MATLAB小函数：计算KL散度与JS散度

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问题：给定两个向量，计算这两个向量之间的Kullback-Leibler Divergence与Jensen-Shannon Divergence。KL散度与JS散度的计算公式参考：相似性度量 - 凯鲁嘎吉 - 开发者的网上家园

1．MATLAB程序

```
function [score_KL, score_JS] = KL_JS_div(vec1, vec2)
% Input: vec1: vector 1, vec2: vector 2
% Output: score_KL: KL divergence, source_JS: JS divergence
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% Make sure vec1 and vec2 sum to 1
if any(vec1(:))
    vec1 = vec1/sum(vec1(:));
end

if any(vec2(:))
    vec2 = vec2/sum(vec2(:));
end

% Compute Kullback-Leibler Divergence
score_KL = sum(sum(vec1.* log(eps + vec1./(vec2+eps))));

% Compute Jensen-Shannon Divergence
score_JS = (sum(sum(vec1.* log(eps + vec1./((vec1+vec2)./2+eps))))+sum(sum(vec2.* log(eps + vec2./((vec1+vec2)./2+eps))))).*/2;

if vec1==vec2
    score_KL=0;
    score_JS=0;
end
```

2．结果

```
>> vec1=[0.2 0.4 0.4];
>> vec2=[0.3 0.2 0.5];
```

```
>> [score_KL, score_JS] = KL_JS_div(vec1, vec2)
score_KL =
   0.106908430076661

score_JS =
   0.024807303850391
```

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