

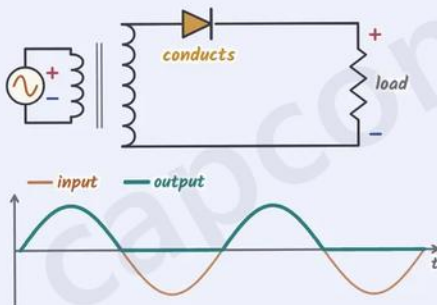
a diode rectifies, special junctions sense and emit light, and a transistor's thin base runs both amplifiers and logic gates

Why rectify at all

- mains is AC, 230 V 50 Hz in India; gadgets need steady DC
- **rectification** converts AC to DC: diodes conduct forward, block reverse
- supply chain: transformer, rectifier, filter, voltage regulator
- the rectifier makes DC unidirectional but pulsating
- the filter removes the ripple, the regulator holds the output steady

Half wave rectifier *

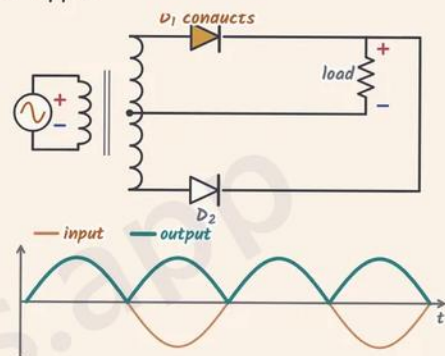
- one diode conducts only ONE half cycle; the other half is thrown away
- output pulses at the input frequency, 50 Hz for 50 Hz input
- poor efficiency (max 40.6%) and heavy ripple



the diode (filled) passes only one half of every cycle

Full wave rectifier

- two diodes on a centre-tapped transformer, or four in a bridge
- BOTH half cycles contribute, the same way through the load
- output pulses at TWICE the input frequency, 100 Hz for 50 Hz input
- better efficiency (max 81.2%, double half wave), smaller ripple



D_1 conducts now, D_2 the next half cycle
 D_1 conducts one half cycle, D_2 the other, same direction through the load: the ripple frequency doubles