HW01 – Appleton Uniforms

Appleton Uniforms provides occupational apparel and manages uniform programs for customers in the transportation, utilities, telecommunications, foodservice, hospitality, mining, and other industries, as well as government organizations.

Operations
Some 70% of the Appleton business comes from industrial laundries, resellers, and distributors that supply customized workwear to employers for production, service, and professional personnel.

Geographic Reach
Tennessee-based Appleton Uniforms operates its business throughout North America.

Strategy
Unique to the uniforms business is that sales are tied to employment levels in the industrial and service sectors, which have suffered during the economic downturn. Because it serves industrial laundries and distributors, rapid delivery of products in a broad range of sizes is one of its advantages. One uniform-friendly area that has grown is security. To this end, Appleton Uniforms inked an $85 million contract from the US Department of Homeland Security's Customs and Border Protection for the supply of uniform items and services. In 2013 Appleton Uniforms was awarded a $50 million contract with the US Department of Homeland Security to outfit its Transportation Security Administration agents.

The company is working to grow its business through several initiatives. It's looking to extend the capabilities of its products and services to new industrial and service apparel distribution channels, markets, and geographies. Appleton Uniforms is also reaching into consumer channels with its traditional business-to-business workwear brands.

Competitors
Carhartt, Inc., Cintas Corporation, Levi Strauss & Co., Superior Uniform Group, Inc., and Williamson-Dickie Manufacturing Company

The Data

Appleton.csv, lot.csv, mfg.csv

For this assignment, you are given data for 2016 that includes orders from Appleton's customers. The data is an aggregate of each customer and its quantities ordered per SKU.

Here is a summary of the data:

RangeIndex: 14497 entries, 0 to 14496
Data columns (total 32 columns):

- Item# - 14497 non-null object – Unique identifier
- Parent# - 14497 non-null object – Customer ID
- Lot - 14497 non-null object – Unique location of uniform item
- Lot Description - 14497 non-null object – description of garments in Lot
- Dim1 - 14497 non-null object – Dimension 1 of garment (such as Sm)
- Dim2 - 14497 non-null object – Dimension 2 of garment (such as 32 waist)
- SKU - 14497 non-null object – unique identifier for that customer and the garment
- Release date - 14497 non-null object – date initially started for customer
- Customer orders - 12069 non-null float64 – number of ordered by customer for this garment
- Units shipped 11940 non-null float64 – number of total shipped units of this garment
- Shipped COGS 11940 non-null float64 – total cost of garments shipped
- On Hand @FC 14159 non-null float64 – number of garments in inventory
- Sellable on hand cost 14159 non-null float64 – Total COG for on hand inventory
- Unsellable on hand units 14159 non-null float64 – Garments on hand that are defected and not sellable
- Vendor units received 10504 non-null float64 – number of garments received by vendor to sell
- Open PO Qty 1505 non-null float64 – Open POs at the end of 2016
- Unfilled customer ordered units 507 non-null float64 – unfilled orders
- Units returned by customers - 4596 non-null float64 – units returned due to size or defective garments
- Category 14497 non-null object – general category
- Subcategory 14497 non-null object - subcategory
- MFG model number 14497 non-null object – Unique number for garment from MFG
- Replenishment code / Item availability 14497 non-null object – type of garment
- Inventory turns - 11636 non-null float64 –days that garments are on hand prior to sale
- Style number 14497 non-null object – unique number for this SKU
- Color 14497 non-null object – actual color for this garment
- Color count 14497 non-null int64 – number of different colors for this type of garment
- Ordered product sales 12069 non-null float64
- Revenue 11940 non-null float64 – total revenue for this SKU per Customer
- Brand code 14497 non-null object – Brand of the uniform item

Guidelines for this homework assignment

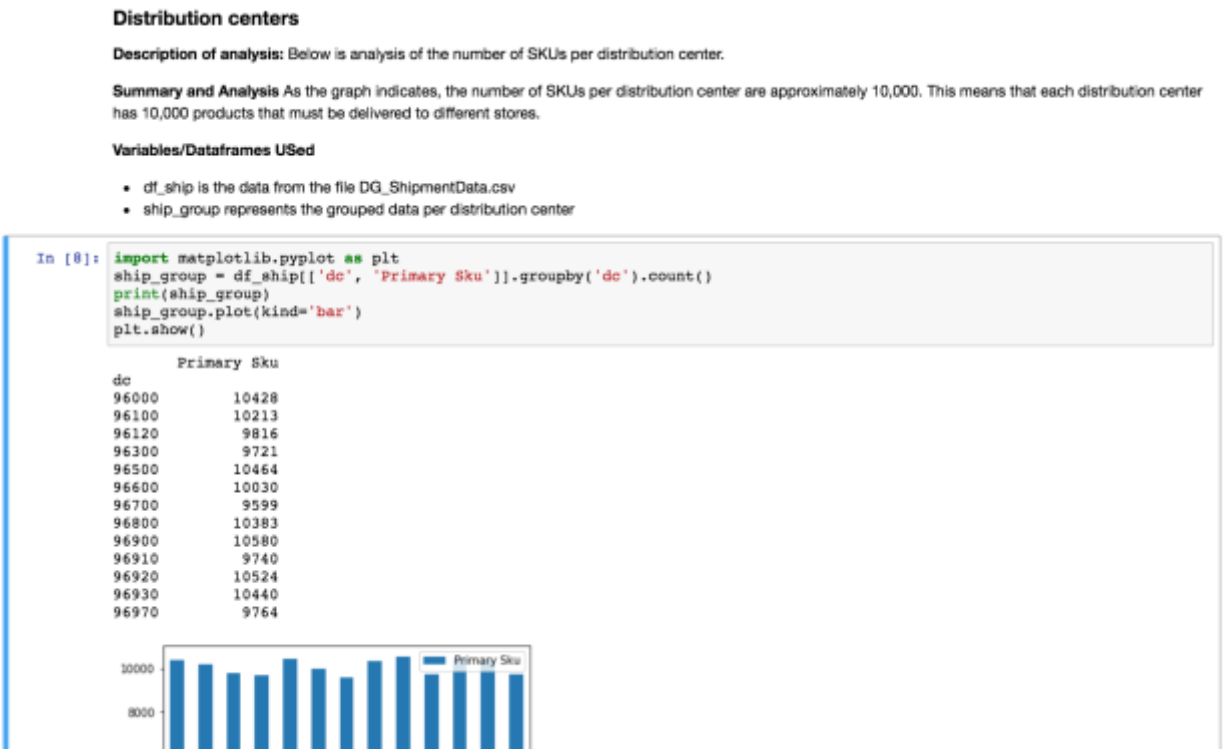
- Download the files with the data from Appleton, Inc.
- Aggregate the data into one dataframe. First, you will need to aggregate as a dataframe
    - The data should be in the same order as listed in the data section.
    - Recode the following columns so that all NaN are coded as 0.
        - Customer orders
        - Units shipped
        - Shipped COGS
        - On Hand @FC
        - Sellable on hand cost
        - Unsellable on hand units
        - Vendor units received
        - Open PO Qty
        - Unfilled customer ordered units
        - Units returned by customers
    - Add a column labeled 'Defective' that:
        - Divides 'Units returned by customers' and by 'Units shipped'
            - If 'Units shipped' is 0, then the value should be NaN
    - Add a column labeled 'Defective Status' that:
        - Looks at the 'Defective' column and if it is less than 0.1, it is "High Quality". If it is 0.1 or above, it is labeled as "Low Quality". If 'Defective' is NaN, then 'Defective Status' should be "No 2016 Sales".
    - Export as a csv file and name it Appleton_Comprehensive.csv.
- Using Appleton_Comprehensive.csv, answer and explore the following:
    - Provide descriptive analysis of each of the subcategories
        - Slice and group based on each of the subcategories
        - Use visual charts and aggregate descriptive statistics to indicate the sales volume, units shipped, defective or any other insight that you feel is important to view.
    - Explore the data based on each customer (Parent #).
        - Who are the best customers?
        - Who are the customers that are ideal?
        - Who are the customers that are not ideal?
        - Which are the most profitable and which ones are not profitable.
    - Explore the data for sales, defective garments, and profitability based on brands.
- Overall, you must include:
    - The use of dataframes.
    - The use of different plots/charts. It is your choosing, but it must make sense and be relevant to the analysis that you are trying to convey.
    - The use of markdown with headings, paragraphs, bullet point.
    - All work must be included in your HW01_LastNameFirstInitial.ipynb file.
    - All analysis should have a heading (###heading 3) and a summary/description of the analysis. (See Figure 1)

To turn in

All code and output MUST be in your Jupyter notebook. Name the File **HW01_LastNameFirstInitial.ipynb**.

All files MUST be in a folder named HW01_LastNameFirstInitial, it must include:

- HW01_LastNameFirstInitial.ipynb
- A folder named data
    - Appleton.csv
    - lot.csv
    - mfg.csv
    - Appleton_Comprehensive.csv



Distribution centers

Description of analysis: Below is analysis of the number of SKUs per distribution center.

Summary and Analysis As the graph indicates, the number of SKUs per distribution center are approximately 10,000. This means that each distribution center has 10,000 products that must be delivered to different stores.

Variables/Dataframes USed

- df_ship is the data from the file DG_ShipmentData.csv
- ship_group represents the grouped data per distribution center

```
In [8]: import matplotlib.pyplot as plt
ship_group = df_ship[['dc', 'Primary Sku']].groupby('dc').count()
print(ship_group)
ship_group.plot(kind='bar')
plt.show()
```

```
       Primary Sku
dc
96000        10428
96100        10213
96120         9816
96300         9721
96500        10464
96600        10030
96700         9599
96800        10383
96900        10580
96910         9740
96920        10524
96930        10440
96970         9764
```


Figure 1: Example of output within your Jupyter Notebook.

Zip the folder and submit it through the D2L Dropbox.