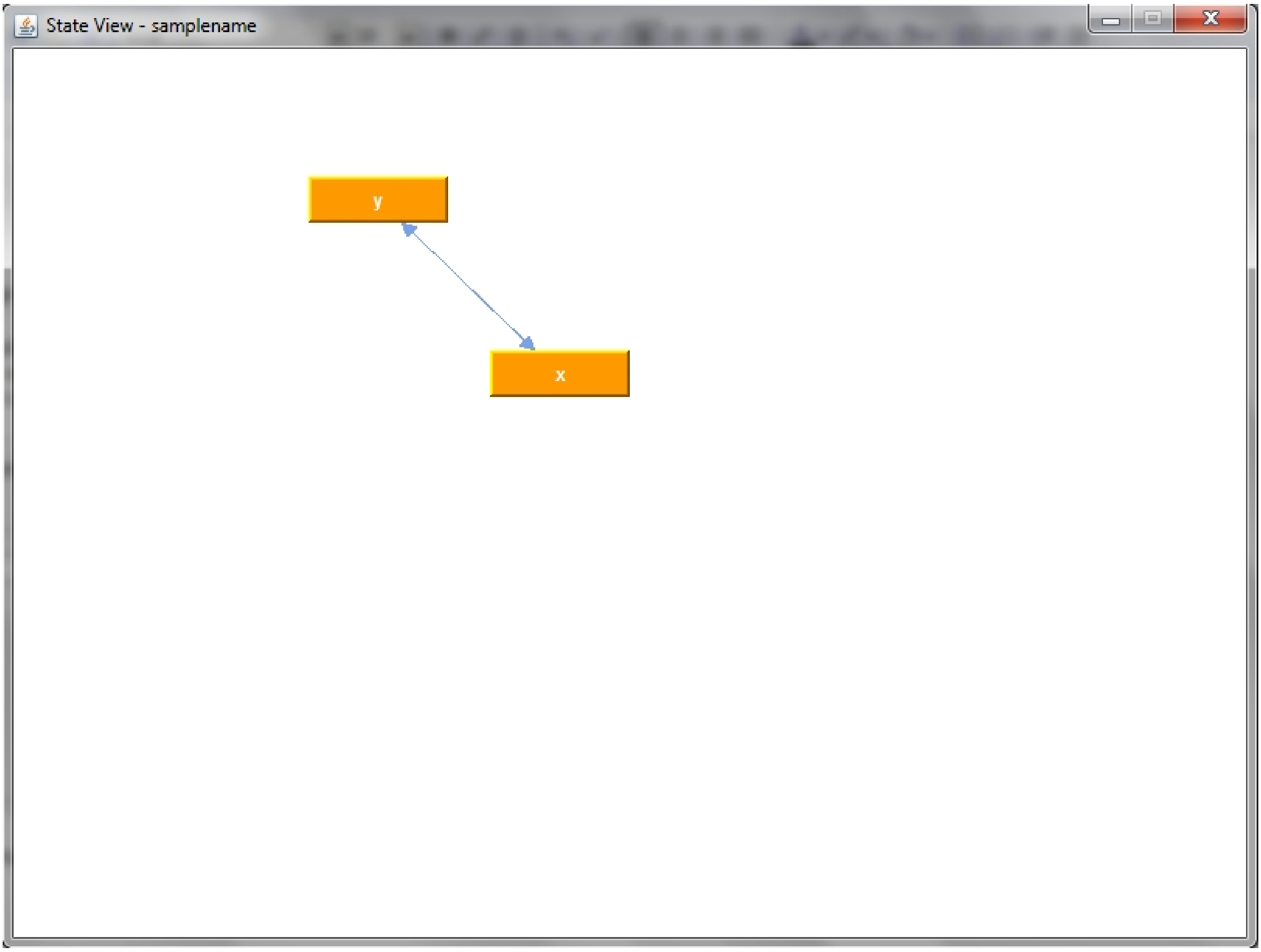
To add more variety and intelligence to your bot, allow it to transfer between Battle Modes.
This way, your bot can adapt to different situations differently depending on what conditions you apply.
You can assign Battle Plans to do so.



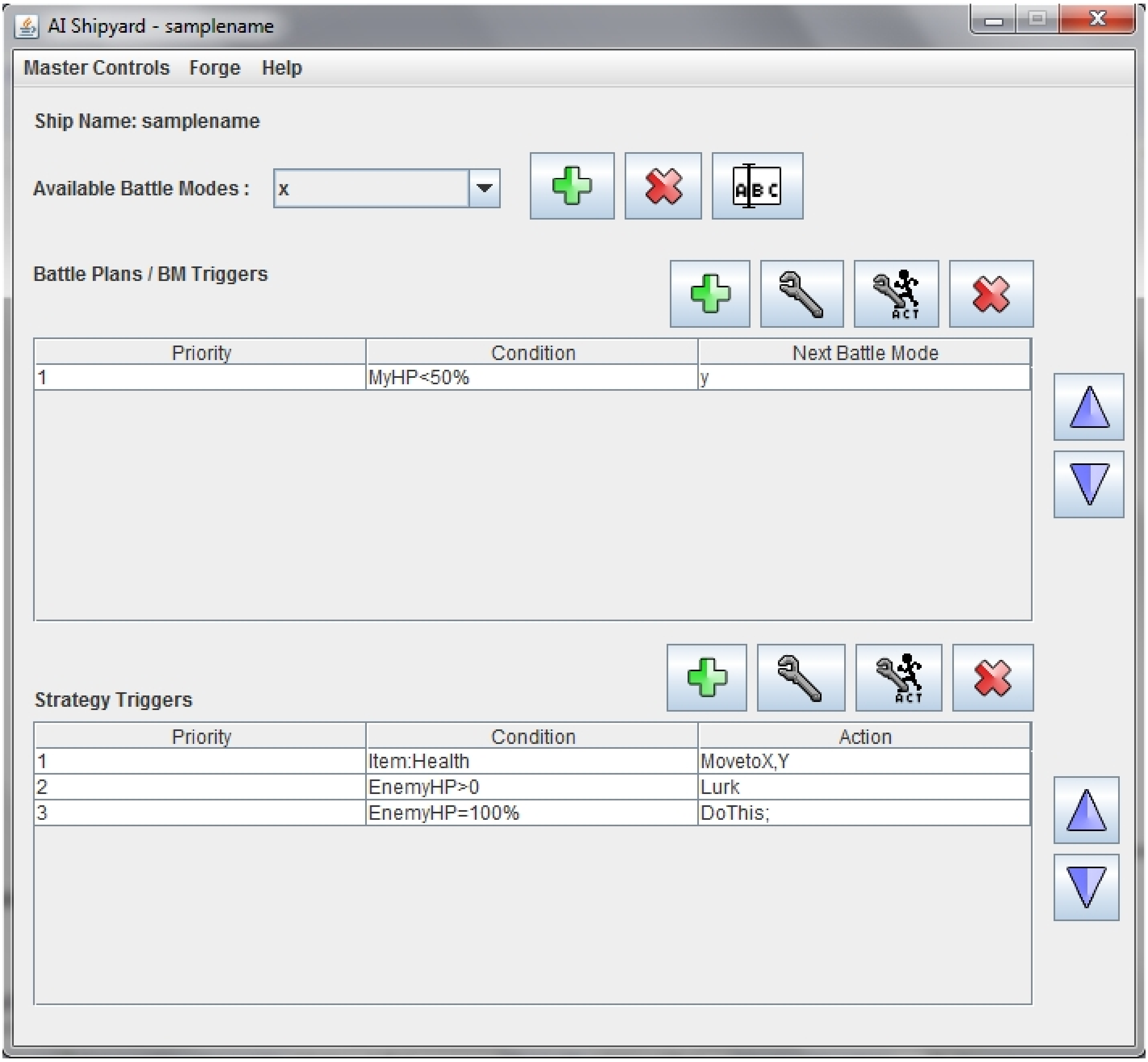
Battle Plans / BM Triggers

Priority	Condition	Next Battle Mode
1	MyHP<50%	y

All changes in the Battle Plan are graphically represented in the graph, so you can see the finite-state machine of your bot.



STEP 4: Testing Your Bot



Ship Name: samplename

Available Battle Modes : x

Battle Plans / BM Triggers

Priority	Condition	Next Battle Mode
1	MyHP<50%	y

Strategy Triggers

Priority	Condition	Action
1	Item:Health	MovetoX,Y
2	EnemyHP>0	Lurk
3	EnemyHP=100%	DoThis;

Sample Configuration

So you've finally created a good enough bot, huh? Well, what better way to check than test it.
If you happen to have time, you can test your bot against AI or a human-controlled bot.
So feel free to run the debugger and test your bot out!

STEP 5: Exporting Your Bot

When you're satisfied with your bot, you can export it as a java file.
Congratulations on creating your bot!

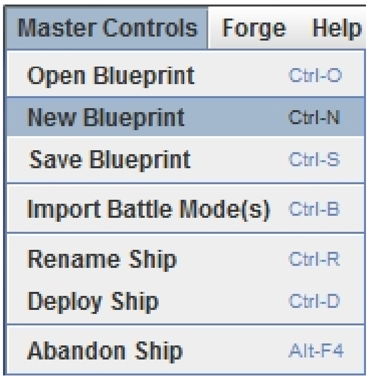
Glossary Of Terms

These are some terms to get you acquainted in using the program:

- **AI Cap'n** is an agent-based JAVA game which was designed as an instruction tool for artificial intelligence algorithms. The game enables creation of agents using the Java programming language as separate java classes which can be uploaded unto the game itself to be initialized as active players. The agents perform actions based on the algorithm programmed into them by a user.
- **Battle Mode** - These are synonymous to the states of an FSM. These are composed of several action sets arranged by priority. This defines the actions of an agent at a given point in time. Upon initializing the system, there is a default battle mode with an empty action list known as the **Idle** battle mode.
- **Battle Plan** – These are composed to conditions and a target battle plan. This facilitates the conditions which the bot will move to another battle mode during a fight.
- **Strategy** - These are composed of conditions, a target, and a corresponding action. These are shown in the system as lists of strategy in each battle mode.
- **Condition** - defined as the proposition/s that must be true in order for the action in the same action set to be performed
- **Target** - defines the receiver of the action. Choosing Enemy refers to the enemy to which the"Enemy" conditions (e.g. Enemy: HP ¡ 50%) are true. Choosing Item coincides with"Item" conditions (e.g. Item: Health exists). Choosing Self is generally used for actions without targets in mind.
- **Action** - defines the commands to be executed when the condition of the action set is considered true. It can be a simple action which uses only one command, or a combination of commands done serially.

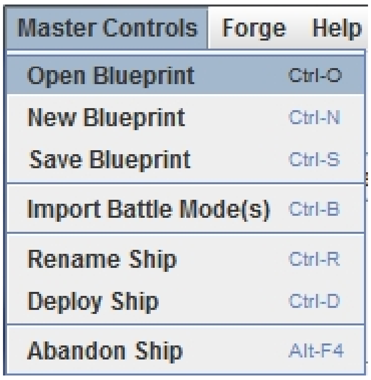
Steps To Making a Bot

Creating a New Bot

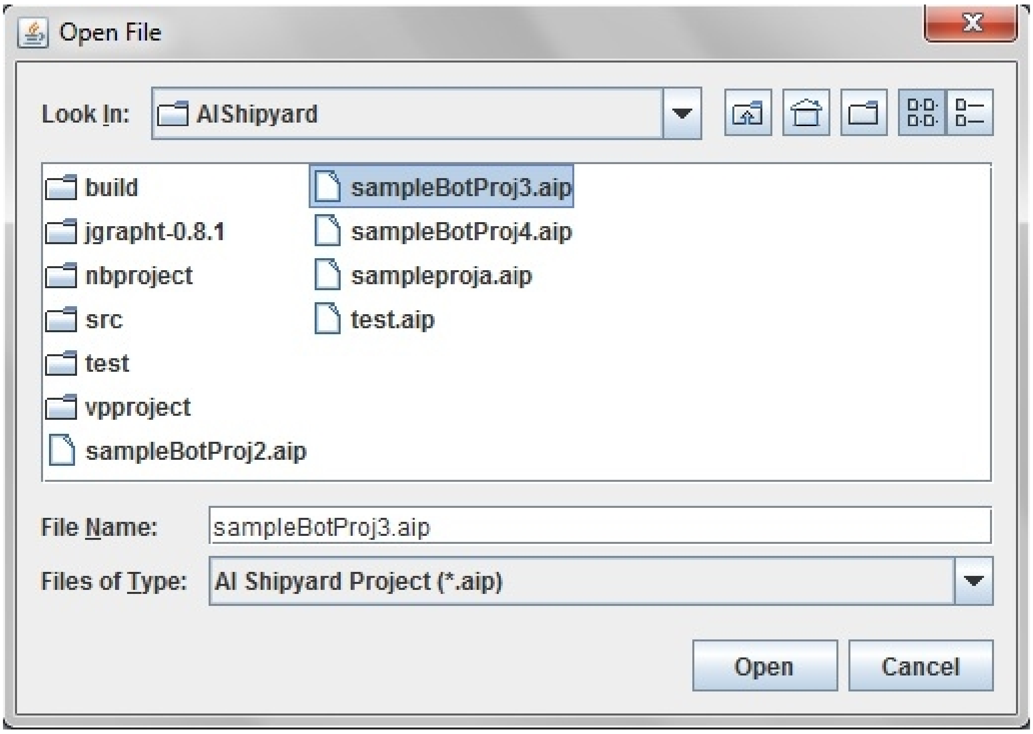


To create a new bot, use **Master Controls > New Blueprint**. Afterwards, there will be a new empty template for you to work with.

Opening an Existing Bot

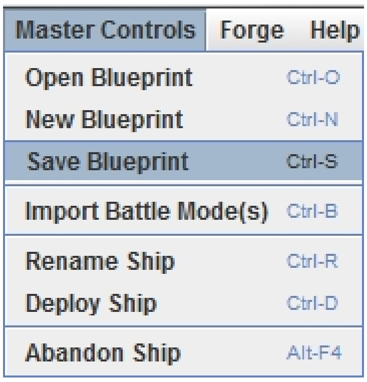


To open an existing project file, go to the menu and select **Master Controls > Open Blueprint**.

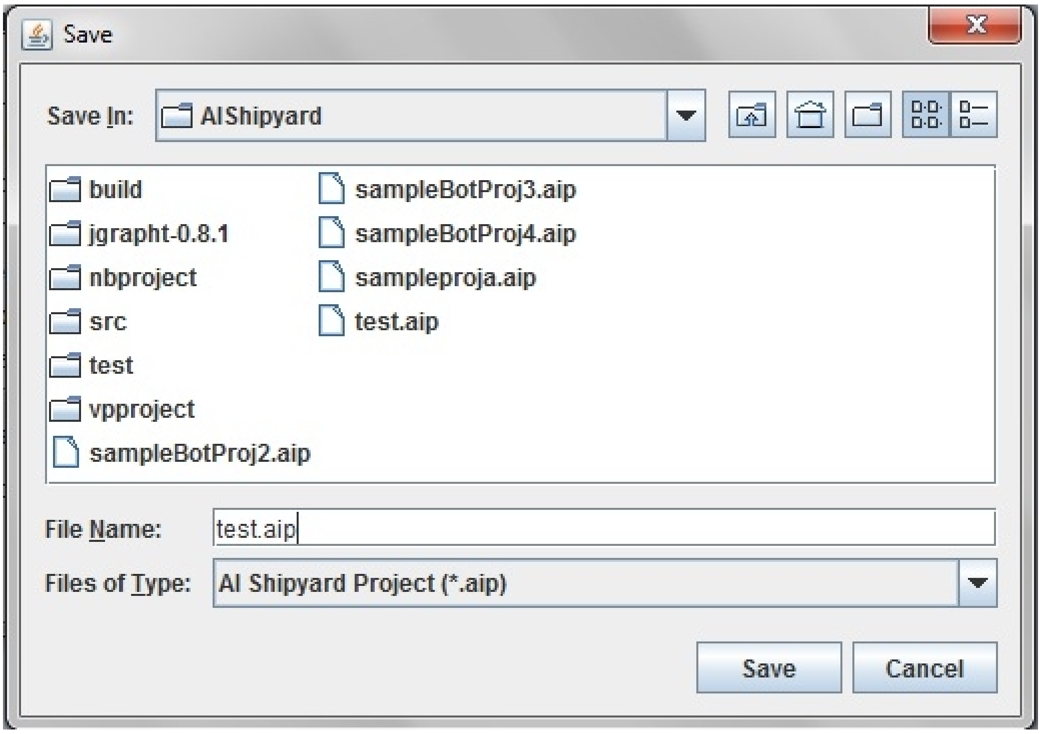


This Open dialog box will appear, and you have to select an **AI Shipyard Project File** or **.aip** file to open it.

Saving Your Progress



To save your work, select **Master Controls > Save Blueprint**.



Save In: AIShipyard

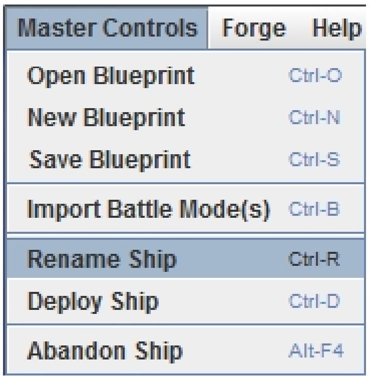
build
jgrapht-0.8.1
nbproject
src
test
vpproject
sampleBotProj2.aip
sampleBotProj3.aip
sampleBotProj4.aip
sampleproja.aip
test.aip

File Name: test.aip

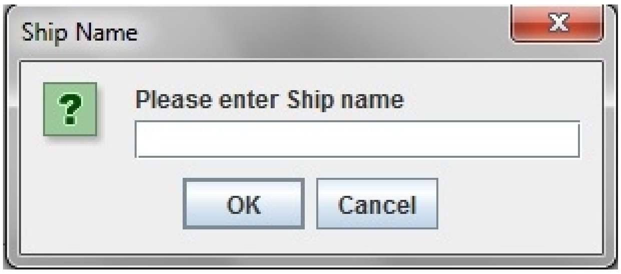
Files of Type: AI Shipyard Project (*.aip)

Then select the folder and save your project as an **.aip** file.

Rename Your Ship



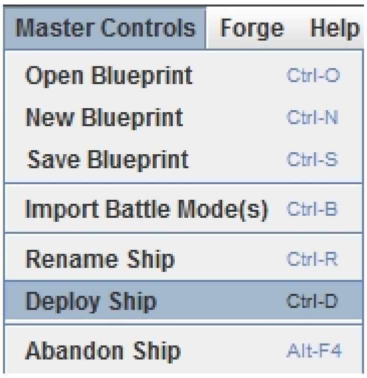
To rename your ship, select **Master Controls > Rename Ship**.



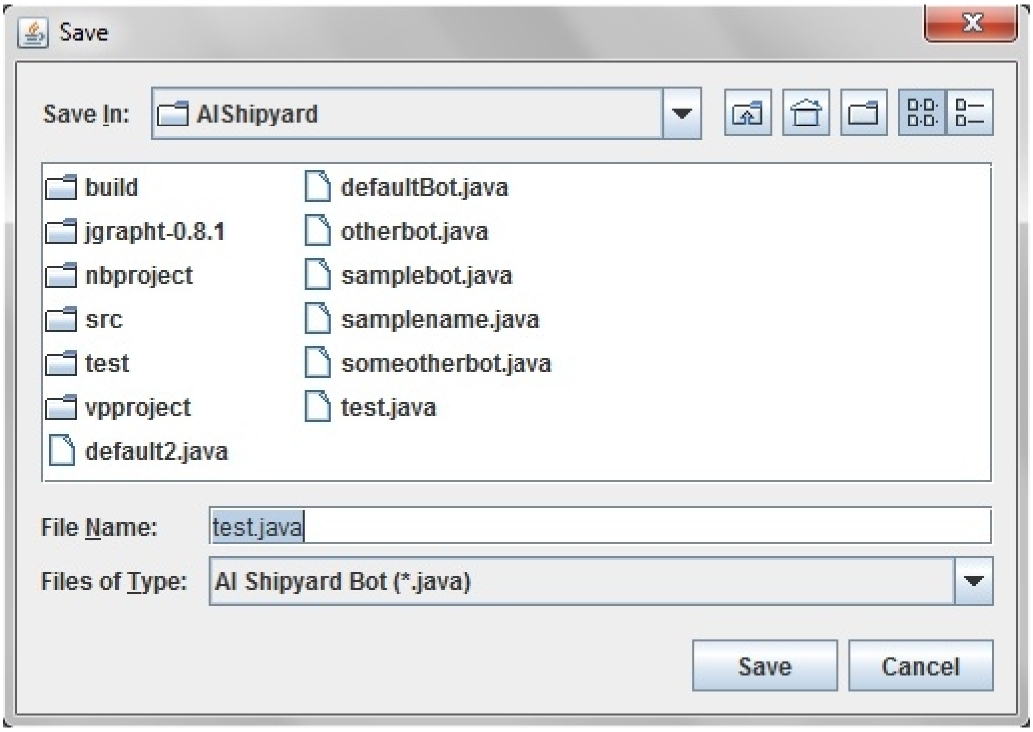
Please enter Ship name

Then fill in the ship's name in the dialog box that appears.

Exporting Your Ship



To generate the .java file of the bot itself, select **Master Controls > Deploy Ship**.



Save In: AIShipyard

File Name: test.java

Files of Type: AI Shipyard Bot (*.java)

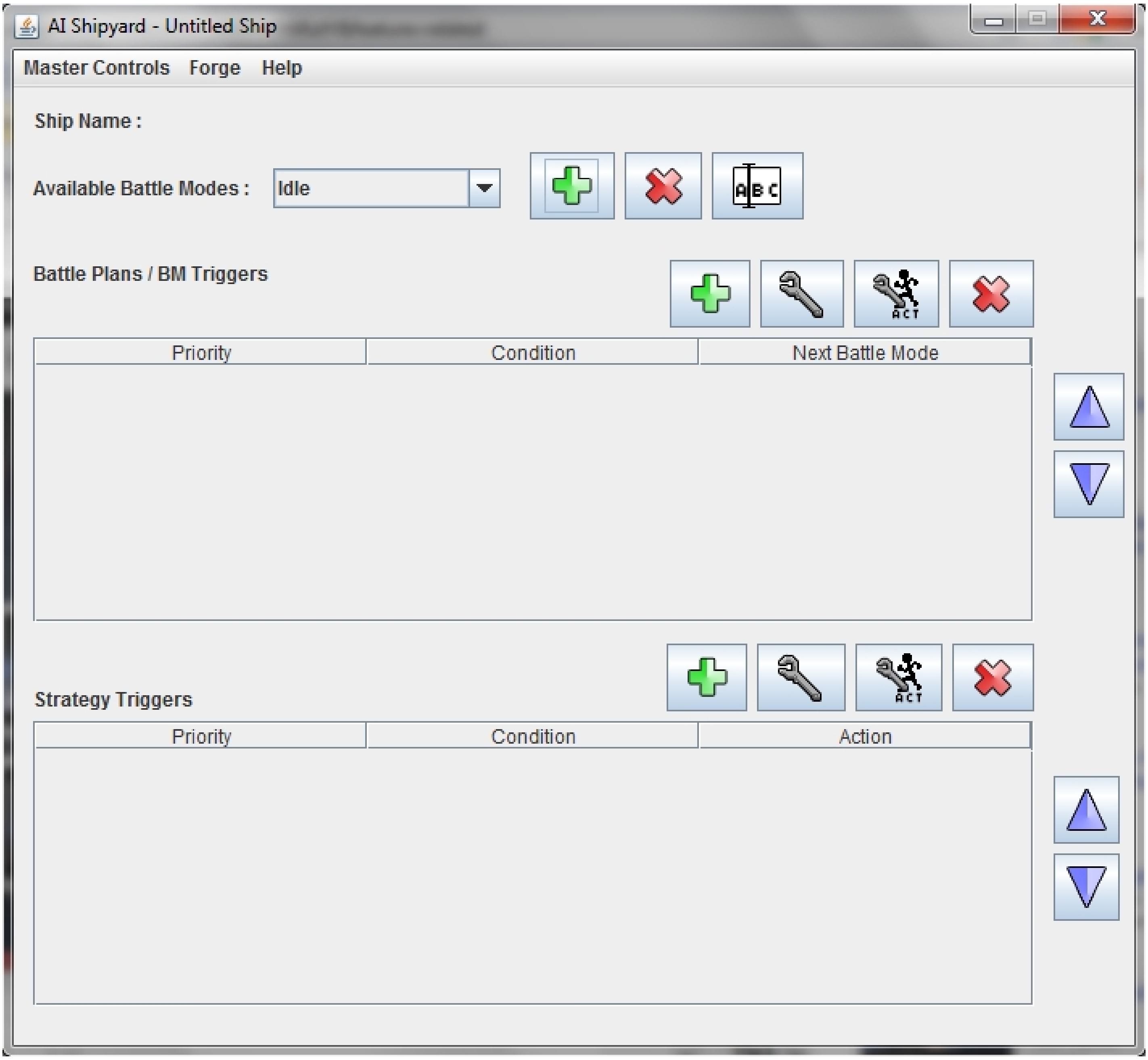
You then have to save as a .java file.

Note:
When you export your bot, it will output a .java and some .class files. For AI Cap'n players, .class files are needed to input your bot into the game. :) When saving your bot, make sure all the class files generated by your bot are present in the same folder. :)

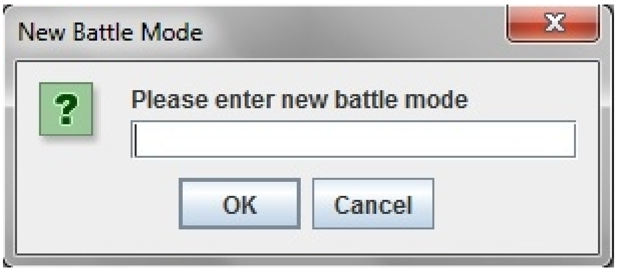
Ship Intelligence

Adding a Battle Mode

Battle Mode is the current state of the bot at a state in time.



To add a battle mode, go and press the **[+]** button at the upper part of the UI.

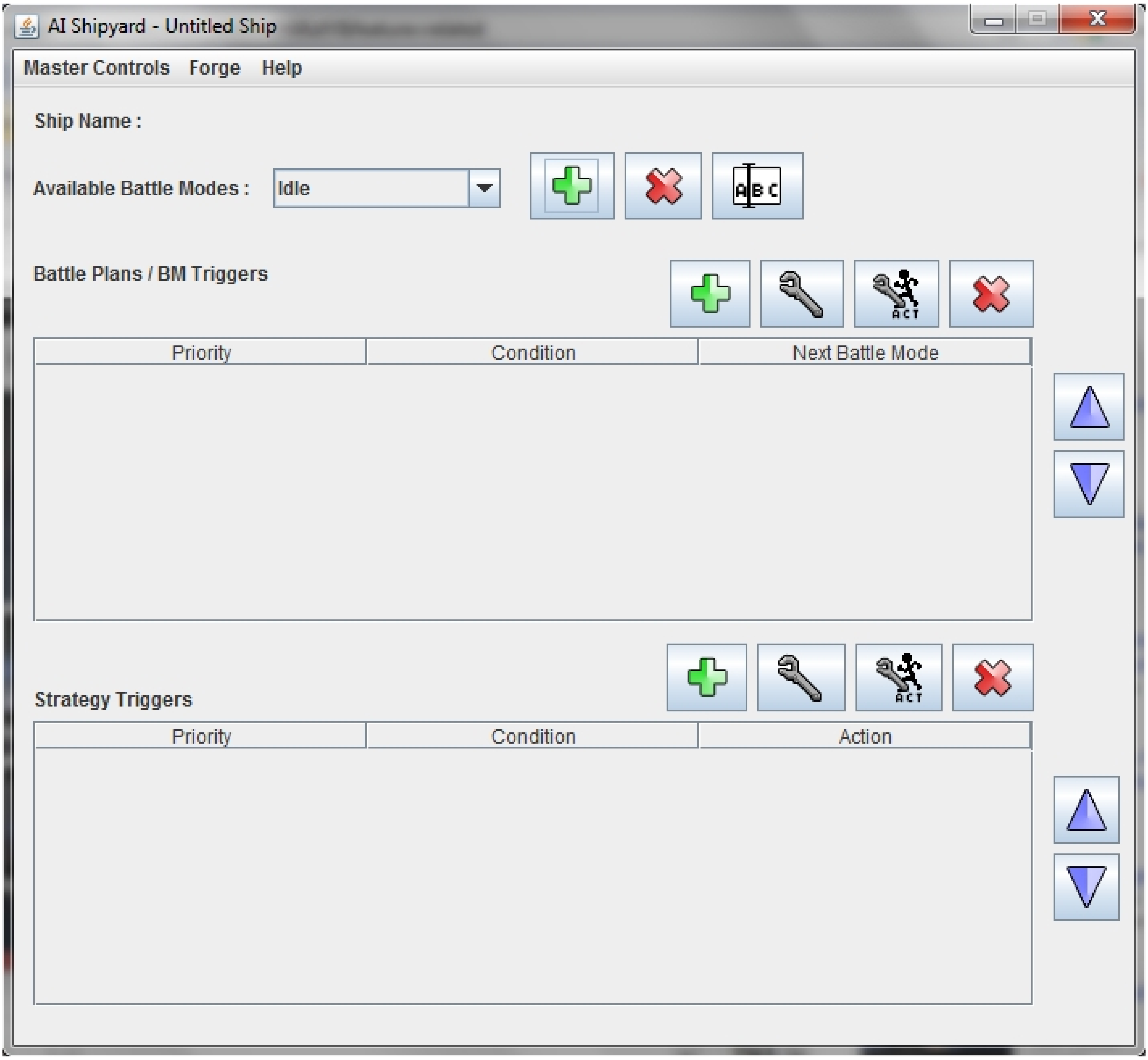


Please enter new battle mode

Then enter a name for your new battle mode. That's it.

Battle Plans

Battle Plans refer to the traversal or traveling conditions from one state to another.



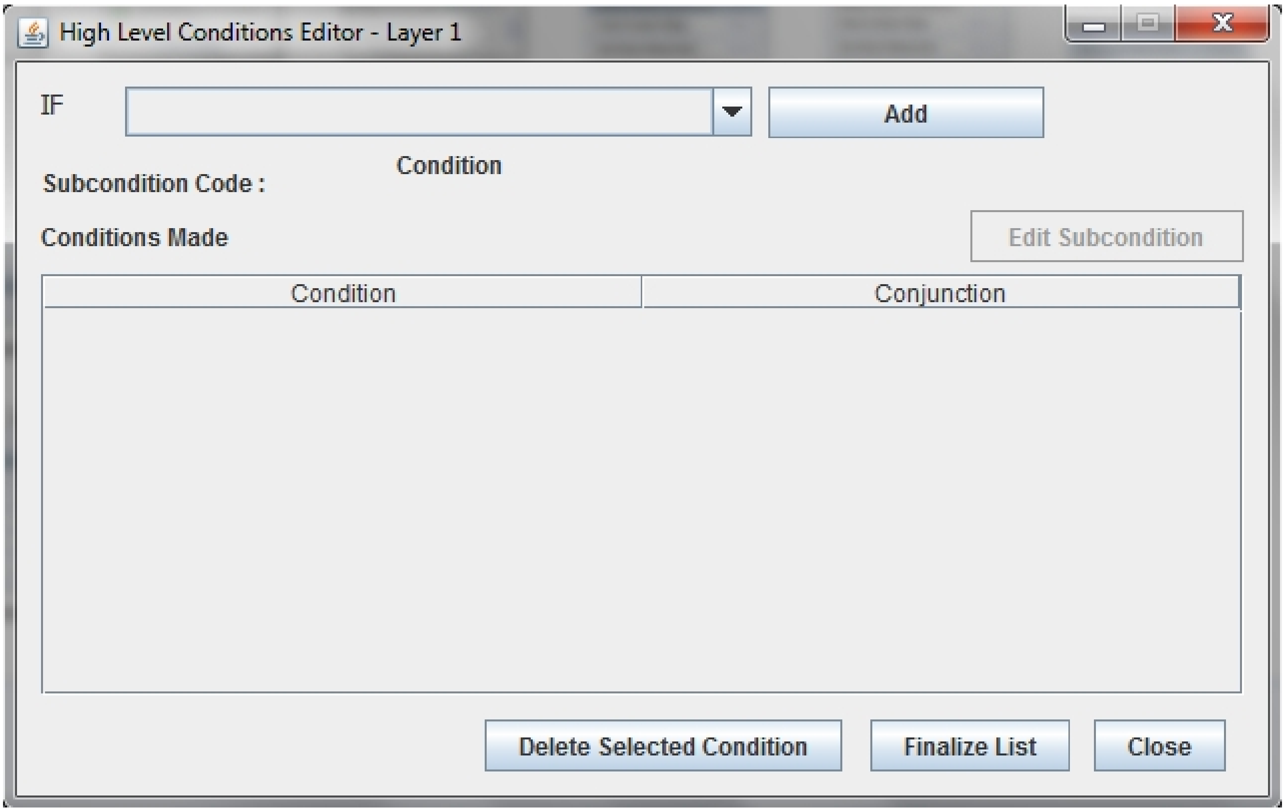
Ship Name :

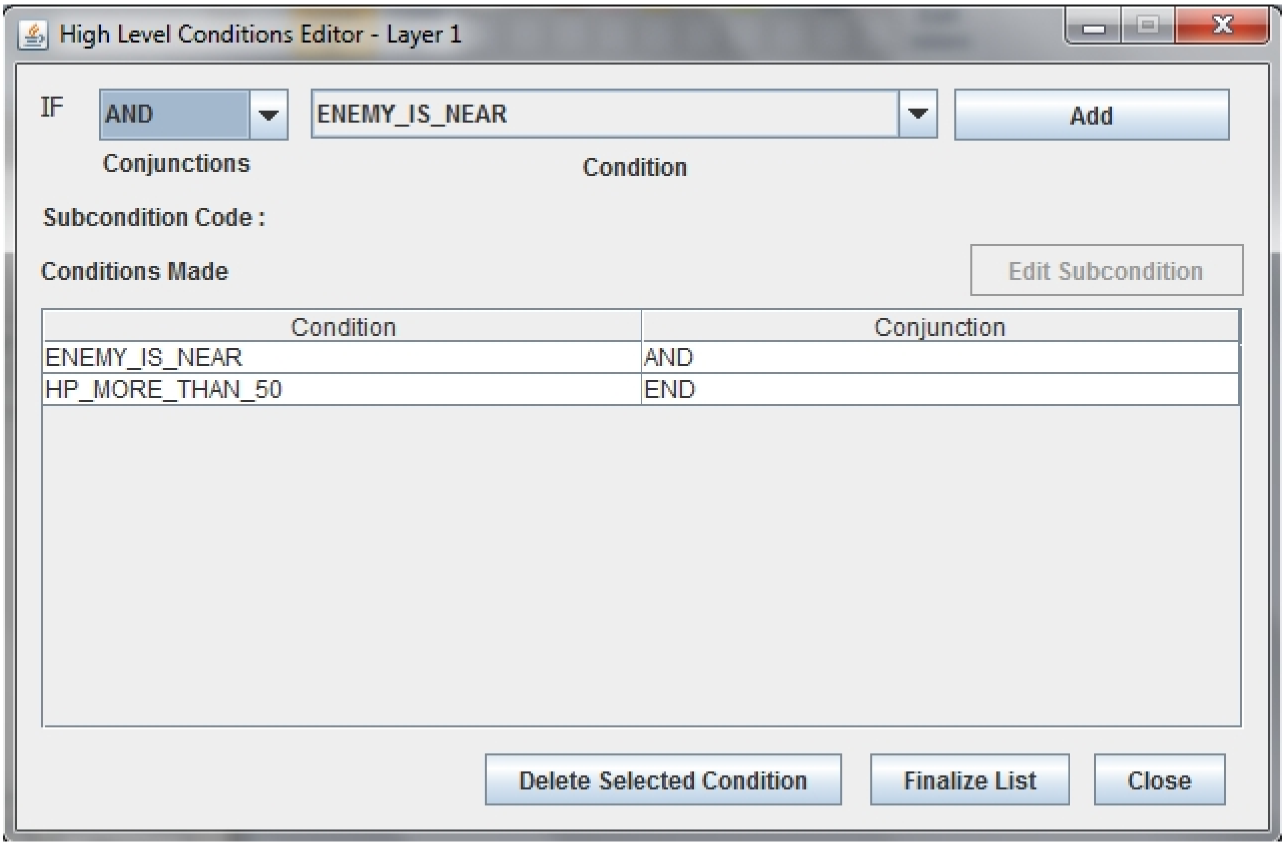
Available Battle Modes : Idle

Priority	Condition	Next Battle Mode

Priority	Condition	Action

To add an entry to the Battle Plan, have a Battle Mode selected and press the **[+]** button to the right of the Battle Plan label.





IF AND ENEMY_IS_NEAR

Condition	Conjunction
ENEMY_IS_NEAR	AND
HP_MORE_THAN_50	END

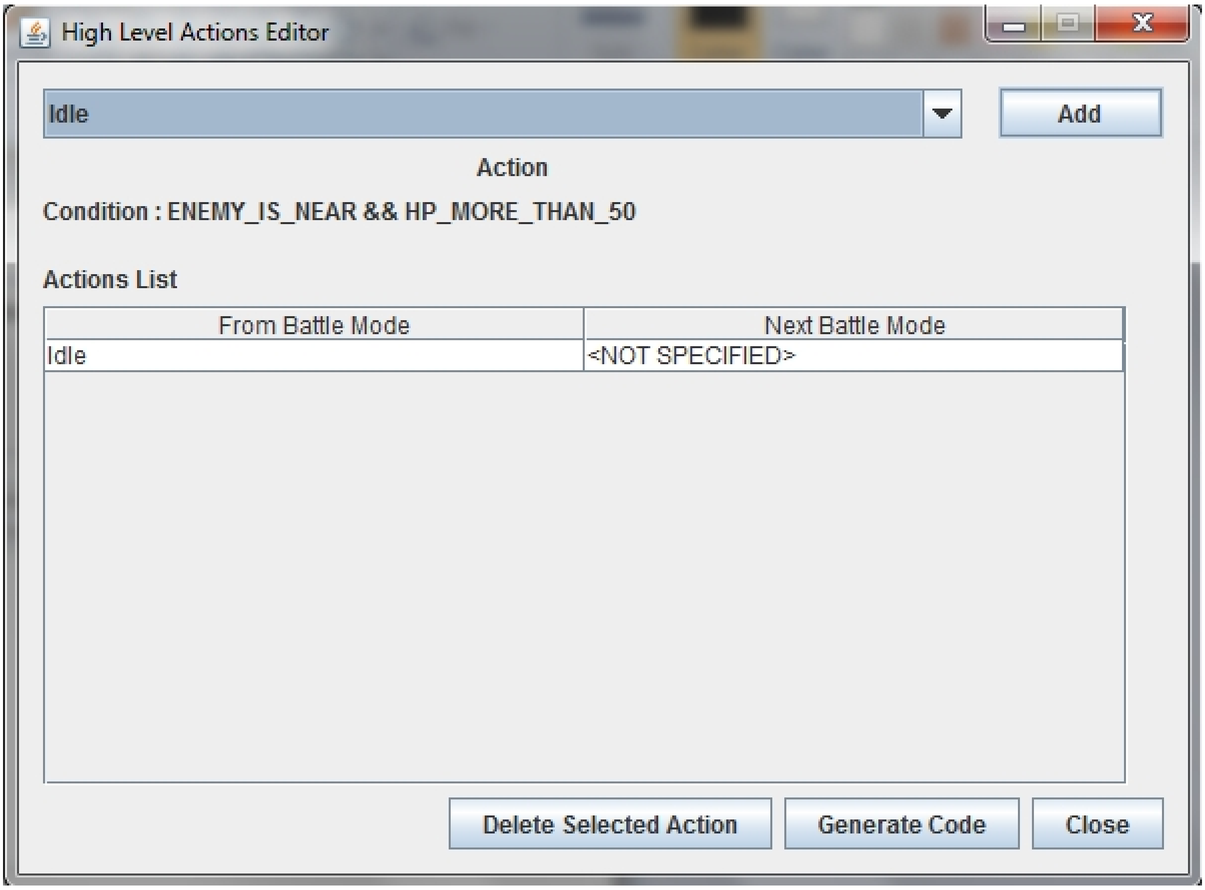
The condition editor will appear. Conditions can be treated as layers, which means one can have nested-if statements. (i.e. condition1AND(condition2ORcondition3))
The parameters are as follows:

Condition drop-down: Allows you to choose one of the existing conditions in the database. Choose *SUBCONDITION* if you want to use nested conditions.
Conjunctions: Let's you choose among AND, OR, or END. the first two should be familiar logical operations. To end the conditions you want, select END to finish with the last condition. So given *condition1ANDcondition2ORcondition3*, it will

look like *condition1 AND condition2 OR condition3 END*.
Add: When you're done with the previous two, press this to add it to the list.

Delete Selected Condition: The selected entry on the table will be deleted.
Finalize List: Can only be used when the END conjunction has been used. This signifies the end of the condition set.
Close: Goes back to main window.

After Finalizing...



Condition : ENEMY_IS_NEAR && HP_MORE_THAN_50

Actions List

From Battle Mode	Next Battle Mode
Idle	<NOT SPECIFIED>

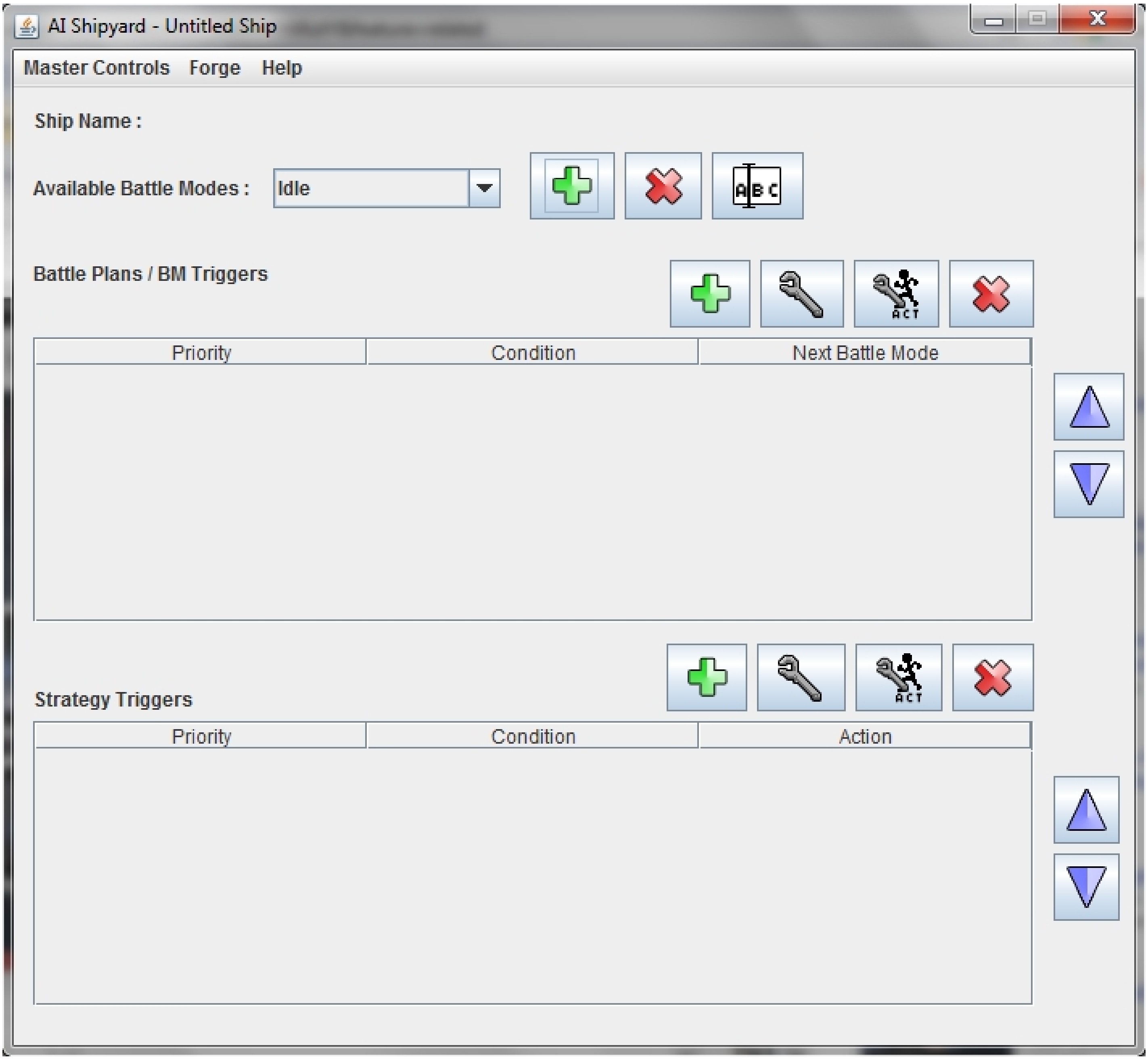
...you will be at the High Level Actions Editor. This dictates the actions to be done by the bot at that condition. In the Battle Plan, actions refer to the next state it has to go to.

Action DropDown: Select from a list of battle modes available.
Add: appends the selected action to the table.

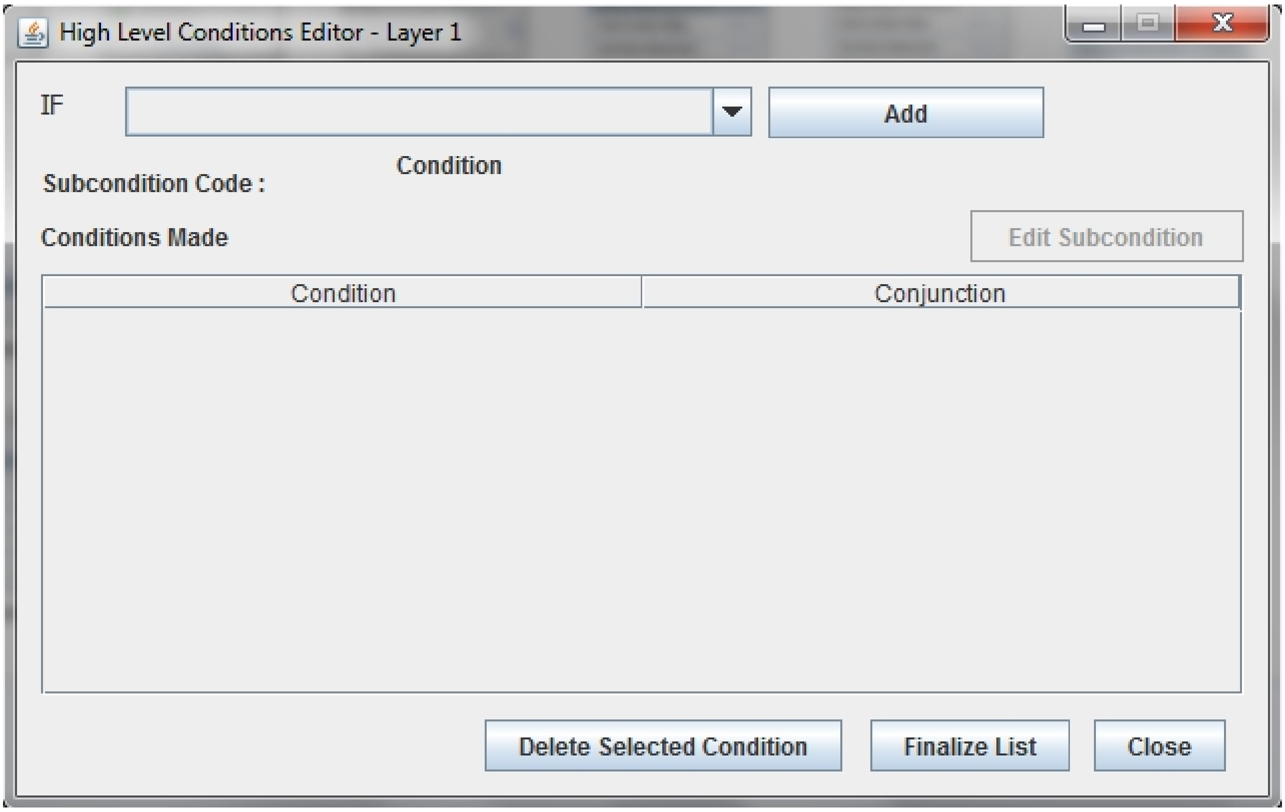
Delete Selected Condition: The selected entry on the table will be deleted.
Generate Code: Appends the action to the main window.
Close: Goes back to main window.

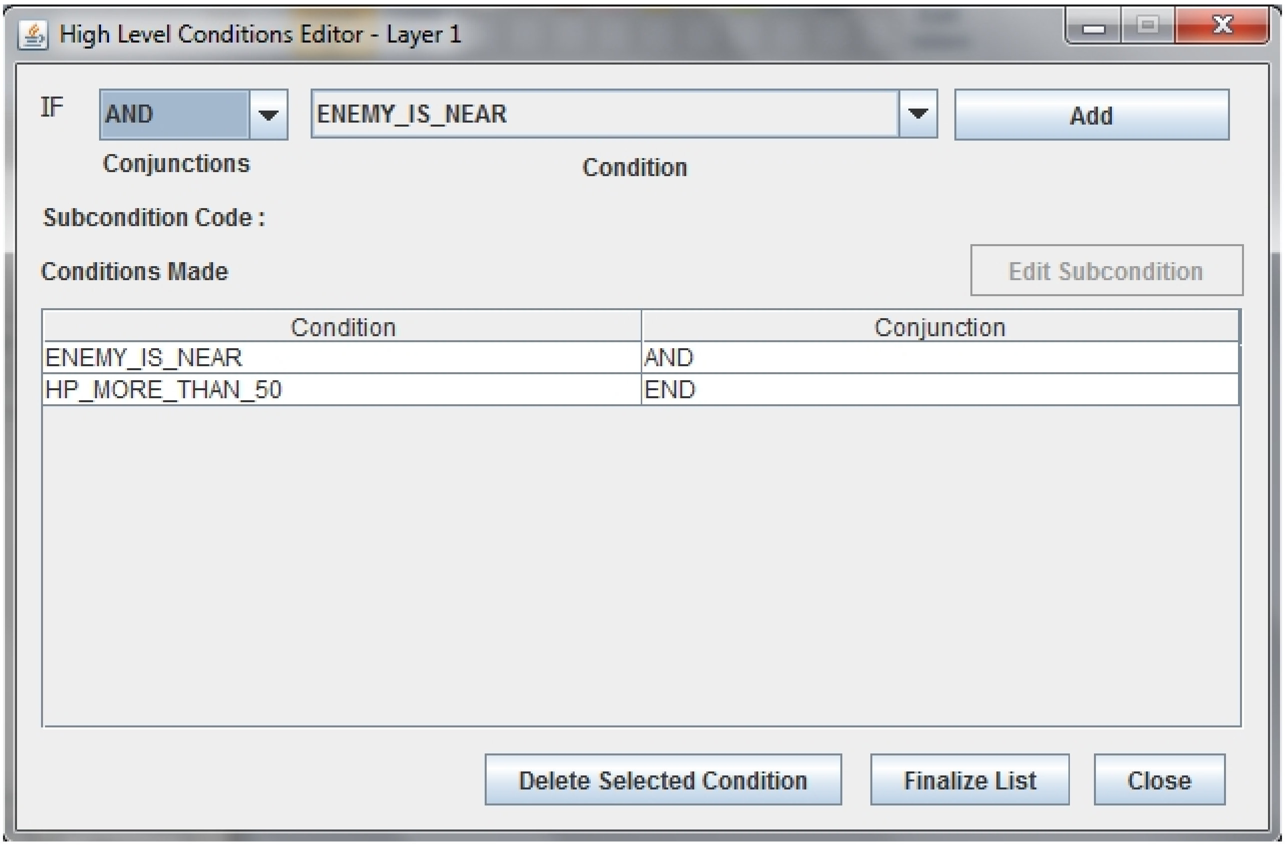
Strategies

Strategies are actions undertaken by the bot given certain conditions. They are arranged by priority, that as long as the first strategy is true, it will continue to do so. If not true, the next priority strategy is checked.



To add an entry to the Strategy, select an existing Battle Mode and press the **[+]** button to the right of the Strategy Triggers.





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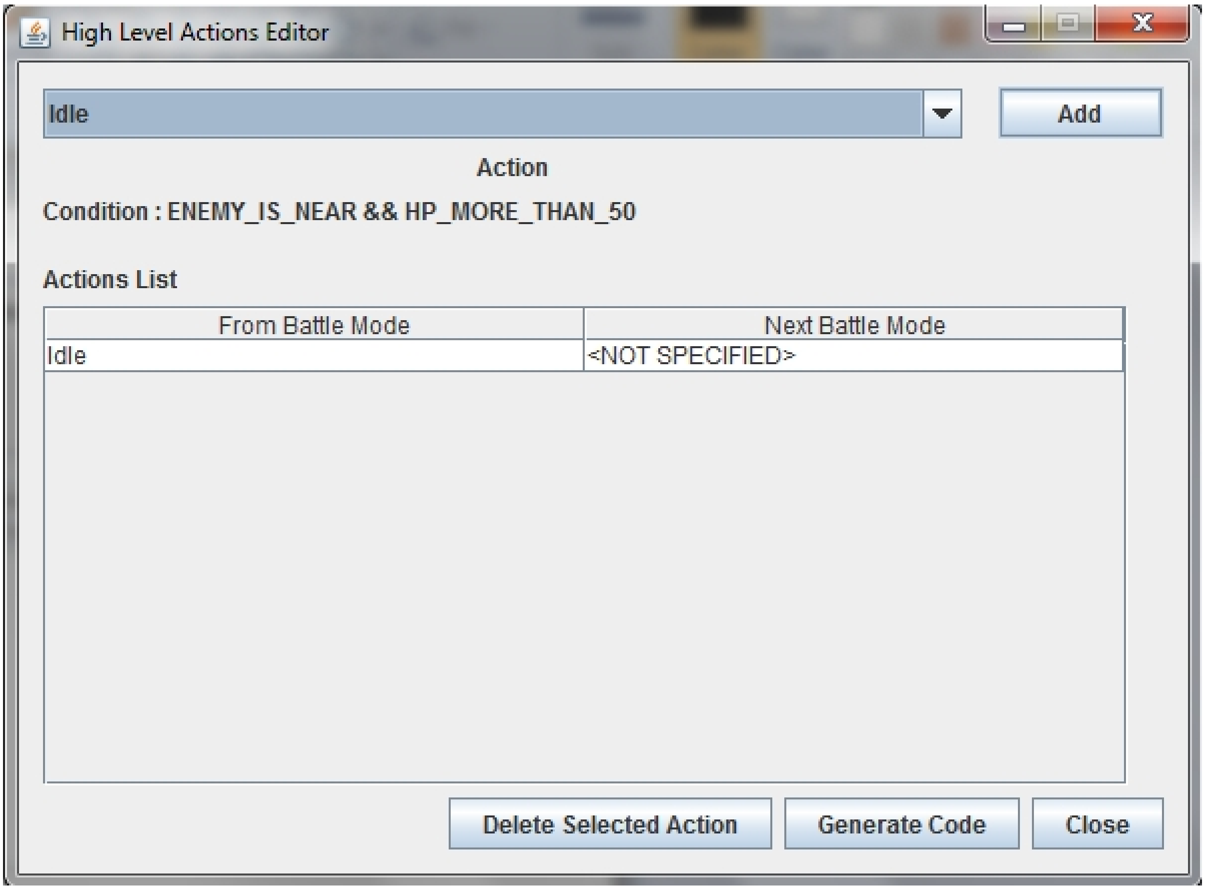


Idle

Condition : ENEMY_IS_NEAR && HP_MORE_THAN_50

Actions List

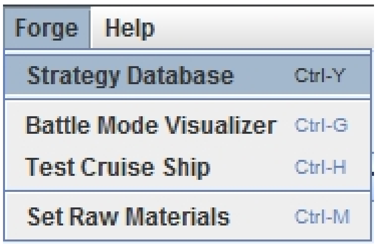
From Battle Mode	Next Battle Mode
Idle	<NOT SPECIFIED>

...you will be at the High Level Actions Editor. This dictates the actions to be done by the bot at that condition.

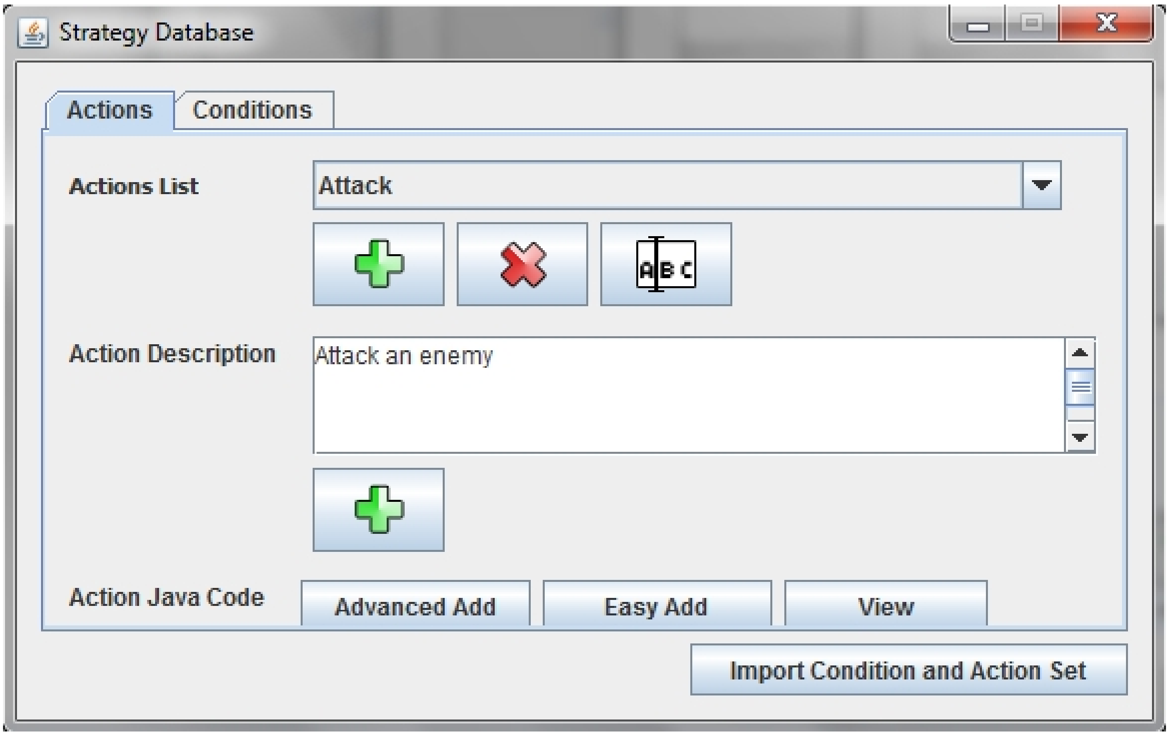
Action DropDown: Select from a list of actions available.
Add: appends the selected action to the table.

Delete Selected Condition: The selected entry on the table will be deleted.
Generate Code: Appends the action to the main window.
Close: Goes back to main window.

Making New Actions



First select **Forge > Strategy Database**.



Actions List: Attack

Action Description: Attack an enemy

Action Java Code

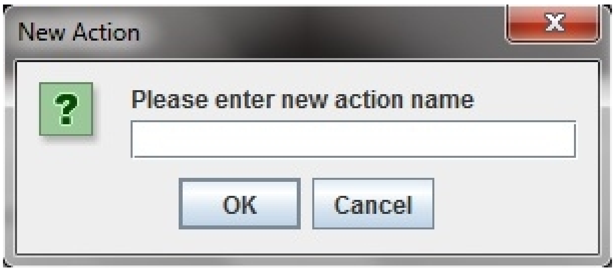
This is the overview of the controls in the database.

Actions List:
[+] - adds a new action to the list
[-] - removes the selected action specified in the drop down
[Ren] - renames the selected action

Action Description:
[+] - save changes to the description

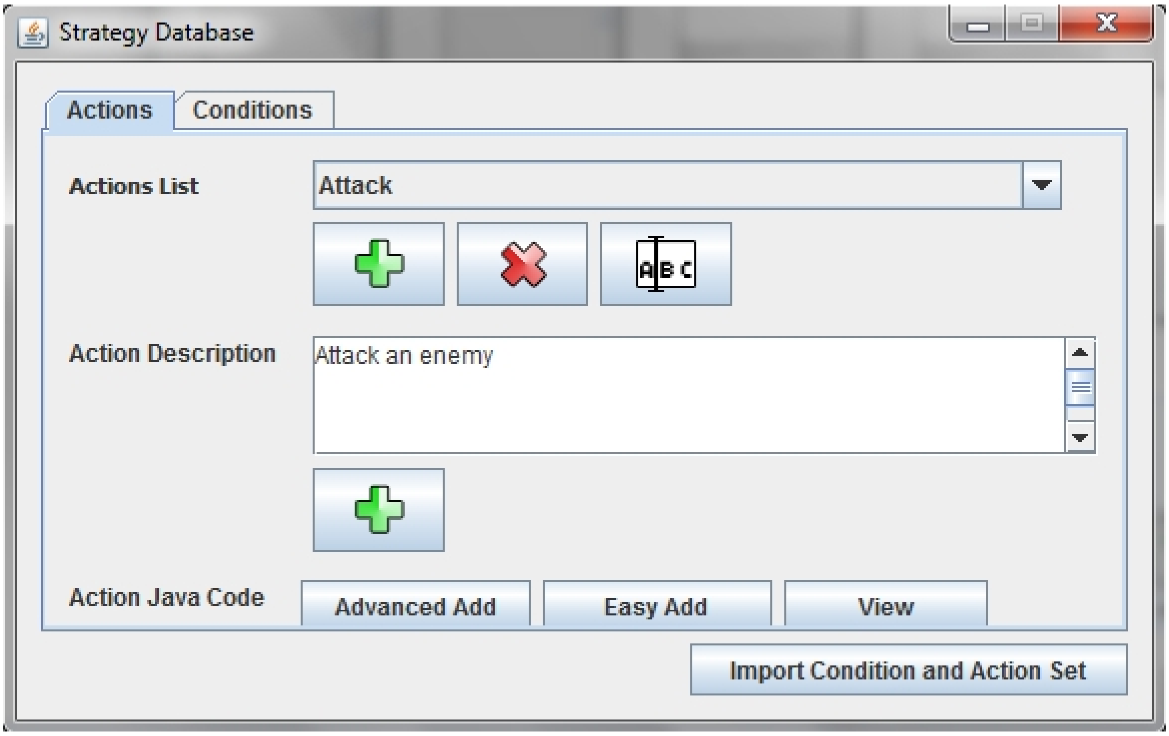
Action Java Code:
Advanced Add - allows you to input your own verbatim java code. For those who know what they're doing.
Easy Add - For non-programmers
View - view the code contents in java format

The first step is to make a new action by giving it a name. So press the Actions List Add button.



Please enter new action name

Enter a name for your action and press OK. you'll be returned to the previous window.



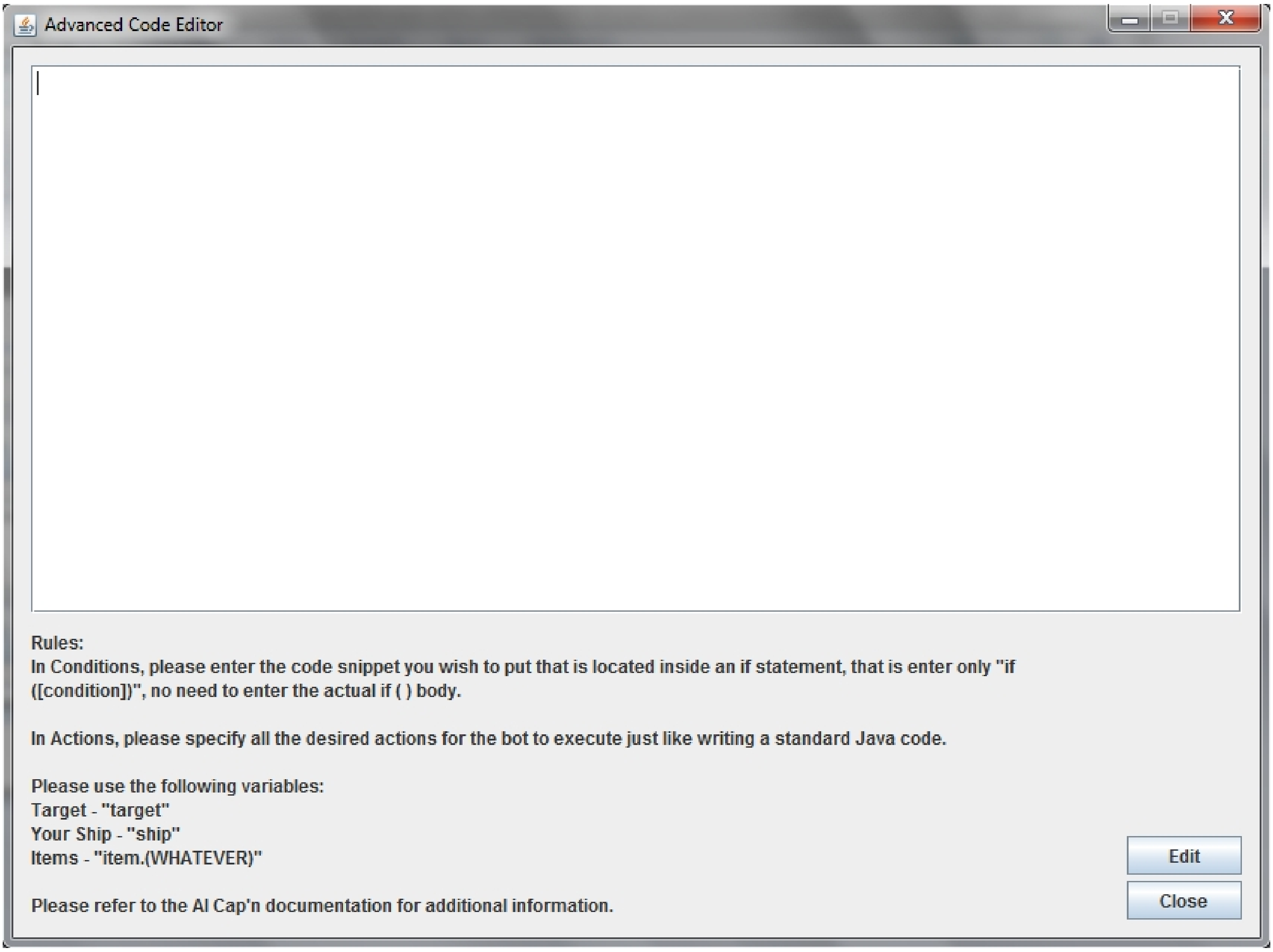
Actions List: Attack

Action Description: Attack an enemy

Action Java Code

Pick your new action from the drop-down menu. Add in a description you like, and then pick either the **Advanced Add** or **Easy Add** to add a new Action.

Advanced Add



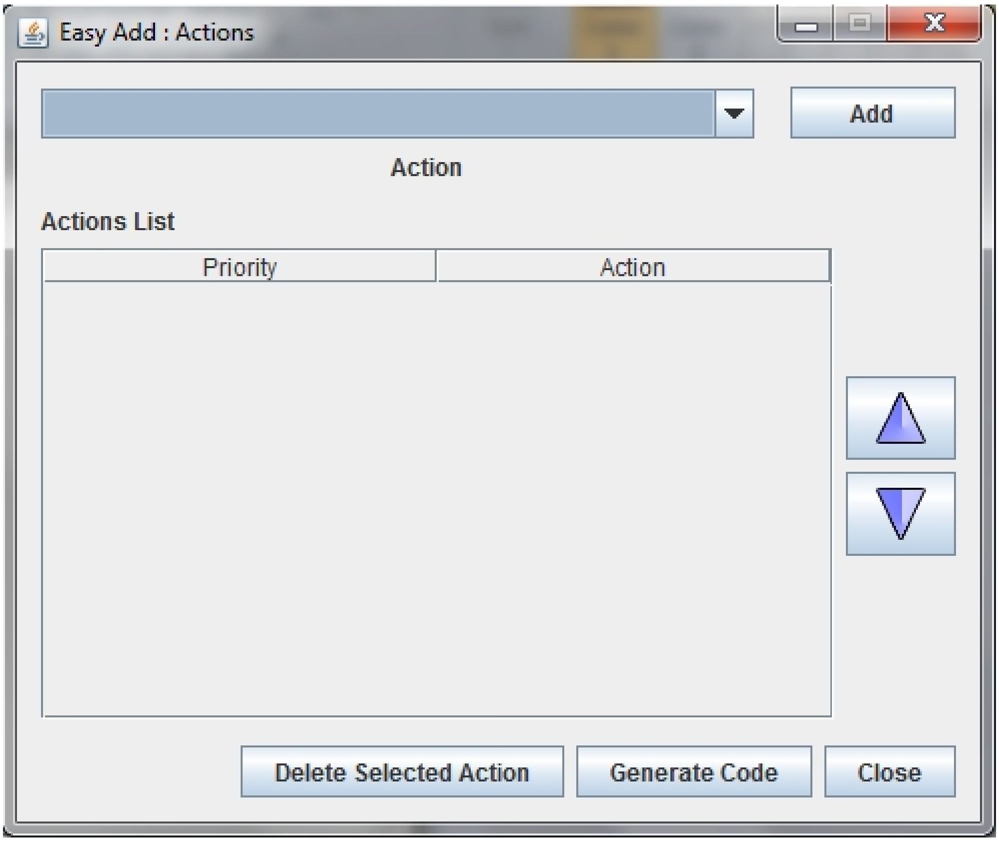
Rules:
In Conditions, please enter the code snippet you wish to put that is located inside an if statement, that is enter only "if ([condition])", no need to enter the actual if ( ) body.

In Actions, please specify all the desired actions for the bot to execute just like writing a standard Java code.

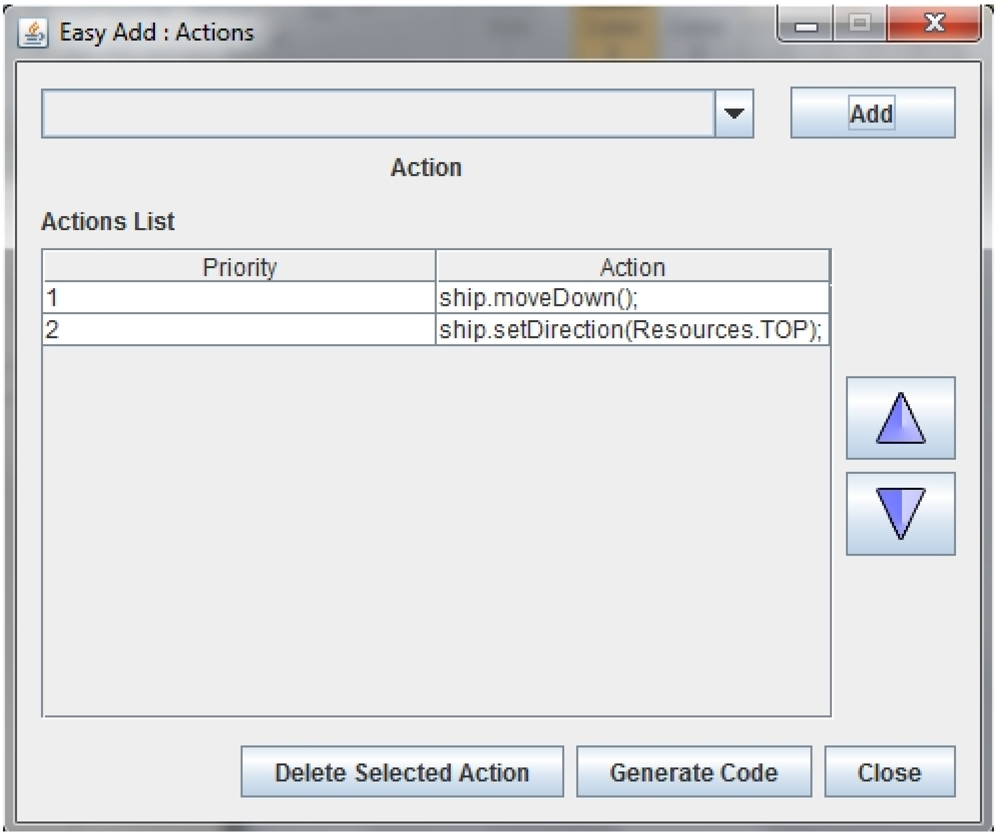
Please use the following variables:
Target - "target"
Your Ship - "ship"
Items - "item.(WHATEVER)"

Please refer to the AI Cap'n documentation for additional information.

Easy Add



Easy add lets you concatenate or put together an action from a set of basic actions in the drop down menu.

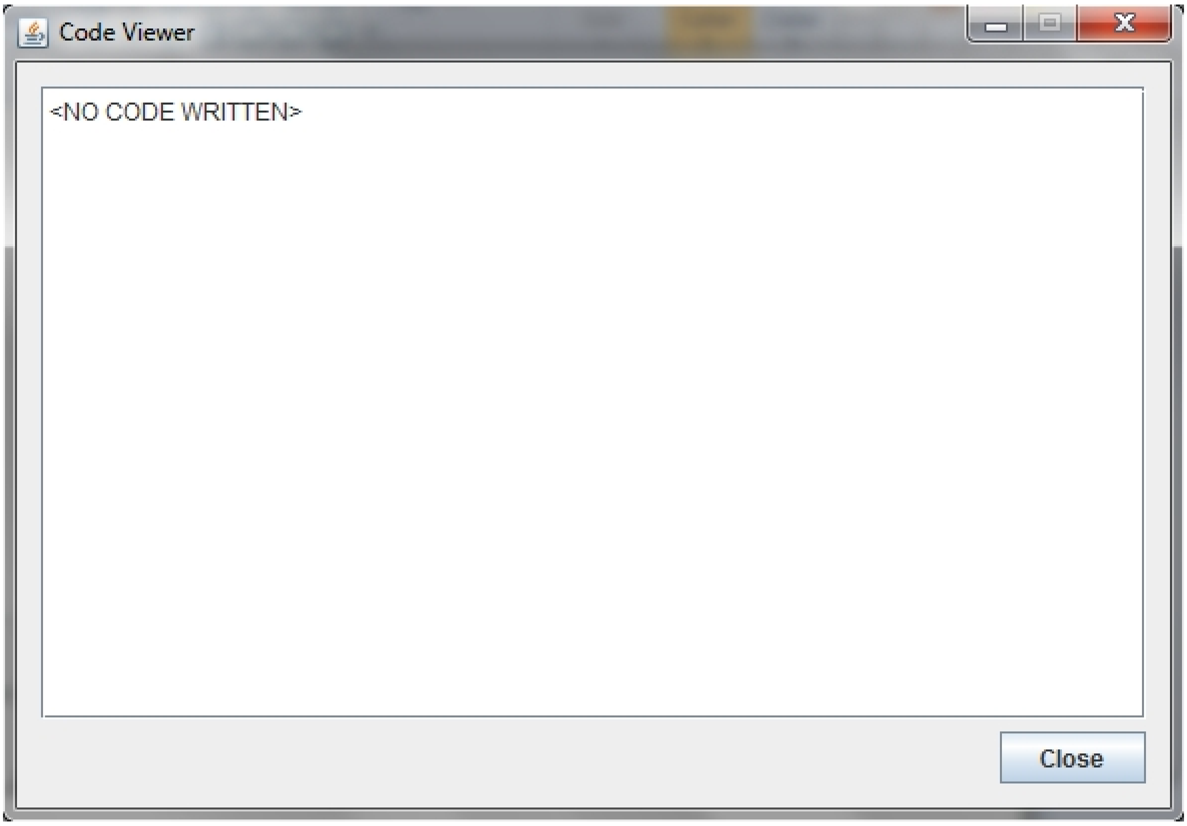


Priority	Action
1	ship.moveDown();
2	ship.setDirection(Resources.TOP);

The actions on the Action List run successively which means they are done one after the other, first-come-first-serve. Press the **Generate Code** button when you're done to finalize the action.

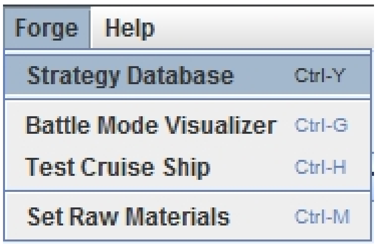
View

If you ever want to see the code of an action, click the **View** button to display the code.

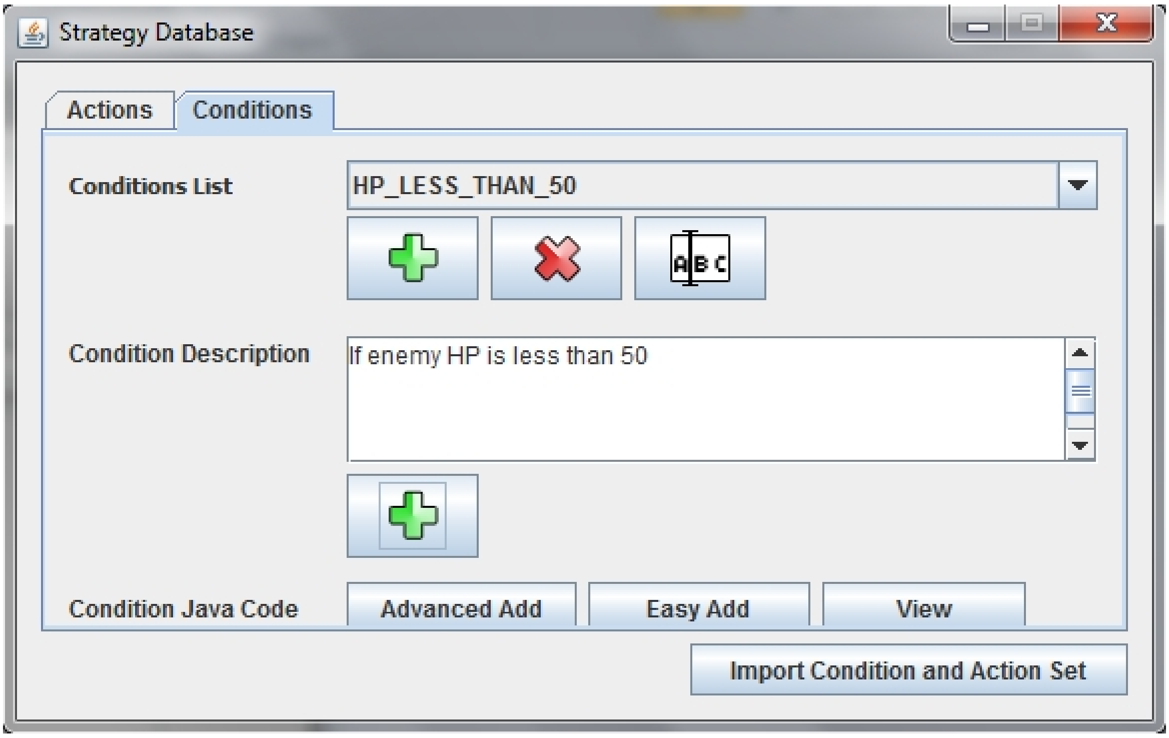


<NO CODE WRITTEN>

Making New Conditions



First select **Forge > Strategy Database**.



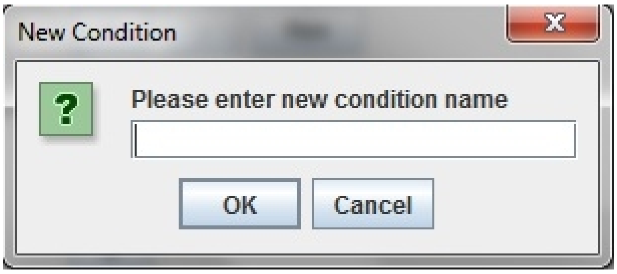
This is the overview of the controls in the database.

Conditions List:
[+] - adds a new condition to the list
[-] - removes the selected condition specified in the drop down
[Ren] - renames the selected action

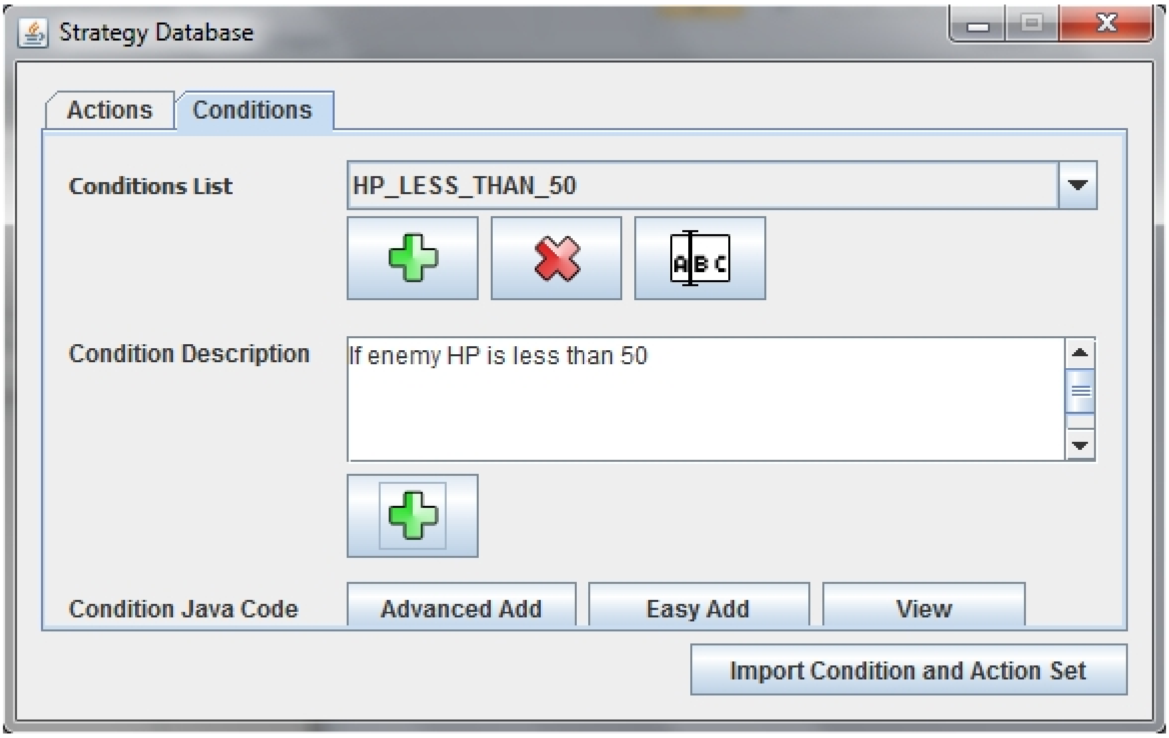
Condition Description:
[+] - save changes to the description

Condition Java Code:
Advanced Add - allows you to input your own verbatim java code. For those who know what they're doing.
Easy Add - For non-programmers
View - view the code contents in java format

The first step is to make a new action by giving it a name. So press the Conditions List Add button.



Enter a name for your condition and press OK. you'll be returned to the previous window.

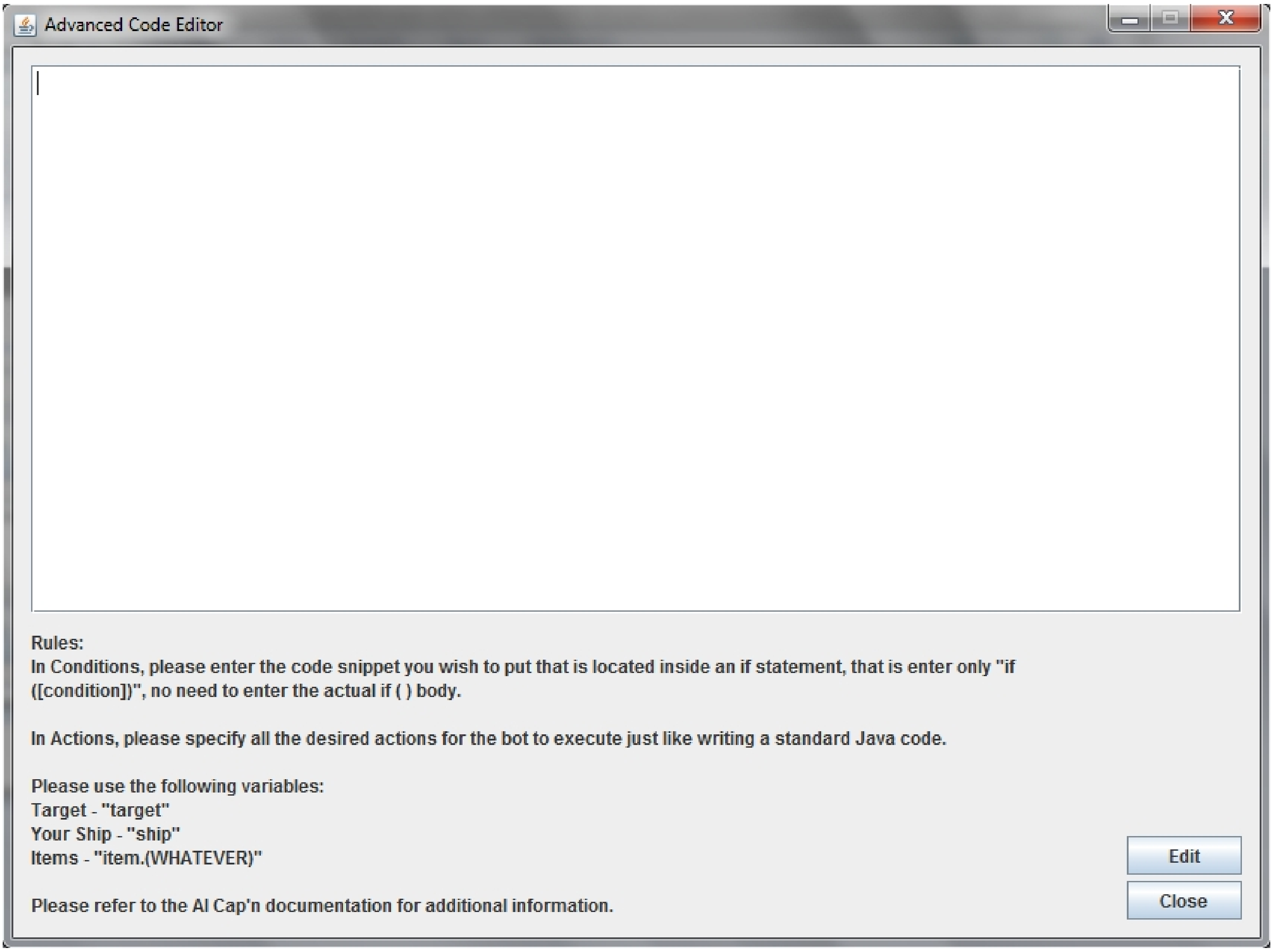


Conditions List: HP_LESS_THAN_50

Condition Description: If enemy HP is less than 50

Pick your new condition from the drop-down menu. Add in a description you like, and then pick either the **Advanced Add** or **Easy Add** to add the code.

Advanced Add



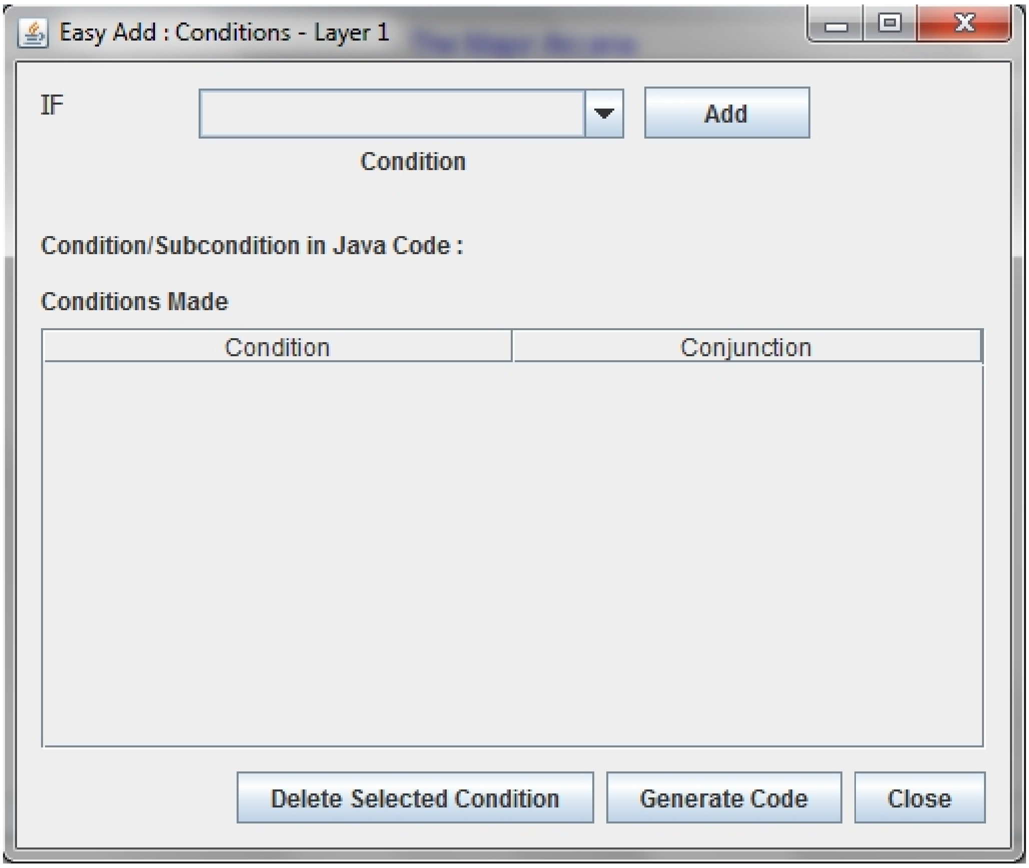
Rules:
In Conditions, please enter the code snippet you wish to put that is located inside an if statement, that is enter only "if ([condition])", no need to enter the actual if ( ) body.

In Actions, please specify all the desired actions for the bot to execute just like writing a standard Java code.

Please use the following variables:
Target - "target"
Your Ship - "ship"
Items - "item.(WHATEVER)"

Please refer to the AI Cap'n documentation for additional information.

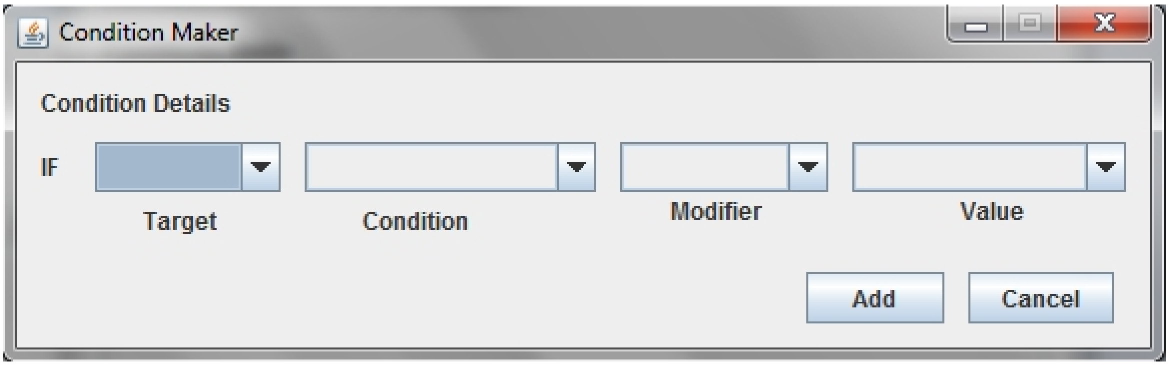
Easy Add


Easy Add : Conditions - Layer 1
IF
Add
Condition
Condition/Subcondition in Java Code :
Conditions Made
Condition
Conjunction
Delete Selected Condition
Generate Code
Close

Conditions come in two forms you can select from the drop-down:
Condition - creates a condition by using the condition maker
Subcondition - allows the nesting of conditions, similar to the grouping property of mathematics. It opens the same Layer

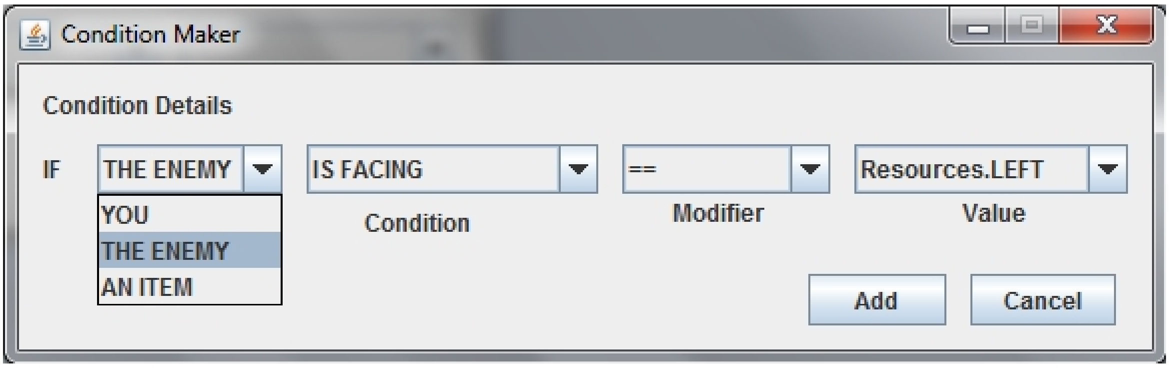
Conjunctions signify the relationship between conditions. It should be familiar to those who know logical math. Pick between ADD or OR.

Afterwards, press the add button to call the Condition Maker...



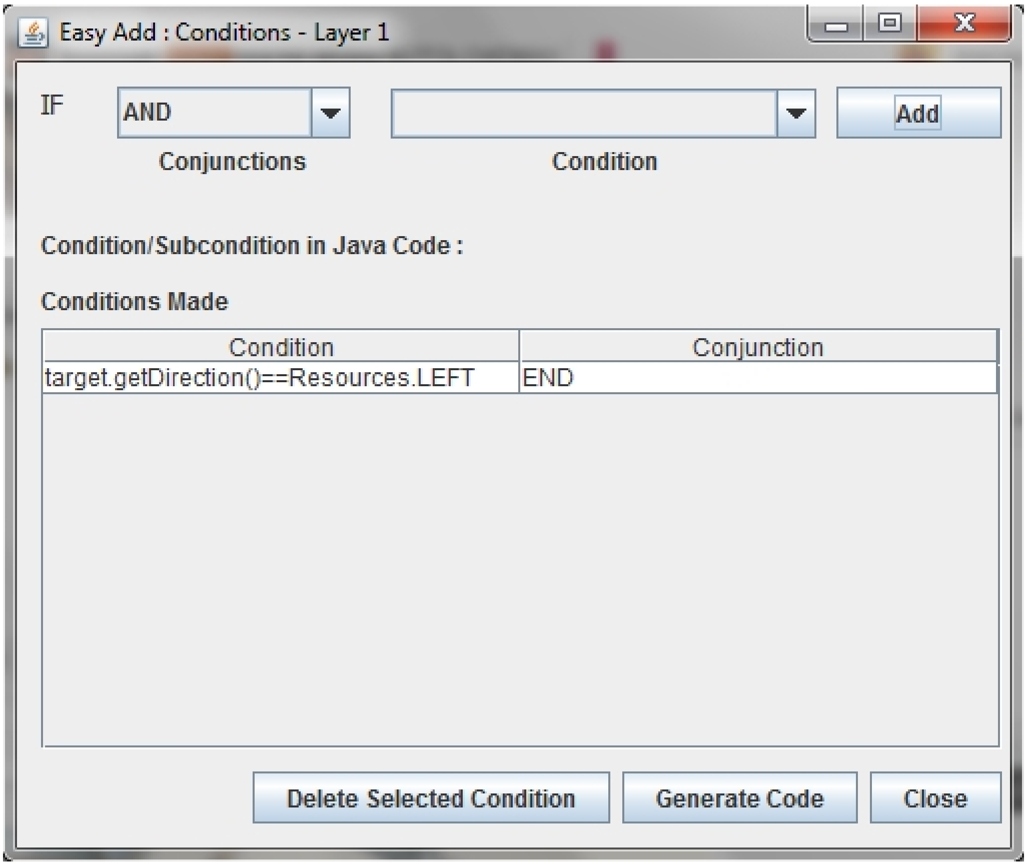
The condition maker helps the user define the conditions with prompts rather than typing it.

Target - Either YOURSELF, an ENEMY, or an ITEM.
Condition - Properties available about the selected target.
Modifier - may be an equals, lesser than, or greater than sign
Value - the value compared to the condition. Varies with condition.



IF THE ENEMY IS FACING == Resources.LEFT

After filling it out, press add to add to the main Condition List.


Easy Add : Conditions - Layer 1
IF
AND
Conjunctions
Condition
Add
Condition/Subcondition in Java Code :
Conditions Made
Delete Selected Condition
Generate Code
Close

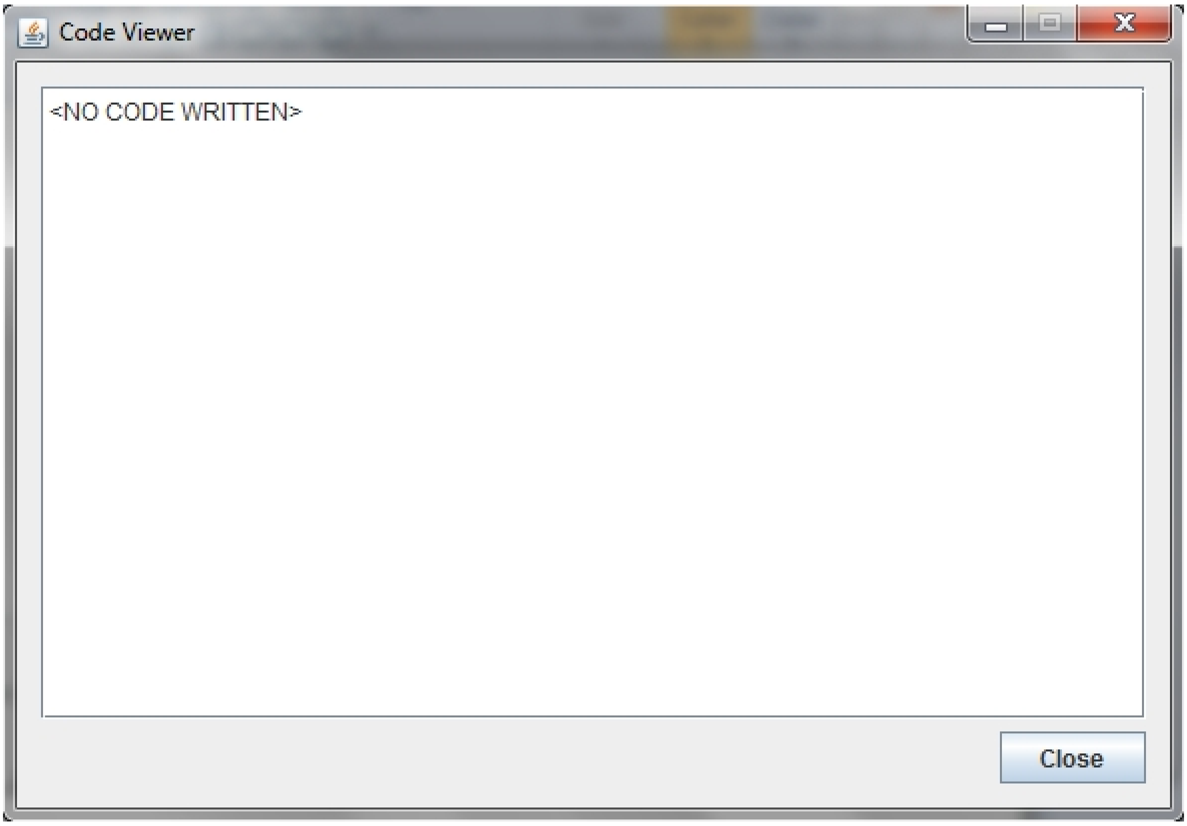
Condition	Conjunction
target.getDirection()==Resources.LEFT	END

Continue adding as many as you want to the condition and repeat the steps above.

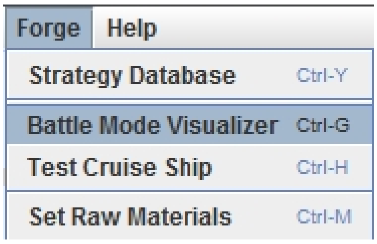
Press the **Generate Code** button when you're done to finalize the condition.

View

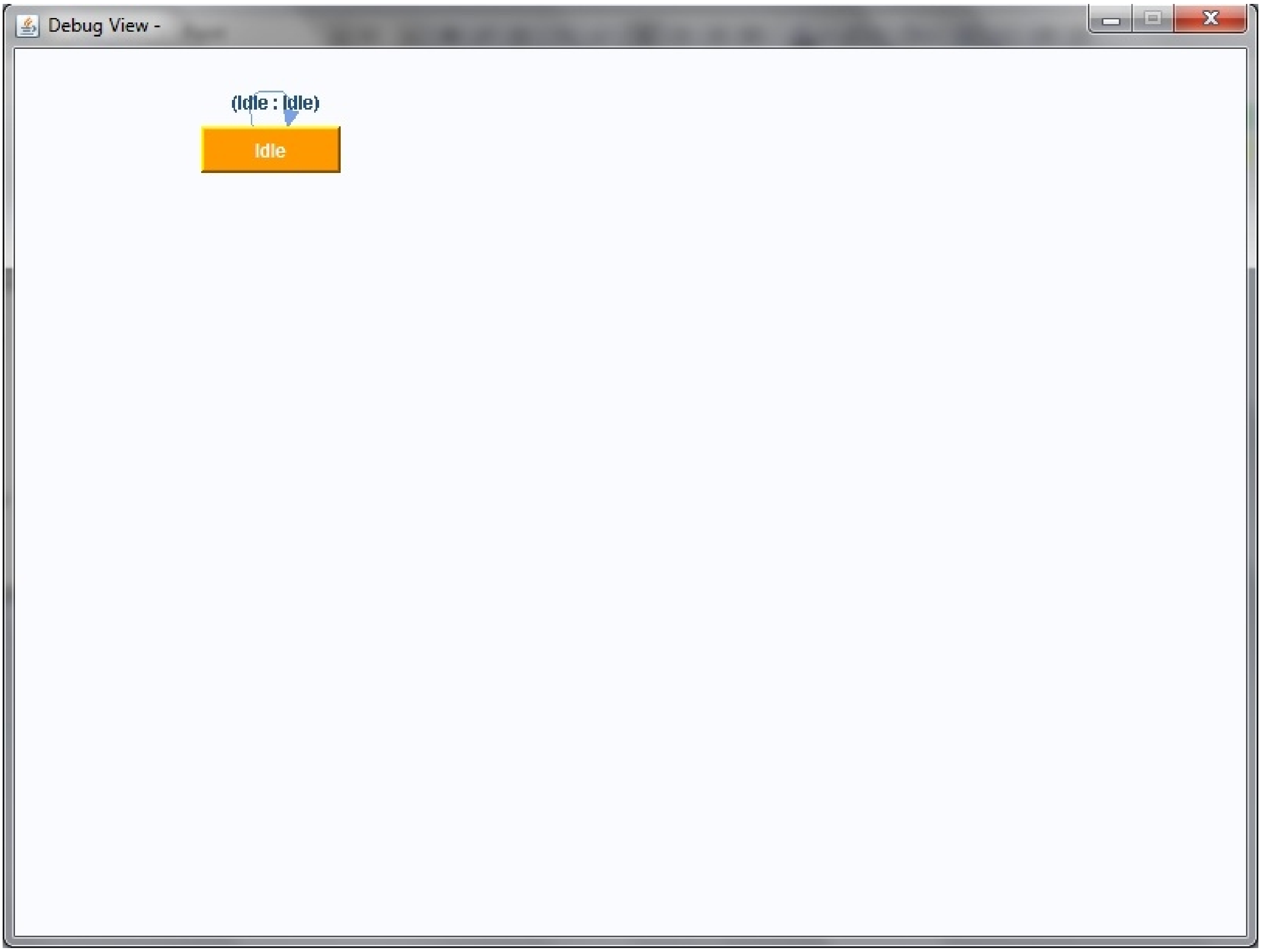
If you ever want to see the code of an action, click the **View** button to display the code.



Viewing The Graph



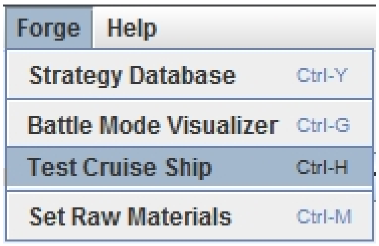
You can view the finite state machine graph of your bot by selecting **Forge > Battle Plan Visualizer**.



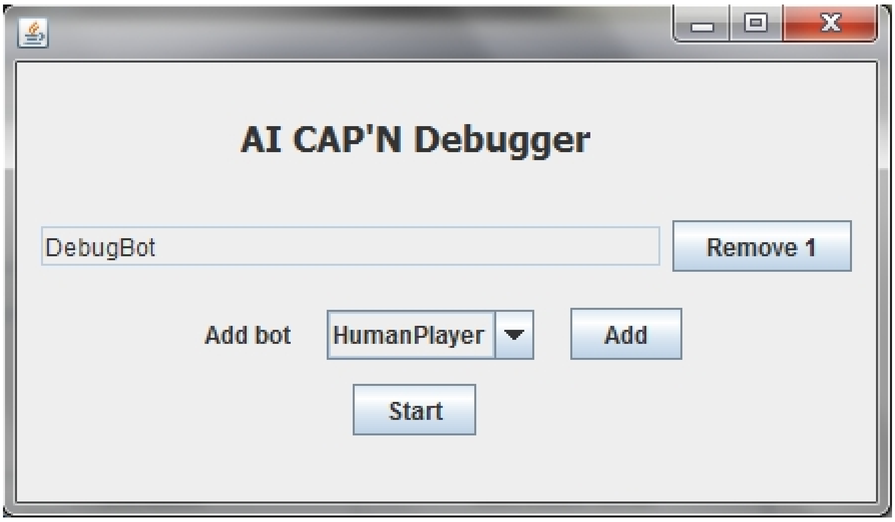
This graph will display the relationships between the states you have created. With arrows pointing to states specified in the **Battle Plan** of that **Battle Mode**.

Debugger

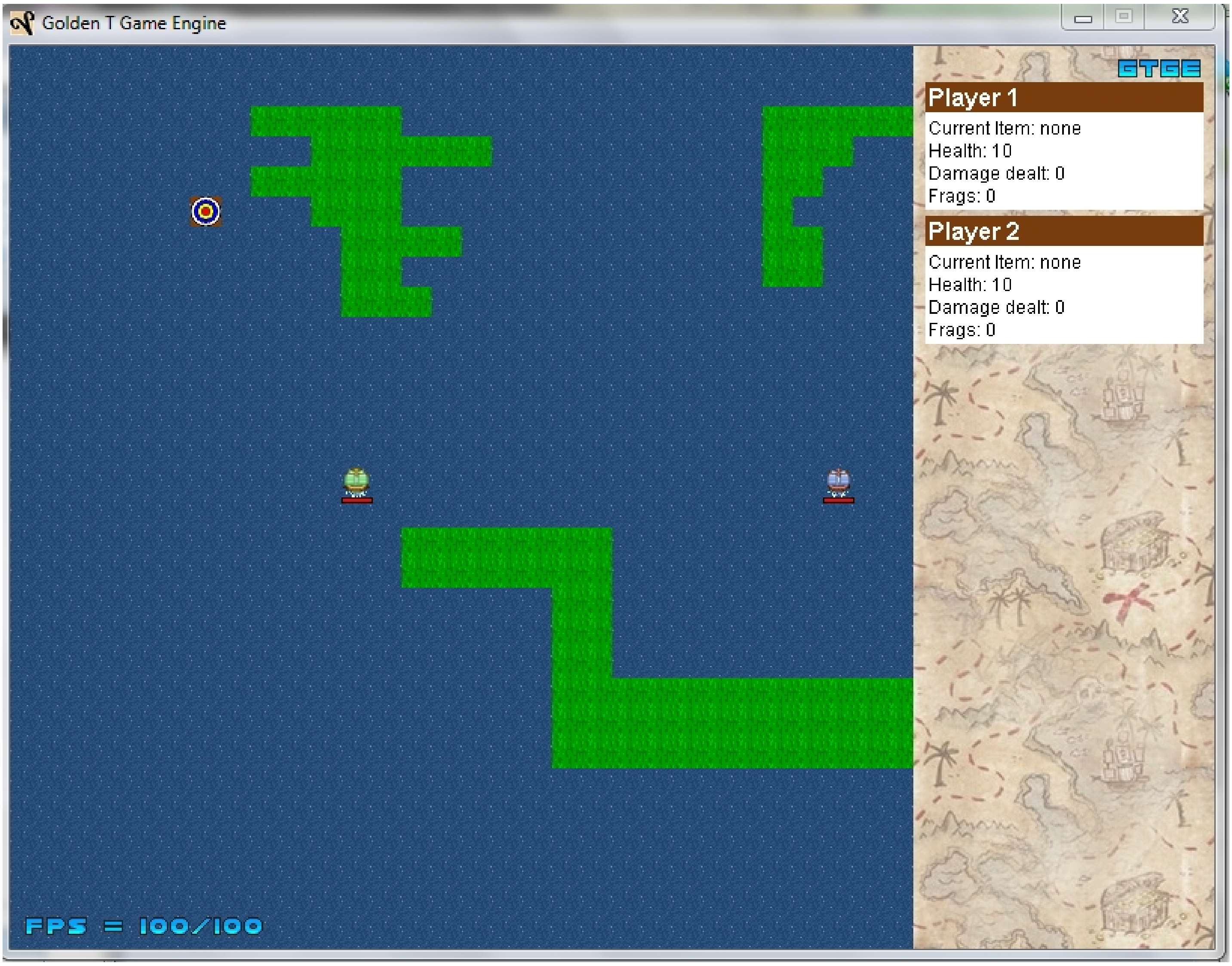
Once you have already created your bot's intelligence, you can test your bot in the AI Cap'n environment!



To use the debugger, go select **Forge > Test Cruise Ship.**



Afterwards, you can choose to pit your bot against other bots. With choice of a human player or an AI-enabled one, or any combination and number of them.
Choose Start to begin the debugger.



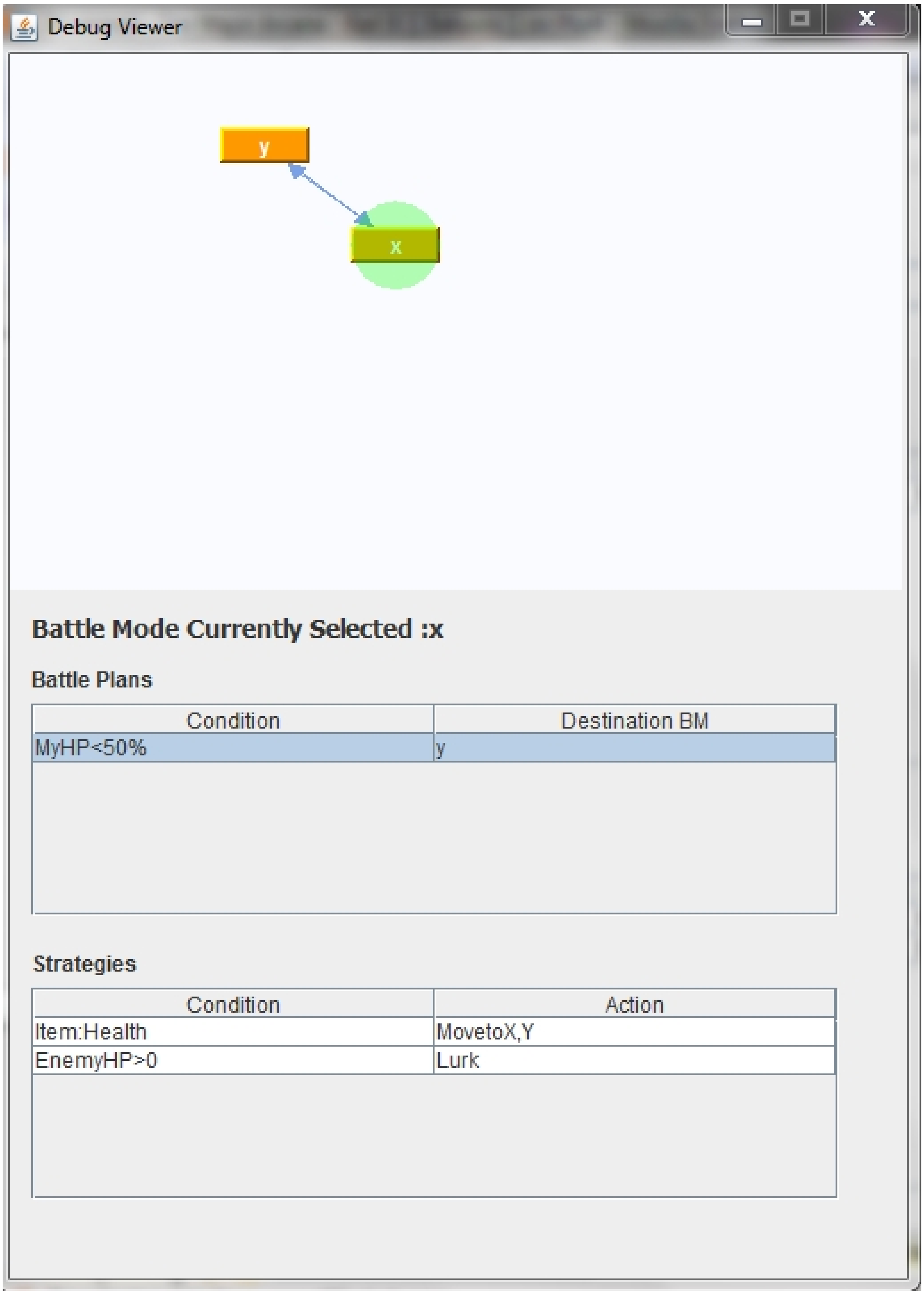
Player 1

Current Item: none
Health: 10
Damage dealt: 0
Frags: 0

Player 2

Current Item: none
Health: 10
Damage dealt: 0
Frags: 0

You'll be shown the AI Cap'n interface afterwards. Where you will see your bot in action.



Battle Mode Currently Selected :x

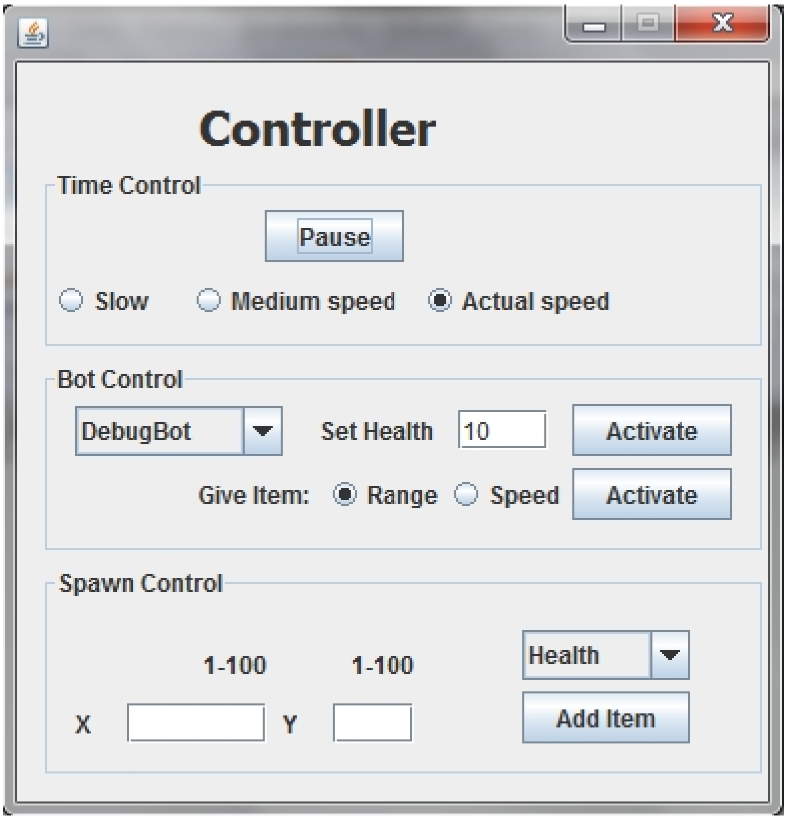
Battle Plans

Condition	Destination BM
MyHP<50%	y

Strategies

Condition	Action
Item:Health	MovetoX,Y
EnemyHP>0	Lurk

On the left of the screen is the **Debug Viewer**, which highlights the current Battle Mode, Battle Plan, and Strategy your bot is in in real-time.



○ Slow ○ Medium speed ● Actual speed

DebugBot Set Health 10

Give Item: ● Range ○ Speed

X Y Health

A **Debug Controller** can also be found, which lets you edit or alter some of the game parameters to test out certain scenarios.

Contact Us

Persona Vitae

For any concerns on the program, please contact any of the following.

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Requirements

Minimum Hardware Requirements:

- Intel Pentium 4 3.0Ghz or greater
- 1GB RAM or greater
- 15MB of Free Hard Disk Space
- 64MB Graphics Memory or greater
- Mouse and Keyboard Input

Minimum Software Requirements:

- Microsoft Windows 2000/XP/Vista/7 Operating System
- Java SE Runtime Environment (JRE6) or later
- A Working copy of AI Cap'n for agent testing

User Specifications:

- User must be able to understand college level English
- User must be computer literate, that is be able to use the computer
- User must know the basics of the AI Cap'n game