

Subject: Re: Euclidean distance
Posted by [Caesar E. Ordonez](#) on Thu, 21 May 1998 07:00:00 GMT
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Imanol Echave wrote:

<BLOCKQUOTE TYPE=CITE>Hi:

<P> I'd like to program the following routine: giving two set of vectors with n and

m vectors respectively (a matrix of size $p \times n$ and another of size $p \times m$),

I want to

obtain a matrix of size $n \times m$ where the element (i,j) is the euclidean distance

from first set's vector i to second set's vector j. I know the solution using

loops, but exists it a different way without loops?</BLOCKQUOTE>

Here's my (quick and dirty) solution for two vectors.

[illegible][illegible][illegible]

```
<BR>&nbsp;&nbsp;&nbsp;& ; print, na, nb
```

 aa = a

 bb = b

```
<BR>&nbsp;&nbsp;&nbsp;  aa[*] = 1
```


 bb[*] = 1

```
<BR>&nbsp;&nbsp;&nbsp;  c1 = a^2#bb
```

```
<BR>&nbsp;&nbsp;&nbsp;  c2 = aa#b^2
```

```
<BR>&nbsp;&nbsp;&nbsp; c = c1+c2
```

```
<BR>&nbsp;&nbsp;&nbsp; c = sqrt(c)
```


 & ; Check with loops

```
<BR>&nbsp;&nbsp;&nbsp;&nbsp; ;d=dblarr(na,nb)
```

[illegible][illegible]
$$d[j,k] = \sqrt{a[j]^2 + b[k]^2}$$

```
<BR>&nbsp;&nbsp;&nbsp;;endfor
```

```
<BR>&nbsp;&nbsp;&nbsp;;endfor
```

[illegible]

```
<BR>&nbsp;&nbsp;&nbsp;& ;print,c-d
```

```
<BR>&nbsp;&nbsp;&nbsp;&nbsp; return, c
```

```
<BR>&nbsp;&nbsp;&nbsp; end
```

<P>You can easily generalize to matrices by inserting code, before

the second line, that checks dimensions of a and b, and transforming

a and/or b to one-dimensional array via reform function.

```
<PRE>--&nbsp; ;
```

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