Line follower is an autonomous robot which follows either black line in white are or white line in black area. Robot must be able to detect particular line and keep following it.

The Line Follower sensor is an add-on for your RedBot that gives your robot the ability to detect lines or nearby objects. The sensor works by detecting reflected light coming from its own infrared LED. By measuring the amount of reflected infrared light, it can detect transitions from light to dark (lines) or even objects directly in front of it.

The sensor has a 3-pin header which connects directly to the RedBot Mainboard via female to female jumper wires. Use the included RedBot library to detect lines or objects. A mounting hole lets you easily connect one or more of these to the front or back of your robot chassis.

These robots usually use an array of IR (infrared) sensors in order to calculate the reflectance of the surface beneath them. The basic criteria is that the black line has a lesser reflectance value (black absorbs light) than the lighter surface around it. This low value of reflectance is the parameter used to detect the position of the line by the robot. The higher value of reflectance will be the surface around the line. So in this linear array of IR sensors, if the leftmost or rightmost IR sensor presents the low value for reflectance, then the black line is toward the left or right of the robot correspondingly. The controller then compensates for this by signaling the motor to go in the opposite direction of the line.

The IR sensor array consists of individual IR LEDs and IR photodiodes. The IR light emitted by the LED strikes the surface and is reflected back to the IR photodiode. The photodiode then gives an output voltage proportional to the reflectance of the surface (high value for a light surface and low for a black or dark surface).