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In [1]: import sys
        sys.path.append("../")

        from connector.cnxn import server_access
        import pandas as pd
```

Build Universe

- Identify stocks having Enterprise Value greater than 1 Billion.
- Assuming that we need to find universe for 2017 we would look for companies based on financial reports of Q3'2016 EV.
- Q4'2016 data will be available once Q1'2017 starts therefore we opt for Q3'2016.

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In [2]: engine = server_access()

        universe_sql = '''
        select symbol from tbl_historical_ev where date = '2016-09-30' and enterpriseValue >
        order by enterpriseValue desc
        '''

        universe_df = pd.read_sql(universe_sql, engine)
        universe_list = universe_df.symbol.to_list()
```

At this point we have a total of 490 stocks in our universe, first step is to compute company's **earnings yield** ($EBIT \div EnterpriseValue$)

$$EBIT = Netincome + interestexpenses + taxes$$

$$EBITDA = Netincome + interestexpense + taxes + depreciation + amortization$$

Based on above formula we derive EBIT from EBITDA using the below formula

$$EBIT = EBITDA - depreciation - amortization$$

Derive working capital and Net Fixed Assets

$$WorkingCapital = CurrentAssets - CurrentLiabilities$$

$$NetFixedAssets = TotalFixedAssets - AccumulatedDepreciation$$

$$ReturnOnCapital = [EBIT \div (NetFixedAssets + WorkingCapital)]$$

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In [3]: data_sql = '''
        select a.symbol,a.enterpriseValue, b.[totalCurrentAssets], b.[totalCurrentLiabilitie
        b.[accumulatedOtherComprehensiveIncomeLoss] accumulatedDepreciation, c.ebitda, c.[de
        from tbl_historical_ev a
        left join tbl_balance_sheet b on a.symbol = b.symbol
        left join [dbo].[tbl_income_statement] c on a.symbol = c.symbol
        where a.date = '2016-09-30' and a.enterpriseValue > 1000000000 and b.calendarYear =
        and c.calendarYear = '2016' and c.period = 'Q3'
        order by a.enterpriseValue desc
        '''

        df = pd.read_sql(data_sql, engine)

        # convert to numeric
        df.ebitda = df.ebitda.astype(float).fillna(0.0)
        df.depreciationAndAmortization = df.depreciationAndAmortization.astype(float).fillna
        df.totalCurrentAssets = df.totalCurrentAssets.astype(float).fillna(0.0)
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df.totalCurrentLiabilities = df.totalCurrentLiabilities.astype(float).fillna(0.0)
df.fixedAsset = df.fixedAsset.astype(float).fillna(0.0)
df.accumulatedDepreciation = df.accumulatedDepreciation.astype(float).fillna(0.0)

# compute earnings yield
df['earnings_yield'] = (df.ebitda - df.depreciationAndAmortization) \
/ df['enterpriseValue']
df['ReturnOnCapital'] = (df.ebitda - df.depreciationAndAmortization) \
/ ((df.fixedAsset - df.accumulatedDepreciation) + (df.totalCurrentAssets - df.total

```

In [4]:

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# map all symbols with their respective industry
ticker_mapping_sql = '''
select * from tbl_tickers
'''

ticker_mapping = pd.read_sql(ticker_mapping_sql, engine)

analysis_df = df[['symbol', 'earnings_yield', 'ReturnOnCapital']]

analysis_df = analysis_df.set_index('symbol').join(ticker_mapping.set_index('Ticker'))

# remove utilities and financials companies
analysis_df = analysis_df[~analysis_df.Industry.isin(['UTILITIES', 'DIVERSIFIED FINAN

# discard those for which industry is unknown
analysis_df = analysis_df[~analysis_df.Industry.isna()]

```

In [5]:

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# sort values based on Earnings Yield and Return on Capital
analysis_df = analysis_df.sort_values(by=['earnings_yield', 'ReturnOnCapital'], asce

```

In [6]:

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# pick top 20 tickers
picked_symbols = analysis_df.index[:30]

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In [7]:

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analysis_df.head(30)
```

Out[7]:

	earnings_yield	ReturnOnCapital	Industry	Sector	Industry_Group
GRVY	0.329351	0.111498	MEDIA & ENTERTAINMENT	COMMUNICATION SERVICES	Entertainment
VEON	0.312699	0.065102	TELECOMMUNICATION SERVICES	COMMUNICATION SERVICES	Wireless Telecommunication Services
CHRS	0.077994	0.663432	PHARMACEUTICALS, BIOTECHNOLOGY & LIFE SCIENCES	HEALTH CARE	Biotechnology
UAL	0.064019	0.090308	TRANSPORTATION	INDUSTRIALS	Airlines
HA	0.062413	0.099858	TRANSPORTATION	INDUSTRIALS	Airlines
PENN	0.058316	0.057177	CONSUMER SERVICES	CONSUMER DISCRETIONARY	Hotels, Restaurants & Leisure
UTHR	0.057762	0.151973	PHARMACEUTICALS, BIOTECHNOLOGY & LIFE SCIENCES	HEALTH CARE	Biotechnology
ESGR	0.057107	9.804015	INSURANCE	FINANCIALS	Insurance

	earnings_yield	ReturnOnCapital	Industry	Sector	Industry_Group
IDCC	0.056556	0.211524	SOFTWARE & SERVICES	INFORMATION TECHNOLOGY	Software
IAC	0.056430	0.057331	MEDIA & ENTERTAINMENT	COMMUNICATION SERVICES	Interactive Media & Services
JBLU	0.055655	0.055228	TRANSPORTATION	INDUSTRIALS	Airlines
CMLS	0.050412	0.225845	MEDIA & ENTERTAINMENT	COMMUNICATION SERVICES	Media
MHLD	0.042805	0.109462	INSURANCE	FINANCIALS	Insurance
ARLP	0.042343	0.077429	ENERGY	ENERGY	Oil, Gas & Consumable Fuels
GILD	0.037117	0.343328	PHARMACEUTICALS, BIOTECHNOLOGY & LIFE SCIENCES	HEALTH CARE	Biotechnology
STLD	0.037037	0.053595	MATERIALS	MATERIALS	Metals & Mining
SSRM	0.034478	0.039138	MATERIALS	MATERIALS	Metals & Mining
AAL	0.034102	0.045542	TRANSPORTATION	INDUSTRIALS	Airlines
RUN	0.032486	0.015551	CAPITAL GOODS	INDUSTRIALS	Electrical Equipment
AMKR	0.032043	0.035858	SEMICONDUCTORS & SEMICONDUCTOR EQUIPMENT	INFORMATION TECHNOLOGY	Semiconductors & Semiconductor Equipment
FSLR	0.031614	0.029025	SEMICONDUCTORS & SEMICONDUCTOR EQUIPMENT	INFORMATION TECHNOLOGY	Semiconductors & Semiconductor Equipment
TSEM	0.031488	-0.195960	SEMICONDUCTORS & SEMICONDUCTOR EQUIPMENT	INFORMATION TECHNOLOGY	Semiconductors & Semiconductor Equipment
PAAS	0.031421	0.038716	MATERIALS	MATERIALS	Metals & Mining
CAR	0.029427	0.036858	TRANSPORTATION	INDUSTRIALS	Road & Rail
GT	0.029373	0.031096	AUTOMOBILES & COMPONENTS	CONSUMER DISCRETIONARY	Auto Components
NSIT	0.029291	0.042214	TECHNOLOGY HARDWARE & EQUIPMENT	INFORMATION TECHNOLOGY	Electronic Equipment, Instruments & Components
GNTX	0.028501	0.095705	AUTOMOBILES & COMPONENTS	CONSUMER DISCRETIONARY	Auto Components
MYGN	0.028465	0.135853	PHARMACEUTICALS, BIOTECHNOLOGY & LIFE SCIENCES	HEALTH CARE	Biotechnology
MERC	0.028313	0.024413	MATERIALS	MATERIALS	Paper & Forest Products
ALGT	0.027686	0.079228	TRANSPORTATION	INDUSTRIALS	Airlines