**Task M1.T1P**

**Programming Paradigms**

**Team: Mark Devereux**

**const byte SIGNAL\_PIN = 7;**

**const byte LED\_PIN = 2;**

**const byte MAX\_PROXIMITY\_CM = 250;**

**const byte MIN\_PROXIMITY\_CM = 50;**

**void ResetPingState()**

**{**

**pinMode(SIGNAL\_PIN, OUTPUT);**

**digitalWrite(SIGNAL\_PIN, LOW);**

**delayMicroseconds(2);**

**digitalWrite(SIGNAL\_PIN, HIGH);**

**delayMicroseconds(5);**

**digitalWrite(SIGNAL\_PIN, LOW);**

**pinMode(SIGNAL\_PIN, INPUT);**

**}**

**void DoRead()**

**{**

**// Speed of sound = 343 m/s == 34,300 cm/s**

**// 34,300 / 1\*10^-6 = 0.0343 cm/us**

**// 1 / 0.0343 = 29.1 us/cm**

**unsigned long durationUs = pulseIn(SIGNAL\_PIN, HIGH);**

**unsigned short distanceCm = (durationUs / 2) / 29;**

**HandleProximity(distanceCm);**

**}**

**void HandleProximity(const unsigned short distanceCm)**

**{**

**if (distanceCm <= MAX\_PROXIMITY\_CM && distanceCm >= MIN\_PROXIMITY\_CM)**

**{**

**digitalWrite(LED\_BUILTIN, HIGH);**

**Serial.print(distanceCm);**

**Serial.println(" cm");**

**}**

**else**

**{**

**digitalWrite(LED\_BUILTIN, LOW);**

**}**

**}**

**void setup()**

**{**

**Serial.begin(9600);**

**pinMode(LED\_BUILTIN, OUTPUT);**

**}**

**void loop()**

**{**

**ResetPingState();**

**// References: https://docs.arduino.cc/built-in-examples/sensors/Ping**

**DoRead();**

**delay(100);**

**}**