

file6

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

```
Out[33]: [0.0, 0.25, 0.5, 0.75, 1.0]
```

```
In [40]: a=[4,5,0,0,1]
          a0=sum(a)
          aX=sum([X[i]*a[i] for i in range(mx)])
          aX/a0
```

```
Out[40]: 0.225
```

```
In [ ]:
```

```
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 [58]: words=['hi','yo','so','hey','he','is','to','we','zip','zap']
freq=[10,1,4,1,7,1,1,5,7,1]
srt=sorted([(elem,i) for i,elem in enumerate(B) if elem != 1])
top=[(words[r[1]],r[0]) for r in reversed(R)]
top
```

```
Out[58]: [('hi', 10), ('zip', 7), ('he', 7), ('we', 5), ('so', 4)]
```

```
In [59]:
```

```
Out[59]: [(4, 2), (5, 7), (7, 4), (7, 8), (10, 0)]
```

```
In [67]: dic={'hi':10,
            'yo':1,
            'so':4,
            'hey':1,
            'he':7,
            'is':1,
            'to':1,
            'we':5,
            'zip':7,
            'zap':1}
dSorted=sorted([(dic[i],i) for i in dic if dic[i] != 1])
top=[(r[1],r[0]) for r in reversed(dSorted)]
top
```

```
Out[67]: [('hi', 10), ('zip', 7), ('he', 7), ('we', 5), ('so', 4)]
```

```
In [62]:
```

```
Out[62]: [(4, 'so'), (5, 'we'), (7, 'he'), (7, 'zip'), (10, 'hi')]
```

```
In [80]: text = 'it was the best of times it was the worst of times \
yo it is nice to see you and nice to say yo yo to you \
say you say me say it together and say yo \
say yo say yo yo to me please oh please yo'
wordlist=text.split()
histo={}
for i in wordlist:
    if i in histo:
        histo[i] += 1
    else:
        histo[i] = 1
histo
```

```
Out[80]: {'and': 2,
          'best': 1,
          'is': 1,
          'it': 4,
          'me': 2,
          'nice': 2,
          'of': 2,
          'oh': 1,
          'please': 2,
          'say': 7,
          'see': 1,
          'the': 2,
          'times': 2,
          'to': 4,
          'together': 1,
          'was': 2,
          'worst': 1,
          'yo': 8,
          'you': 3}
```

```
In [76]: dSorted=sorted([(histo[i],i) for i in histo if histo[i] != 1])
top=[(r[1],r[0]) for r in reversed(dSorted)]
top
```

```
Out[76]: [('yo', 8),
          ('say', 7),
          ('to', 4),
          ('it', 4),
          ('you', 3),
          ('was', 2),
          ('times', 2),
          ('the', 2),
          ('please', 2),
          ('of', 2),
          ('nice', 2),
          ('me', 2),
          ('and', 2)]
```

```
In [ ]:
```