

7.

```
int i=0, j=0;
```

```
Semaphore mutex_i=1, mutex_j=1;
```

```
Consumer( )
```

```
{
```

```
    进入面包店
```

```
    P(mutex_i);
```

```
    取号i;
```

```
    i++;
```

```
    V(mutex_i);
```

```
    等待叫号i;
```

```
}
```

```
Seller( )
```

```
{
```

```
    while(1){
```

```
        P(mutex_j)
```

```
        if (j <= i) {
```

```
            叫号j;
```

```
            j++;
```

```
            V(mutex_j);
```

```
        } else { 销售面包;
```

```
            V(mutex_j);
```

```
            休息片刻;
```

```
        }
```

```
    }
```

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8.

Semaphore mutex1 = 1;

Semaphore empty1 = 10;

Semaphore full1 = 0;

Semaphore mutex2 = 1;

Semaphore empty2 = 10;

Semaphore full2 = 0;

Producer1 ( )

```

{
    while (1)
    {
        生产一个产品A;
        P(empty1);
        P(mutex1);
        将产品A存放在货架F1上;
        V(mutex1);
        V(full1);
    }
}

```

```

}
Producer2 ( )
{

```

```

    while (1)
    {
        生产一个产品B;
        P(empty2);
        P(mutex2);
        将产品B存放在货架上;
        V(mutex2);
        V(full2);
    }
}

```

Assembler ( ) {

```

    while (1)
    {
        P(full1);
        P(mutex1);
        从货架上取一个A产品;
        V(mutex1);
        V(empty1);
        P(full2);
        P(mutex2);
        从货架上取一个B产品;
        V(mutex2);
        V(empty2);
        组装产品;
    }
}

```

7.

```

Semaphore empty1 = 10;
Semaphore mutex1 = 1; // 缸
Semaphore full1 = 0;
Semaphore mutex = 1; // #

```

```

Producer() {
    while(1) {
        P(empty2);
        P(mutex2);
        拿桶
        V(mutex2);
        V(full2);
        P(mutex);
        取水;
        V(mutex);
        P(empty1);
        P(mutex1);
        放水;
        V(full1);
        V(mutex1);
    }
}

```

```

Semaphore empty2 = 3;
Semaphore mutex2 = 1; // 桶
Semaphore full2 = 0;

```

```

Consumer() {
    while(1) {
        P(full2);
        P(mutex2);
        拿桶
        V(mutex2);
        V(empty2);
        P(full1);
        P(mutex1);
        喝水
        V(empty1);
        V(mutex1);
    }
}

```

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10.

Semaphore mutex=1; //输入设备

Semaphore Sa=0; //a

Semaphore Sb=0; //b

Semaphore Sc=0; //c

Semaphore Sx=0; //x

Semaphore Sy=0; //y

Semaphore Sz=0; //z

P1() {

P(mutex);

输入a;

V(mutex);

V(Sa);

V(Sa);

V(Sa);

P(Sa)

P(Sb)

x=a+b;

V(Sx);

P(Sx);

P(Sy);

P(Sz);

打印x,y,z;

}

P2() {

P(mutex);

输入b;

V(mutex);

V(Sb);

V(Sb);

P(Sa);

P(Sb);

y=a\*b

V(Sy);

V(Sy);

}

P3() {

P(mutex);

输入c;

V(mutex);

V(Sc);

P(Sa);

P(Sc);

P(Sy);

z=y+c-a;

V(Sz);

}

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11.

```

Semaphore empty = N;
Semaphore wheel = 0;
Semaphore frame = 0;
Semaphore s1 = N-2; //车架最大数
Semaphore s2 = N-1; //轮子最大数

```

```

Worker1() {
    while(1) {
        加工一个车架;
        P(s1);
        P(empty);
        车架放入箱中;
        V(frame);
    }
}

```

```

Worker2() {
    while(1) {
        加工一个车轮;
        P(s2);
        P(empty);
        车轮放入箱中;
        V(wheel);
    }
}

```

```

Worker3() {
    while(1) {
        P(frame);
        箱中取一个车架;
        V(empty);
        V(s1);
        P(wheel);
        P(wheel);
        箱中取两个车轮;
        V(empty);
        V(empty);
        V(s2);
        V(s2);
        组装车;
    }
}

```

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