A motor driver is a little current amplifier; the function of motor drivers is to take a low-current control signal and then turn it into a higher-current signal that can drive a motor.

The Arduino Motor Shield is based on the L298 (datasheet), which is a dual full-bridge driver designed to drive inductive loads such as relays, solenoids, DC and stepping motors. It lets you drive two DC motors with your Arduino board, controlling the speed and direction of each one independently.

microcontroller and motor driver take power from main power rails (there might be two different power rails for both). However the need for motor driver arises because your micro-controller is not powerful enough. It has GPIO pins which can help you glow a couple of LEDs but they won't provide you enough current to drive a big motor.

In such cases, you need a motor driver. They are specifically built for this purpose. They take the power from power lines and dump into the motor. However they lack the brains.

For this, we again turn back to the micro-controller, which tells the driver what to do. As such, micro-controller controls the motor indirectly.