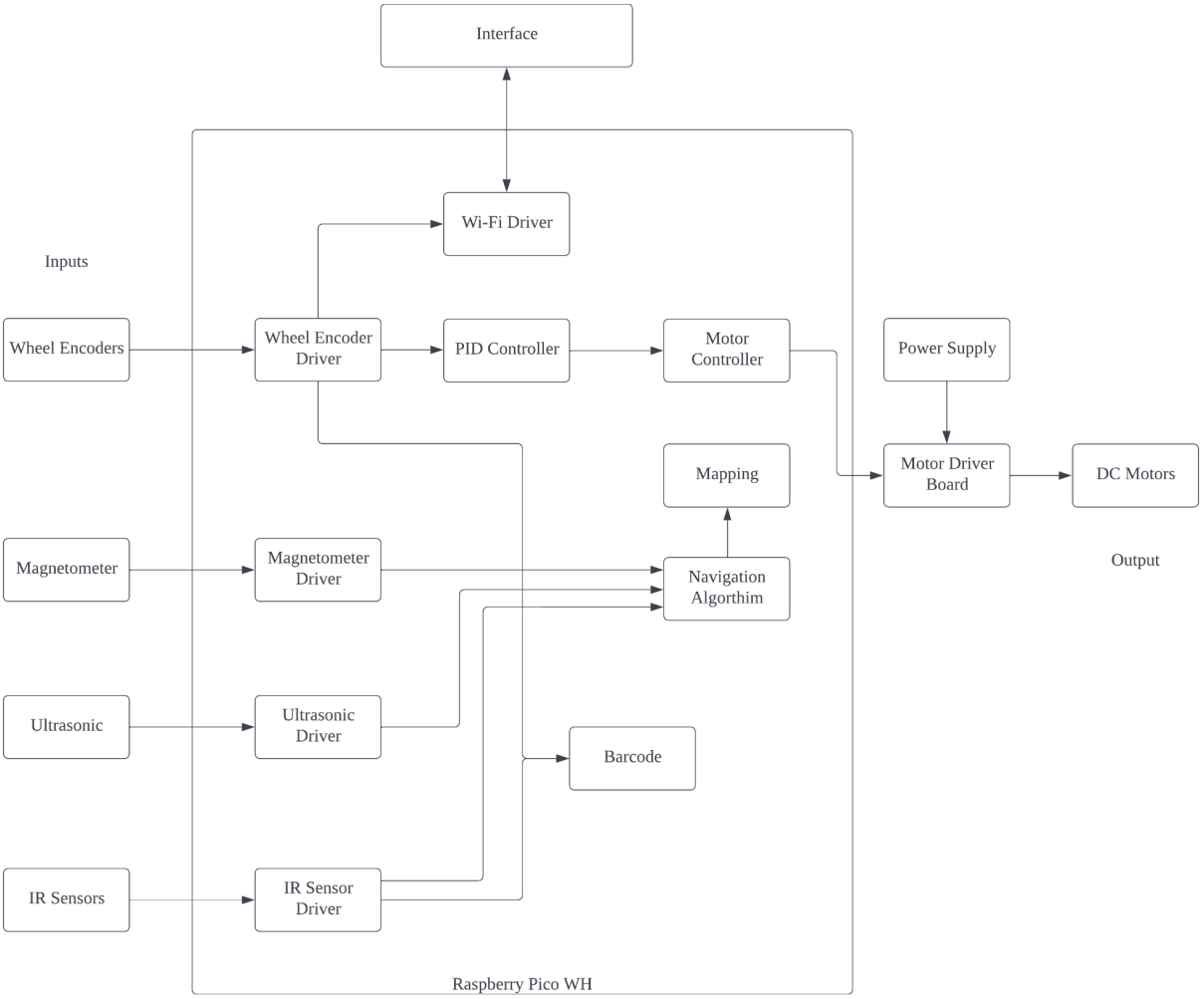
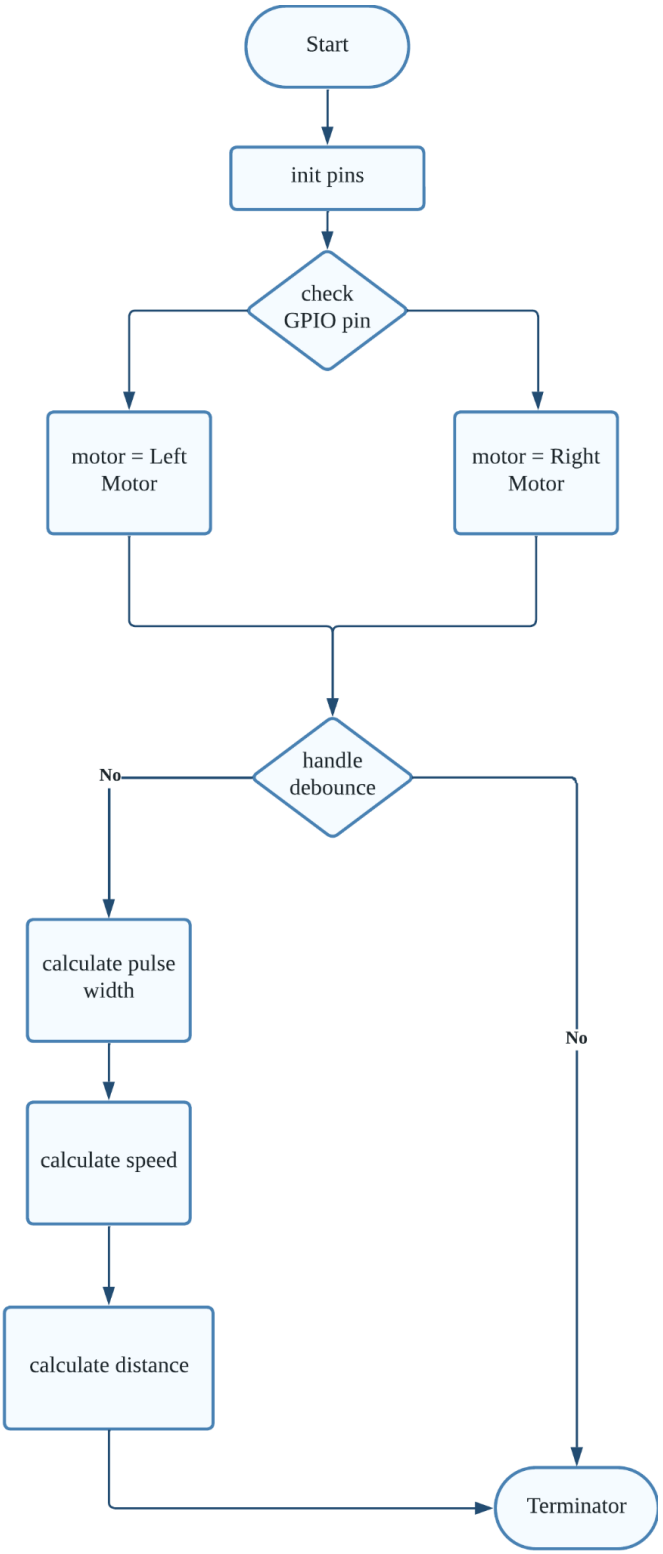
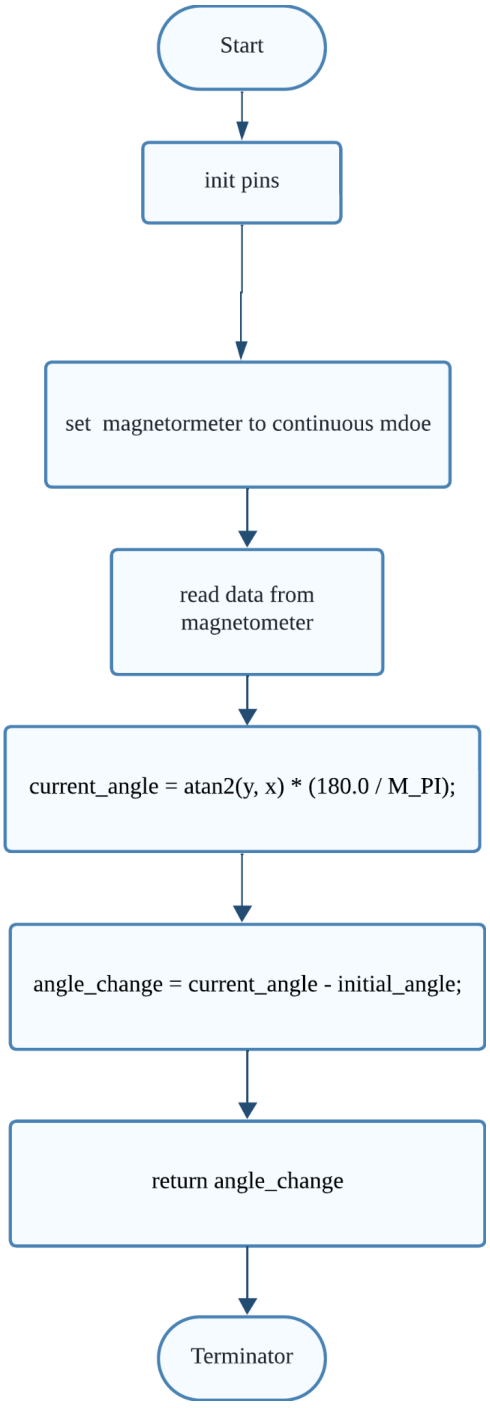
Block Diagram



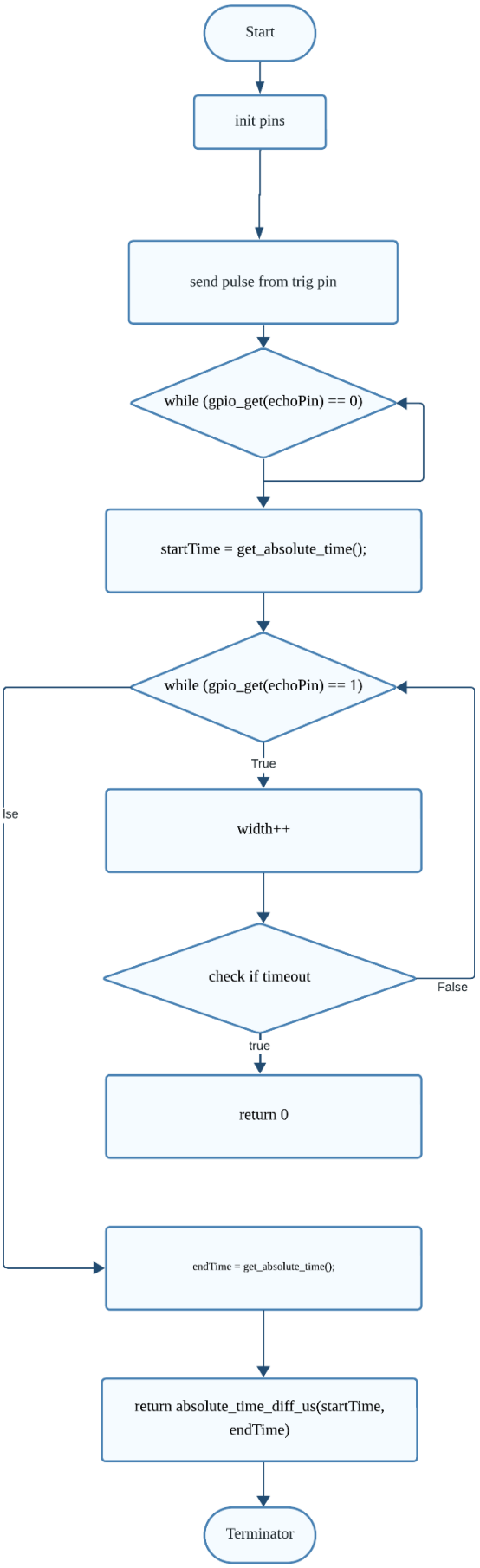
Wheel Encoder Driver



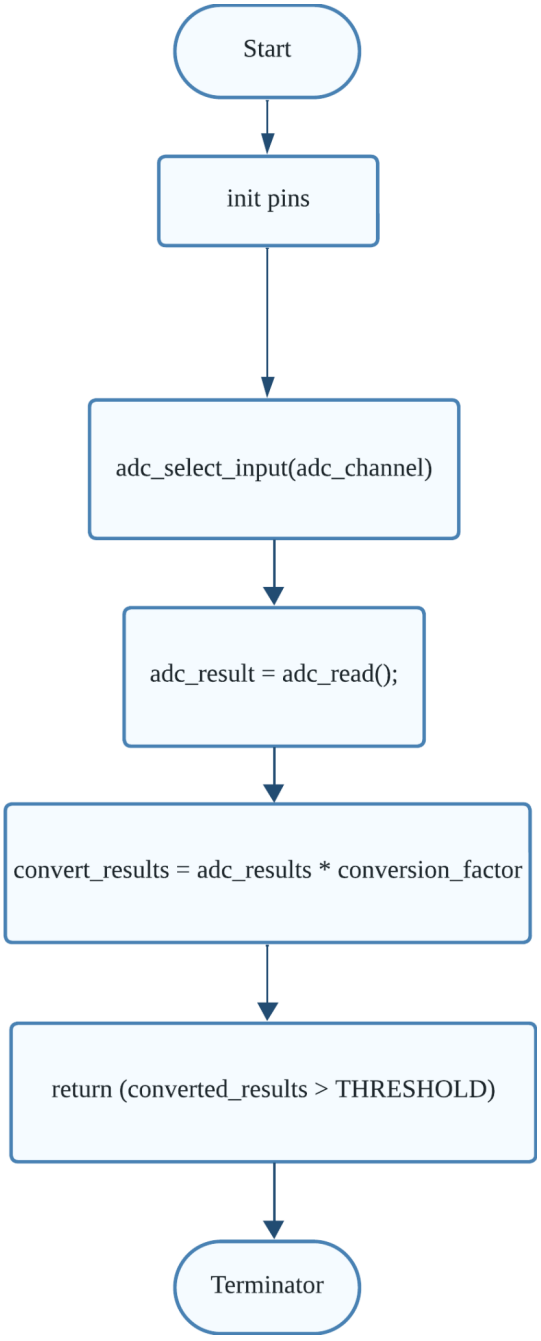
Magnetometer Driver



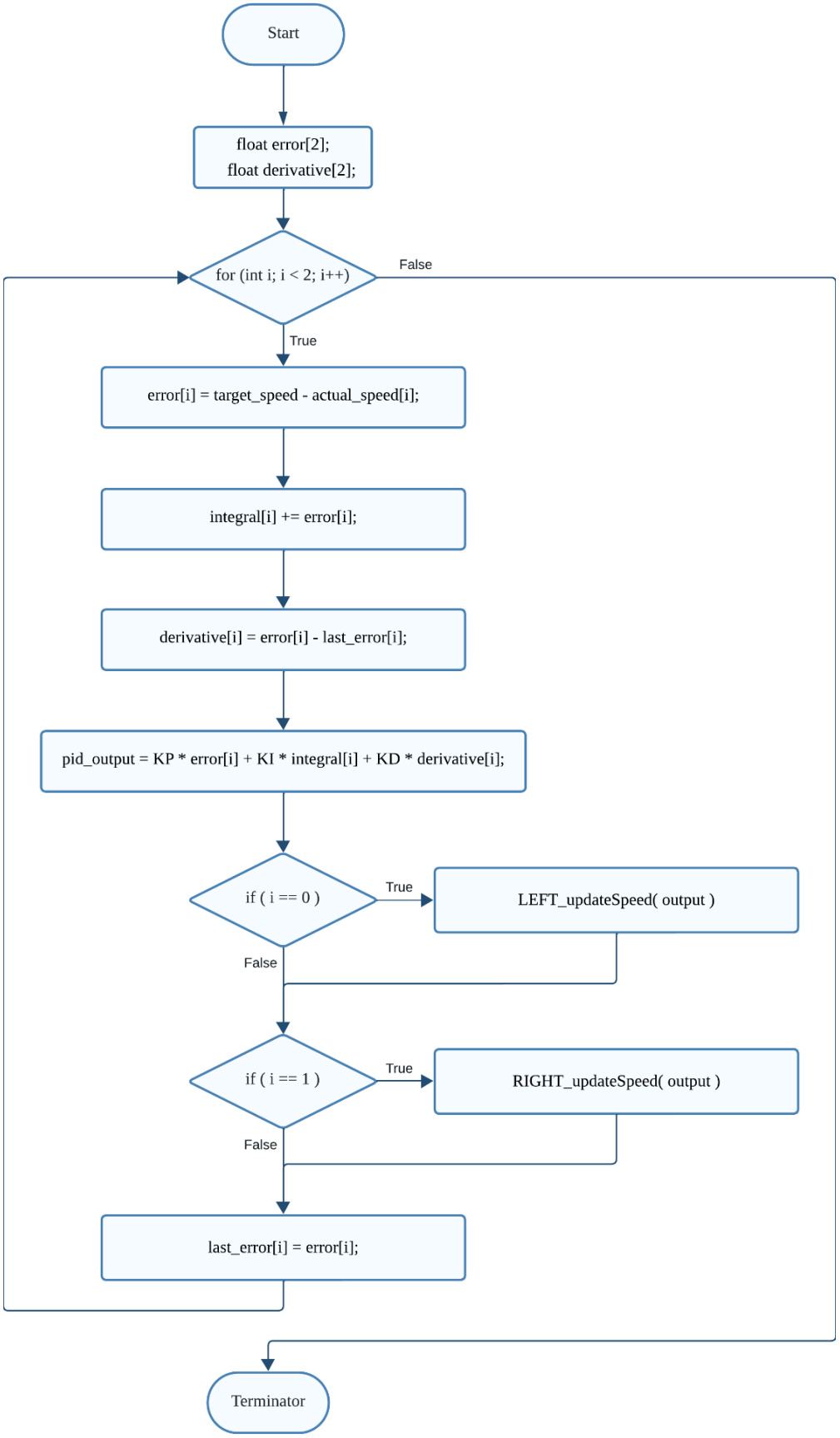
Ultrasonic Driver



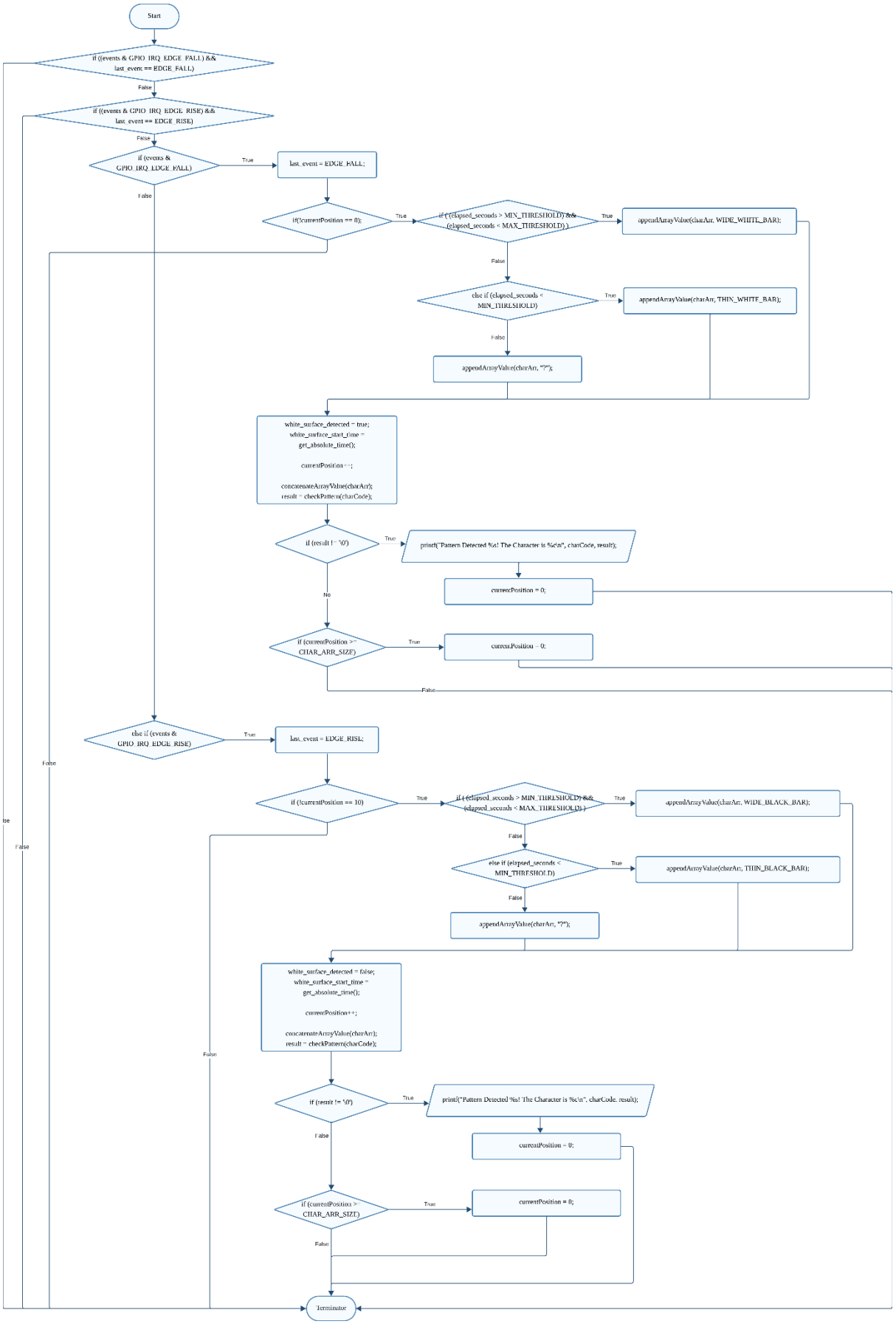
IR Sensor Driver



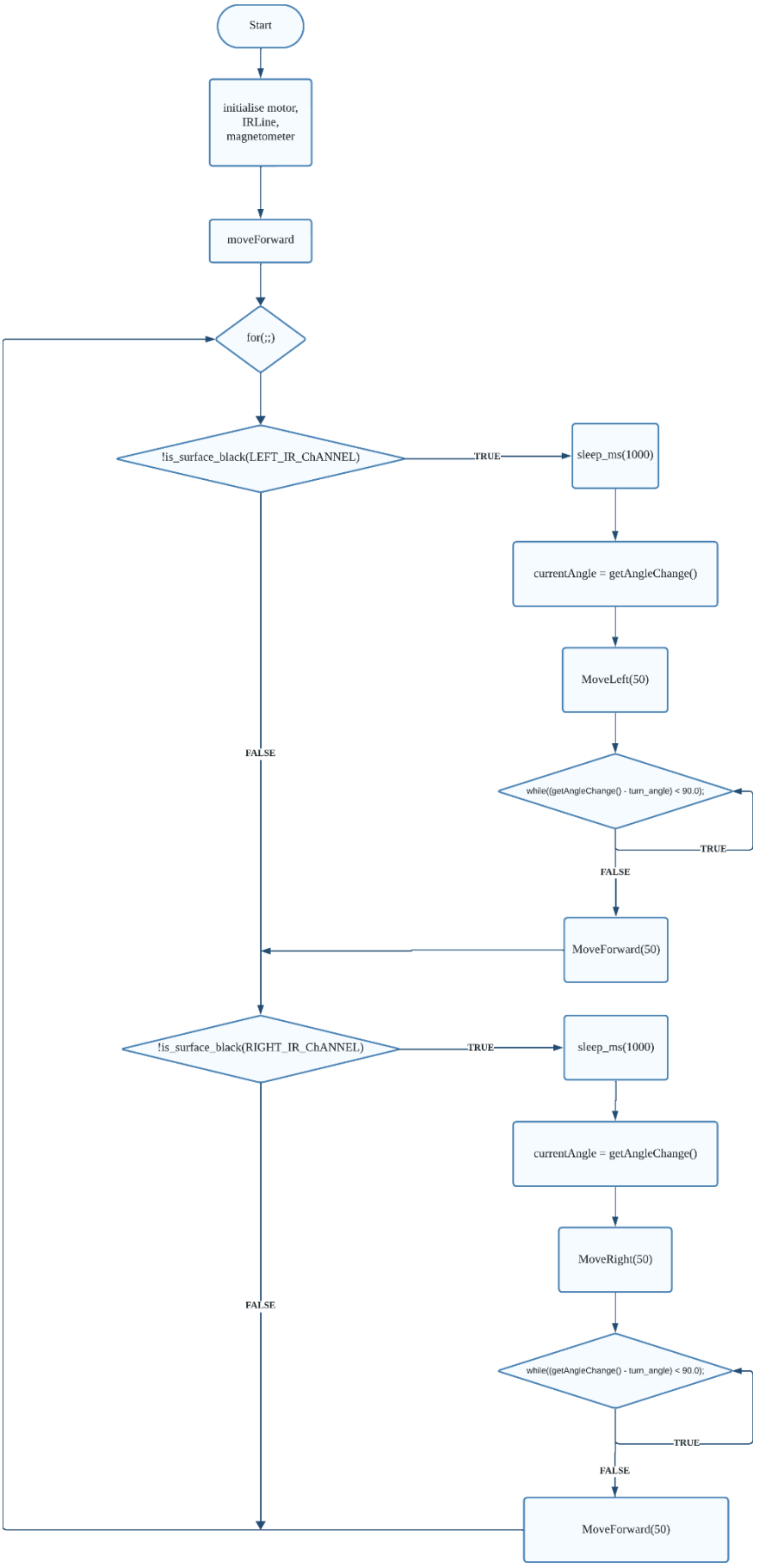
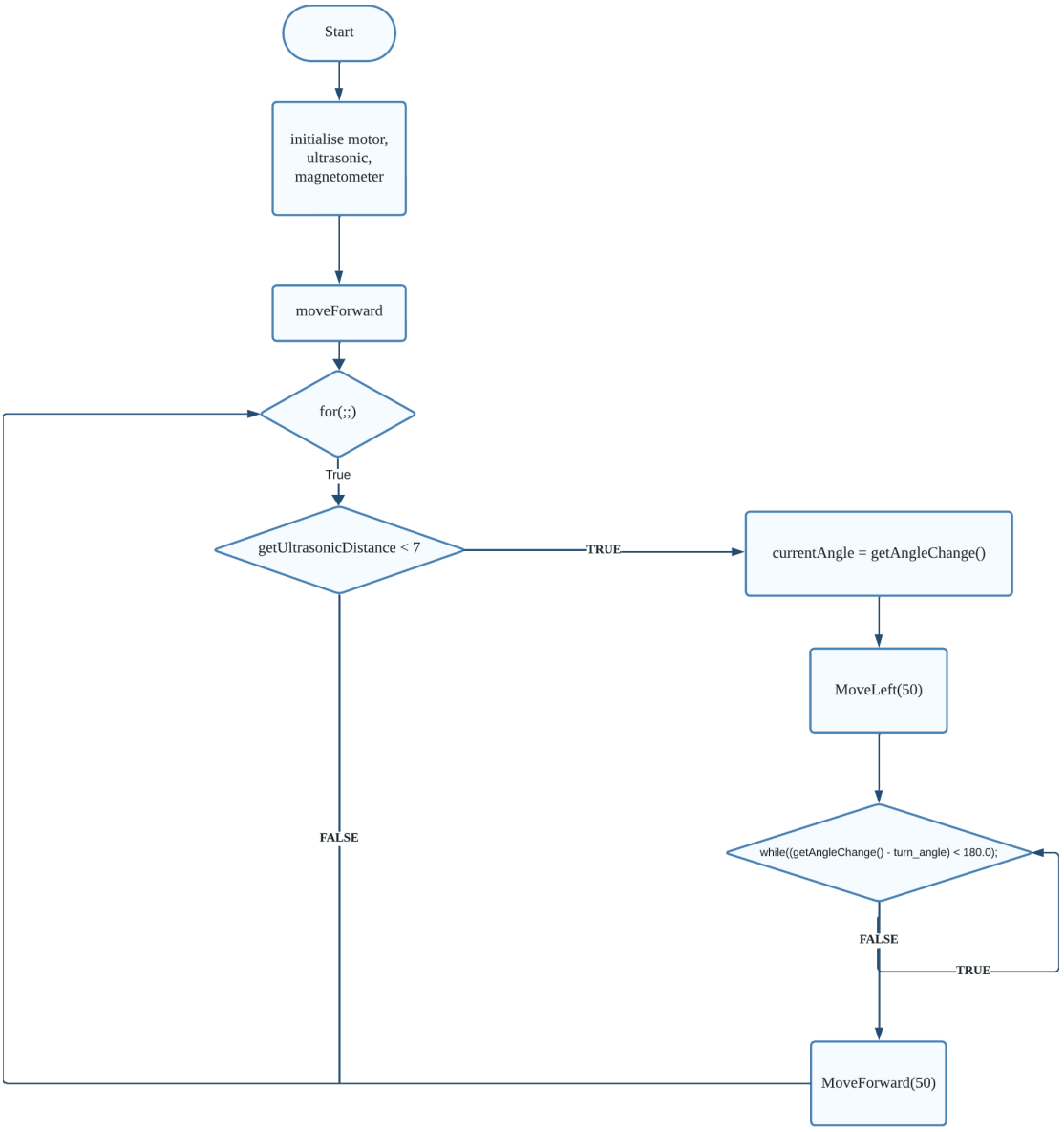
PID Controller



Barcode


Start
if ((events & GPIO_IRQ_EDGE_FALL) && last_event == EDGE_FALL)
False
if ((events & GPIO_IRQ_EDGE_RISE) && last_event == EDGE_RISE)
False
if (events & GPIO_IRQ_EDGE_FALL)
True
last_event = EDGE_FALL;
False
if(!currentPosition == 0);
True
if ((elapsed_seconds > MIN_THRESHOLD) && (elapsed_seconds < MAX_THRESHOLD))
True
appendArrayValue(charArr, WIDE_WHITE_BAR);
False
else if (elapsed_seconds < MIN_THRESHOLD)
True
appendArrayValue(charArr, THIN_WHITE_BAR);
False
appendArrayValue(charArr, "?");
white_surface_detected = true;
white_surface_start_time = get_absolute_time();
currentPosition++;
concatenateArrayValue(charArr);
result = checkPattern(charCode);
if (result != '\0')
True
printf("Pattern Detected %s! The Character is %c\n", charCode, result);
currentPosition = 0;
No
if (currentPosition > CHAR_ARR_SIZE)
True
currentPosition = 0;
False
else if (events & GPIO_IRQ_EDGE_RISE)
True
last_event = EDGE_RISE;
False
if (!currentPosition == 10)
True
if ((elapsed_seconds > MIN_THRESHOLD) && (elapsed_seconds < MAX_THRESHOLD))
True
appendArrayValue(charArr, WIDE_BLACK_BAR);
False
else if (elapsed_seconds < MIN_THRESHOLD)
True
appendArrayValue(charArr, THIN_BLACK_BAR);
False
appendArrayValue(charArr, "?");
white_surface_detected = false;
white_surface_start_time = get_absolute_time();
currentPosition++;
concatenateArrayValue(charArr);
result = checkPattern(charCode);
False
if (result != '\0')
True
printf("Pattern Detected %s! The Character is %c\n", charCode, result);
False
currentPosition = 0;
if (currentPosition > CHAR_ARR_SIZE)
True
currentPosition = 0;
False
Terminator

Navigation Algorithm - turning



Navigation Algorithm - reverse