

## Sales Forecasting & Ordering

### Goal

Build a model to accurately predict unit sales of items by ASIN and ordering region. Should be able to place an order for varying periods (1, 4, 7 weeks) and be able to assess accuracy (e.g. historic out-of-sample prediction errors, or method of choice) to decide whether to place order as is or if additional analysis is needed.

### Background

Pattern places orders regularly with brands and needs to predict how many sales will occur in a given period. If Pattern doesn't order enough, it will sell out early and miss potential sales. If Pattern orders too much, it ties money up in inventory and loses available warehouse space for products that could sell.

Since product availability and lead times vary by supplier, it's important to accurately predict product sales to maximize value for Pattern and its clients.

### Notes

While the language chosen to build the model is open to anything, Pattern uses Python for its scripts and is preferable if same results are yielded. Results are paramount to language.

### Vocabulary

**3PN:** Third party network. Pattern uses a third-party network to sell some of its items.

**ASIN:** Amazon Standard Identification Number

**iServe:** Pattern's prior name

**Pending:** An order has been placed but has not charged the payment method

**SNS:** Subscribe and save. Amazon subscriptions

**VAT:** Value-Added Tax.

## Data Set

### training\_data.csv

This data set contains all information that is used to predict sales quantities. You will need to sum the data to make predictions on the proper granularity. However greater granularity is provided in case it's useful. For example, the vendor name by prove useful especially with sales on new products.

Column	Notes
PRIMARY_ID	Key for rows. Granularity - product id for items sold by iServe (Pattern) and seller_asin_id for 3PN items.
PRODUCT_ID	Id created using the unique combination of sku and country
SELLER_ASIN_ID	Id created for a particular 3PN seller/asin combination
ASIN	Amazon Standard Identification Number. Id for items on Amazon's site
VENDOR_NAME	Name of partner
COUNTRY_NAME	Name of the country where the item was sold
COUNTRY_REGION	e.g. China (CN), Europe (EU), Flinn–Engdahl (FE), Indai (IN), North America (NA).
ORDERING_REGION	Region (e.g. Australia (AU), Canda (CA), Europe (EU), United States of America (US)) where there order will be placed for.
MARKETPLACE	Marketplace in which the order took place (Amazon, Walmart, etc)
DATE	Date the order was placed
CURRENCY_CODE	Currency the order was purchased with
RATE	Currency exchange rate for the currency used in the purchase for that date (to get convert to USD, do sales/rate)
VAT_TAX	Applicable when VAT was in the list price. Often used in Australia and Europe (to get actual pricing, do sales/(1+vat_tax))
UNITS	Quantity sold
SALES	Revenue
RETURNED_QUANTITY	Quantity returned
DISCOUNT	IF there was a coupon and iServe was not reimbursed, then this is the amount to reduce sales by to account for the discount
RETURNED_REVENUE	Revenue lost due to returns
QUANTITY_SNS	Sum of units if part of a subscribe and save order
QUANTITY_PENDING	Units from orders that are currently pending
REVENUE_PENDING	Revenue from orders that are currently pending
UPDATED_AT	Time when the data was refreshed