

file3

January 9, 2017

```
In [1]: [x**0.5 for x in range(100) if x**2<25]
```

```
Out[1]: [0.0, 1.0, 1.4142135623730951, 1.7320508075688772, 2.0]
```

```
In [5]: L=[]
        for x in range(100):
            if x**2<25:
                L.append(x**0.5)
        L
```

```
Out[5]: [0.0, 1.0, 1.4142135623730951, 1.7320508075688772, 2.0]
```

```
In [10]: M=list(filter(lambda x: x**2 < 25, range(100)))
          L=list(map(lambda x: x**0.5, M))
          L
```

```
Out[10]: [0.0, 1.0, 1.4142135623730951, 1.7320508075688772, 2.0]
```

```
In [2]: mx=5
        [x/(mx-1) for x in range(mx)]
```

```
Out[2]: [0.0, 0.25, 0.5, 0.75, 1.0]
```

```
In [7]: mx=5
        my=6
        X=[ [x/(mx-1) for x in range(mx)] for y in range(my) ]
        X
```

```
Out[7]: [[0.0, 0.25, 0.5, 0.75, 1.0],
          [0.0, 0.25, 0.5, 0.75, 1.0],
          [0.0, 0.25, 0.5, 0.75, 1.0],
          [0.0, 0.25, 0.5, 0.75, 1.0],
          [0.0, 0.25, 0.5, 0.75, 1.0],
          [0.0, 0.25, 0.5, 0.75, 1.0]]
```

```
In [13]: mx=5
         my=6
         Y=[ [y/(my-1) for x in range(mx)] for y in range(my) ]
         Y
```

```
Out[13]: [[0.0, 0.0, 0.0, 0.0, 0.0],
          [0.2, 0.2, 0.2, 0.2, 0.2],
          [0.4, 0.4, 0.4, 0.4, 0.4],
          [0.6, 0.6, 0.6, 0.6, 0.6],
          [0.8, 0.8, 0.8, 0.8, 0.8],
          [1.0, 1.0, 1.0, 1.0, 1.0]]
```

```
In [16]: a=[[1,2,3,4,5],
            [5,6,7,8,9],
            [9,10,11,12,13],
            [13,14,15,16,17],
            [10,25,40,25,10],
            [10,25,40,25,10]]
          sum([sum(c) for c in a])
```

```
Out[16]: 400
```

```
In [15]: x
```

```
Out[15]: [[0.0, 0.25, 0.5, 0.75, 1.0],
          [0.0, 0.25, 0.5, 0.75, 1.0],
          [0.0, 0.25, 0.5, 0.75, 1.0],
          [0.0, 0.25, 0.5, 0.75, 1.0],
          [0.0, 0.25, 0.5, 0.75, 1.0],
          [0.0, 0.25, 0.5, 0.75, 1.0]]
```

```
In [17]: aX1=sum([sum([a[i][j]*X[i][j] for i in range(my)]) for j in range(mx)])
          aX1
```

```
Out[17]: 210.0
```

```
In [18]: a0=sum([sum([a[i][j] for i in range(my)]) for j in range(mx)])
          a0
```

```
Out[18]: 400
```

```
In [19]: aX2=sum([sum([a[i][j]*X[i][j]*X[i][j] for i in range(my)]) for j in range(mx)])
          aX2
```

```
Out[19]: 148.75
```

```
In [20]: ax=aX1/a0
          ax
```

```
Out[20]: 0.525
```

```
In [21]: aY1=sum([sum([a[i][j]*Y[i][j] for i in range(my)]) for j in range(mx)])
          aY1
```

```
Out[21]: 272.0
```

```
In [22]: ay=aY1/a0
         ay
```

```
Out[22]: 0.68
```

```
In [15]: P=[x,y,z] for x in range(1,100) for y in range(x,100) for z in range(y,100)
```

```
In [9]: def centroids(A):
        my=len(A)
        mx=len(A[0])
        A0=sum([sum([A[i][j] for i in range(my)]) for j in range(mx)])
        X=[x/(mx-1) for x in range(mx)] for y in range(my) ]
        Y=[y/(my-1) for x in range(mx)] for y in range(my) ]
        AX=sum([sum([A[i][j]*X[i][j] for i in range(my)]) for j in range(mx)])
        AY=sum([sum([A[i][j]*Y[i][j] for i in range(my)]) for j in range(mx)])
        Ax=AX/A0
        Ay=AY/A0
        return (Ax,Ay)
```

```
In [16]: centroids(P)
```

```
Out[16]: (0.6111111111111112, 0.6151167426677631)
```

```
In [29]: P=[x,y,z] for x in range(1,26) \
          for y in range(x,26) \
          for z in range(y,26) if x**2 + y**2 == z**2]
P
```

```
Out[29]: [[3, 4, 5],
          [5, 12, 13],
          [6, 8, 10],
          [7, 24, 25],
          [8, 15, 17],
          [9, 12, 15],
          [12, 16, 20],
          [15, 20, 25]]
```

```
In [19]: P
```

```
Out[19]: [[3, 4, 5], [5, 12, 13], [6, 8, 10], [8, 15, 17], [9, 12, 15]]
```

```
In [22]: Q=[x,y,z] for x in range(1,240) for y in range(x,240) for z in range(y,240)
          centroids(Q)
```

```
Out[22]: (0.6168428878242194, 0.6161335621366104)
```

```
In [ ]:
```