**3Primitive flight control system for helicopter**

1. Use Two-line LCD display and LED indications to show the system status.
2. Glow green LED when helicopter is in flight. Blink green when helicopter is ascending or descending.
3. Blink yellow LED when obstacle is detected (< 30 cm)
4. Print appropriate log messages on the UART terminal every time the system status changes.
5. Use the IMU on the sensor booster pack to implement lift, thrust (pitch), and direction control (yaw rotation)
6. Base speed of the main rotor and tail motor can be set using potentiometer on the Edu ARM board. Tail motor rotates in anti-clockwise direction to stabilize the helicopter. Main motor rotates in clockwise direction.
7. Z-axis movement controls speed of the main rotor. Minimal base speed is maintained at ground level.
8. Adjust the tail rotor speed to counter the torque from the main rotor and keep the helicopter stable.
9. Increase the speed of the main rotor to generate lift, allowing the helicopter to climb altitude.
10. Pitch angle controls the thrust direction and magnitude, indicated using the tilt on the servo motor.
11. Forward/Backward direction: by tilting the main rotor blade slightly forward or backward using the servo, thrust can be created in the desired direction, simulating forward or backward movement.
12. Direction control is implemented using yaw rotation of the IMU sensor.
13. Left/Right Turn:  Adjust the speed of the tail rotor. Increase the speed in a desired direction (let us say Clockwiopposite direction (counterclockwise), and vice-versa.
14. Bonus points:
15. Modular and robust design with reliable code
16. Use ultra-sonic sensor to detect obstacle and measure distance between the helicopter and the obstacle. Buzzer is triggered and yellow LED starts blinking if the obstacle comes within the range (< 30 cm)
17. Sudden drop in the altitude should be indicated using Red LED blinking and buzzer sound

Reference link:

1. Helicopter Controls (spinningw[ing.com)](https://www.spinningwing.com/the-helicopter/helicopter-controls/)
2. <https://www.ti.com/lit/pdf/spmt282>