BasicCar.h

```cpp
#ifndef __BASICCAR_H__
#define __BASICCAR_H__


#include <iostream>
#include "BasicEngine.h"

using namespace std;

class BasicCar
{
    private:
    BasicEngine _engine;

    public:
    BasicCar() { _engine =  BasicEngine::BasicEngine(); }
    virtual ~BasicCar() {};

    virtual void go() { _engine.on(); }
    virtual void stop() { _engine.off(); }

    BasicEngine getEngine() { return _engine; }
    void setEngine(BasicEngine engine) { _engine = engine; }

};

#endif
```

CarMidrange.h

```cpp
#ifndef __CARMIDRANGE_H__
#define __CARMIDRANGE_H__

#include <iostream>
#include "BasicEngine.h"
#include "BasicCar.h"

class CarMidrange: public BasicCar
{
    public:
        virtual void updateEngine(BasicEngine engine)
            { setEngine(engine); };
};
#endif
```

CarTop.h

```cpp
#include <iostream>
#include "CarMidrange.h"
#include "Xtreme.h"

class CarTop: public CarMidrange
{
    private:
        Xtreme _xtra;
        int _hasXtra = 0;

    public:
        CarTop() { CarMidrange::CarMidrange(); }

    virtual void go()
    {
        CarMidrange::go();
        if (_hasXtra == 1)
        _xtra.on();
    }

    virtual void stop()
    {
        CarMidrange::stop();
        if (_hasXtra == 1)
        _xtra.off();
    }

    virtual void addXtra(Xtreme engine)
    {
        _xtra = engine;
        _hasXtra = 1;
    }
};
```

BasicEngine.h

```
#ifndef __BASICENGINE_H__
#define __BASICENGINE_H__

#include <iostream>
using namespace std;

class BasicEngine
{
    public:
    BasicEngine() {};

    virtual void on() { cout << "Basic engine on!" << endl; }
    virtual void off() { cout << "Basic engine off!" << endl;
}
};

#endif
```

Xtreme.h

```
#ifndef __XTREME_H__
#define __XTREME_H__

#include <iostream>

class Xtreme
{
    public:
    Xtreme() {};

    virtual void on() { cout << "Xtreme engine on!" << endl; }
    virtual void off() { cout << "Xtreme engine off!" << endl;
}
};

#endif
```

main.cpp

```cpp
#include <iostream>
#include "BasicCar.h"
#include "CarMidrange.h"
#include "CarTop.h"
#include "BasicEngine.h"
#include "Xtreme.h"

using namespace std;

int main()
{
    BasicCar::BasicCar c1;
    CarMidrange c2;
    CarTop c3;

    c1.go();
    c2.go();
    c3.go();

    c1.stop();
    c2.stop();
    c3.stop();

    BasicEngine e;

    c2.updateEngine(e);
    c3.updateEngine(e);

    c2.go();
    c3.go();
    c2.stop();
    c3.stop();

    Xtreme xtra;

    c3.addXtra(xtra);
    c3.go();
    c3.stop();

}
```