Ian Johnston (s1018358), Contributions to SDP group 8 for milestone 1

Built a robot for the milestone and wrote simple programs to perform each action (i.e. A kick program and a move in a straight line program.) The robot successfully completed every task in the milestone without fail. Giving the team a full 6 points.

Looked into ideas for future designs these include 2 different movement ideas that will allow omni-directional movement as well as a simple but effective fall back design (based on 2011 group 11's robot) in case we can't either of the previous design to work. Also looked into putting a "spinner" onto the front of the ball for superior ball control, this idea currently looks very promising.

I encountered 2 major programs over the course of the milestone

- Making a kicker powerful enough to kick from 1 end of the pitch to the other.
  - Initially a kicker that kicked along a linear path was made this only had the power to kick it about 5cm.
  - Attempts to increase its power by adding some springs were then tried, these failed as well as the motor didn't have the torque to compress the springs. Could have tried using gears to increase the torque but this wasn't tried.
  - Looked back at previous successful design to see where they got the power from, It was found that by increasing the length of the kicker increases the power (which makes sense since it acts like a lever). A kicker with the maximum height of the robot was then built, this was just powerful enough to perform the kick, a little more power was then added by having the robot perform a small forward movement to the ball when kicking it.
- Making the robot move in a straight line across the pitch, this was a huge challenge due to the addition of the carpet, producing a lot of different lumps and slopes in different parts of the pitch.
  - Initially tried using the tachometer on the NXT servo motors to make sure each wheel turns the exact same distance at the exact same speed (thus meaning its moved in a straight line), this worked perfectly on flat surfaces but failed on the pitch itself. Could program round the program but as soon as you start from a slightly different point (even a few mm) it would once again fail.
  - Reinforced the chassis of the robot to reduce unwanted movement to try and get more consist results from each attempt. Didn't make any noticeable difference.
  - Tried using a pair of ultrasonic sensors, one at the front and one at the back of the robot to detect the distance so we know when the robot starts to go off course and correct. This failed due to the ultrasonic sensors interfering with each other.
  - A compass sensor was tried, with the theory that its usable to make sure the robot stays on the correct heading. This failed due to electromagnetic interference from the motors.
  - Finally rebuilt the robot with tank tracks in the hope it would make it more of an "all terrain" robot, this worked! It removed all problems caused by the carpet. There was still a slight curve to the left cause by the table slope but this was easy to fix though programming.

I feel I deserve a 4 or perhaps even a 5 for my efforts in this milestone.

I also feel that both Iain Richardson and Richard Williams both deserve a mark of 4. Iain for his superior organisation skills and his work on the comns. Richard for implementing the A* algorithm while being a very effective team leader. I also feel no one in the group deserve a mark of less then 3.