README file for the Helicopter assignment

Flight design:

1. **PIN CONFIGURATION:**
   1. **ultrasonic sensor**:
      1. PD3 is configured as an output pin for sending trigger signals to the ultrasonic sensor.
      2. PD2 is configured as an input pin to receive the echo signal from the ultrasonic sensor.
      3. The buzzer is connected to PD6; whenever the distance is less than 30cm, the buzzer makes a sound.
   2. **BOOSTXL-SENSHUB**
      1. J2.6 is connected to port D pin 1 (PD1). (SDA)
      2. j2.7 connected to port D pin 0 (PD0). (SCL)
      3. j2.2 connected to port E pin 1 (PE1). (INTERRPUT) for motion detection.
      4. In the boost xl-senshub sensor, I used MPU9150 for acceleration and motion(i.e., pitch, roll, Yaw, acceleration, Magnetometer) and BMP180 for free fall detection, using pressure and temperature from the sensor.
   3. **TAIL MOTOR**:
      1. PMW out is connected to PE4.
      2. For Direction control, two pins PE3=low, PE4 = high.
   4. **HEAD MOTOR:**
      1. PMW out is connected to PE5..
      2. For Direction control, two pins PC6=low, PC7 = high
   5. **SERVO MOTOR :**
      1. PMW out is connected to PC4.
2. **CODE WORKING(for main.c):**
   1. **INITIALIZATION:** 
      1. **ADC\_PWM\_init();** - To initialize PWM & pins for Tail Motor.
      2. **ConfigureUART();-** To initialize UART printing & pins(A0,A1) for transmitting and receiving data.
      3. **MPU9150\_IN\_IT();-** To initialize MPU9150 for acceleration and motion & pins and for I2C communication.
      4. **configure\_systick();-** configuring systick for frequency of 1MHz.
      5. **SERVO\_PWM\_init();** - To initialize PWM & pins for Servo Motor.
      6. **Timer0ACapture\_init();** - To initialize Wtimer for Ultrasonic Pulses.
      7. **BMP180\_IN\_IT();** -To initialize BMP180 for acceleration and motion & pins and for I2C communication.
      8. **Motor\_in\_it();-** To initialize PWM & pins for HEAD Motor.
   2. **WORKING FUNCTIONS:**
      1. **tailmotor()** - working of tail-motor based on Yaw values.
      2. **HEADmotor()** - working of Head-motor based on MAGNETOMETER values.
      3. **BMP180()** - To get pressure and temp from the imu sensor to calculate the altitude, and based on height, we detect free fall.
      4. **ultrasonic() –** To calculate the distance between the obstacle and flight if a distance of less than 30 obstacle is detected and the buzzer makes a sound.
      5. **MPU9150()-** To get Acceleration, Gyroscope, and Magnetometer from the IMU sensor and to calculate yaw and pitch values.
      6. **SERVO\_control()** - the working of the servo motor is based on pitch values.