

Schoolbots Manual

Lesson 3 – Enhance your robot's movement

Lesson Duration: 15 minutes

**By: Dr. Liam Noonan
ICT Department**

www.schoolbots.ie

www.tippinst.ie/games

Tipperary Institute



In this lesson you are going to improve your robots movement by having it move a distance if it gets hit. You will also have it “bounce” of the walls by heading of at an angle of 135 degrees.

1. Open the robocode editor

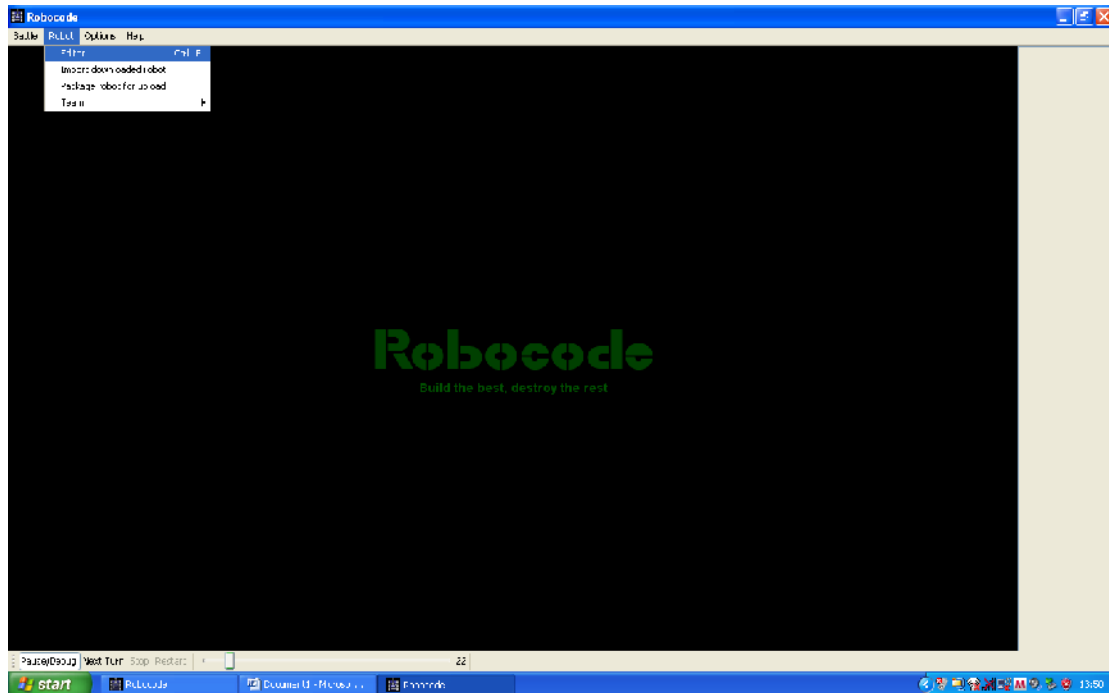


Figure 1 – Starting the robot editor

2. Select the option **Open** to open an existing robot

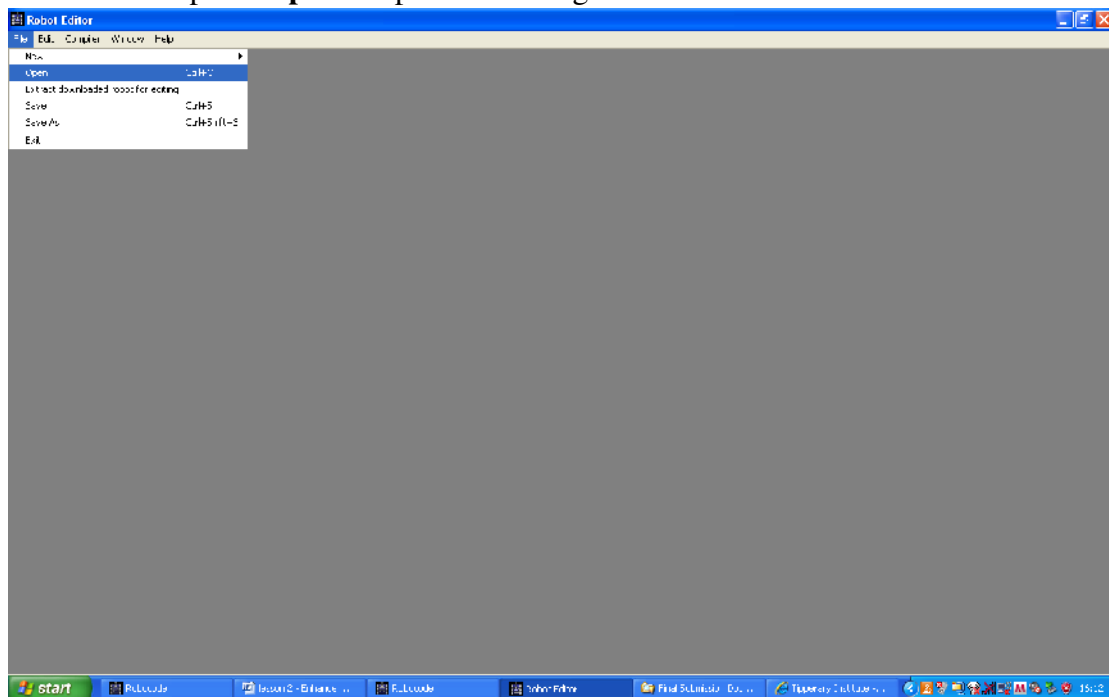
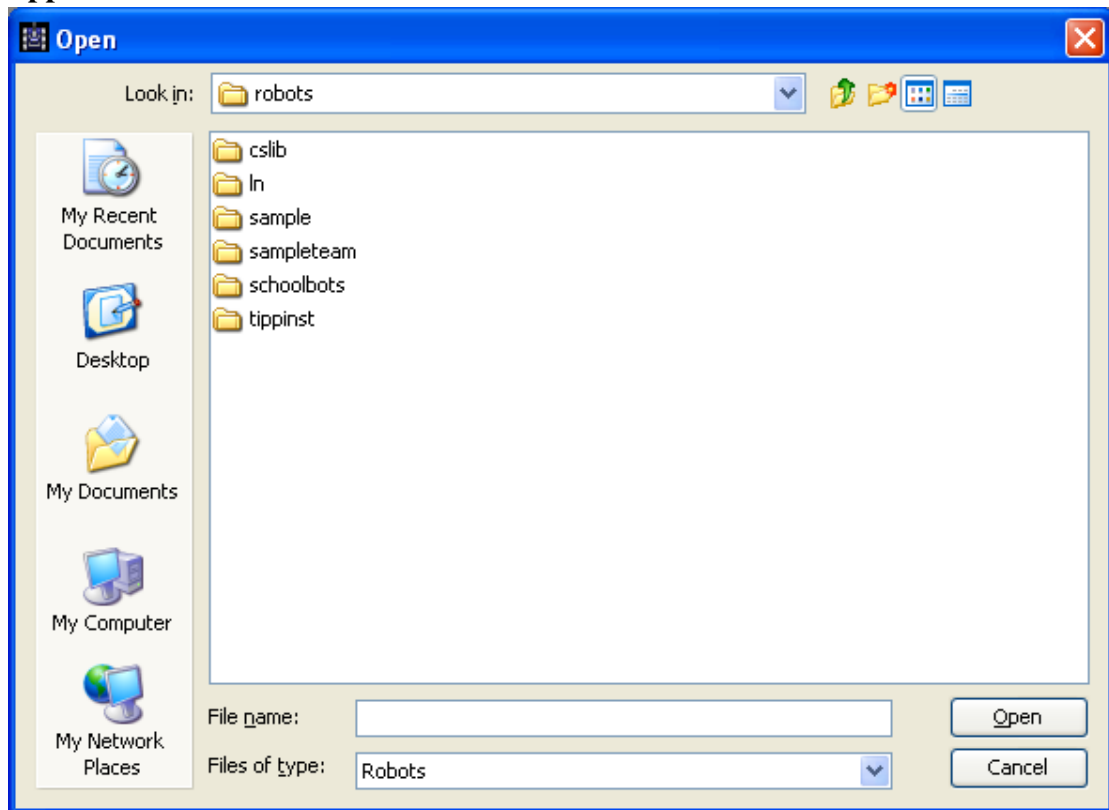
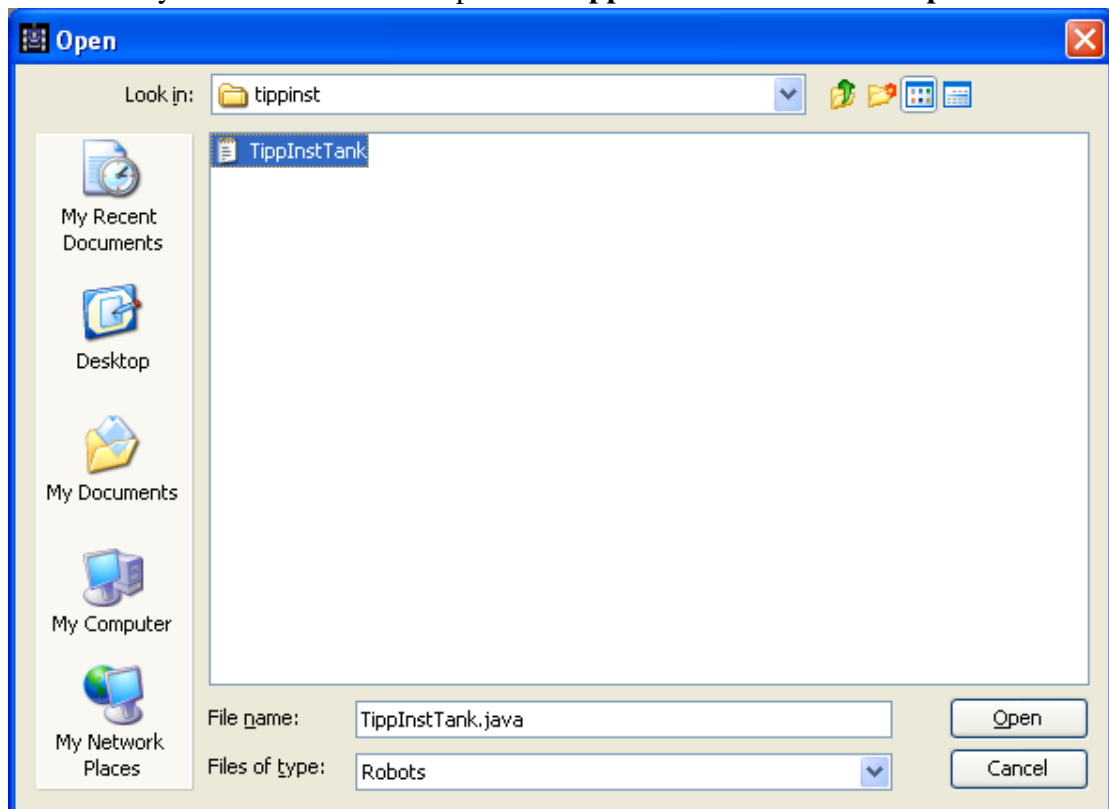


Figure 2 – Opening a new robot

3. Select the package folder that corresponds to your robot, in this example it is **tippinst**



4. Click on your robot in this example it is **TippInstTank** and select **Open**

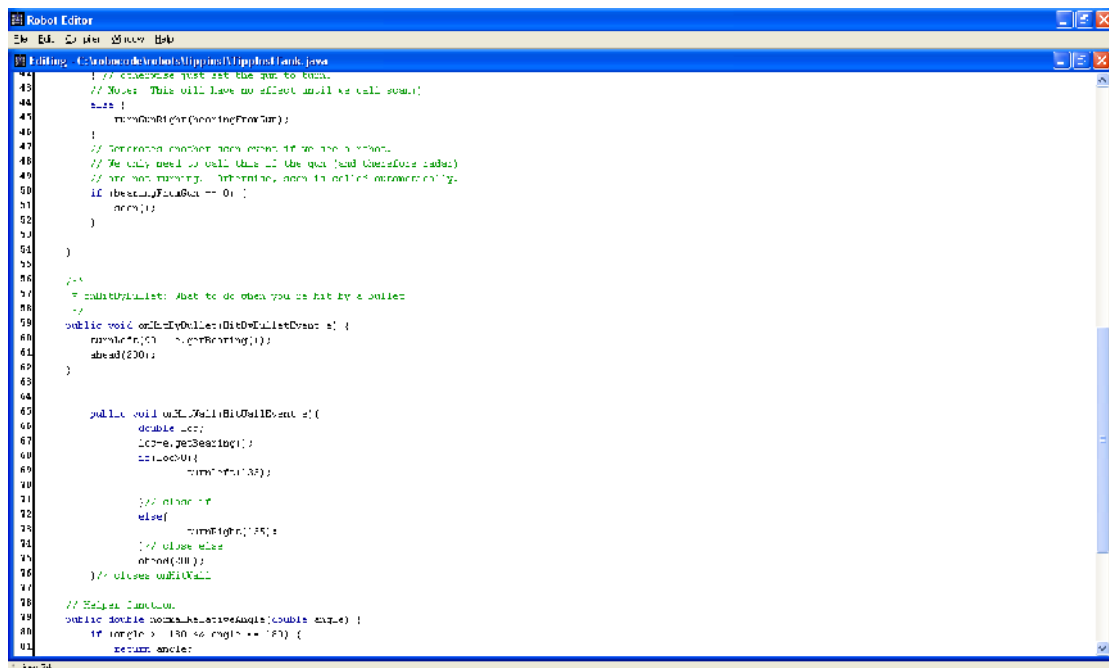


5. In this lesson we are going to improve the the onHitByBullet event. The tank will now turn 90 degrees away from the enemies current position and move 200 pixels ahead.

We replace on

`public void onHitByBullet(HitByBulletEvent e) {` with the following code.

```
public void onHitByBullet(HitByBulletEvent e) {  
    turnLeft(90 - e.getBearing());  
    ahead(200);  
}
```



```
Robot Editor  
File Edit View Help  
HitByBullet: C:\robot\karel\hitByBullet.java  
43 // case where just hit the gun to turn.  
44 // Note: This will have no effect until we call turn!  
45 turnRight(bearingFromT);  
46 }  
47 // Turn when another robot comes up to the robot.  
48 // We only need to call this if the gun had been fired.  
49 // We are not running. Otherwise, we are in control of movement.  
50 if (bearingFromGun == 0) {  
51     turn();  
52 }  
53 }  
54 }  
55 }  
56 }  
57 }  
58 // onHitByBullet: What to do when you are hit by a bullet.  
59 //  
60 public void onHitByBullet(HitByBulletEvent e) {  
61     turnLeft(90 - e.getBearing());  
62     ahead(200);  
63 }  
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Figure 3 – Robot editor with the changes made to onHitByBullet

7. We are also going to add a new event that will handle the scenario of the tank hitting a wall. If the tank hits a wall it will either turn left or right 135 degrees depending on its bearing and move forward 200 pixels.

```
public void onHitWall(HitWallEvent e){
    double loc;
    loc=e.getBearing();
    if(loc>0){
        turnLeft(135);

    }// close if
    else{
        turnRight(135);

    }// close else
    ahead(200);
}// closes onHitWall
```

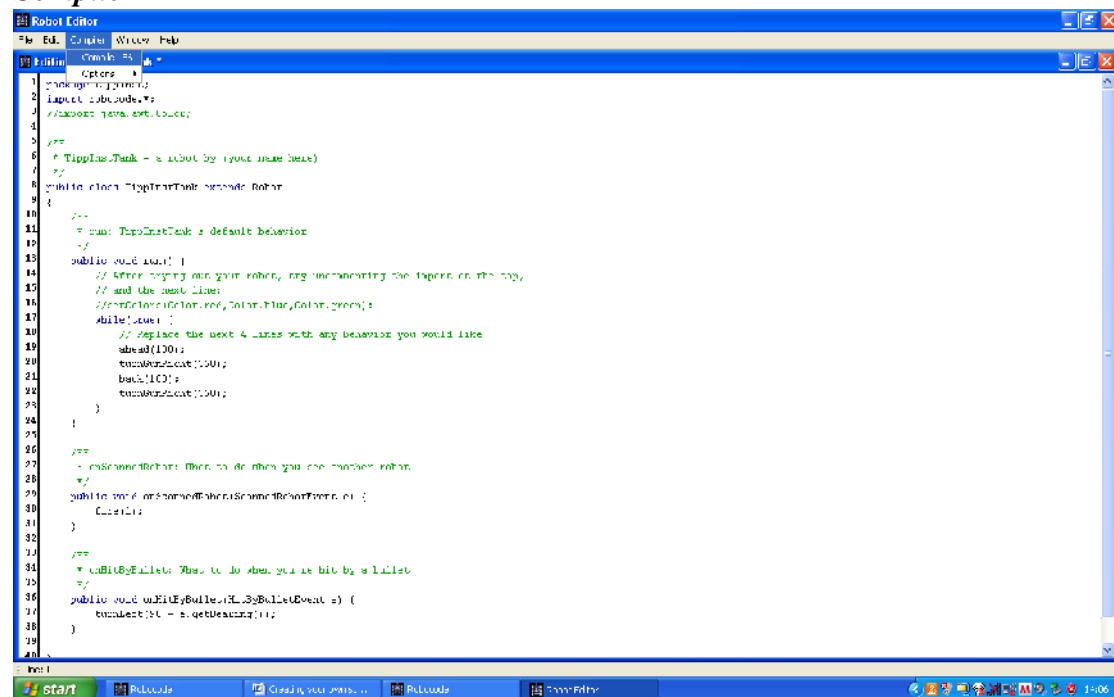
```

42 // otherwise just set the gun to 0000.
43 // Note: This will have no effect until we call shoot.
44 class {
45     turnOnLight("shootingFront");
46     {
47         // Turn on the motor here, even if we don't shoot.
48         // We only need to call this if the gun had been fired.
49         // We are not running, otherwise, we are in control of our movement.
50         if (bearingFront == 0) {
51             ahead();
52         }
53     }
54 }
55
56 //
57 // Robot's initial state: what to do when you're hit by a bullet
58 //
59 public void onHitOfBullet(HitWallEvent e) {
60     turnLeft(135);
61     ahead(200);
62 }
63
64
65 public void onHitWall(HitWallEvent e) {
66     double loc;
67     loc=e.getBearing();
68     if(loc>0){
69         turnLeft(135);
70
71     } // close if
72     else{
73         turnRight(135);
74     } // close else
75     ahead(200);
76 } // closes onHitWall
77
78 // Robot's function
79 public double rotateToScreenAngle(double start) {
80     if (angle > 180 || angle < -180) {
81         return angle;

```

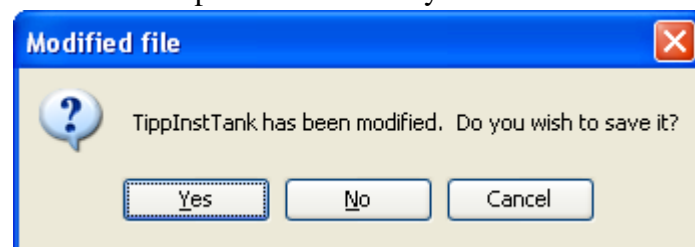
Figure 4 – onHitWall event code

7.. Before the robot can be used it needs to be compiled. Select **Compiler then Compile**

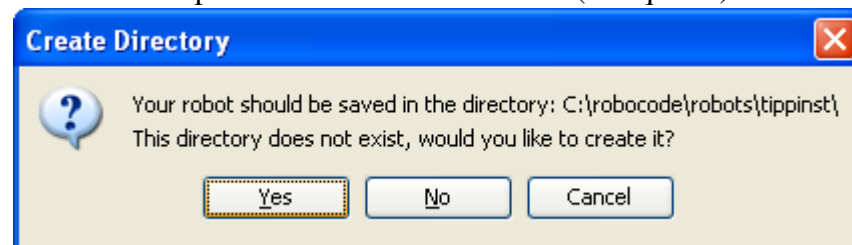


```
1 package tipinst;
2 import edu.cmu.robocode.*;
3 //import java.awt.Color;
4
5 /**
6  * TipInstTank - a robot by (your name here)
7  */
8 public class TipInstTank extends Robot
9 {
10     /**
11      * @see Tank: default behavior
12      */
13     public void run() {
14         // After copying out your robot, try uncommenting the lines on the top,
15         // and the next lines:
16         //setDirection(Dir.UP, Color.BLUE, Color.GREEN);
17         //setSpeed(1);
18         // replace the next 4 lines with any behavior you would like
19         ahead(100);
20         turnAround(100);
21         back(100);
22         turnAround(100);
23     }
24 }
25
26 /**
27  * @see Tank: then to do when you see another robot.
28  */
29 public void onScannedRobot(ScannedRobotEvent e) {
30     // do it
31 }
32
33 /**
34  * @see Tank: What to do when you are hit by a bullet
35  */
36 public void onHitByBullet(int x, int y, BulletEvent e) {
37     // do it
38 }
39 }
```

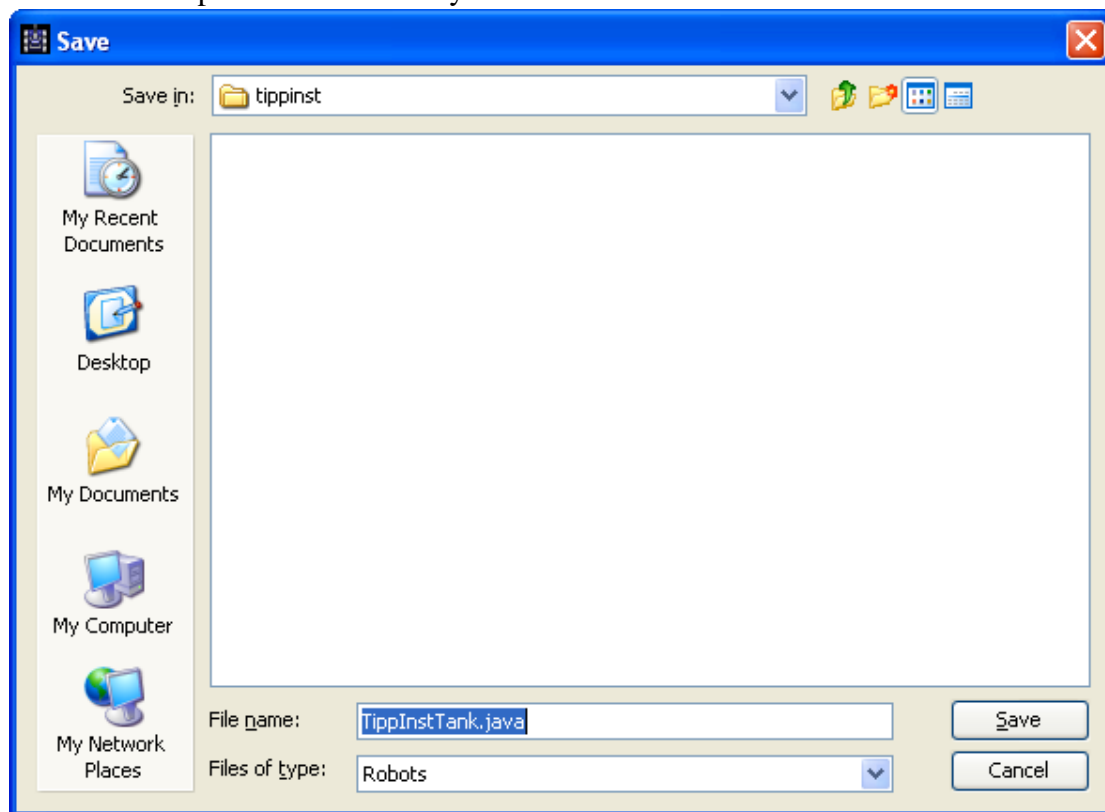
8. Select the option **Yes** to save your tank



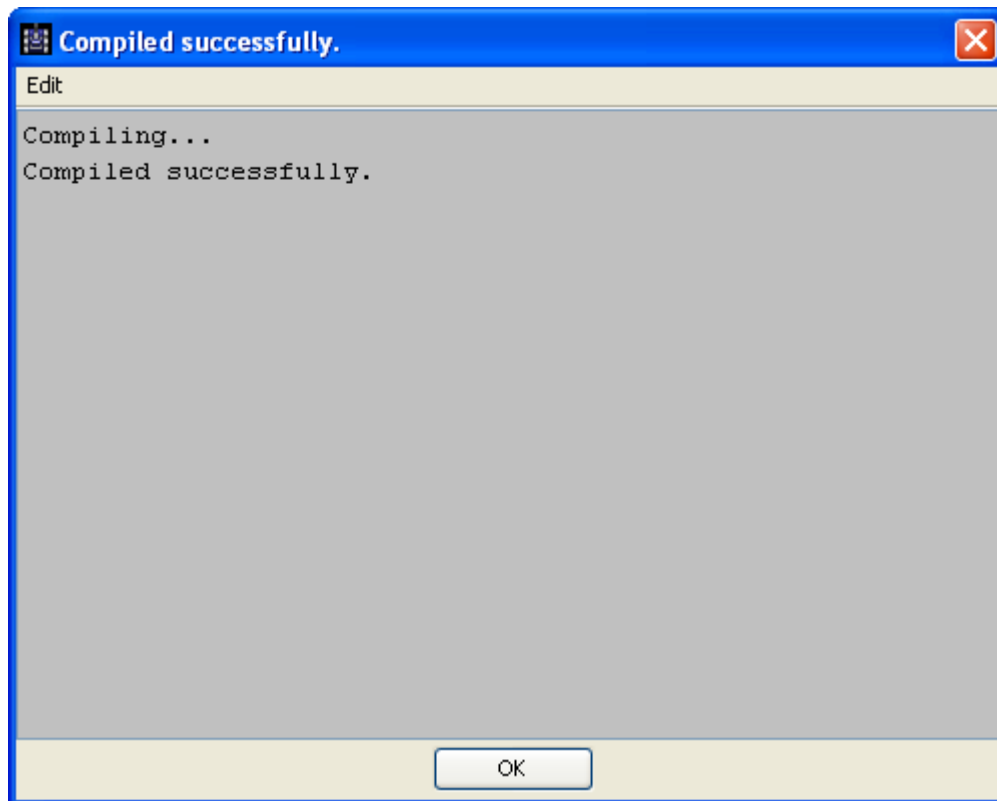
9. Select the option **Yes** to create the folder (if required)



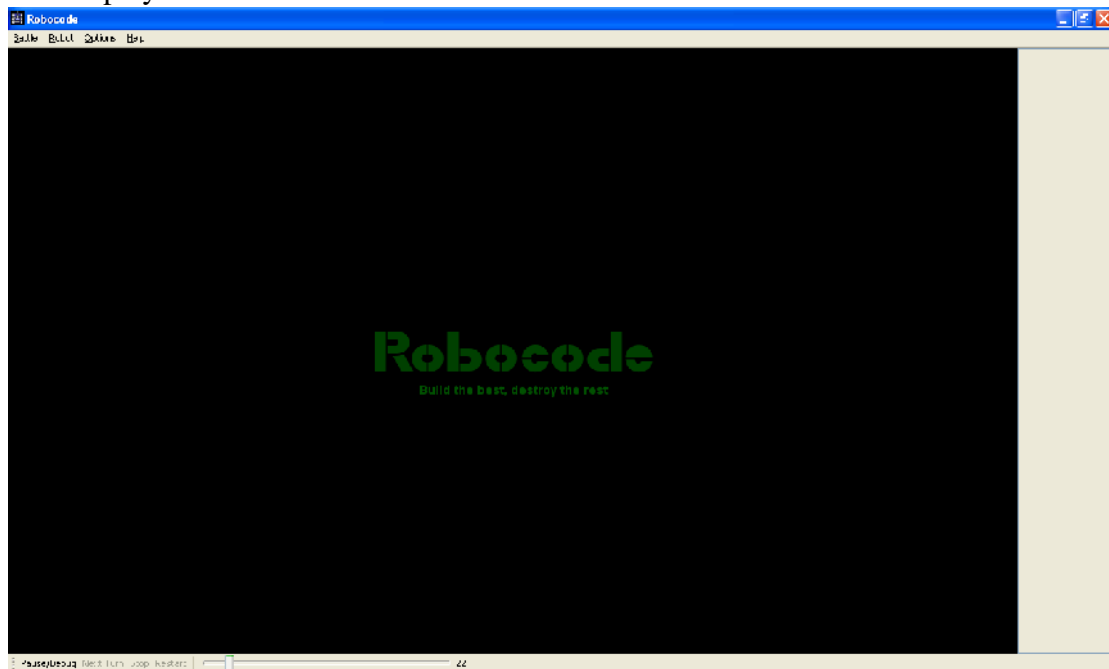
10. Click the option **Save** to save your tank



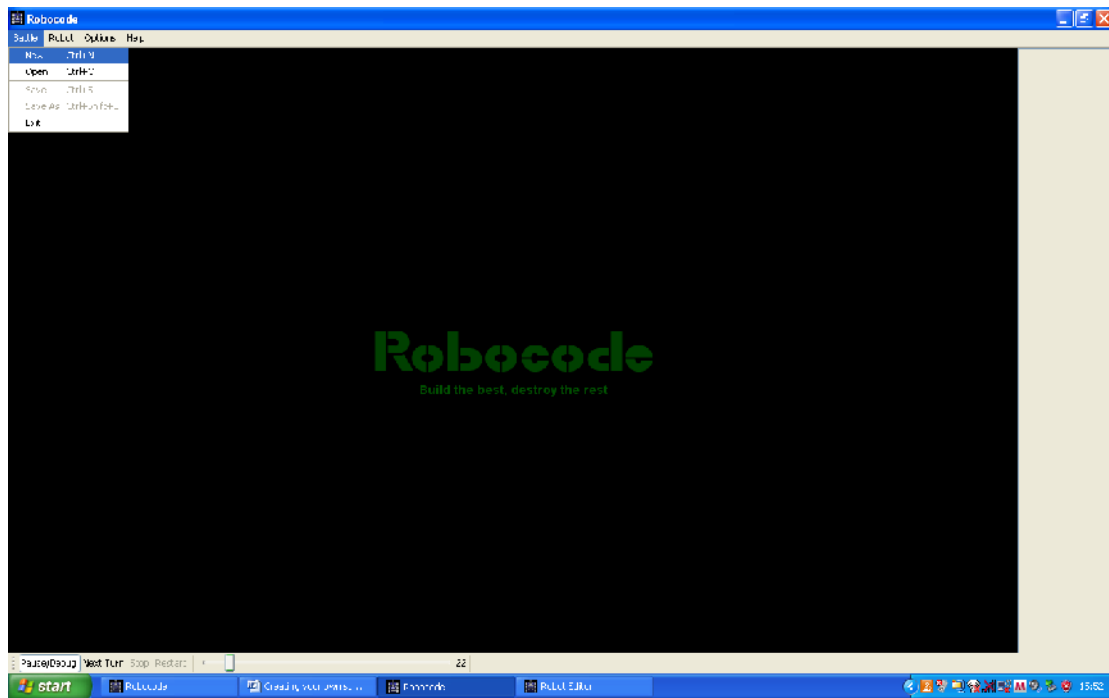
11. You should see a compile successfully message appear.



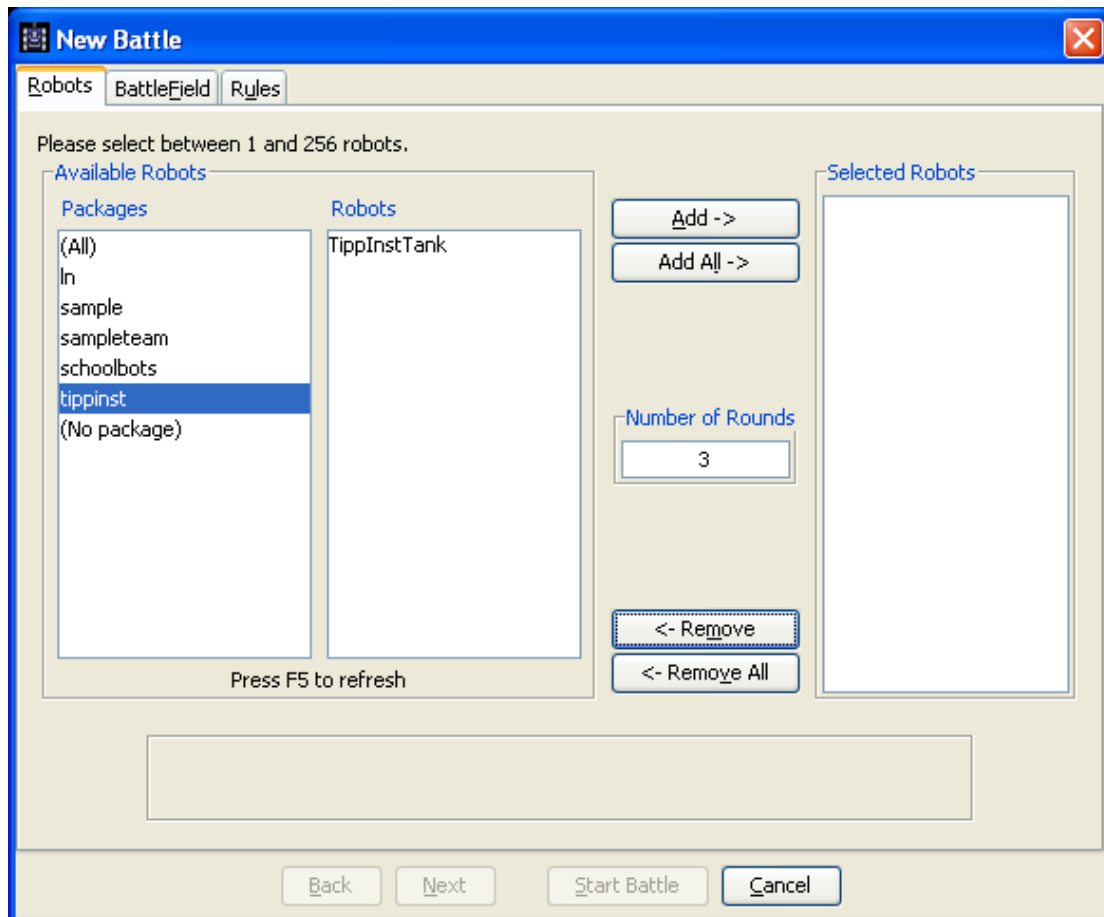
12. To see your tank in a battle click on the **Robocode** program in the task bar. This will display the Robocode screen



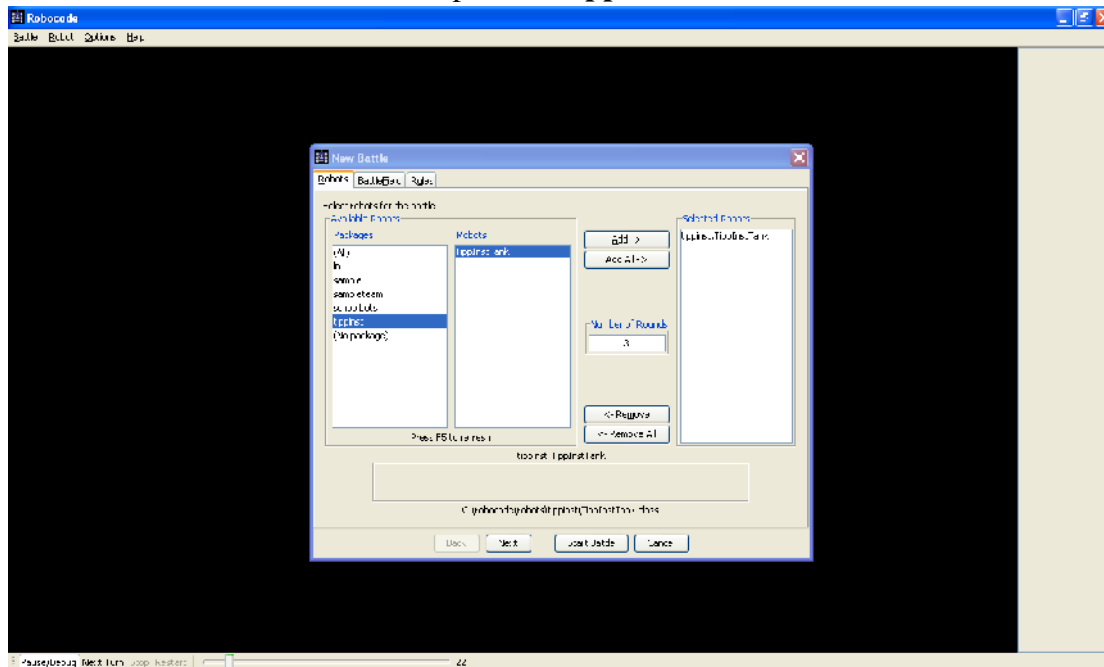
13. Select **Battle – New**



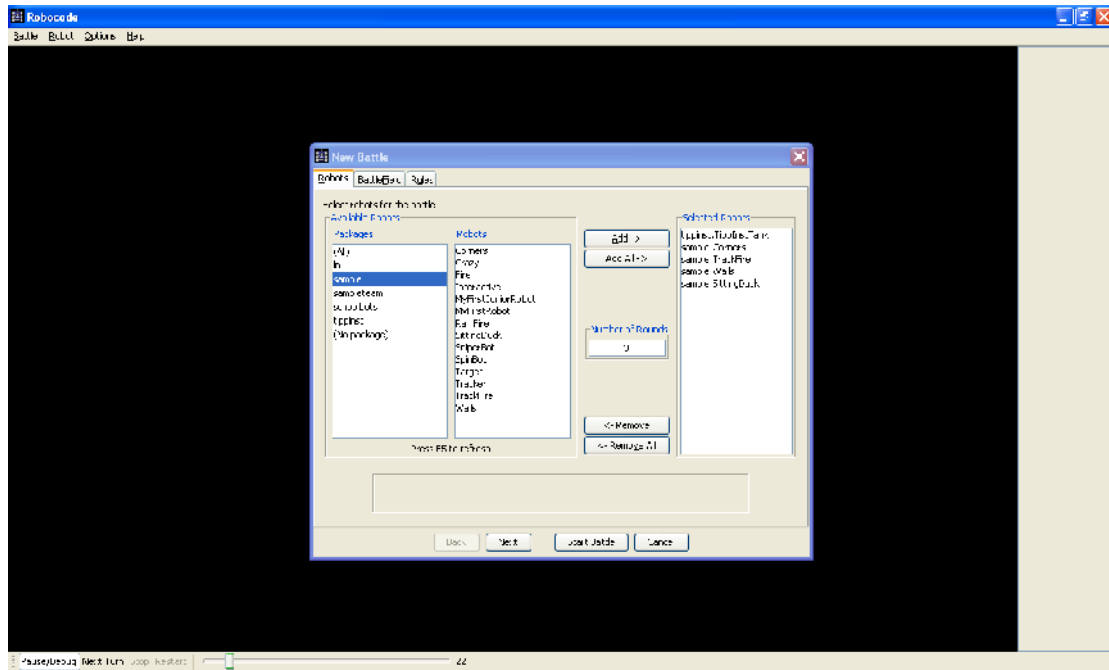
14. Double click on the package you created, in this example it is **tippinst**



15. Click on the robot in this example it is **TippInstTank** and the click **Add**



16. Click on the sample package and add a number of robots. In this example corners, trackfire, sittingduck and walls have been added to this battle



17. Click on the **Start Battle** button. Robocode will run 3 battles and display the overall placings



