```
function [allt,allw]=rkf(f,a,b,alpha,tol,hmin,hmax)
%Runge-Kutta-Fehlberg

allt=a;
allw=alpha(:)';
h=hmax;
i=1;
while 1
  w=allw(i,:);
  t=allt(i);
  k1=h*f(t,w);
  k2=h*f(t+h/4,w+k1/4);
  k3=h*f(t+3/8*h,w+3/32*k1+9/32*k2);
  k4=h*f(t+12/13*h,w+1932/2197*k1-7200/2197*k2+7296/2197*k3);
  k5=h*f(t+h,w+439/216*k1-8*k2+3680/513*k3-845/4104*k4);
  k6=h*f(t+h/2,w-8/27*k1+2*k2-3544/2565*k3+1859/4104*k4-11/40*k5);
  R=1/h*abs(1/360*k1-128/4275*k3-2197/75240*k4+1/50*k5+2/55*k6);
  if R<=tol
    t=t+h;
    i=i+1;
    allt(i,1)=t;
    w=w+25/216*k1+1408/2565*k3+2197/4104*k4-1/5*k5;
    allw(i,:)=w;
  end
  delta=0.84*(tol/R)^(1/4);
  if delta<=0.1
    h=0.1*h;
  elseif delta>=4
    h=4*h;
  else
    h=delta*h;
  end
  if h>hmax, h=hmax; end
  if t>=b
    break;
  elseif t+h>b
    h=b-t;
  elseif h<hmin
    error('Minimum h exceeded');
  end
end
```