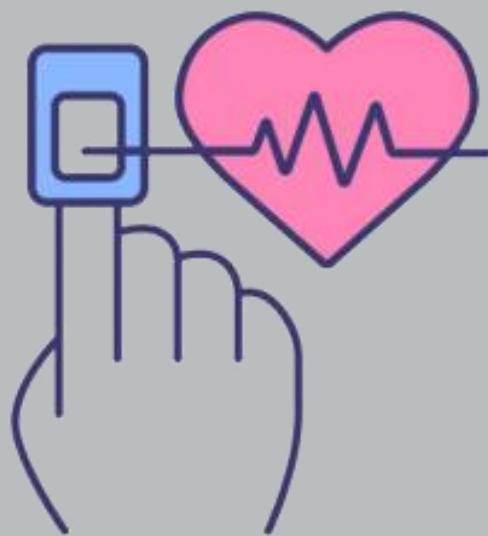


BME 2232: BIOMEDICAL INSTRUMENTATION

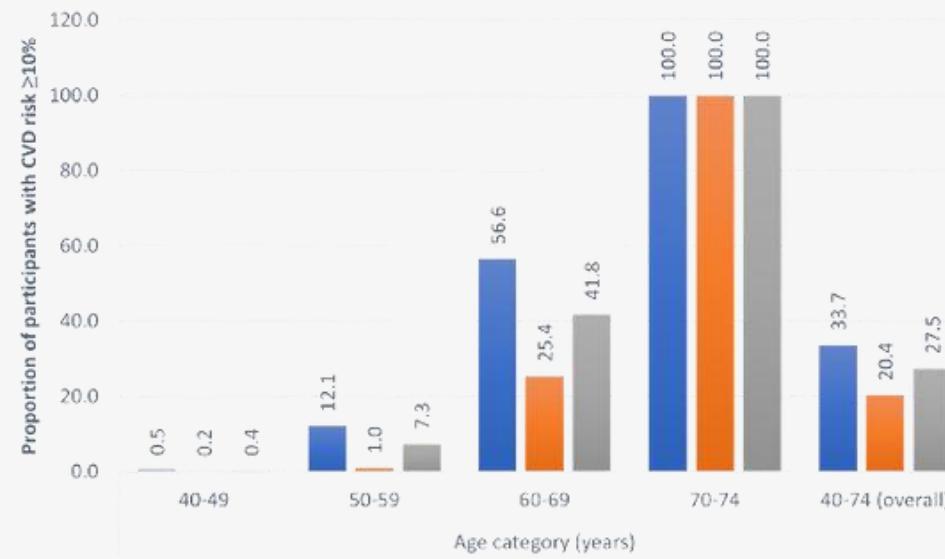
COURSE ENDING PROJECT SHOWCASING

HEART RATE MEASUREMENT CIRCUIT

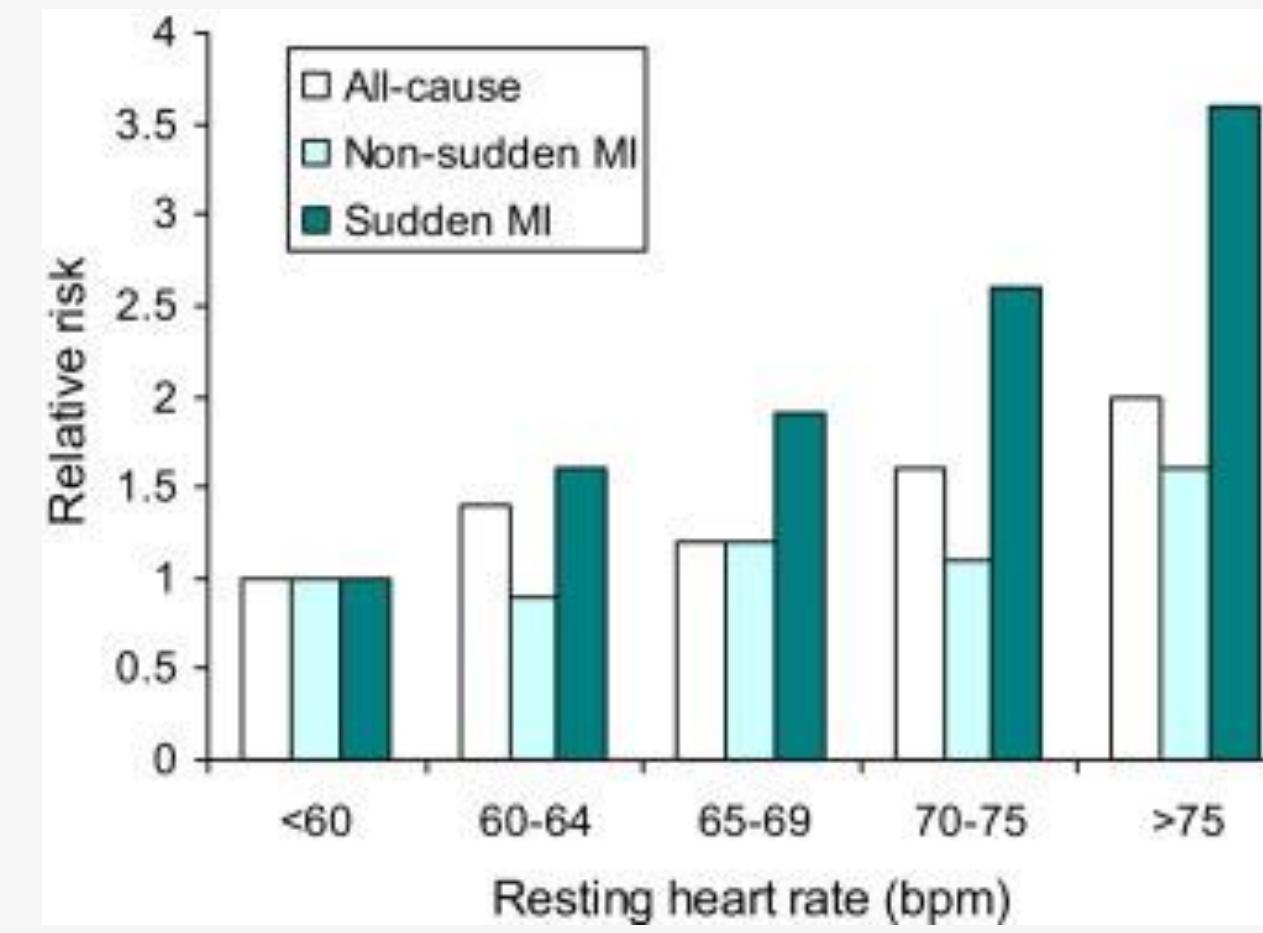




MOTIVATION



HIGH RISK OF CVD IN BD

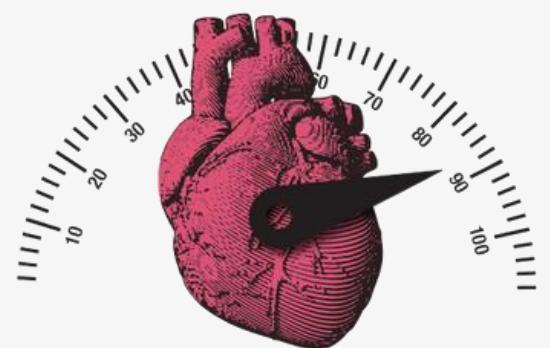


HEART RATE INDICATES CONDITION OF HEART





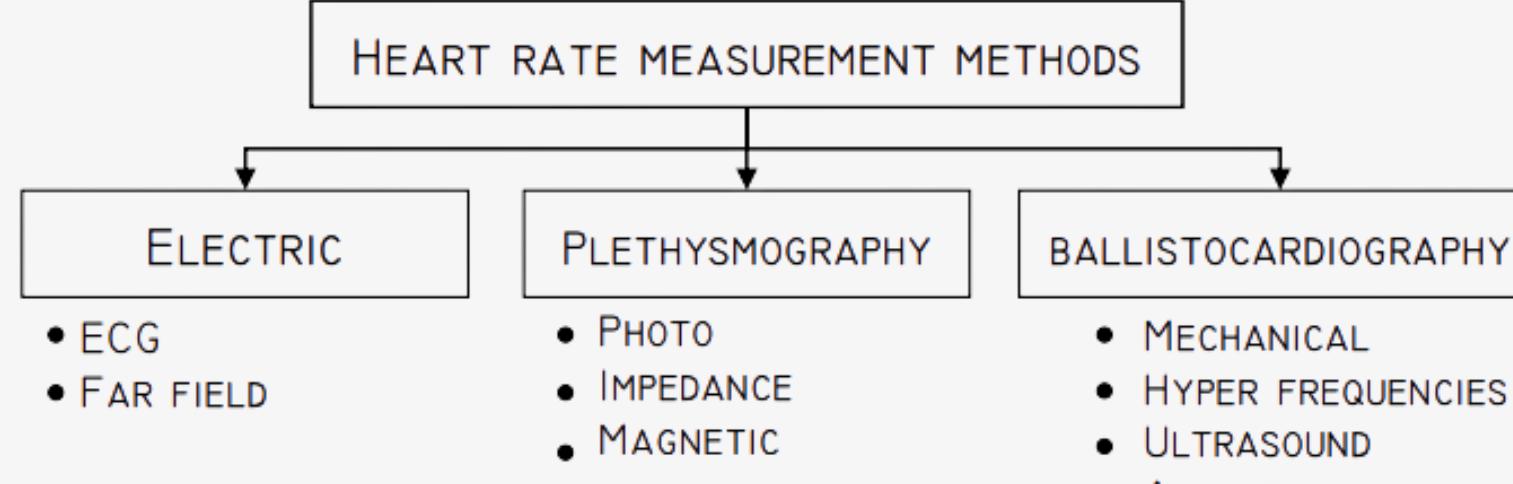
BACKGROUND STUDY



NUMBER OF HEART BEAT/MIN

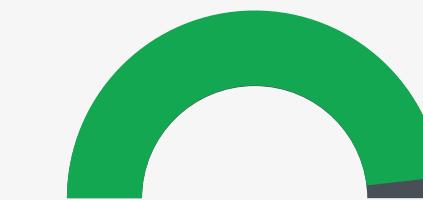


NORMAL PEOPLE :60-100 BM



WHY PHOTO PLETHYSMOGRAPH??

NON
INVASIVE



94.6% ACCURACY
WITHIN 100MS

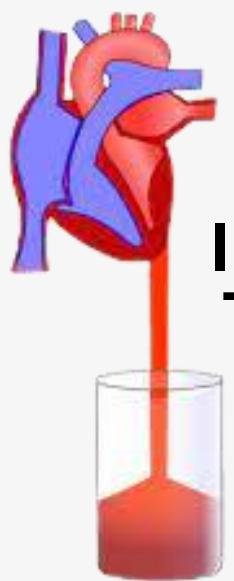


Painless

01



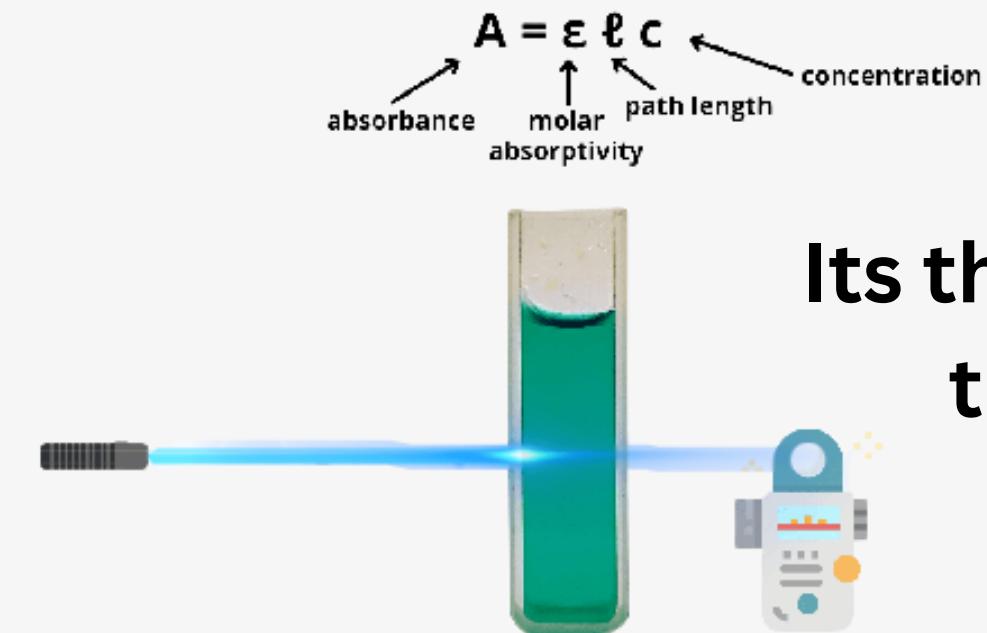
BASIC PRINCIPLE



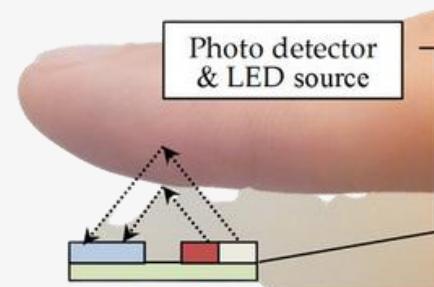
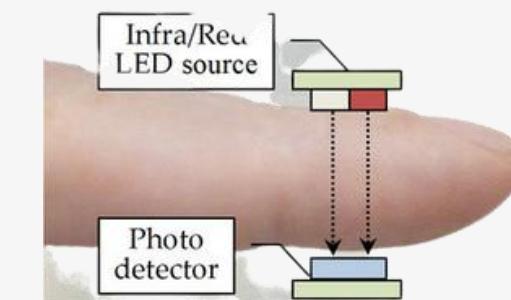
VARIATION OF THE BLOOD VOLUME
INSIDE A FINGER ARTERY, CAUSED BY
THE PUMPING ACTION OF THE HEART.



THICKNESS AND EASY ACCESS , THE
INDEX FINGER (AS CONTROL OVER INDEX
FINGER IS GOOD ,LESSER CHANCES FOR
DETACHMENT



It's the basic science of
the mechanism

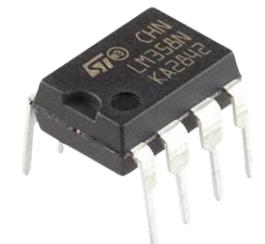


TWO WAYS : TRANSMISSIVE AND
REFLECTIVE



BME 2232

COMPONENT WE NEED



LM358

10 TAKA



IR LED



PHOTO DIODE



LED



RESISTOR



CAPACITOR



ARDUINO UNO



LCD DISPLAY



BUZZER



01



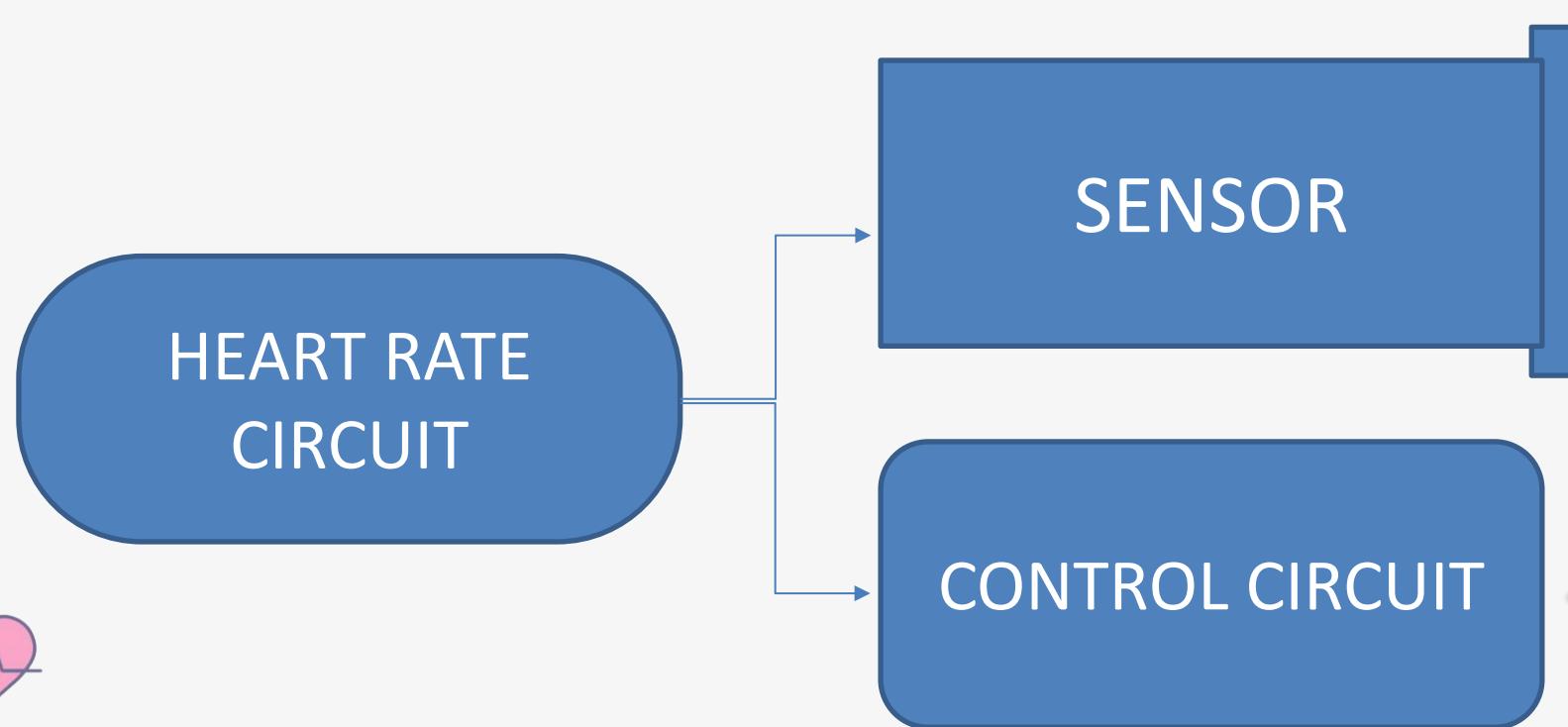
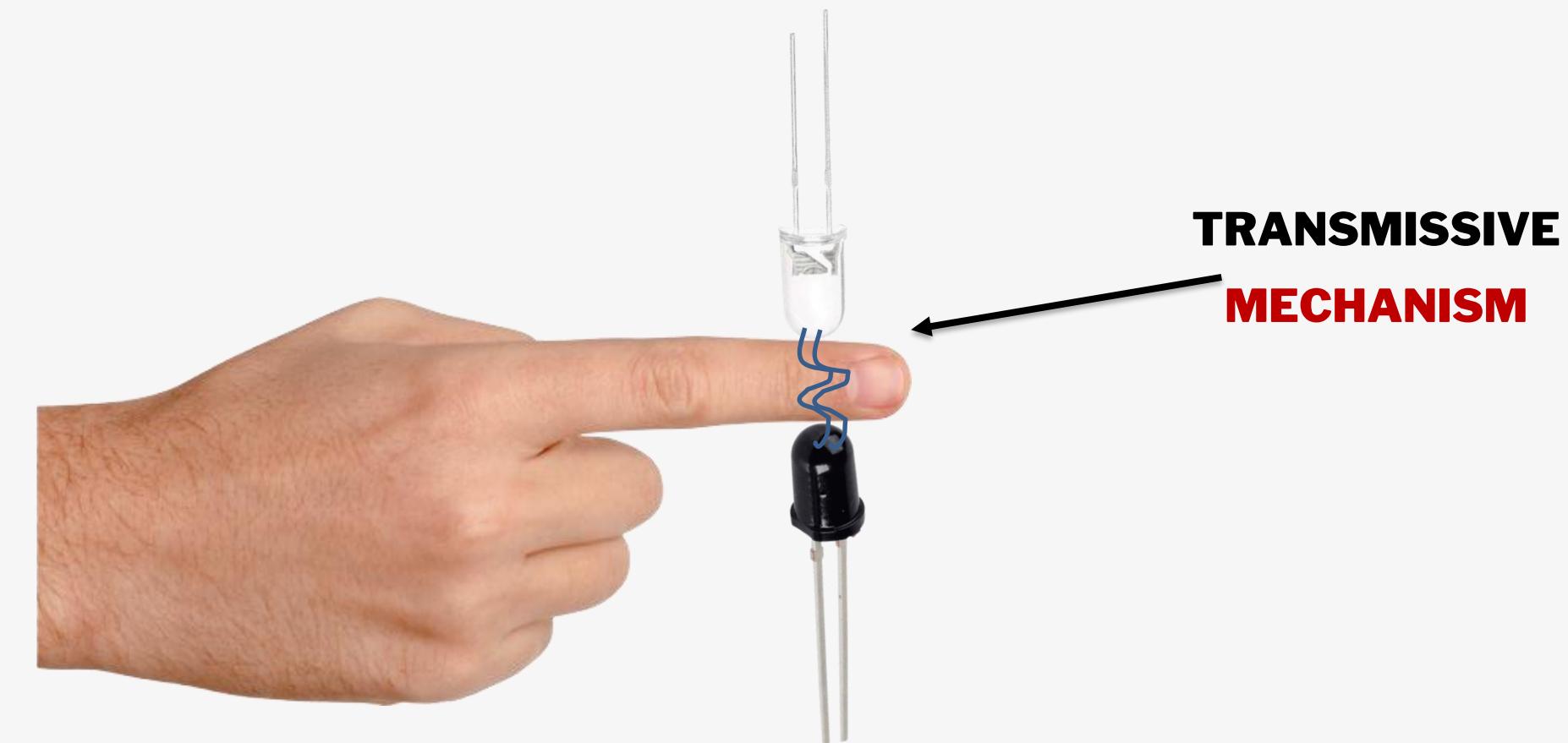
CIRCUIT PRINCIPLE



IR LED
Source



PHOTO DIODE
Detector



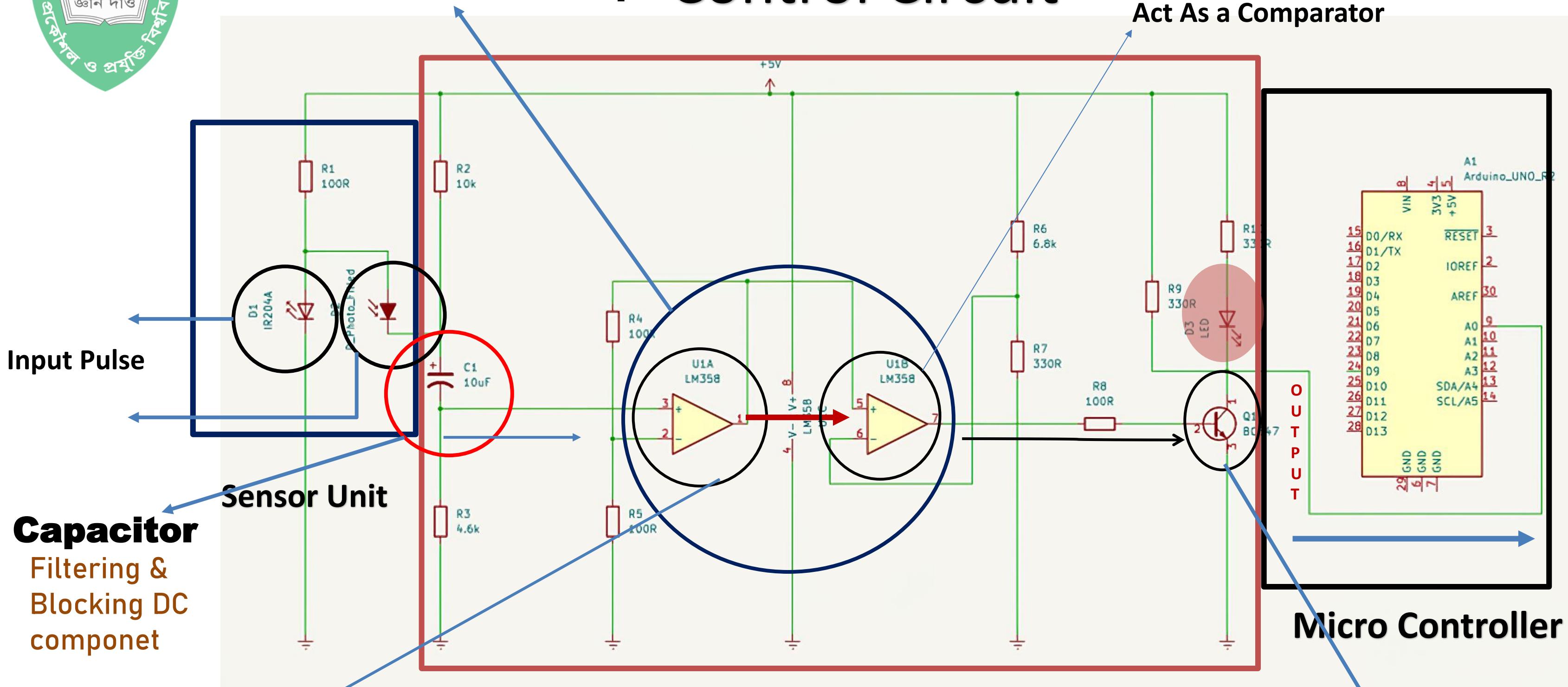


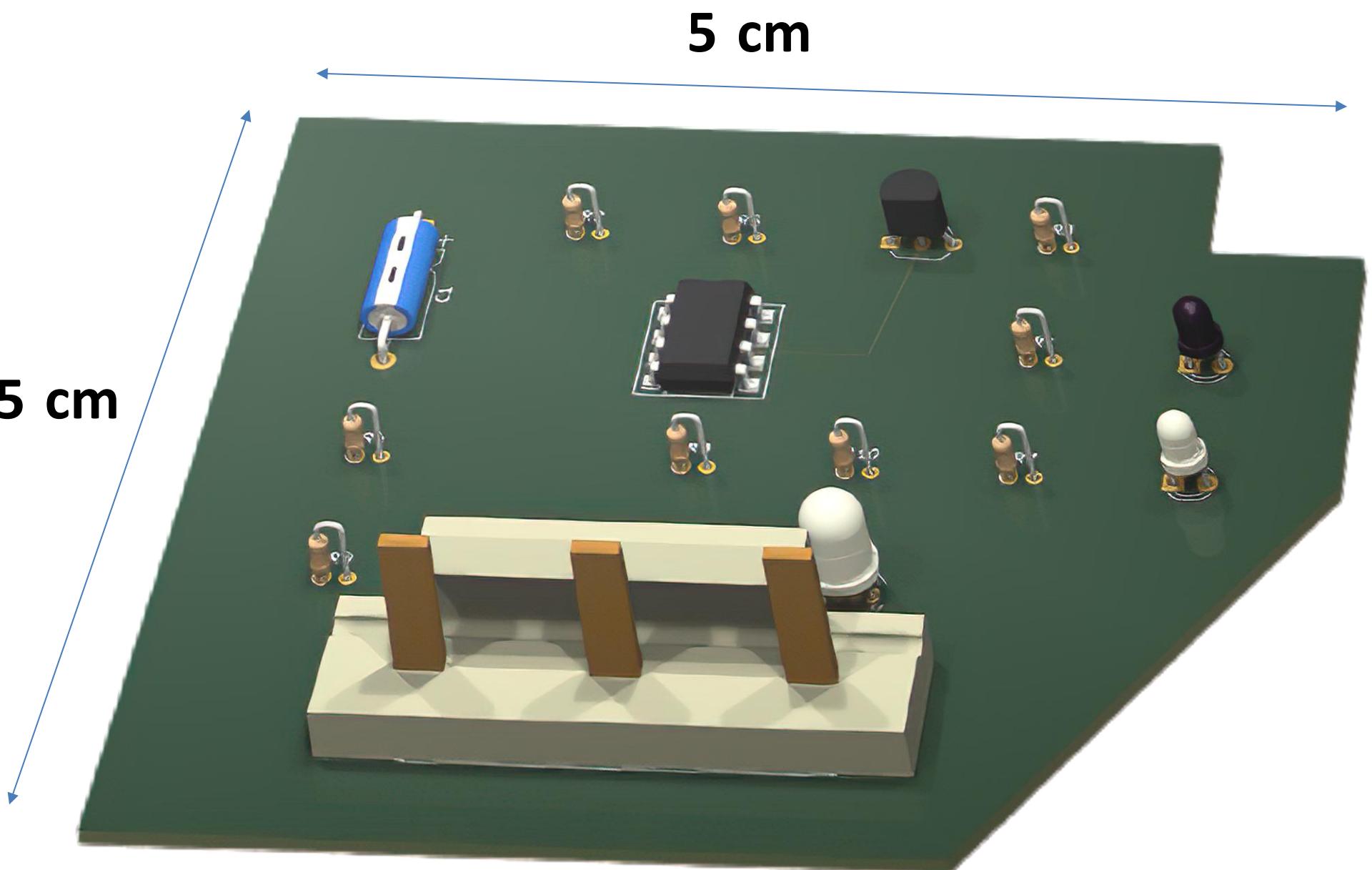
LM 358

Consist of Two OP-Amp

Control Circuit

BME 2232





3D PCB BOARD
USING KICAD

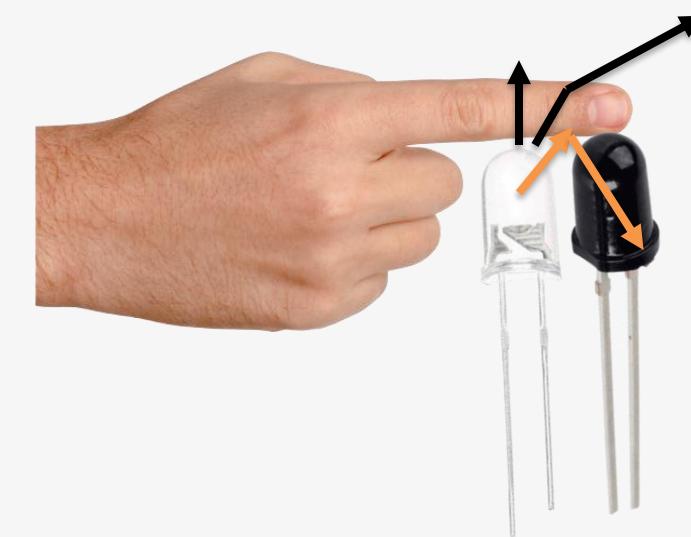




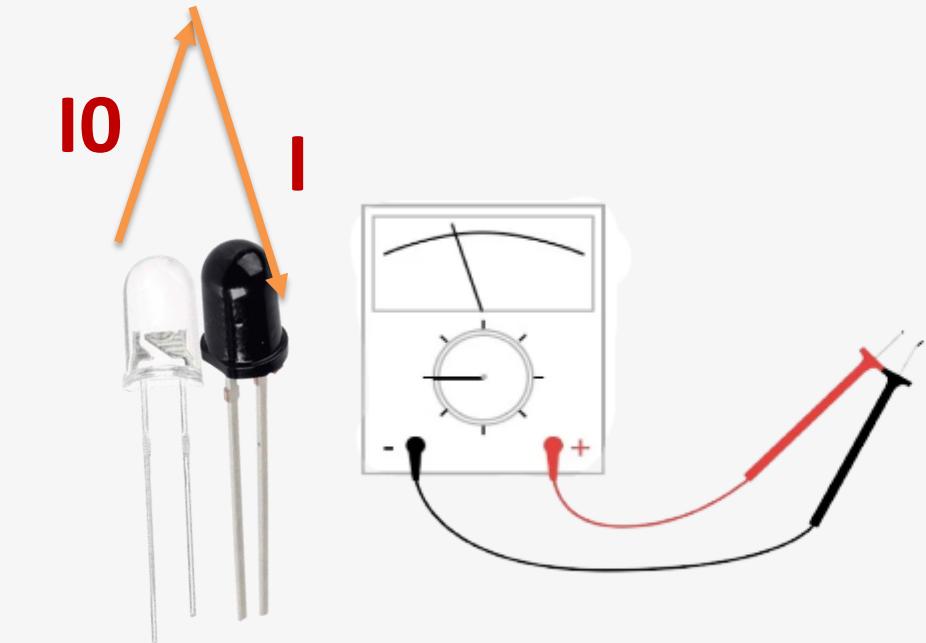
CIRCUIT PRINCIPLE (Reflectance)



SAME SIDE OF THE BODY



THREE THINGS HAPPENED:
ABSORPTION,
REFRACTION, REFLECTION

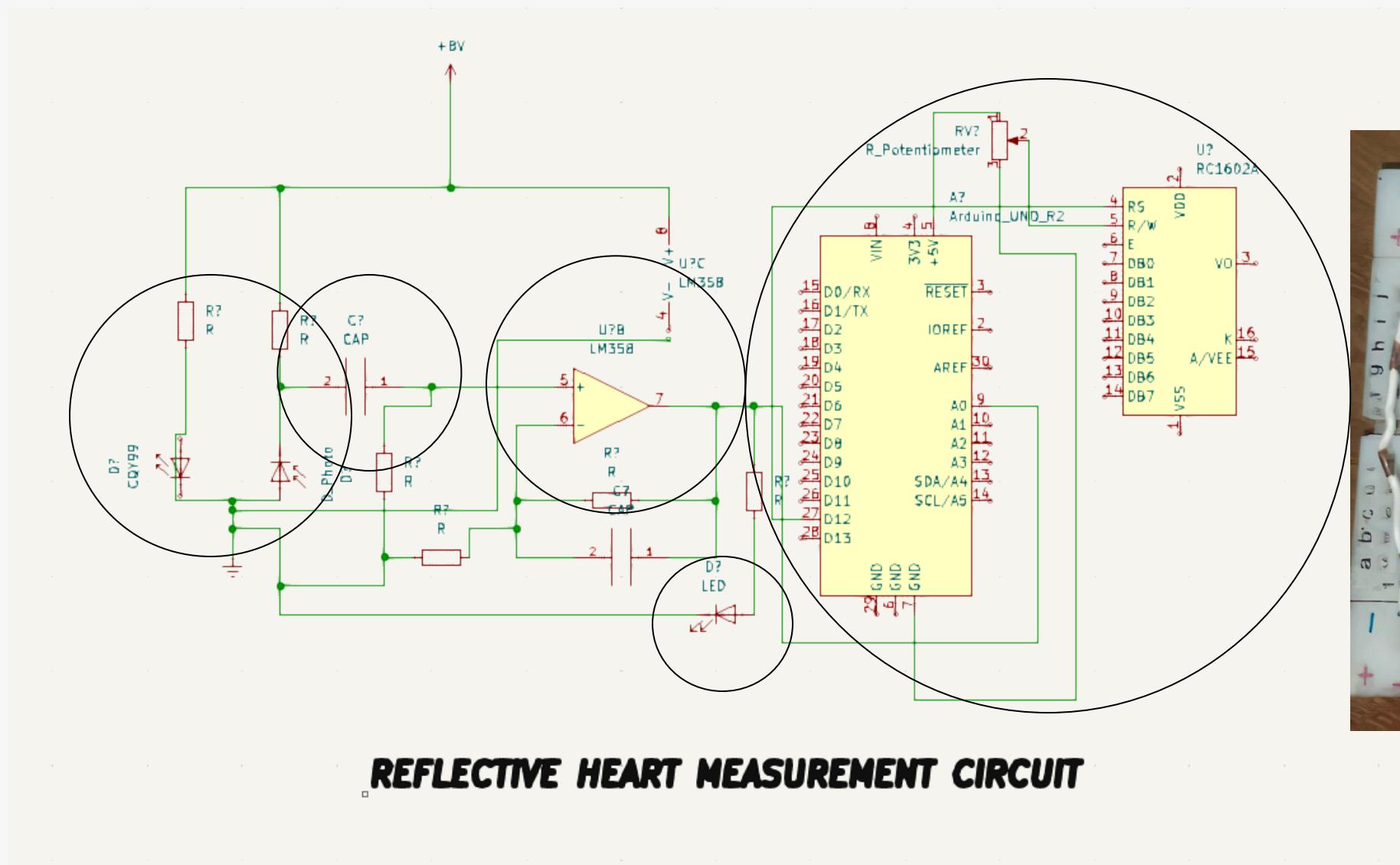


This Intensity change provide voltage in output

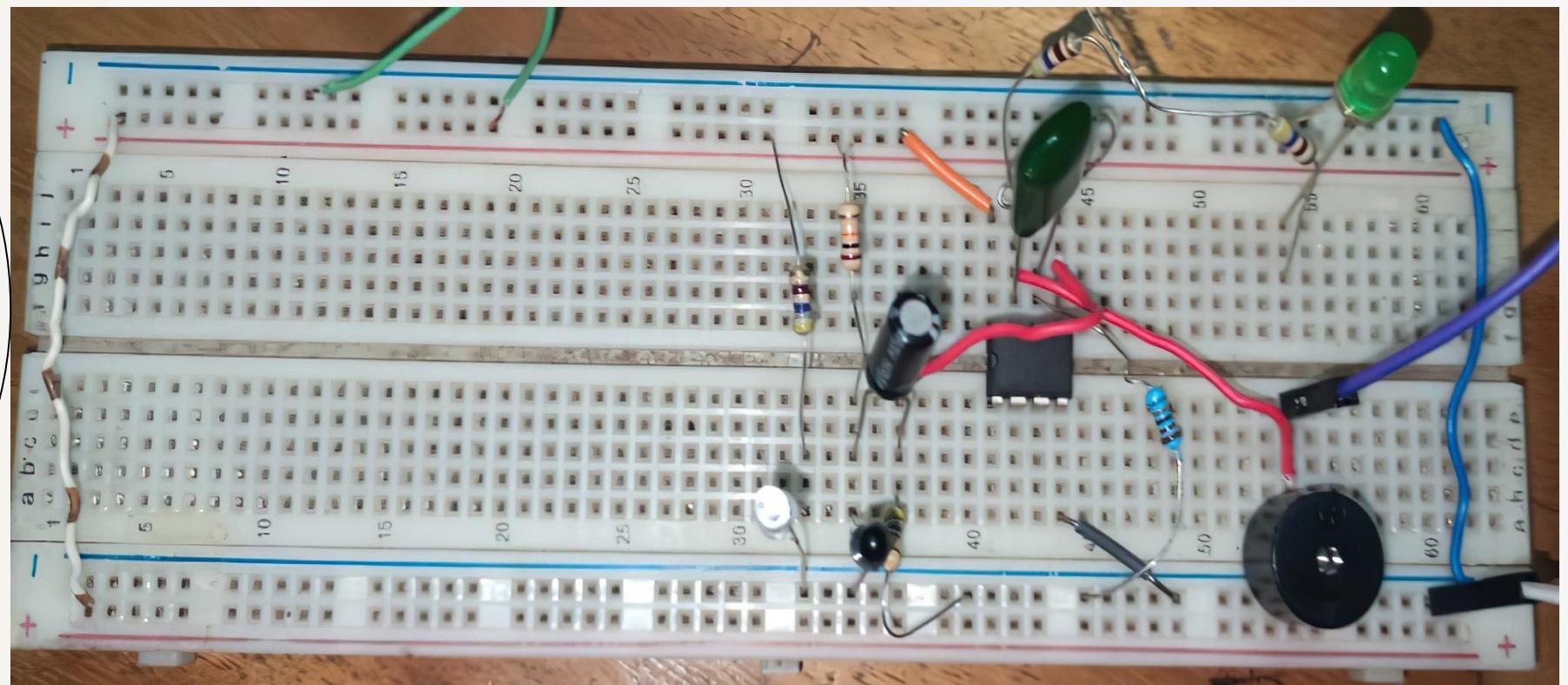




CIRCUIT DIAGRAM (Reflectance)



PROPOSED SCHEMATIC DIAGRAM



IMPLEMENTED CIRCUIT ON BREAD BOARD

IMPLEMENTATION SUCCESSION = 99.976%



CIRCUIT DIAGRAM (DISPLAY AND PROCESSING)

