

```
public class summen_thread_test1 extends JFrame {
```

```
    private long summe;
```

```
    private void BnOk_Click() {
```

```
        summe=0;
```

```
        System.out.println("Test1");
```

```
        myThread[] ths = new myThread[10];
```

```
        for (int i=0; i<ths.length; i++) {
```

```
            ths[i] = new myThread(i+1,100000);
```

```
        }
```

```
        for (int i=0; i<ths.length; i++) {
```

```
            ths[i].start();
```

```
        }
```

```
        try {
```

```
            for (int i=0; i<ths.length; i++) {
```

```
                ths[i].join();
```

```
            }
```

```
        }
```

```
        catch (InterruptedException e) {
```

```
        }
```

```
        memo.setText("Summe: "+Long.toString(summe) );
```

```
    }
```

```
class myThread extends Thread {
```

```
    int _n;
```

```
    int _nr;
```

```
    public myThread (int nr, int n) {
```

```
        _n = n;
```

```
        _nr = nr;
```

```
    }
```

```
    // Thread Methode
```

```
    public void run() {
```

```
        for (int i=1; i<=_n; i++) {
```

```
            summe=summe+1; // _nr;
```

```
        }
```

```
    }
```

```
}
```

```
public class summen_thread_test2 extends JFrame {
```

```
    private final int MAX=10;
```

```
private void BnTest1_Click() {
```

```
    long t1, t2;
```

```
    summe=0;
```

```
    System.out.println("Test1");
```

```
    myThread1[] ths = new myThread1[MAX];
```

```
    for (int i=0; i<ths.length; i++) {
```

```
        ths[i] = new myThread1(i+1, 1000000);
```

```
    }
```

```
    t1 = System.currentTimeMillis();
```

```
    for (int i=0; i<ths.length; i++) {
```

```
        ths[i].start();
```

```
    }
```

```
    try {
```

```
        for (int i=0; i<ths.length; i++) {
```

```
            ths[i].join();
```

```
        }
```

```
    }
```

```
    catch (InterruptedException e) {
```

```
    }
```

```
    t2 = System.currentTimeMillis();
```

```
    memo.setText("Summe: "+Long.toString(summe)+"    Soll: "+(1000000*ths.length)+"\n\r"+ "Zeit: "+Long.toString(t2-t1) );
```

```
    } // Test1
```

```

private void BnTest2_Click() {

    long t1, t2;

    summe=0;

    System.out.println("Test2");

    myThread2[] ths = new myThread2[MAX];

    for (int i=0; i<ths.length; i++) {

        ths[i] = new myThread2(i+1, 1000000);

    }

    t1 = System.currentTimeMillis();

    for (int i=0; i<ths.length; i++) {

        ths[i].start();

    }

    try {

        for (int i=0; i<ths.length; i++) {

            ths[i].join();

        }

    }

    catch (InterruptedException e) {

    }

    t2 = System.currentTimeMillis();

    memo.setText("Summe: "+Long.toString(summe)+"    Soll: "+(1000000*ths.length)+"\n\r"+ "Zeit: "+Long.toString(t2-t1) );

} // Test2

```

```

private void BnTest3_Click() {

    long t1, t2;

    summe=0;

    System.out.println("Test3");

    myThread3[] ths = new myThread3[MAX];

    for (int i=0; i<ths.length; i++) {

        ths[i] = new myThread3(i+1,1000000);

    }

    t1 = System.currentTimeMillis();

    for (int i=0; i<ths.length; i++) {

        ths[i].start();

    }

    try {

        for (int i=0; i<ths.length; i++) {

            ths[i].join();

        }

    }

    catch (InterruptedException e) {

    }

    t2 = System.currentTimeMillis();

    memo.setText("Summe: "+Long.toString(summe)+"    Soll: "+(1000000*ths.length)+"\n\r"+ "Zeit:
"+Long.toString(t2-t1) );

} // Test3

```

```

// fastest

private void BnTest4_Click() {

    long t1, t2;

    summe=0;

    long n = 1000000*MAX;

    t1 = System.currentTimeMillis();

    for (int i=1; i<=n; i++) {

        addNr4(1); // _nr;

    }    //setVisible(false);

    t2 = System.currentTimeMillis();

    memo.setText("Summe: "+Long.toString(summe)+"    Soll: "+(1000000*10)+"\n\r"+ "Zeit:
"+Long.toString(t2-t1) );

}


private void addNr1(int nr) {

    summe+=nr;

}

private synchronized void addNr2(int nr) {

    summe+=nr;

}

private synchronized void addNr3(int nr) {

    summe+=nr;

}

private void addNr4(int nr) {

    summe+=nr;

}

```

```
class myThread1 extends Thread {
```

```
    int _n;
```

```
    int _nr;
```

```
    public myThread1 (int nr, int n) {
```

```
        _n = n;
```

```
        _nr = nr;
```

```
    }
```

```
    // Thread Methode
```

```
    public void run() {
```

```
        for (int i=1; i<=_n; i++) {
```

```
            addNr1(1); // _nr;
```

```
        }
```

```
    }
```

```
} // myThread1
```

```
class myThread2 extends Thread {
```

```
    int _n;
```

```
    int _nr;
```

```
    public myThread2 (int nr, int n) {
```

```
        _n = n;
```

```
        _nr = nr;
```

```
    }
```

```
    // Thread Methode
```

```
    public void run() {
```

```
        for (int i=1; i<=_n; i++) {
```

```
            addNr2(1); // _nr;
```

```
        }
```

```
    }
```

```
} // myThread2
```



```
class myThread3 extends Thread {
```

```
    int _n;
```

```
    int _nr;
```

```
    public myThread3 (int nr, int n) {
```

```
        _n = n;
```

```
        _nr = nr;
```

```
    }
```

```
    // Thread Methode
```

```
    public void run() {
```

```
        int summe=0;
```

```
        for (int i=1; i<=_n; i++) {
```

```
            summe+=1; // _nr;
```

```
        }
```

```
        addNr3(summe);
```

```
    }
```

```
} // myThread3
```