

```

function [sys,x0,str,ts]=sfun(t,x,u,flag,m0,m1,m2,j1,j2,l1,l2,l,f0,f1,✓
f2,g0,g)
switch flag
    case 0                                %初始化
        [sys,x0,str,ts]=mdlInitializeSizes;
    case 1                                %计算连续状态
        sys=mdlDerivatives(t,x,u,m0,m1,m2,j1,j2,l1,l2,l,f0,f1,f2,g0,✓
g);
    case 2                                %计算离散状态
        sys=mdlUpdate(t,x,u);
    case 3                                %计算输出
        sys=mdlOutputs(t,x,u);
    case 4                                %计算采样时间
        sys=mdlGetTimeOfNextVarHit(t,x,u);
    case 9                                %结束时的动作
        sys=mdlTerminate(t,x,u);
    otherwise                             %flag错误
        error(['不正确的flag=',num2str(flag)]);
end

```

%初始化

```

function [sys,x0,str,ts]=mdlInitializeSizes()
    sizes=simsizes;                        %创建尺寸结构
    sizes.NumContStates = 6;               %连续状态的个数为0
    sizes.NumDiscStates = 0;               %离散状态的个数为0
    sizes.NumOutputs     = 6;               %输出个数为1
    sizes.NumInputs       = 1;               %输入个数为2
    sizes.DirFeedthrough= 0;               %直接反馈输入
    sizes.NumSampleTimes= 1;               %至少需一个采样时间
    sys = simsizes(sizes);
    x0      = [0 0 0 0 0 0];               %无状态,故初始状态为空
    str      = [];                           %系统保留
    ts       = [0 0];                       %初始化采样时间数组

```

```

function sys=mdlDerivatives(t,x,u,m0,m1,m2,j1,j2,l1,l2,l,f0,f1,f2,g0,✓
g)

```

%计算连续状态

```

    Mass = [      m0+m1+m2,                (m1*l1+m2*l1)*cos(x(2)), ✓
m2*l2*cos(x(3));

```

```

                (m1*l1+m2*l)*cos(x(2)),          j1+m1*l1^2+m2*l^2, ✓
m2*l1*l*cos(x(3)-x(2));
                m2*l2*cos(x(3)),                m2*l2*l*cos(x(3)-x(2)), ✓
j2+m2*l2^2
            ];

    F = [          -f0,      (m1*l1+m2*l)*sin(x(2))*x(5),          m2*l2*sin ✓
(x(2))*x(6);
          0,      -(f1+f2), ✓
f2+m2*l2*l*sin(x(3)-x(2))*x(6);
          0,      -m2*l2*l*sin(x(3)-x(2))*x(6)+f2,      -f2
        ] ;

    N = [          u;      (m1*l1+m2*l)*g*sin(x(2));          m2*l2*g*sin(x ✓
(3))    ];

    G = [g0; 0; 0];
    %x'
    sys = [zeros(3), eye(3); zeros(3), inv(Mass)*F] * x + [zeros(3,1); ✓
inv(Mass)*N] + [zeros(3,1); inv(Mass)*G]*u;

function sys=mdlUpdate(t,x,u)
%无离散状态
    sys =[];

function sys=mdlOutputs(t,x,u)
%计算输出
    sys = x;

function sys=mdlGetTimeOfNextVarHit(t,x,u)
%计算采样时间
    sampleTime = 1;

function sys=mdlTerminate(t,x,u)
%结束时的动作
    sys = [];

```