```cpp
#pragma once

class PI_ctrl //creating a class
{
protected:
    float m_P;
    float m_I;
    float m_integrator;
    float m_dT;
public:
    PI_ctrl(float P,float I, float dT); // constructor for PI controller
    float calc_ctrl_P(float error); // function that calculates control input based on provided error from the system we aim to control.
    float calc_ctrl_I(float error);

};


class PID_ctrl : public PI_ctrl   //inheriting PI_ctrl to PID_ctrl class
{
private:
    float m_d;
    float m_differniator;
    float calc_ctrl_D(float error, float perror);

public:
    PID_ctrl(float P, float I, float dT, float D);// constructor for I, D and inherited P part
    float calc_ctrl_PID(float error, float perror);

};
```