

12/08p1

實作復數加減乘除

```
/* 12/08 楊育哲
 * 實作第一題：複數加減乘除
 */
public class h1_1208 {
    static class Complex{
        private float i;
        private float c;
        Complex(float I, float C){i=I;c=C;}
        public Complex add(Complex B){
            return new Complex(i+B.i, c+B.c);
        }
        public Complex sub(Complex B){
            return new Complex(i-B.i, c-B.c);
        }
        public Complex multiply(Complex B){
            return new Complex(i*B.c+B.i*c, c*B.c-i*B.i);
        }
        public Complex div(Complex B){
            Complex t1 = new Complex(-1*B.i, B.c);
            Complex t2 = multiply(t1);
            return new Complex(t2.i/(B.i*B.i+B.c*B.c), t2.c/(B.i*B.i+B.c*B.c));
        }
        public String to_string(){
            return "real: "+c+" + "+"i:"+i;
        }
    }
    static public void main(String args[]){
        Complex A = new Complex(2, 1);//A=1+2i
        Complex B = new Complex(4, 3);//B=3+4i
        System.out.println("A:"+A.to_string());
        System.out.println("B:"+B.to_string());
        System.out.println("A+B:"+A.add(B).to_string());
        System.out.println("A-B:"+A.sub(B).to_string());
        System.out.println("A*B:"+A.multiply(B).to_string());
        System.out.println("A/B:"+A.div(B).to_string());
    }
}
```

輸出:

A:real: 1.0 + i:2.0

B:real: 3.0 + i:4.0

A+B:real: 4.0 + i:6.0

A-B:real: -2.0 + i:-2.0

A*B:real: -5.0 + i:10.0

A/B:real: 0.44 + i:0.08

說明：

$$A: 1+2i$$

$$B: 3+4i$$

$$A+B = 4+6i$$

$$A-B = -2-2i$$

$$A \times B = (1+2i)(3+4i) = 3+6i+4i-8 = -5+10i$$

$$A \div B = \frac{(1+2i)(3-4i)}{(3+4i)(3-4i)} = \frac{3+6i-4i+8}{3^2-(4i)^2} = \frac{11+2i}{25}$$
$$(-0.44+0.08i)$$