```
import matplotlib.pyplot as plt
import numpy as np
from matplotlib import colormaps

cmap=plt.get_cmap('gist_rainbow')
fig = plt.figure(figsize=(5,5))
base = [2,3,5,7]
x = np.arange(0,1)
y = 1
for k in range(1,211):
    a = 0
    b = 1
    if k % 2 == 0:
        a = a+1/2
    else:
        b = b-1/2
    denom = 2*3
    p = 3
    if k%p == 0:
        a = a+(p-1)/(2*denom)
        b = b-(p-1)/(2*denom)
    else:
        if ((k%p)%2) == 0 :
            b = b-(p+1)/(2*denom)
        else:
            if ((k%p)%2) == 1 :
                a = a+(p+1)/(2*denom)
    p = 5
    denom = 2*3*5
    if k%p == 0:
        a = a+(p-1)/(2*denom)
        b = b-(p-1)/(2*denom)
    else:
        if ((k%p) %2) == 0:
            b = b-(p+1)/(2*denom)
        else:
            if ((k%p) %2) == 1:
                a = a+(p+1)/(2*denom)
    p = 7
    denom = 2*3*5*7
    if k%p == 0:
        a = a+(p-1)/(2*denom)
        b = b-(p-1)/(2*denom)
    else:
        if ((k%p) %2) == 0:
            b = b-(p+1)/(2*denom)
        else:
            if ((k%p) %2) == 1:
                a = a+(p+1)/(2*denom)
    print(k,' a = ',a,' b = ',b)
    plt.fill([a,a,b,b],[0,1,1,0],alpha=0.5,color=cmap(k))
    plt.annotate(k,xy=((a+b)/2,1/y))
    #plt.plot([a,b],[y,y])
    #plt.plot([a,a],[0,211],'--',color='black')
    #plt.plot([b,b],[0,211],'--',color='black')
    #plt.annotate(k,xy=((a+b)/2,y+0.03))
    y = y+1
plt.show()
```