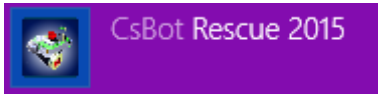
Getting Started Guide

COSPACE ROBOTICS

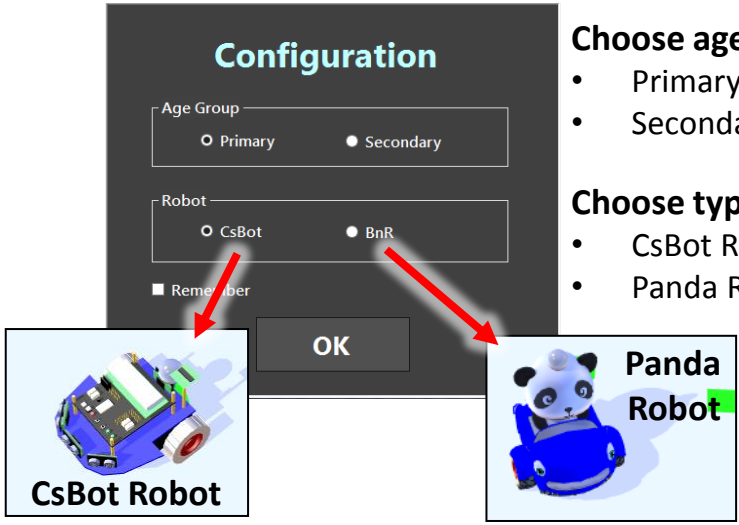
www.cospace.org.uk
cospace.rcj@gmail.com

Opening Cospace:

Open CsBot Rescue 2015:



Choose the correct configuration options:



Choose age group:

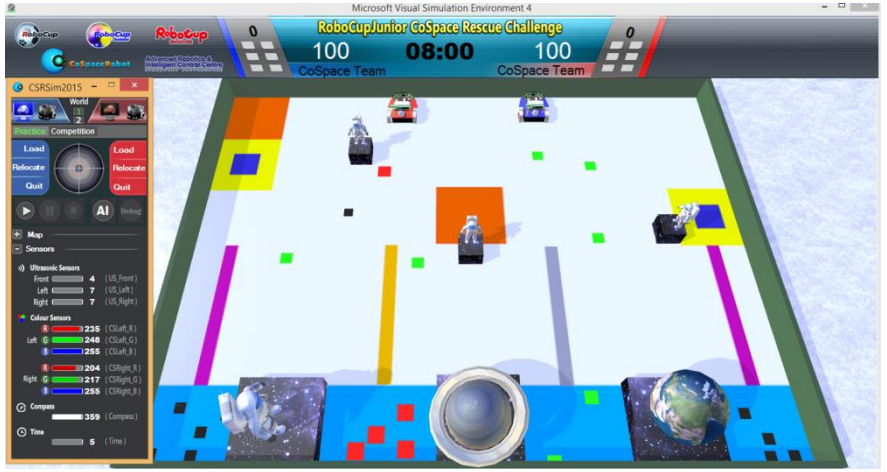
- Primary =< 14 years
- Secondary = 15+ years

Choose type of robot:

- CsBot Robot
- Panda Robot

If this doesn't appear, ctrl+s will open the configuration panel

The cospace environment should then open:



TASK 1: Moving Around

COSPACE ROBOTICS

Step 1: Open the AI Programming window

Make sure the 'practice' tab is selected

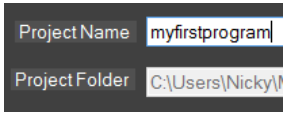
Open the AI window

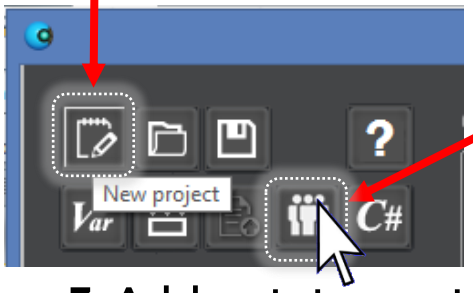
AI Button: Opens the AI development panel where programs are developed

Step 2: Create a new program

Start a new project

…and give the project a name:



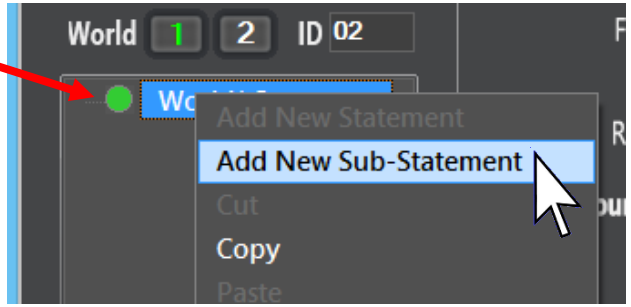


Add a Team Name

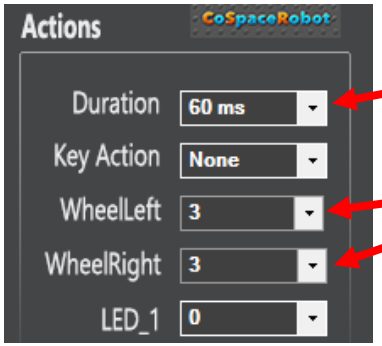
Step 3: Add a statement to move forwards

Right click and add a new sub-statement.

Name the statement 'forward'



Step 4: Add a statement to move forwards



Set the duration to 60ms

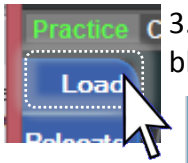
Set the wheels to move forwards

+ is forwards
- is backwards

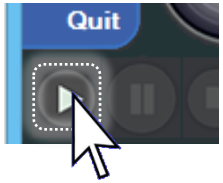
Step 5: Save, build, load & run

1. Save your project
2. Build your project

Now close the AI window



3. Load onto your robot (choose between the red or blue robot), make sure you select the .dll file



4. Start your program running!!

When you are finished, press the stop button:

Challenge

- Edit your program to make your robot go backwards. Test this works!
- Edit your program to make your robot spin on the spot. Test this works!

TASK 2: Detect the wall & turn

COSPACE ROBOTICS

Get the robot to move forwards and turn when it detects a wall

Step 1: Stop the match running, and click on AI, and create a new program.

If the robot is still running, press the stop button

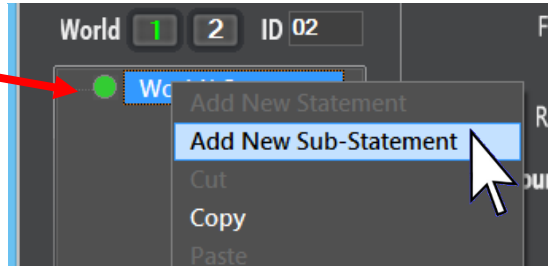
Open the AI window, and open your program

Start a new project and give this a name

Step 2: Add a statement to move forwards

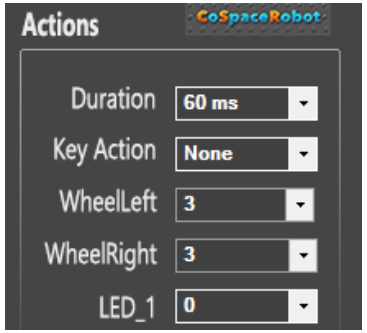
Like before right click and add a new sub-statement.

Name the statement 'forward'

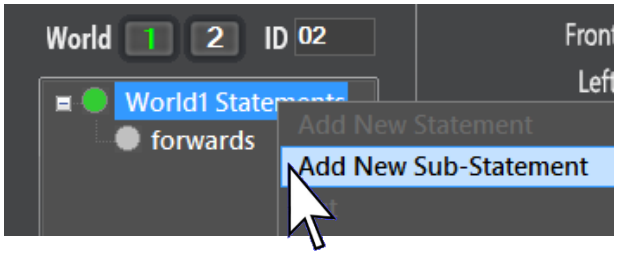


Step 3: Set the action to move forwards:

- Duration = 60ms
- WheelLeft = 3
- WheelRight = 3

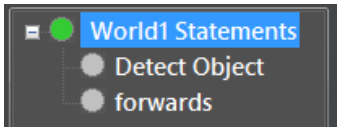


Step 4: Add a statement at the top to detect the wall and turn

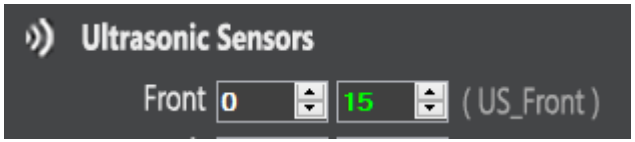


Right click and add a new statement and name it '**detect object**'

Your program should now look like this:



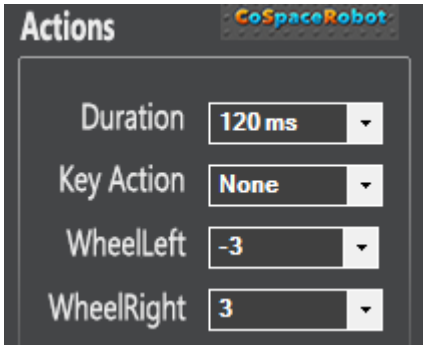
Step 5: Set the conditions to detect walls using the ultrasound sensor



Set the condition for the statement so it is true if the distance to the wall is between 0 and 15 cm.

Step 6: Set the action to turn when a wall or object is detected

- **Set the duration to 120ms**
- **Set the wheels so that one is forwards and one backwards**



Step 7: Save, build, load & run

1. Save

2. Build

Now close the AI window

3. Load

4. Run

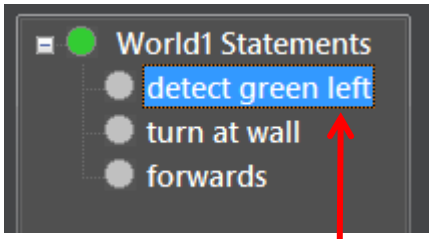
TASK 3: Pick Up Green Objects

COSPACE ROBOTICS

Detect green objects, stop and pick them up to get points!!

Step 1: Stop the competition, and click on AI, your Task 2 program should be open

Step 2: Add another statement for detecting a green object on the left colour sensor <u>at the top</u> of the list of statements



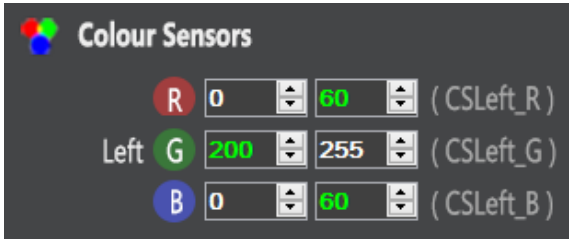
Add this statement

Hint: to add a statement right click at the top of the statement tree and select 'add new sub-statement

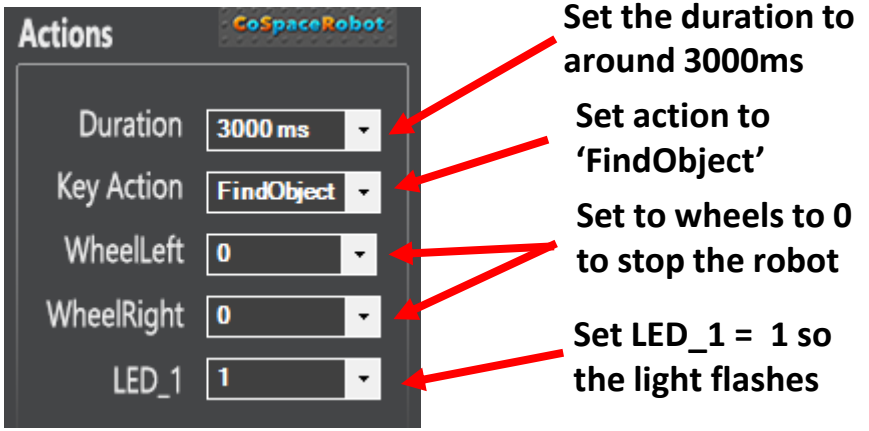
Hint: if you need to change the order of statements, right click the statement and select move up/move down

Step 3: set the conditions to detect green objects on the LEFT colour sensor. Here are colour values to set:

These are the **red**, **green** and **blue** values for the LEFT colour sensor.



Step 4: Set the action to stop, pick up object and flash the lamp for 3 seconds (3000ms)



Step 5: Save, build, load & run

Step 6: Add another statement for detecting a green object using the <u>right</u> colour sensor. Test this works.

TASK 4: Pick Up All Objects

COSPACE ROBOTICS

Now, statements need to be added to pick up objects of different coloured objects for both the **left** and **right** colour sensor.

Red Objects
10 points

Green Objects
15 points

Black Objects
20 points

- Objects in blue areas are worth double
- For each Red, Green and Black object deposited in one deposition, there are bonus points.

Step 1: Open up your previous program

Step 2: You need to add 4 more statements for:

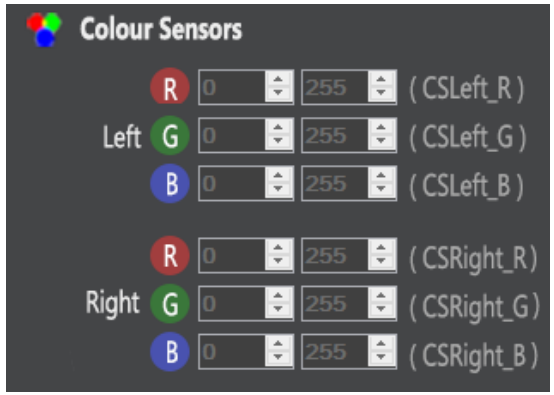
- Detecting Red on Left
- Detecting Red on Right
- Detecting Black on Left
- Detecting Black on Right

For all of these you need to add the condition & action...

Hint:

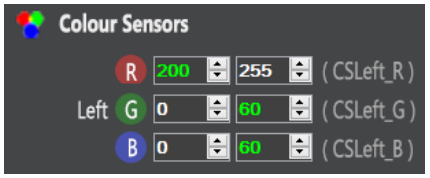
Use these conditions to detect objects on the left

Set these conditions to detect objects on the right

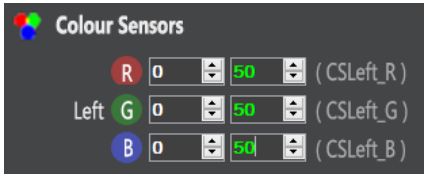


These are the colour sensor values to use for detecting red and black:

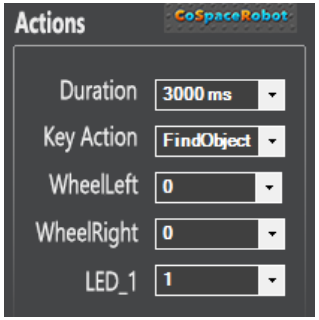
Detecting **Red**:



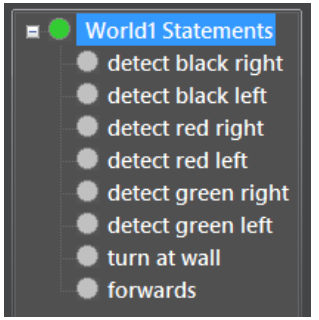
Detecting **Black**:



This is the action to use to pick up all objects, and should be used in all of the statements.



Your program should now look like this:



Step 3: Save, build, load & run

1. Save

2. Build

Now close the AI window

3. Load

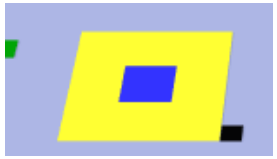
4. Run

Check your program picks up red, green and black objects using both the left and right sensors.

TASK 5: Avoiding the Traps

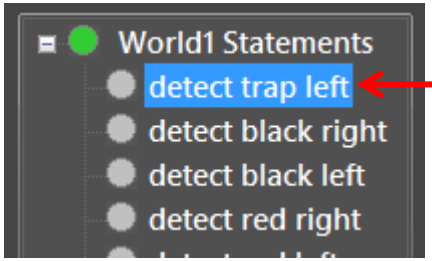
COSPACE ROBOTICS

Stop your robot from loosing objects when it goes over traps



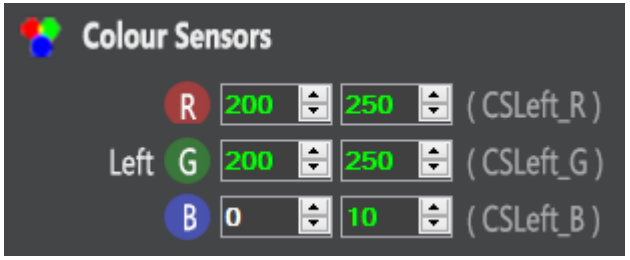
Step 1: Open the AI Programming window and make sure you existing program is open

Step 2: Add a new statement at the top for detecting the yellow trap on the left colour sensor :

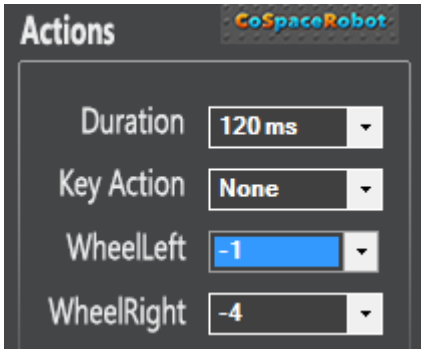


Right click and select 'add new statement' to add the statement

Step 3: set the condition of the statement to detect yellow on the left colour sensor:



Step 4: set the action to get the robot to move away from the yellow area, to stop the robot going over the trap:



We are setting the wheels so that we reverse and turn away from the trap

Step 5: Save, build, load & run

1. Save

2. Build

Now close the AI window

3. Load

4. Run

Step 6: now add another statement for avoiding the trap on the **right** colour sensor.

In your action think about which direction you want to move away from the trap.

(Hint – use the same condition but for the RIGHT colour sensor, and use the action WheelRight =-1 & WheelLeft = -4)

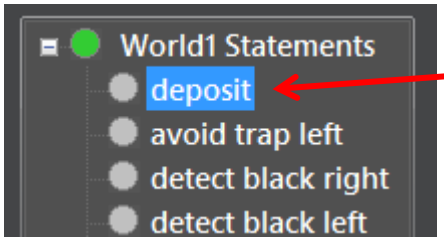
TASK 6: Depositing Blocks

COSPACE ROBOTICS

Deposit blocks on the orange square, and then move off the orange.

Step 1: Open up your previous program

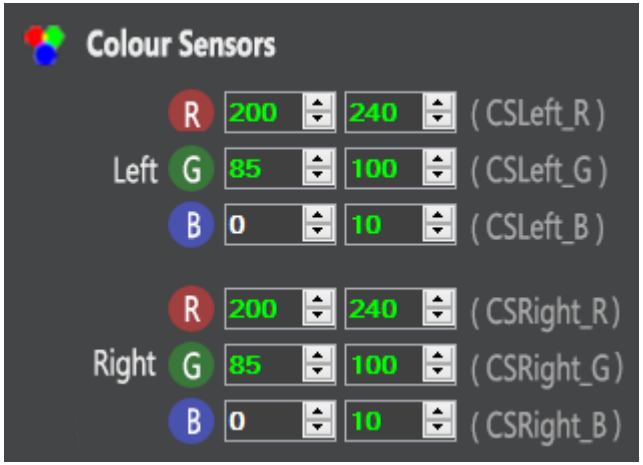
Step 2: Add a new statement at the top of the list for detecting the orange deposition area:



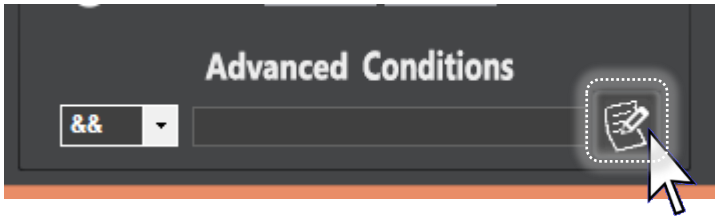
Right click and select 'add new sub=statement'

Remember – if you right click you can select move up/move down to change the order of statements.

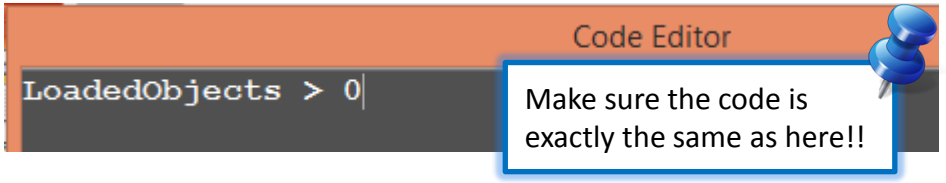
Step 3: set the condition to detect orange on BOTH the left and right colour sensors:



Step 4: Open the advanced conditions from the bottom of the conditions section.

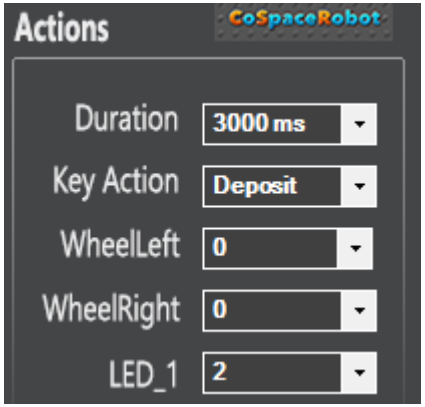


Step 5: Enter the following code:



LoadedObjects is an internal variable that is updated by the software and counts the number of objects carried by the robot. The robot only needs to deposit when this is greater than zero.

Step 6: Set the actions to deposit



Step 7: Save, build, load & run

1. Save

2. Build

Now close the AI window

3. Load

4. Run

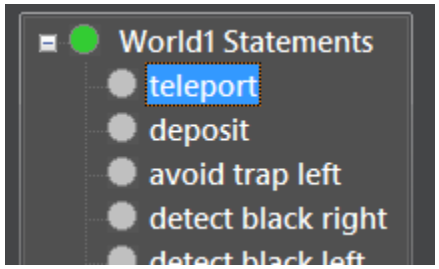
TASK 7: Teleporting to World 2

COSPACE ROBOTICS

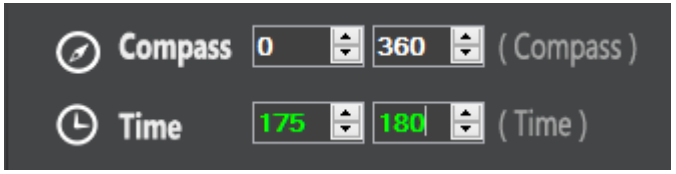
Move from world 1 to world 2 for 100 points!! You can teleport between 3 and 5 minutes.

Step 1: Open up your previous program

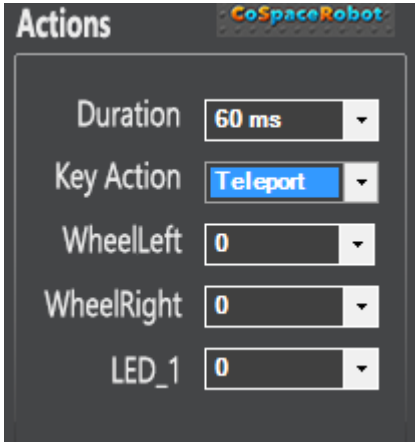
Step 2: Add a new statement at the top of your program, so it has the highest priority:



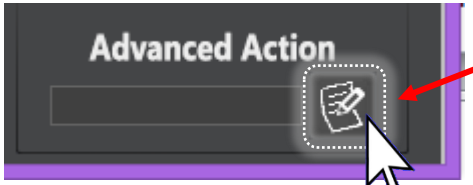
Step 3: Set the condition to be the time at which you want to teleport just before three minutes (i.e. 180 secs).



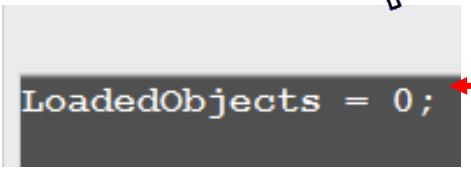
Step 4: Set the action to teleport



Step 5: Set the variable 'loadedobjects' to reset, so you can collect up to 6 objects in World 2



Click here to open advanced actions



Add this advanced action

Step 5: Save, build, load & run

1. Save

2. Build

Now close the AI window

3. Load

4. Run

Test that the robot teleports at 3 minutes!

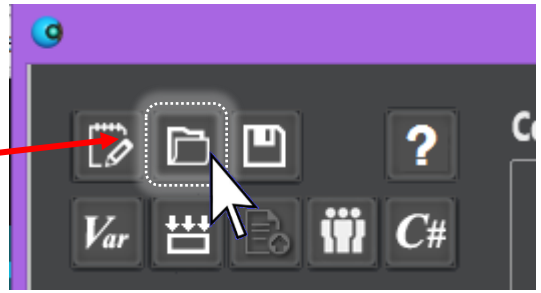
You have now finished programming World 1!!

SAVING YOUR PROGRAM ON THE MEMORY STICK

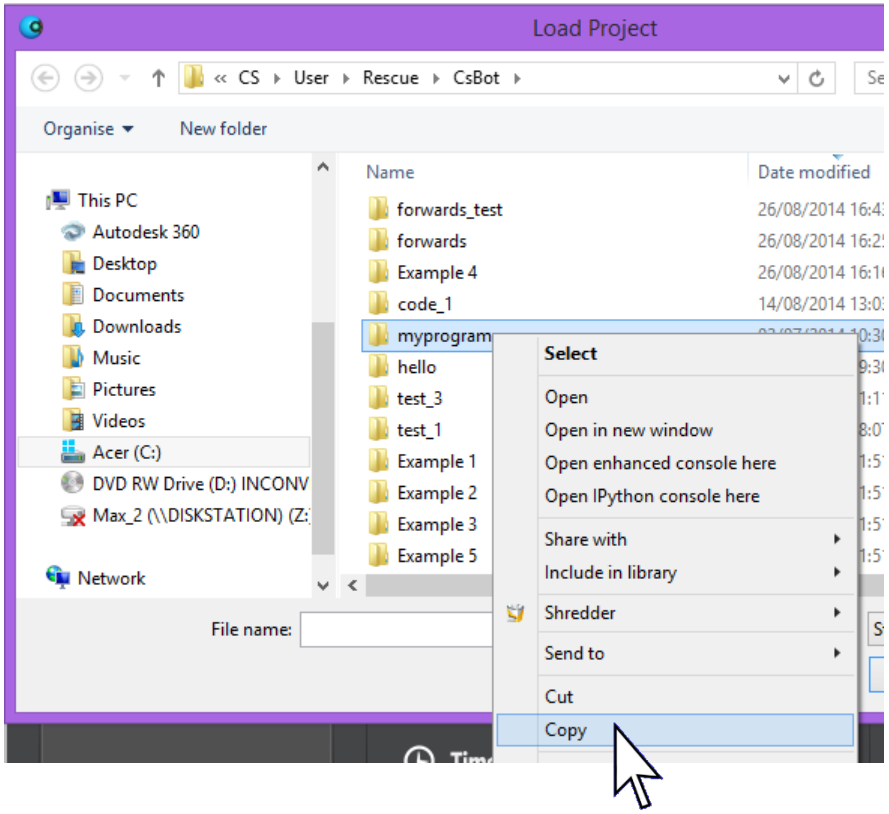
COSPACE ROBOTICS

Step 1: Open up the AI panel

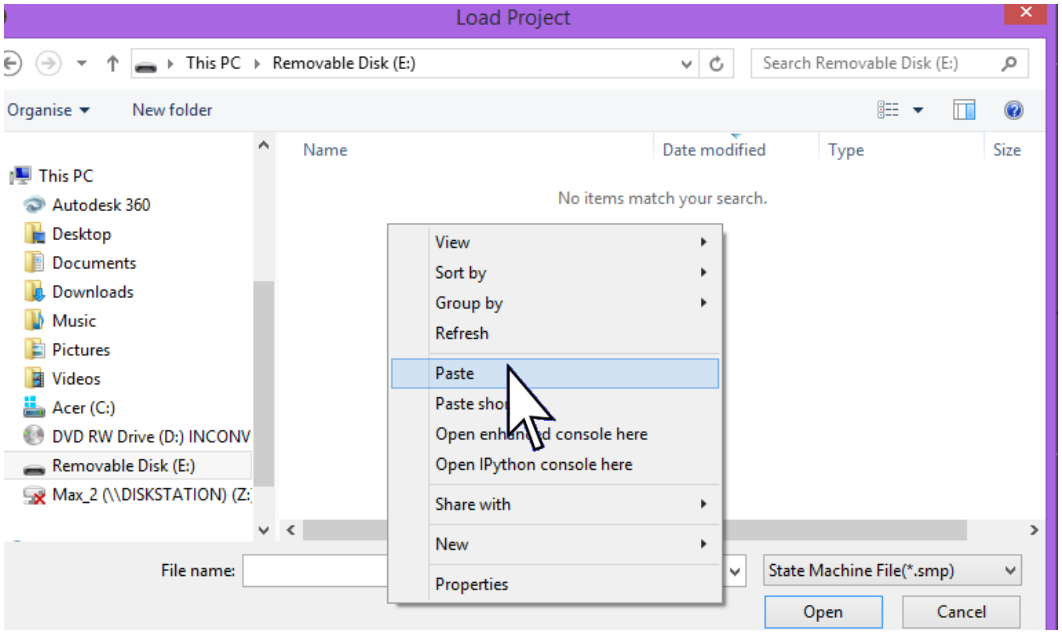
Step 2: Click on the open button



Step 3: Using File explorer, find the folder which contains your program



Step 4: Using File explorer, copy this folder on to the memory stick



Step 5: Close the file explorer window, and you can now remove your memory stick!!