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% Created by Zach Jones (c) 2014
%www.activityhacker.com

%input Parameters
sig = vone; %load target Vector
act = 585; %actual number of steps
f_min = 0.05; %min amplitude Hysterises
f_max = 0.5; % max amplitude hysterises
d_min = 2; %Min Min samples between peaks
d_max = 25; %Max min samples between peak

res = zeros(25,11); %Create Results Matrix

%Label Results Matrix
i = 2;
while i <= (f_max/f_min)+1;
    res(1,i) = f_min+(i-2)/20;
    i = i+1;
end

i = 2;
while i <= (d_max-d_min)+2;
    res(i,1) = d_min+(i-2);
    i = i+1;
end

j = 2; %rows
while j <= 25;
    d = res(j,1);
    k = 2; %Columns
    while k <=11;
        f = res(1,k);

%Setup Counter Variables
au = 0; %amplitud UP counter
ad = 0; %amplitud DOWN counter
pu = 0; %period counter UP
pd = 0; %period counter DOWN
area = 0; %number of sufficent areas above or below the curve

i = 1;
while i <= length(sig);
    if sig(i)>=1+f;
        pd = 0;
        ad = 0;
        pu = pu+1;
        if pu >=d;
            if au ==0;
                area = area+1;
                au = 1;
            end
        end
    end
end
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    end
elseif sig(i)<=1-f;
    pu = 0;
    au = 0;
    pd = pd+1;
    if pd >=d;
        if ad==0;
            area = area+1;
            ad =1;
        end
    end
else
    pu = 0;
    pd = 0;
    au =0;
    ad=0;
end
i = i+1;
end

%Export the number of qualifying peaks, divided by two
res(j,k) = abs(round(area/2)-act)/act;
k = k+1;
end
j = j+1;
end

res
```