In [24]:
```
import numpy as np
import pandas as pd
import scipy as sp
import matplotlib
import sklearn as skl
```

In [25]:
```
df_org=pd.read_csv('Office.csv')
```

In [26]:
```
# df_org.describe()
df_org.head()
```

Out[26]:

	OrderDate	Region	Rep	Item	Units	Unit Price
0	4-Jul-14	East	Richard	Pen Set	62	4.99
1	12-Jul-14	East	Nick	Binder	29	1.99
2	21-Jul-14	Central	Morgan	Pen Set	55	12.49
3	29-Jul-14	East	Susan	Binder	81	19.99
4	7-Aug-14	Central	Matthew	Pen Set	42	23.95

In [27]:
```
df=pd.DataFrame()
df=pd.concat([df,df_org])
col_len = len(df['OrderDate'])
df['X']=np.random.uniform(0,100,col_len)
df['Y']=np.random.uniform(0,100,col_len)
```

In [28]:
```
df['Z']=(df['X']+df['Y'])/2
```

In [29]:
```
df.head()
```

Out[29]:

	OrderDate	Region	Rep	Item	Units	Unit Price	X	Y	Z
0	4-Jul-14	East	Richard	Pen Set	62	4.99	34.751314	73.323516	54.037415
1	12-Jul-14	East	Nick	Binder	29	1.99	10.829730	95.934536	53.382133
2	21-Jul-14	Central	Morgan	Pen Set	55	12.49	2.697159	93.102217	47.899688
3	29-Jul-14	East	Susan	Binder	81	19.99	24.962410	13.455831	19.209121
4	7-Aug-14	Central	Matthew	Pen Set	42	23.95	64.753100	84.984083	74.868591

In [30]:
```
numberofelements=col_len
ZZ=np.arange(numberofelements)
T=np.array(list(zip(df['X'],df['Y'],df['Z'],ZZ)))
```

In [31]:
```
df2=pd.DataFrame({'X':T[:,0],'Y':T[:,1],'Z':T[:,2],
                  'ZZ':T[:,3]})
```

In [32]:
```
df_comb=pd.concat([df_org, df2], axis=1, sort=False)
```

In [33]:
```
df_comb.head()
```

Out[33]:

	OrderDate	Region	Rep	Item	Units	Unit Price	X	Y	Z	ZZ
0	4-Jul-14	East	Richard	Pen Set	62	4.99	34.751314	73.323516	54.037415	0.0
1	12-Jul-14	East	Nick	Binder	29	1.99	10.829730	95.934536	53.382133	1.0
2	21-Jul-14	Central	Morgan	Pen Set	55	12.49	2.697159	93.102217	47.899688	2.0
3	29-Jul-14	East	Susan	Binder	81	19.99	24.962410	13.455831	19.209121	3.0
4	7-Aug-14	Central	Matthew	Pen Set	42	23.95	64.753100	84.984083	74.868591	4.0

In [34]:
```
df_comb.columns=df_comb.columns.str.replace('X','Demand')
df_comb.columns=df_comb.columns.str.replace('Y','Supply')
df_comb.columns=df_comb.columns.str.replace('ZZ','Index')
df_comb.columns=df_comb.columns.str.replace('Z','Projected Growth')
```

In [35]:
```
df_comb.head()
```

Out[35]:

	OrderDate	Region	Rep	Item	Units	Unit Price	Demand	Supply	Projected Growth	Inc
0	4-Jul-14	East	Richard	Pen Set	62	4.99	34.751314	73.323516	54.037415	0.0
1	12-Jul-14	East	Nick	Binder	29	1.99	10.829730	95.934536	53.382133	1.0
2	21-Jul-14	Central	Morgan	Pen Set	55	12.49	2.697159	93.102217	47.899688	2.0
3	29-Jul-14	East	Susan	Binder	81	19.99	24.962410	13.455831	19.209121	3.0
4	7-Aug-14	Central	Matthew	Pen Set	42	23.95	64.753100	84.984083	74.868591	4.0

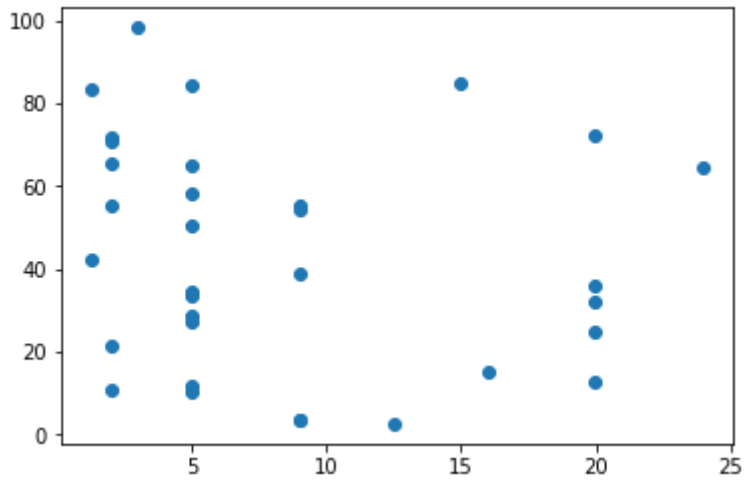
In [36]:
```
df_selctd=df_comb[(df_comb['Units']>20.0) & (df_comb['Unit Price']<100.0
) & (df_comb['Demand']<500.0)]
```

In [37]:
```
df_selctd.head()
```

Out[37]:

	OrderDate	Region	Rep	Item	Units	Unit Price	Demand	Supply	Projected Growth	Inc
0	4-Jul-14	East	Richard	Pen Set	62	4.99	34.751314	73.323516	54.037415	0.0
1	12-Jul-14	East	Nick	Binder	29	1.99	10.829730	95.934536	53.382133	1.0
2	21-Jul-14	Central	Morgan	Pen Set	55	12.49	2.697159	93.102217	47.899688	2.0
3	29-Jul-14	East	Susan	Binder	81	19.99	24.962410	13.455831	19.209121	3.0
4	7-Aug-14	Central	Matthew	Pen Set	42	23.95	64.753100	84.984083	74.868591	4.0

In [38]:
```
import matplotlib.pyplot as plt
plt.scatter(df_selctd['Unit Price'],df_selctd.Demand)
plt.show()
```



In [39]:
```
df_selctd.to_csv('Solution1.cvs')
```