Company Analysis

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1 Financial Analysis of PEGA and CRM

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1.2 Introduction

Pegasystems (PEGA) and Salesforce (CRM) are software developing companies that make applications for marketing, sales, service, and operations. Pegasystems has a strong focus on customer relationship management applications and giving clients the tools to build their own applications. Salesforce has a similar focus, but the company offers more services in the cloud. The customer base for these companies includes a wide range of firms and individuals: the sales teams are regularly competing for the same future clients.

2 Import Data

```
In [ ]: import numpy as np
        import pandas as pd

In [105]: pega = pd.read_csv("pega.csv", index_col="figures")
          #Transpose
          pega = pega.T
          pega

Out[105]: figures  SalesGrowth  ChangeInNI  ChangeInLongTermDebt  TotalDebtRatio  \
          2012            0.11        1.16                   NaN            0.46
          2013            0.10        0.74                   NaN            0.49
          2014            0.16       -0.13                   NaN            0.50
          2015            0.16        0.09                   NaN            0.49
          2016            0.10       -0.26                   NaN            0.50

          figures  DebtEquityRatio  EquityMultiplier  ProfitMargin   ROA   ROE  \
          2012                0.86              1.86          0.05  0.05  0.09
          2013                0.96              1.96          0.07  0.07  0.14
          2014                0.99              1.99          0.06  0.06  0.11
          2015                0.94              1.94          0.05  0.06  0.11
          2016                1.00              2.00          0.04  0.04  0.08
```

```
         figures  ReceivablesTurnover  TotalAssetTurnover
         2012                    3.29                1.05
         2013                    2.99                0.95
         2014                    3.70                1.00
         2015                    3.15                1.09
         2016                    2.69                1.12
```

In [41]: crm = pd.read_csv("crm.csv", index_col="figures")
         #Transpose
         crm = crm.T
         crm

```
Out[41]: figures  SalesGrowth  ChangeInNI  ChangeInLongTermDebt  TotalDebtRatio  \
         2012            0.35      -39.28                  0.08            0.57
         2013            0.33        0.24                 12.78            0.66
         2014            0.33       -0.40                  0.12            0.62
         2015            0.24        0.78                 -0.07            0.60
         2016            0.26        4.09                  0.13            0.56

         figures  DebtEquityRatio  EquityMultiplier  ProfitMargin   ROA   ROE  \
         2012                1.32              2.32         -0.09 -0.05 -0.12
         2013                1.94              2.94         -0.05 -0.02 -0.07
         2014                1.62              2.62         -0.05 -0.03 -0.07
         2015                1.47              2.47         -0.01 -0.01 -0.01
         2016                1.27              2.27          0.02  0.01  0.03

         figures  ReceivablesTurnover  TotalAssetTurnover
         2012                    4.14                0.57
         2013                    3.31                0.45
         2014                    3.39                0.51
         2015                    3.19                0.54
         2016                    3.18                0.50
```

In [189]: snap = pd.read_csv("snapshot.csv", index_col="figures")
          #Transpose
          snap = snap.T
          snap

```
Out[189]: figures     market cap  price/book value  enterprise value    eps      pe  \
          crm       7.808200e+10               9.3      7.145000e+10  -0.11   66.70
          pega      4.009000e+09              11.1      4.280000e+09   0.62   82.64

          figures        ebitda     evebitda
          crm       464080000.0   153.960524
          pega       75150000.0    56.952761
```

2.0.1   Visualization Package Installation

In [109]: **import matplotlib.pyplot as plt**
   %**matplotlib** inline

3 Growth Analysis

To dial in on how how viable a company is in terms or revenue and earnings, it is critical to anaylze sales and net income data. Determining whether or not a company is able to produce growth and stability in sales and net income speaks to the value and future of the entire organization.

3.1 Sales Growth

```
In [143]: psg = pega.SalesGrowth.plot()
          csg = crm.SalesGrowth.plot(grid="on", title="PEGA and CRM Annual Sales Growth")
          csg.set_ylim(0.10,0.40)
          plt.xlabel("Year")
          plt.ylabel("Percent Change in Sales Growth")
          plt.legend(["PEGA", "CRM"]);
          plt.show()

          print('Average PEGA Sales Growth: ' + str(np.mean(pega.SalesGrowth)))
          print('Average CRM Sales Growth: ' + str(np.mean(crm.SalesGrowth)))
```
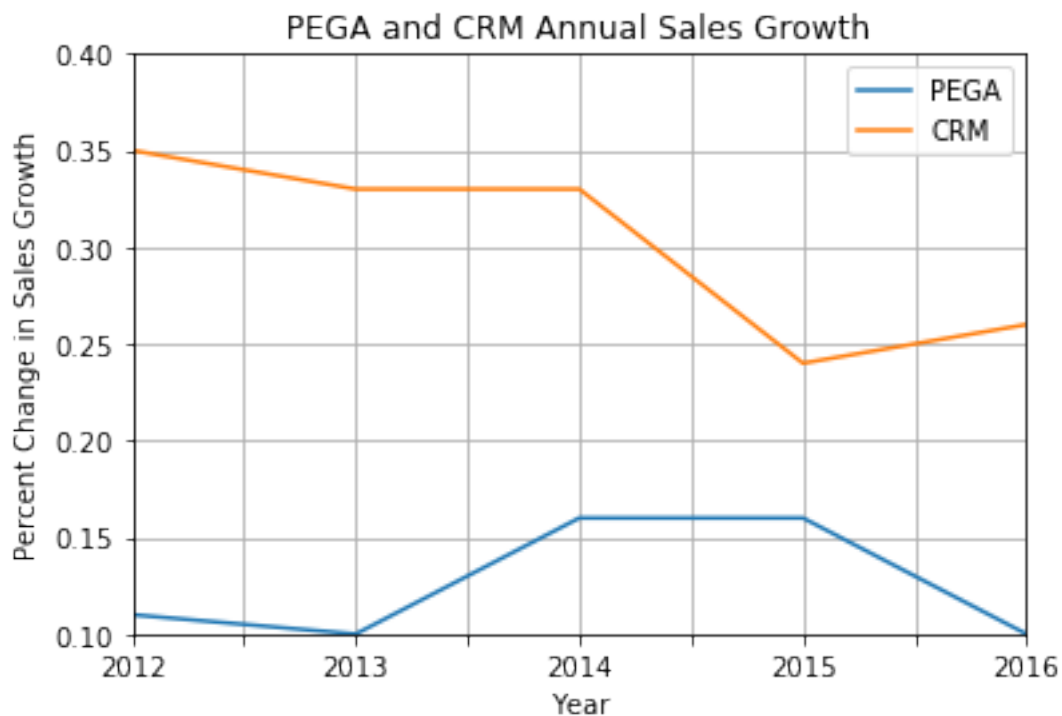


```
Average PEGA Sales Growth: 0.126
Average CRM Sales Growth: 0.302
```

While both companies have been increasing revenue annually, Saleforce appears to be reaching new, significant highs year after year. Over the past five years, Saleforce has seen an averge of 30% annual sales growth and Pegesystems has averaged at about 13%.

3.2 Change in Net Income

```
In [134]: pni = pega.ChangeInNI.plot()
          cni = crm.ChangeInNI.plot(grid="on", title="PEGA and CRM Annual Change in Net Income"
          cni.set_ylim(-40,5)
          plt.xlabel("Year")
          plt.ylabel("Percent Change in Net Income")
          plt.legend(["PEGA", "CRM"]);
          plt.show()
```
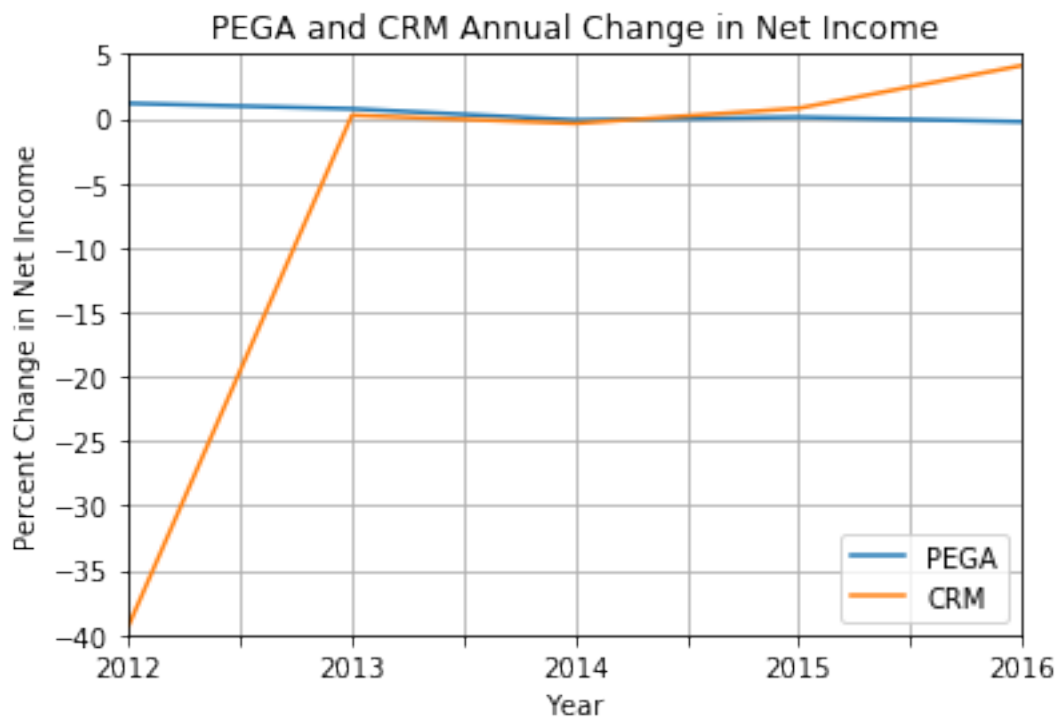

Salesforce has seen a massive flucation on net income figures in the last five years, averaging at a -697% annual change. While Salesforce is reporting net income with large deviation from year to year, Pegasytems remains stable. Pegasystems ability to produce consistent earning show maturity and defensiveness.

4 Debt and Leverage Analysis

Analyzing leverage ratios is a way to asses each company's ability to pay off debt. All companies have financial obligations, and how comfortably a company can pay for debts says a lot about its financial health. The inability to meet these obligations can result in selling assets or declaring bankruptcy.

4.1 Total Debt Ratio

```
In [139]: ptd = pega.TotalDebtRatio.plot()
          ctd = crm.TotalDebtRatio.plot(grid="on", title="PEGA and CRM Annual Total Debt Ratio"
          ctd.set_ylim(0.4,0.7)
          plt.xlabel("Year")
          plt.ylabel("Total Debt Ratio")
          plt.legend(["PEGA", "CRM"]);
          plt.show()
```
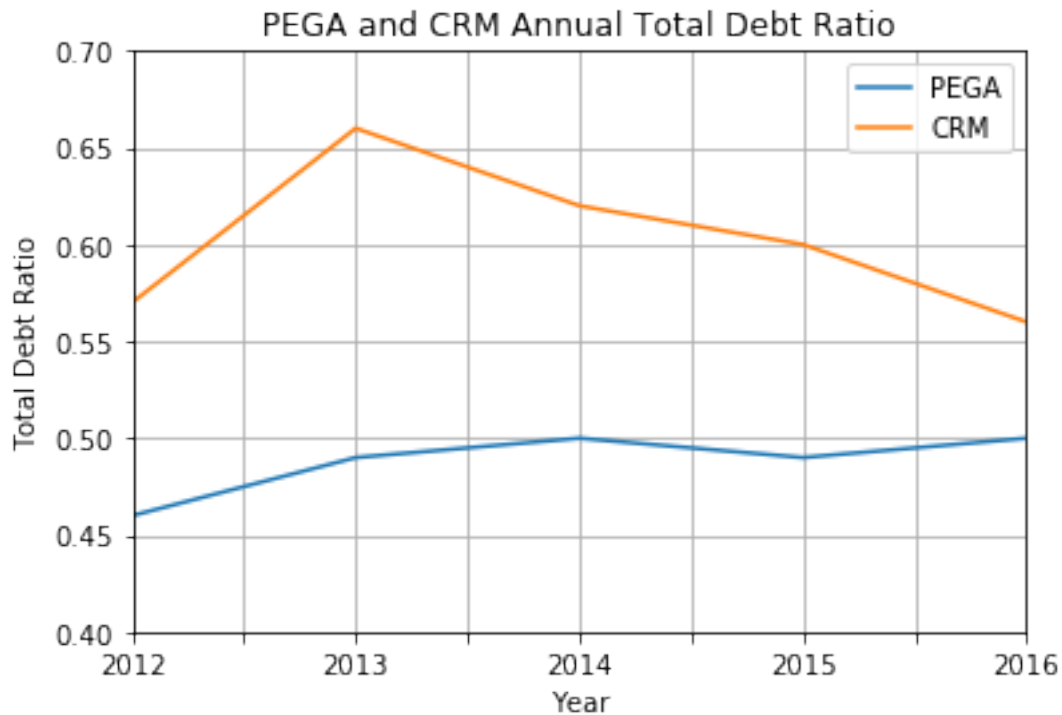

The graph shows Saleforce well above Pegasystems in terms of leverage. Showing a total debt ratio greater than 0.5 is concerning because that means a company operates with debt thats more than half the size of its assets.

4.2 Debt Equity Ratio

```
In [142]: pde = pega.DebtEquityRatio.plot()
          cde = crm.DebtEquityRatio.plot(grid="on", title="PEGA and CRM Annual Debt Equity Rati
          cde.set_ylim(0.8,2.0)
          plt.xlabel("Year")
          plt.ylabel("Debt Equity Ratio")
          plt.legend(["PEGA", "CRM"]);
          plt.show()
```

```
print('Average PEGA Debt Equity: ' + str(np.mean(pega.DebtEquityRatio)))
print('Average CRM Debt Equity: ' + str(np.mean(crm.DebtEquityRatio)))
```

PEGA and CRM Annual Debt Equity Ratio
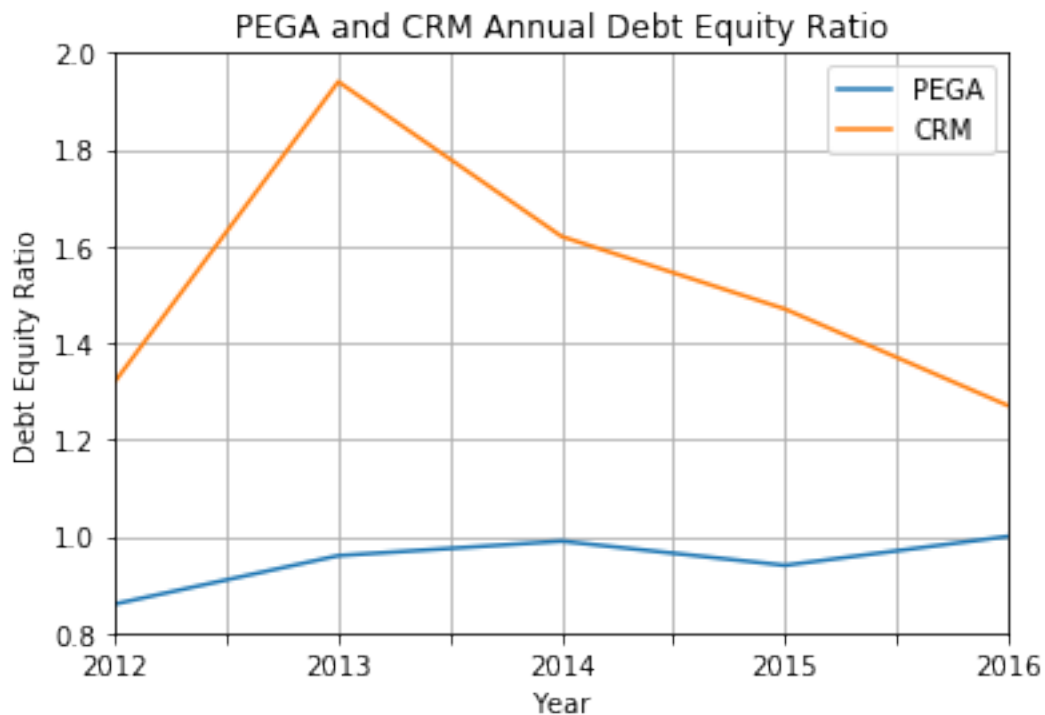

```
Average PEGA Sales Growth: 0.95
Average CRM Sales Growth:1.524
```

Over the past five years, Pega has had an average 95 cents of debt for every $1 of equity, while Salesforce is at $1.52. This puts Salesforce at a disadvantage because of the possible consequences of debt.

4.3 Change in Long-Term Debt

PEGA LTD is not reported on financials

```
In [140]: cltd = crm.ChangeInLongTermDebt.plot(grid="on", title="PEGA and CRM Annual Change in
          cltd.set_ylim(-0.1,15)
          plt.xlabel("Year")
          plt.ylabel("Percent Change in Long Term Debt")
          plt.legend(["CRM"]);
          plt.show()
```

PEGA and CRM Annual Change in Long-Term Debt
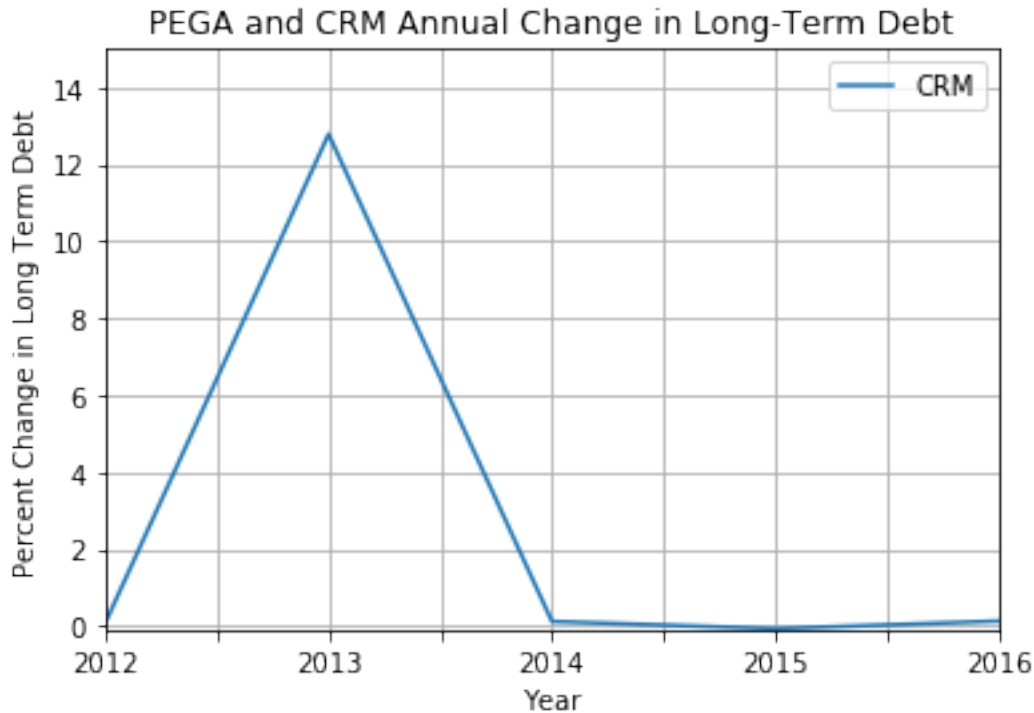
It becomes clear why Saleforce's total debt and debt equity ratios saw a large increase in 2013. It appears that Salesforce took on a large increase to debt in 2013. Looking at the total debt and debt equity ratios over the last three years, Saleforce is slowly decreasing its liabilities and becoming less leveraged.

5   Profitability Anaylsis

By analyzing the profitability ratios of Pegasystems and Salesforce, we can see a clear leader in how efficiently the company manages its assets and operations. The higher the figure in these ratios, the higher the earnings relative to expenses and other costs.

5.1   Net Profit Margin

```
In [145]: ppm = pega.ProfitMargin.plot()
          cpm = crm.ProfitMargin.plot(grid="on", title="PEGA and CRM Annual Net Profit Margin")
          cpm.set_ylim(-0.20,0.20)
          plt.xlabel("Year")
          plt.ylabel("Net Profit Margin")
          plt.legend(["PEGA", "CRM"]);
          plt.show()
```
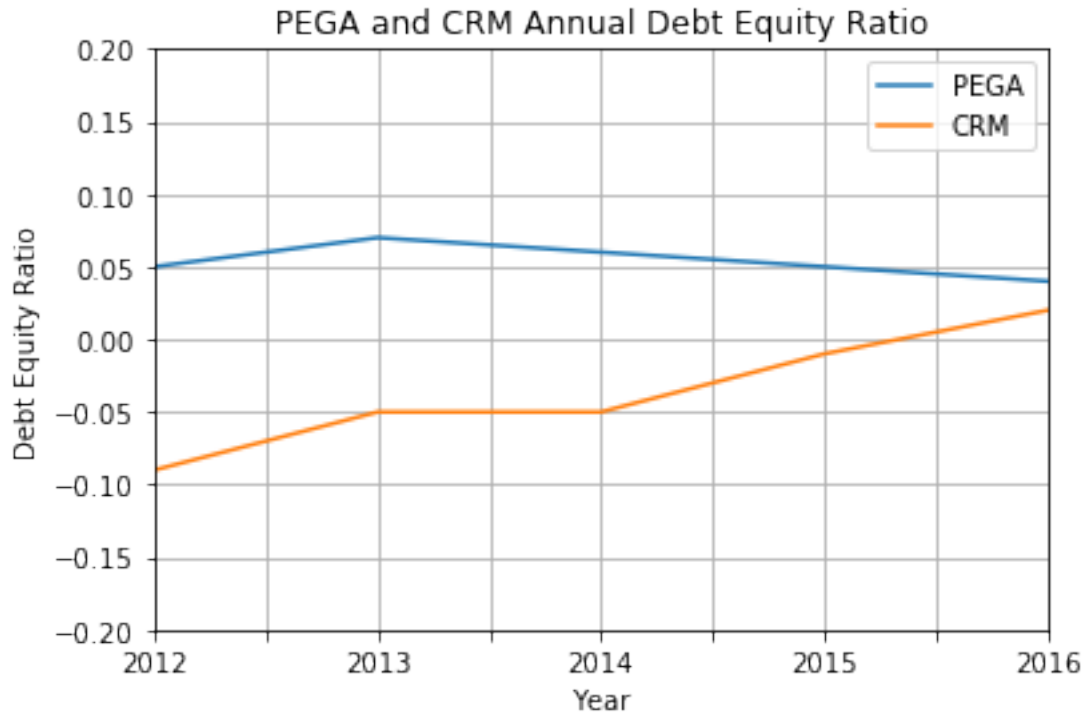
For Pega, the net profit margin in the last 5 years peaked at 7% in 2013 but is currently at 4%. Salesforce was down at -9% in 2012 but has recently resurfaced to 2%. The negative margins suggest that Salesforce was losing money from selling, but possibly making up losses with a higher volume of sales. Pega's ability to earn a profit is uniform and Salesforce is slowly catching up.
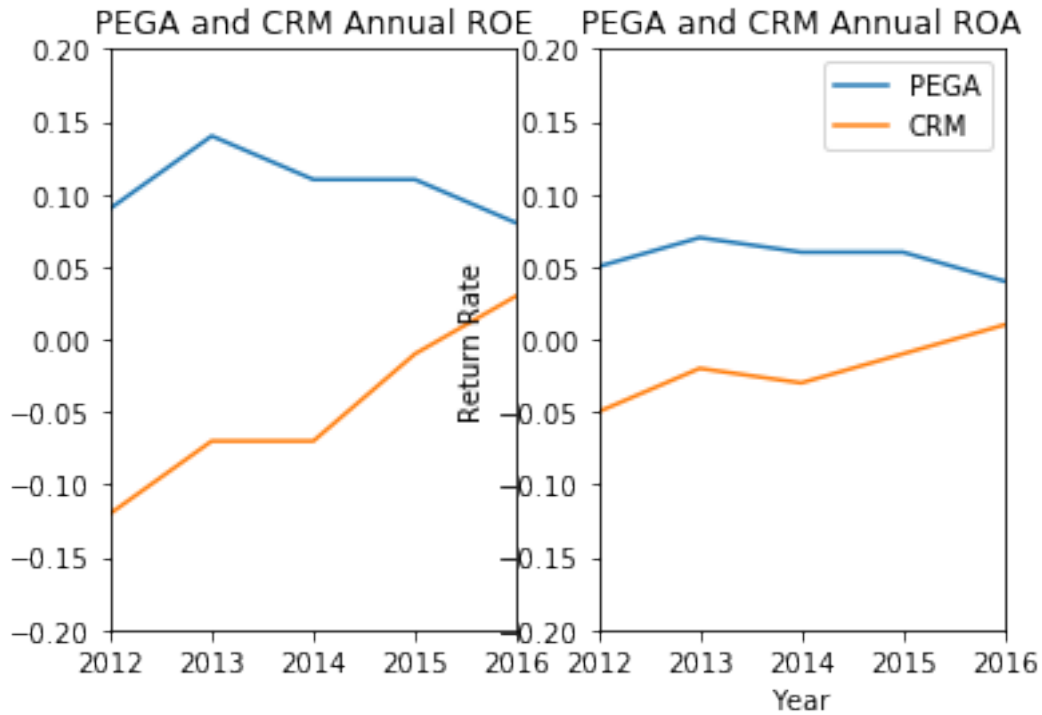
6 ROE and ROA

```
In [162]: fig, axs = plt.subplots(1,2)

          proe = pega.ROE.plot(ax=axs[0], title="PEGA and CRM Annual ROE")
          croe = crm.ROE.plot(ax=axs[0])


          proa = pega.ROA.plot(ax=axs[1], title="PEGA and CRM Annual ROA")
          croa = crm.ROA.plot(ax=axs[1])
          proa.set_ylim(-0.20,0.20)
          proe.set_ylim(-0.20,0.20)
          plt.xlabel("Year")
          plt.ylabel("Return Rate")
          plt.legend(["PEGA", "CRM"]);
          plt.show()
```

Pegasystems is keeping a higher percentage of its earnings over equity and assets. Being able to produce postive ROA and ROE consistently show that a company is efficient and in good financial health.

7 Size and Profitability
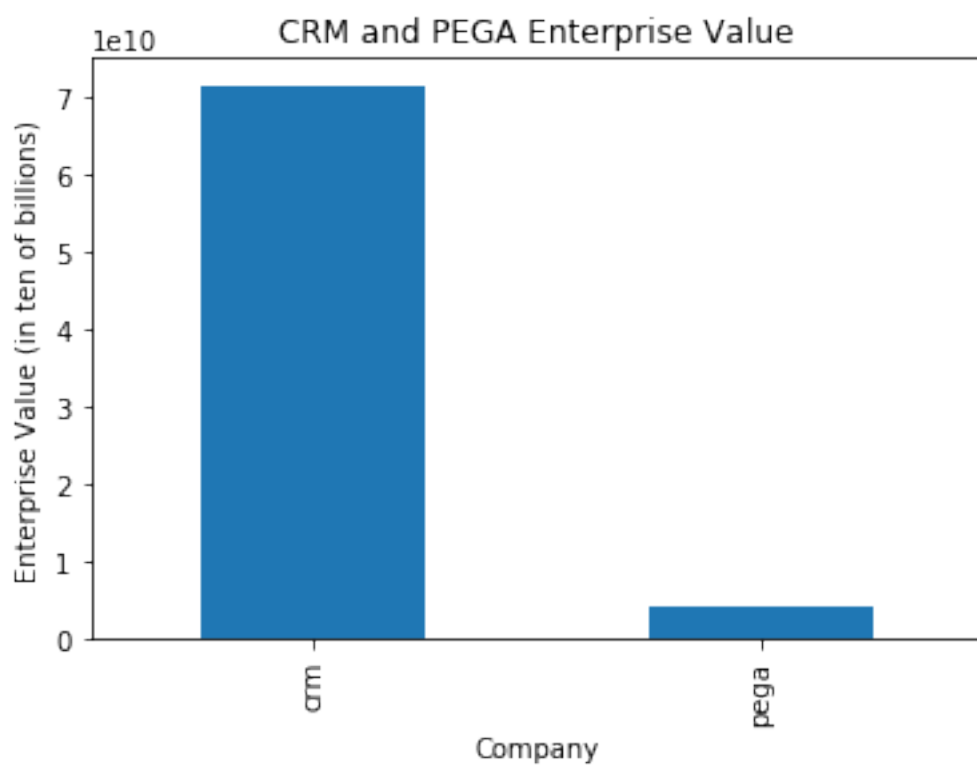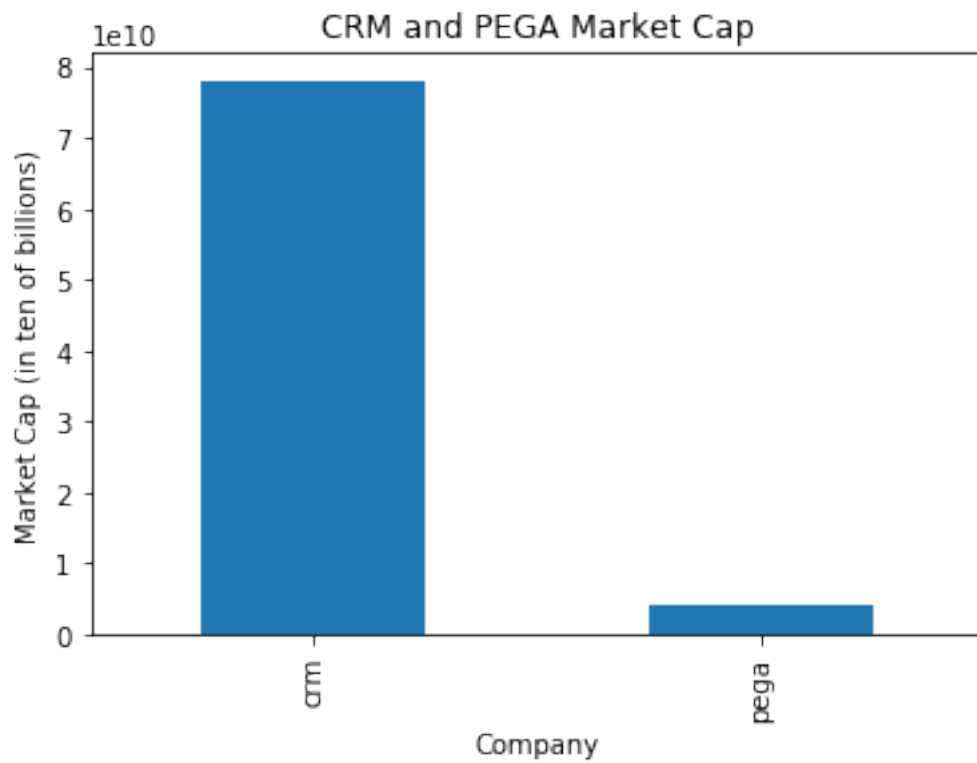
7.1 Company Size

```
In [176]: pmc = snap.marketcap.plot(kind="bar", title="CRM and PEGA Market Cap")

          plt.xlabel("Company")
          plt.ylabel("Market Cap (in ten of billions)")
          plt.show()

          pev = snap.enterprisevalue.plot(kind="bar", title="CRM and PEGA Enterprise Value")

          plt.xlabel("Company")
          plt.ylabel("Enterprise Value (in ten of billions)")
          plt.show()
```

CRM and PEGA Market Cap
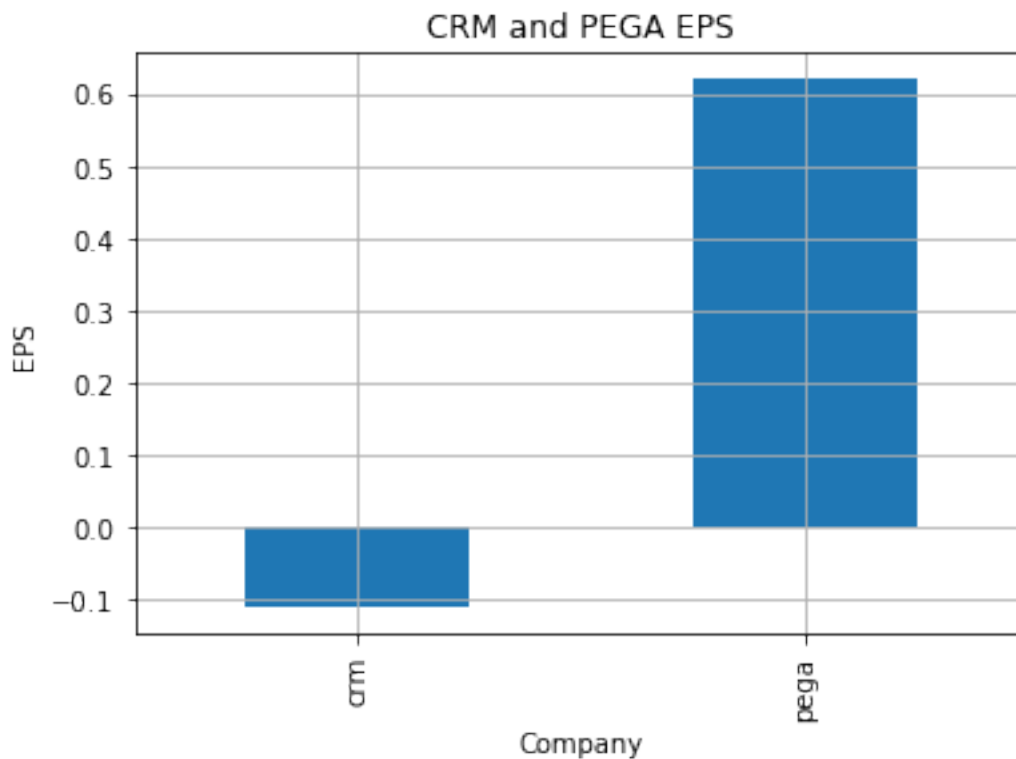

CRM and PEGA Enterprise Value

Salesforce is much larger in both market cap and enterprise value. When comparing these companies based on ratios, some of the figures are so similar, it's suprising to see how massive one is compared to the other. All finances at Salesforce are run at much higher capacity.

7.2 Profitability Measures

7.2.1 Earning Per Share

```
In [186]: peps = snap.eps.plot(kind="bar", title="CRM and PEGA EPS", grid=True)

          plt.xlabel("Company")
          plt.ylabel("EPS")
          plt.show()
```
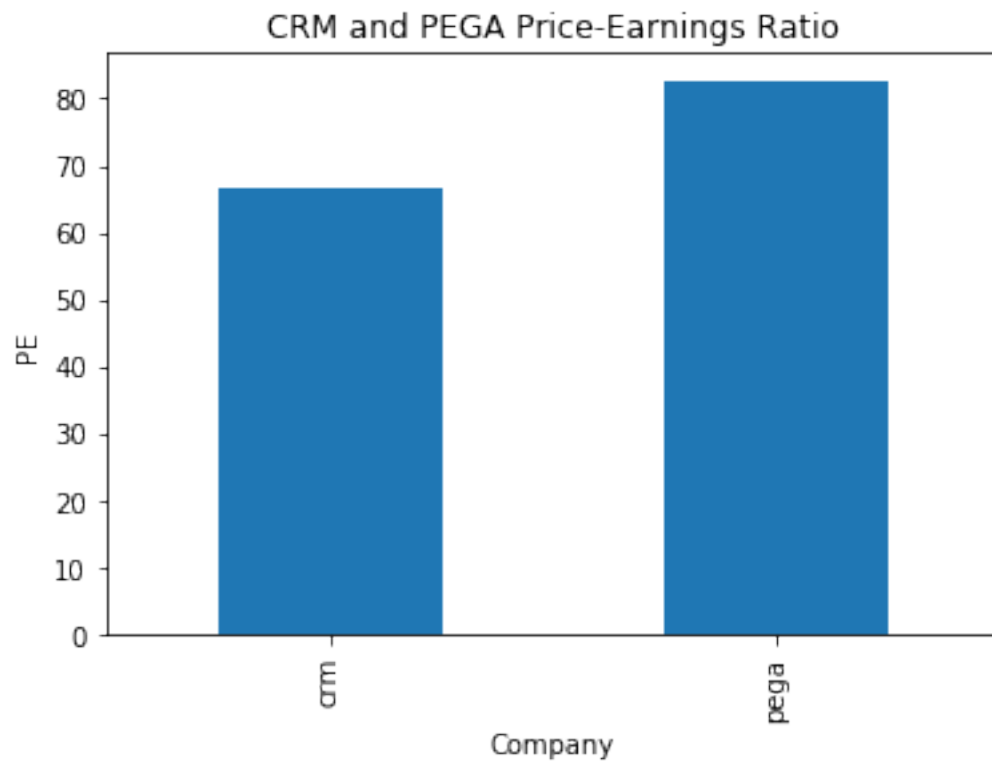

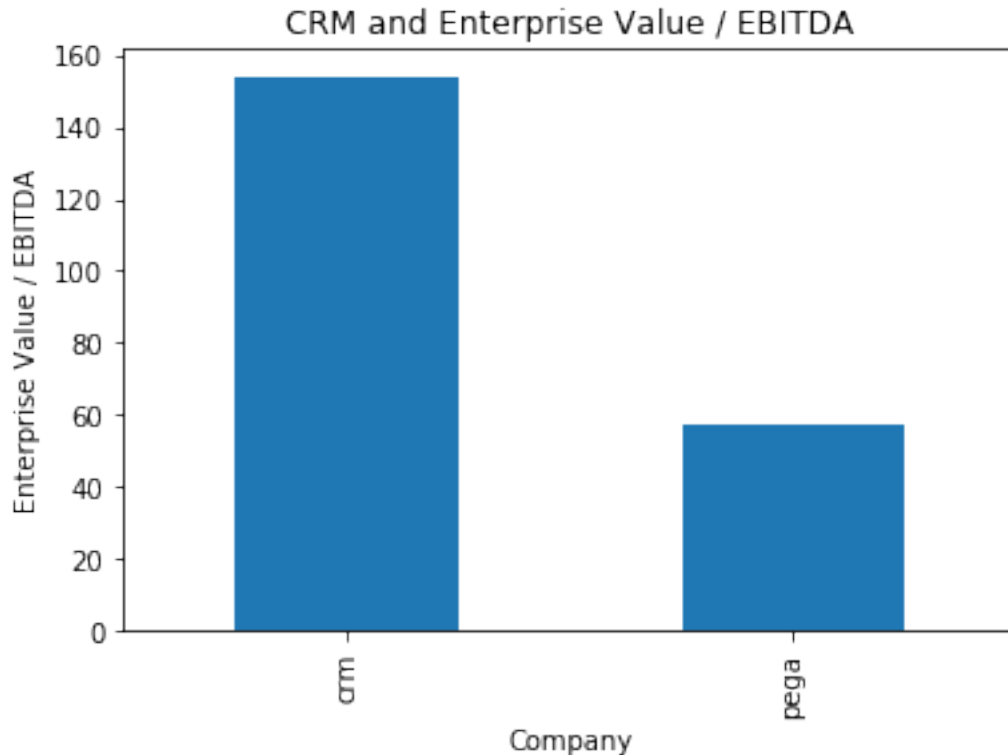### 7.2.2 PE and Enterprise Value/EBITDA

```
In [187]: ppe = snap.pe.plot(kind="bar", title="CRM and PEGA Price-Earnings Ratio")

          plt.xlabel("Company")
          plt.ylabel("PE")
          plt.show()
```

CRM and PEGA Price-Earnings Ratio


```
In [191]: peve = snap.evebitda.plot(kind="bar", title="CRM and Enterprise Value / EBITDA")

          plt.xlabel("Company")
          plt.ylabel("Enterprise Value / EBITDA")
          plt.show()
```

CRM and Enterprise Value / EBITDA

According tot the PE ratio, investers have a lot of faith in the futures of Salesforce and Pegasystems. Investors are willing to pay about \$82 for \$1 of Pegasystems earnings and \$66 for Salesforce. Salesforce has a suprisingly high PE considering the company currently has a negative EPS of -0.11 and very high Enterprise Value/EBITDA ratio.

8   Conclusion

In the last five years, both Salesforce and Pegasystems have improved their financial health. Even though these two companies are very different in size, these ratios give an insight into their financials. Pega proves to be the more mature company. Pega is doing very well based on not being highly-leveraged and consistently reporting positive returns on assets and equity. However, Salesforce isn't too far behind: financials reported in 2016 show the company improving quickly with a 409% boost in net income.

In [ ]: