FE 520 Assignment-1

1 Linear Regression 30 pts

```
class Linear_regression:


    def __init__(self, x, y, m, c, epochs, L):
        self.x = x
        self.y = y
        self.m = m
        self.c = c
        self.epochs = epochs
        self.L = L



    def gradient_descent(self) :
        for a in range(self.epochs):
            Dm=[]
            Dc=[]
            for i in range(len(self.x)):
                for j in range(len(self.x[i])):
                    ypredi = (self.x[i][j] *self.m) + self.c
                    Dm.append(self.x[i][j]*(ypredi-self.y[i]))
                    Dc.append(ypredi-self.y[i])
            dm = sum(Dm)/len(Dm)
            dc = sum(Dc)/len(Dc)
            self.m = self.m - self.L * dm
            self.c = self.c - self.L * dc
        return(self.m,self.c)


    def predict(self,x_new):
```

```
        # add your code here

         arr = []

         for i in (x_new):

             ypredi = (i *self.m) + self.c

             arr.append(ypredi)

         return(arr)
```

2 Credit Transaction data(30 points)

```
Total amount spending captured in this dataset 188040606.2299999
Total amount spend at WW GRAINGER 5089340.5600000005
Total amount spend at WM SUPERCENTER 157457.46
Total amount spend at GROCERY STORES 1271339.9799999997
```

3 Data Processing with Pandas (40 points)

```
  warn("Workbook contains no default style, apply openpyxl's default")
   Global Company Key  Data Date  Fiscal Year  Fiscal Quarter  ...  Stock Exchange Code CIK Number Active/Inactive Status Marker Current ISO Country Code - Incorporation
0                1380   20100331         2010               1  ...                   11      4447                          A                                        USA
1                1380   20100630         2010               2  ...                   11      4447                          A                                        USA
2                1380   20100930         2010               3  ...                   11      4447                          A                                        USA
3                1380   20101231         2010               4  ...                   11      4447                          A                                        USA
4                1380   20110331         2011               1  ...                   11      4447                          A                                        USA
5                1380   20110630         2011               2  ...                   11      4447                          A                                        USA
6                1380   20110930         2011               3  ...                   11      4447                          A                                        USA
7                1380   20111231         2011               4  ...                   11      4447                          A                                        USA
8                1380   20120331         2012               1  ...                   11      4447                          A                                        USA
9                1380   20120630         2012               2  ...                   11      4447                          A                                        USA

[10 rows x 175 columns]
   Global Company Key  Data Date  Fiscal Year  Fiscal Quarter  ...  Stock Exchange Code CIK Number Active/Inactive Status Marker Current ISO Country Code - Incorporation
0                1380   20100331         2010               1  ...                   11      4447                          A                                        USA
1                1380   20100630         2010               2  ...                   11      4447                          A                                        USA
2                1380   20100930         2010               3  ...                   11      4447                          A                                        USA
3                1380   20101231         2010               4  ...                   11      4447                          A                                        USA
4                1380   20110331         2011               1  ...                   11      4447                          A                                        USA
5                1380   20110630         2011               2  ...                   11      4447                          A                                        USA
6                1380   20110930         2011               3  ...                   11      4447                          A                                        USA
7                1380   20111231         2011               4  ...                   11      4447                          A                                        USA
8                1380   20120331         2012               1  ...                   11      4447                          A                                        USA
9                1380   20120630         2012               2  ...                   11      4447                          A                                        USA

[10 rows x 163 columns]
```

```
   Global Company Key  Data Date  Fiscal Year  ...  Selling, General and Administrative Expenses  Stock Exchange Code  CIK Number
0                 0.0   0.000000     0.000000  ...                                      0.123384                  NaN         0.0
1                 0.0   0.004910     0.000000  ...                                      0.127173                  NaN         0.0
2                 0.0   0.009836     0.000000  ...                                      0.134305                  NaN         0.0
3                 0.0   0.014778     0.000000  ...                                      0.178214                  NaN         0.0
4                 0.0   0.164204     0.142857  ...                                      0.168184                  NaN         0.0
5                 0.0   0.169113     0.142857  ...                                      0.149907                  NaN         0.0
6                 0.0   0.174039     0.142857  ...                                      0.141883                  NaN         0.0
7                 0.0   0.178982     0.142857  ...                                      0.196268                  NaN         0.0
8                 0.0   0.328407     0.285714  ...                                      0.084601                  NaN         0.0
9                 0.0   0.333317     0.285714  ...                                      0.074571                  NaN         0.0

[10 rows x 151 columns]
Correaltion Matrix ::

                                Current Assets - Other - Total  Current Assets - Total  Other Long-term Assets  Assets Netting & Other Adjustments
Current Assets - Other - Total                        1.000000                0.790047                0.637424                            0.047226
Current Assets - Total                                0.790047                1.000000                0.677142                           -0.081643
Other Long-term Assets                                0.637424                0.677142                1.000000                           -0.030717
Assets Netting & Other Adjustments                    0.047226               -0.081643               -0.030717                            1.000000
     Global Company Key S&P Domestic Long Term Issuer Credit Rating  ...  Active/Inactive Status Marker Current ISO Country Code - Incorporation
0                  1380                                        BBB-  ...                             A                                     USA
1                  1380                                        BBB-  ...                             A                                     USA
2                  1380                                         BBB  ...                             A                                     USA
3                  1380                                         BBB  ...                             A                                     USA
4                  1380                                         BBB  ...                             A                                     USA
..                  ...                                         ...  ...                           ...                                     ...
817              186989                                         BBB  ...                             A                                     USA
818              186989                                         BBB  ...                             A                                     USA
819              186989                                         BBB  ...                             A                                     USA
820              186989                                         BBB  ...                             A                                     USA
821              186989                                         BBB  ...                             A                                     USA

[822 rows x 168 columns]
```

```
   Global Company Key S&P Domestic Long Term Issuer Credit Rating  ...  Current ISO Country Code - Incorporation  Rate
0                1380                                        BBB-  ...                                     USA   9.0
1                1380                                        BBB-  ...                                     USA   9.0
2                1380                                         BBB  ...                                     USA   8.0
3                1380                                         BBB  ...                                     USA   8.0
4                1380                                         BBB  ...                                     USA   8.0
5                1380                                         BBB  ...                                     USA   8.0
6                1380                                         BBB  ...                                     USA   8.0
7                1380                                         BBB  ...                                     USA   8.0
8                1380                                         BBB  ...                                     USA   8.0
9                1380                                         BBB  ...                                     USA   8.0

[10 rows x 169 columns]
```