AI Project

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In [1]:
```
#required packages
import requests
import json
import csv

import sklearn
import pandas
import numpy
import matplotlib.pyplot
```

In [14]:
```
#getting json
def getitems(iterations):
    '''queries PoE API to collect items into a list'''
    apipath_ = "http://api.pathofexile.com/public-stash-tabs/"
    id_ = "116306827-121847288-114286128-131835488-123127819"
    items = []
    uniqueaccount = []

    for i in range(iterations):
        #get next shard
        if id_ != "":
            apipath_ += "?id=:" + id_
        r = requests.get(apipath_)

        #bad query
        if r.status_code != 200:
            print('status at request:', i+1, ':', r.status_code)
            return items

        results = json.loads(r.text)
        id_ = results['next_change_id']
        stashes = results['stashes']

        #check users
        for user in stashes:
            #public users only
```

```
            if user['accountName'] !=  None:
                #unique users
                if not(user['accountName'] in uniqueaccount):
                    uniqueaccount.append(user['accountName'])
                    items += user['items']

        apipath_ = "http://api.pathofexile.com/public-stash-tabs/"

    print('Unique users found:', len(uniqueaccount))
    print('Total items found:', len(items))
    return items

def parseweapons(items):
    '''gets only list of weapons from all item list from trading'''
    itemtable = []

    for item in items:
        #reset
        rarity = 'na'
        sockets = -1
        links = -1
        league = 'na'
        ilvl = -1
        phys = -1
        crit = -1
        aps  = -1
        price = 'na'

        #skip nonweapons
        iconurl = item['icon']
        if ('Weapons' not in iconurl):
            continue

        #item rarity
        if 'explicitMods' in item.keys():
            mods = len(item['explicitMods'])
            if mods <= 2:
                rarity = 'magic'
            else:
                if 'flavourText' in item.keys():
                    rarity = 'unique'
                else:
                    rarity = 'rare'
        else:
            rarity = 'normal'

        #sockets
        sockets = len(item['sockets'])
```

```
                #links
                maxgroup = 1
                for s in item['sockets']:
                    groupcount = s['group']
                    if groupcount > maxgroup:
                        maxgroup += 1
                links = sockets - maxgroup

                #league
                league = item['league']

                #item level
                ilvl = item['ilvl']

                properties = item['properties']

                #phys, crit, aps
                for prop in properties:
                    if prop['name'] == 'Physical Damage':
                        physval = prop['values'][0][0].split('-')
                        phys = (float(physval[0]) + float(physval[1]))/2
                    if prop['name'] == 'Critical Strike Chance':
                        crit = float(prop['values'][0][0].strip('%'))
                    if prop['name'] == 'Attacks per Second':
                        aps = float(prop['values'][0][0])

                #price
                if 'note' in item.keys():
                    pricestring = item['note'].split()
                    if (pricestring[0] == '~price'):
                        price = pricestring

                itemdata = [price, rarity, sockets, links, league, ilvl, phys, crit, aps]
                itemtable.append(itemdata)
            return itemtable
```

```
In [17]: items = getitems(1000)
```

```
Unique users found: 105
Total items found: 2677
```

```
In [18]: #for i in range(10):
         #    print(items[3])

         itemdata = parseweapons(items)
```

```
In [19]: for i in range(len(itemdata)):
             print(itemdata[i])
```

```
In [77]: def priceconvert(price):
             '''change price to chaos from list'''
             prices = dict()
             prices['chaos'] = 1
             prices['ex'] = 105
             prices['exa'] = 105
             prices['exalted'] = 105
             prices['gcp'] = 1.1
             prices['gemc'] = 1.1
             prices['fus'] = 0.6
             prices['fuse'] = 0.6
             prices['alch'] = 0.3
             prices['alchemy'] = 0.3
             prices['jew'] = 0.15
             prices['chance'] = 0.13
             prices['div'] = 19
             prices['divine'] = 19
             prices['chisel'] = 0.27
             prices['cart'] = 0.27
             prices['scour'] = 0.5
             prices['blesse'] = 0.25
             prices['regal'] = 0.52
             prices['rega'] = 0.52
             prices['regr'] = 1.1
             prices['regret'] = 1.1
             prices['vaal'] = 1.1

             if len(price) != 3:
                 return -1
             else:
                 val = float(price[1])
                 if price[2] in prices:
                     return val*prices[price[2]]
                 else:
                     return -1

         def pricedata(items):
             '''change item prices to all chaos'''
             citem = []
             for item in items:
                 price = item[0]
                 features = item[1:]
                 cprice = priceconvert(price)
                 newf = [cprice] + features
                 citem.append(newf)
             return citem

         def cleanuniques(items):
```

```
            '''removes uniques'''
            nuitem = []
            for item in items:
                if item[1] != 'unique':
                    nuitem.append(item)
            return(nuitem)

        def listeditems(items):
            '''store only priced items'''
            pitem = []
            for item in items:
                if item[0] != -1:
                    pitem.append(item)
            return pitem
```

In [82]:
```
equalval = pricedata(itemdata)
clean = cleanuniques(equalval)
priced = listeditems(clean)
priced
```

Out[82]:
```
[[0.3, 'rare', 1, 0, 'Standard', 8, 13.5, 6.0, 1.62],
 [2.4, 'rare', 1, 0, 'Standard', 75, 95.0, 6.5, 1.3],
 [15.0, 'rare', 2, 1, 'Standard', 59, 128.5, 7.68, 1.15]]
```

In [83]:
```
import sklearn.preprocessing
```

In [93]:
```
#label encoding
data = numpy.array(priced)
y = data[:,0]
X = data[:,1:]
label = sklearn.preprocessing.LabelEncoder()
```

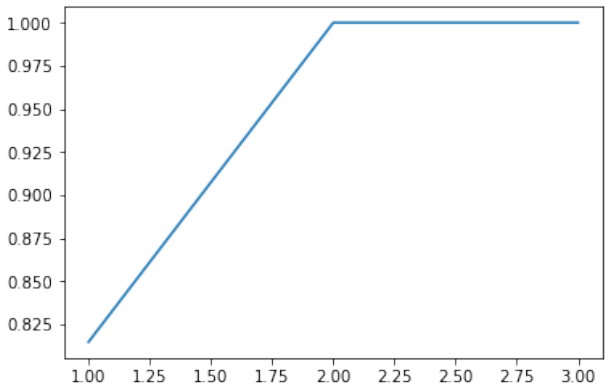
In [94]:
```
print(X[0])

X[:,0] = label.fit_transform(X[:,0])
X[:,3] = label.fit_transform(X[:,3])
print(X[0])
```

```
['rare' '1' '0' 'Standard' '8' '13.5' '6.0' '1.62']
['0' '1' '0' '0' '8' '13.5' '6.0' '1.62']
```

In [95]:
```
X = X.astype(float)
y = y.astype(float)
print(X)
```

```
[[  0.   1.   0.   0.   8.  13.5  6.   1.62]
 [  0.   1.   0.   0.  75.  95.   6.5  1.3 ]
 [  0.   2.   1.   0.  59.  128.5  7.68  1.15]]
```

```
In [91]: import sklearn.decomposition
         import sklearn.preprocessing

In [96]: #PCA elimates redundant features
         scaler = sklearn.preprocessing.StandardScaler()
         X[:,[1,2,4,5,6,7]] = scaler.fit_transform(X[:,[1,2,4,5,6,7]])
         pca = sklearn.decomposition.PCA(n_components=None)
         pcaX = pca.fit_transform(X)

In [101]: var = pca.explained_variance_ratio_
          cvar = numpy.cumsum(var)

          xrange = numpy.arange(len(cvar))
          xrange = xrange + numpy.ones(len(cvar))

          matplotlib.pyplot.plot(xrange, cvar, '-')
          matplotlib.pyplot.show()
```

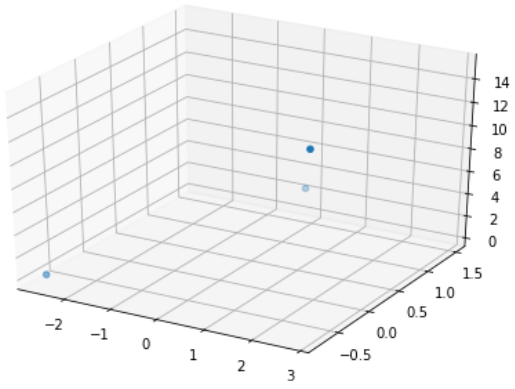



```
In [102]: fitpca = sklearn.decomposition.PCA(n_components=2)
          X = fitpca.fit_transform(X)
          print(X)

[[-2.63916616 -0.79941797]
 [-0.13312128  1.4889517 ]
 [ 2.77228745 -0.68953373]]


In [104]: print('X with PCA selected features:\n',X)
          print('y values:\n', y)

X with PCA selected features:
 [[-2.63916616 -0.79941797]
 [-0.13312128  1.4889517 ]
 [ 2.77228745 -0.68953373]]
```

```
y values:
 [  0.3   2.4  15. ]
```

```
In [105]: import sklearn.neighbors
          import sklearn.ensemble
          import sklearn.svm
          import mpl_toolkits.mplot3d
```

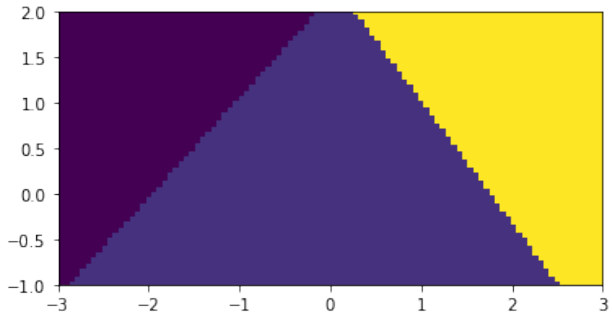
```
In [106]: #visualize priced item data since we have two PCA features
          figure = matplotlib.pyplot.figure()
          axes = mpl_toolkits.mplot3d.Axes3D(figure)

          axes.scatter(X[:,0], X[:,1], y)
          matplotlib.pyplot.show()
          #i wish we had more data :')
```




```
In [120]: def plotheatmap(classifer):
              x1range = numpy.linspace(-3,3, num=100)
              x2range = numpy.linspace(-1,2, num=100)
              imgarr = []

              for x2 in x2range:
                  row = []
                  for x1 in x1range:
                      point = numpy.array([x1, x2])
                      point = point.reshape(1,-1)
                      val = classifer.predict(point)[0]
                      row.append(val)
                  imgarr.append(row)

              matplotlib.pyplot.imshow(imgarr, extent=[-3,3,-1,2])
              matplotlib.pyplot.show()
```

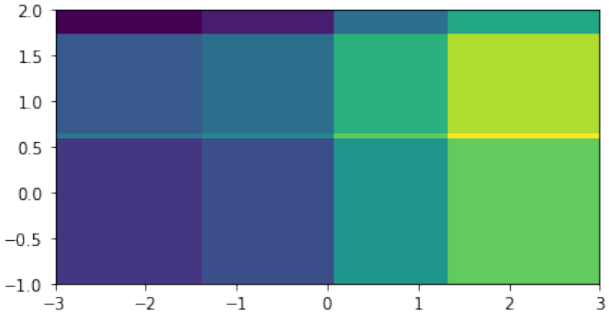
In [121]:
```
knnreg = sklearn.neighbors.KNeighborsRegressor(n_neighbors=1)
knnreg.fit(X, y)

#if we could run for longer and collect more data,
#would split into test and train sets, but cant really
#split a dataset of 3 observations

yhat = knnreg.predict(X)

mse = numpy.sum((yhat - y) * (yhat - y))
print('mean squared error KNN:', mse)

plotheatmap(knnreg)
```

```
mean squared error KNN: 0.0
```



In [122]:
```
tree = sklearn.ensemble.RandomForestRegressor()
tree.fit(X, y)

yhat = tree.predict(X)

mse = numpy.sum((yhat - y) * (yhat - y))
print('mean squared error Forest:', mse)

plotheatmap(tree)
```

```
mean squared error Forest: 74.088
```



In [124]:
```
svm = sklearn.svm.SVR(kernel='linear')
svm.fit(X, y)

yhat = svm.predict(X)

mse = numpy.sum((yhat - y) * (yhat - y))
print('mean squared error SVM:', mse)

plotheatmap(svm)
```

```
mean squared error SVM: 0.0216931058304
```