MJE182
left pin - Emitter
center pin - Collector
right pin - Base

MJE182 NPN Power Transistor

220Ω

-ve fan
motor pin

+ve fan
motor pin

CPU Fan Motor

# Arduino Bootcamp : From Novice to Professional - Learning Through Projects

Controlling an CPU Fan - User Input Control - Part 1

# Project Objectives

- In this project you will learn:

    - What is a transistor

    - The different ways a transistor can be used

    - How an npn transistor works

    - Using the Serial Monitor on the Arduino IDE

    - How to accept and process keyboard input in your Arduino programs

# Parts

- Arduino Uno

- USB A-B cable

- Breadboard

- CPU Fan

- 220 Ω resistor

- MJE182 npn power transistor
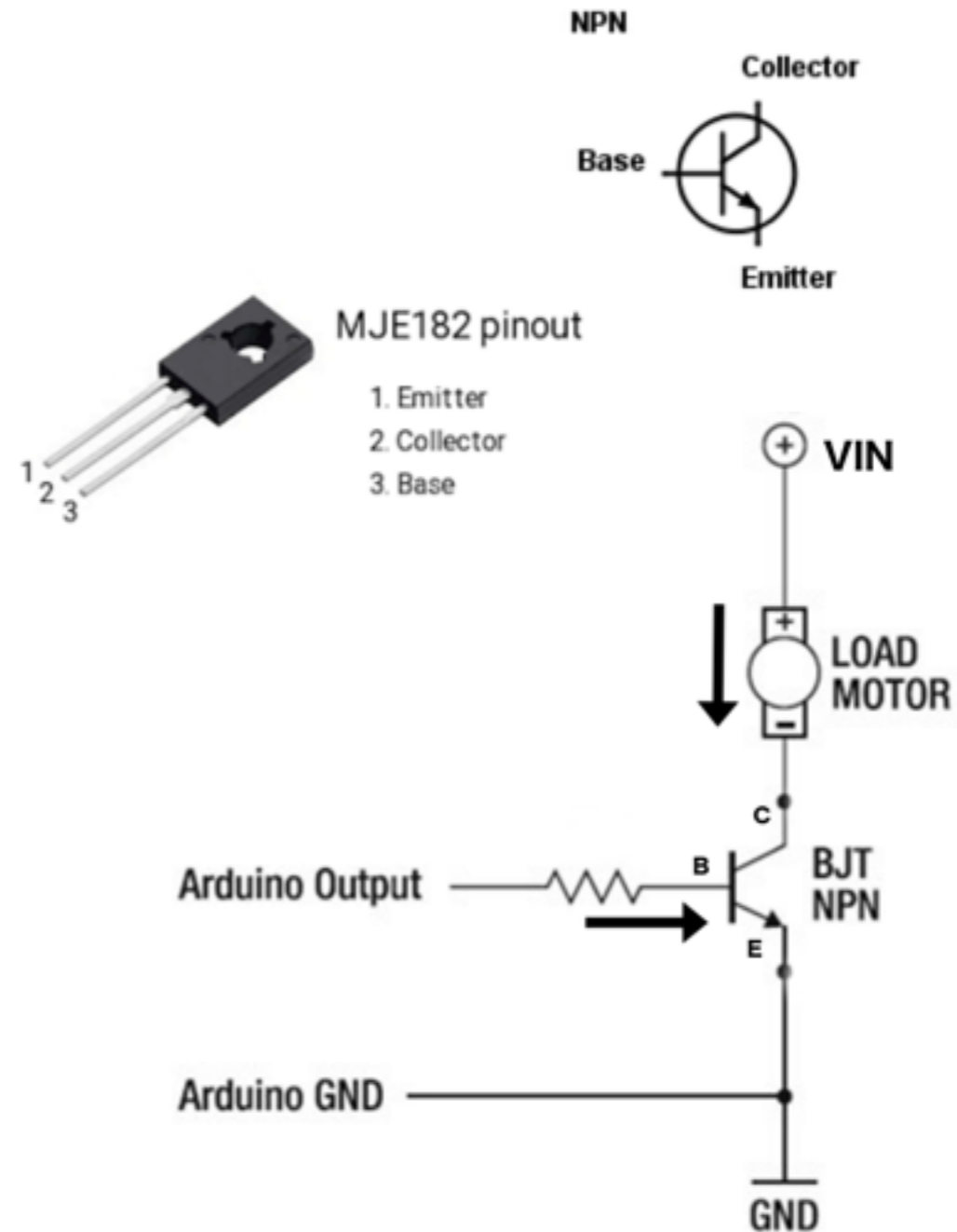
- Connecting wires

- 12 V DC Power Supply

# What are transistors?

- They form the building blocks of the majority of electronic circuitry today

- Semiconductor devices that consist of three leads

  - Base

  - Emitter

  - Collector

- They are essentially miniature electronic switches, which maintain logic state i.e. they have two operating positions – on and off

- Transistors can be connected in circuits to operate as switches or amplifiers
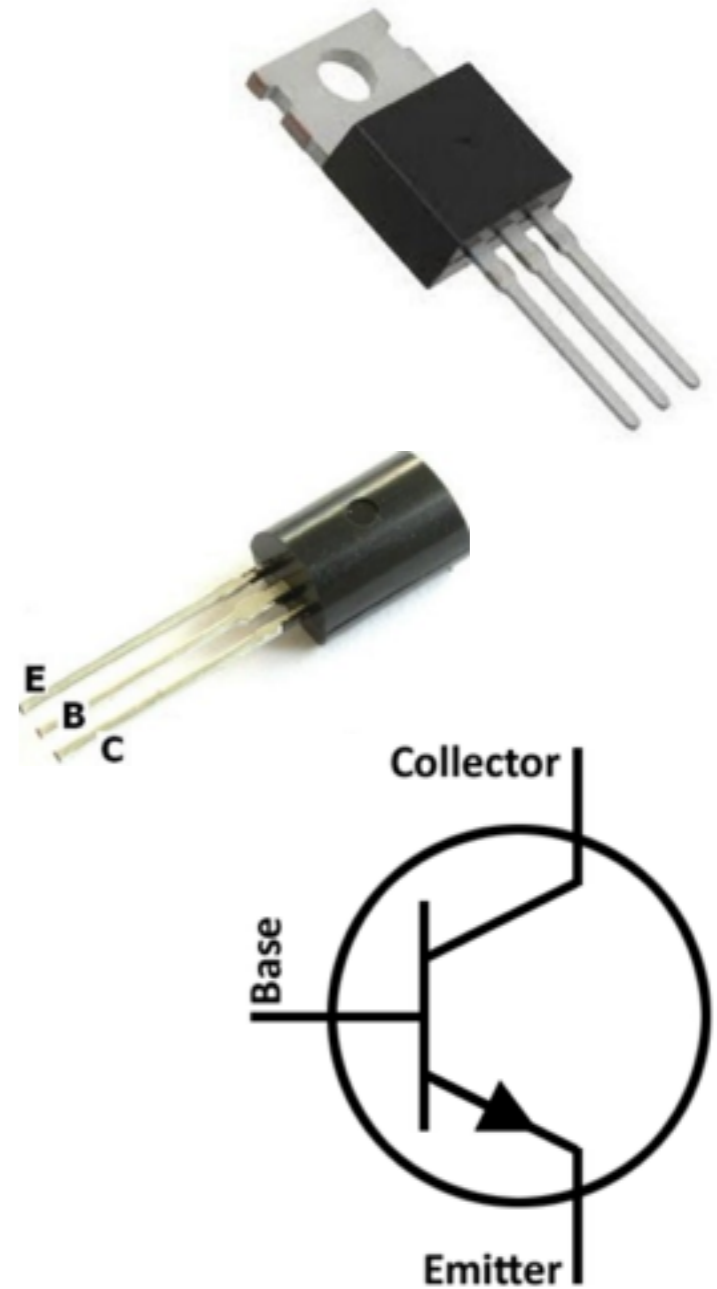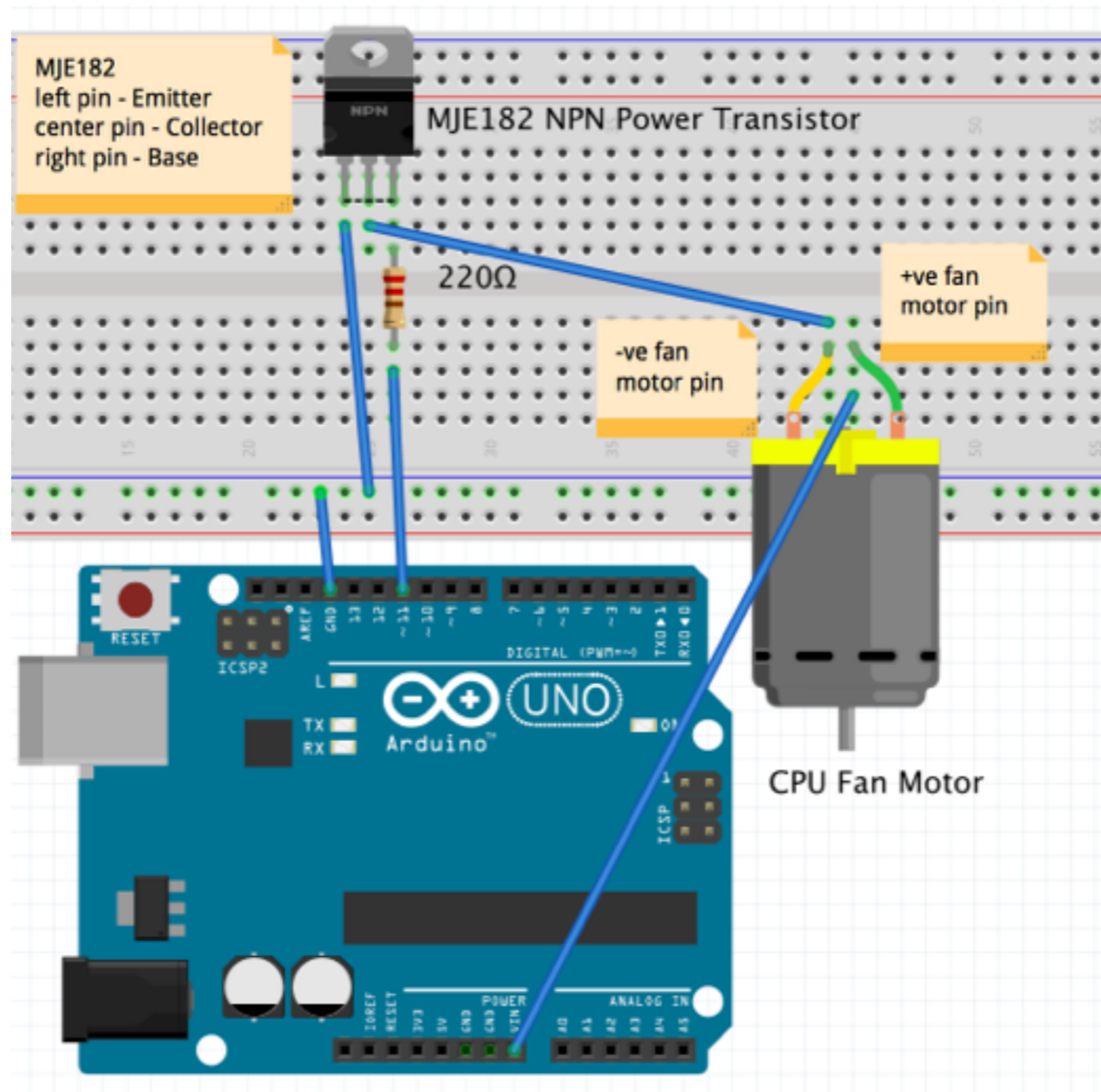
# NPN BJT transistor operation

- If no base current is flowing, collector current will not flow

- NPN transistor is off and motor is off when there is no base current

- Once base current is applied, collector current flows and the motor will turn on

NPN

Collector

Base

Emitter

MJE182 pinout

1. Emitter
2. Collector
3. Base

1
2
3

(+) VIN

+
LOAD
MOTOR
-

C

Arduino Output ——WW—— B

BJT
NPN

E

Arduino GND ————

GND

# Circuit Diagram

# Summary

- In this project you learnt:

  - How a transistor works

  - How to use and connect an npn transistor

  - Using the Serial Monitor in Arduino

  - Accepting and processing keyboard input in your Arduino programs