Instacart

or finding your next coupon target

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Marketing

"Why have them buy later, when you can get them to buy now?"

The Million Dollar Question

Can we find those users who are on the tipping point of purchase, and convince them to buy?

— Instacart Partners (Wholefoods, Safeway, Costco)

The Project

- *Dig into Instacart data to get a sense of buying patterns and likelihood of repurchasing an item*

- *Identify targets/users for coupons and discounts*

The Features

- *Engineered 55+ features from existing data*

  - *User specific*

  - *Product specific*

  - *User*Product specific*

The Features

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  - *User specific*

  - *Product specific*

  - ***User*Product specific ← Turned out to be most important***

The Main Models

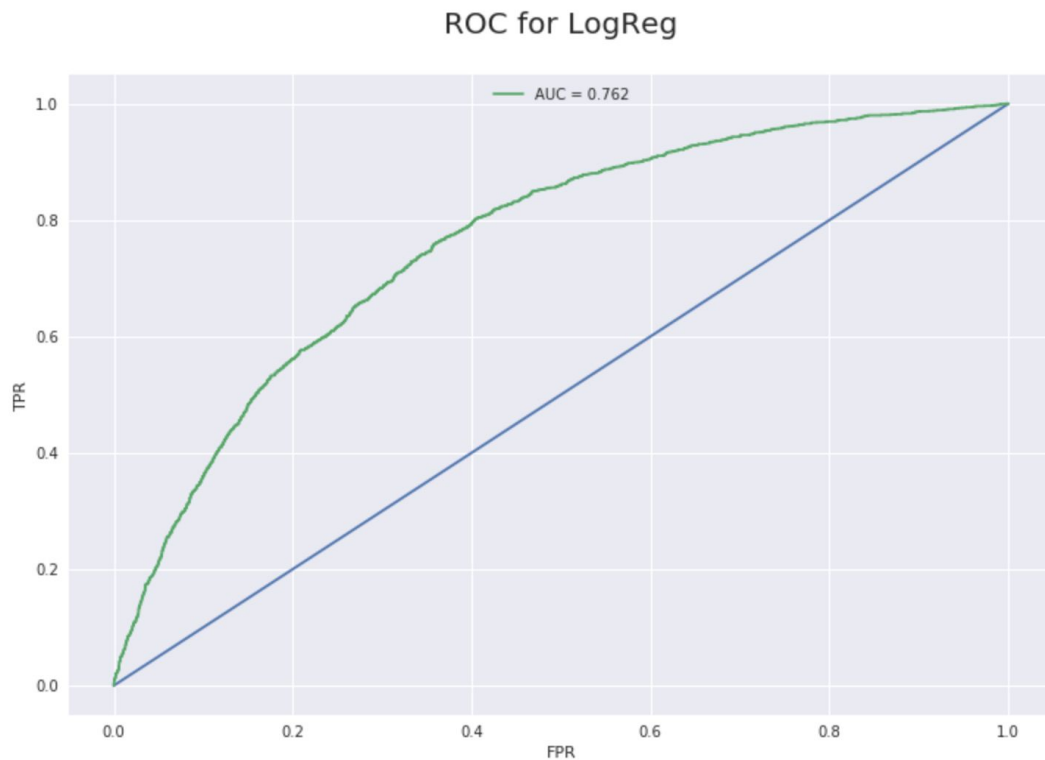- *Logistic Regression*

- *Random Forest*

Also tried Naive Bayes

The Results: Logistic Regression

- *Good Baseline, Interpretable*

- *With Regularization and Oversampling*

- *Scaled*

# The Results: Logistic Regression

ROC for LogReg

The Result: Logistic Regression

- *Most important features and their coefficients:*

  - *Share of past occasions product was ordered by user ('fan')*

    - *Descaled coefficient: 0.472*
    - *Multiplicative effect on odds (p/(1-p)) = 1.603*
    - *+1 → odds*1.603*

  - *Average share of carts occupied by new products ('adventurous)*

    - *Descaled coefficient: -0.046,*
    - *Multiplicative effect on odds (p/(1-p)) = 0.955*
    - *+1 → odds*0.955*

The Results: Random Forest

- *Did well with more, collinear features*

- *Less interpretable, but given the objective, not an issue*

The Results: Random Forest

ROC for RandomForest
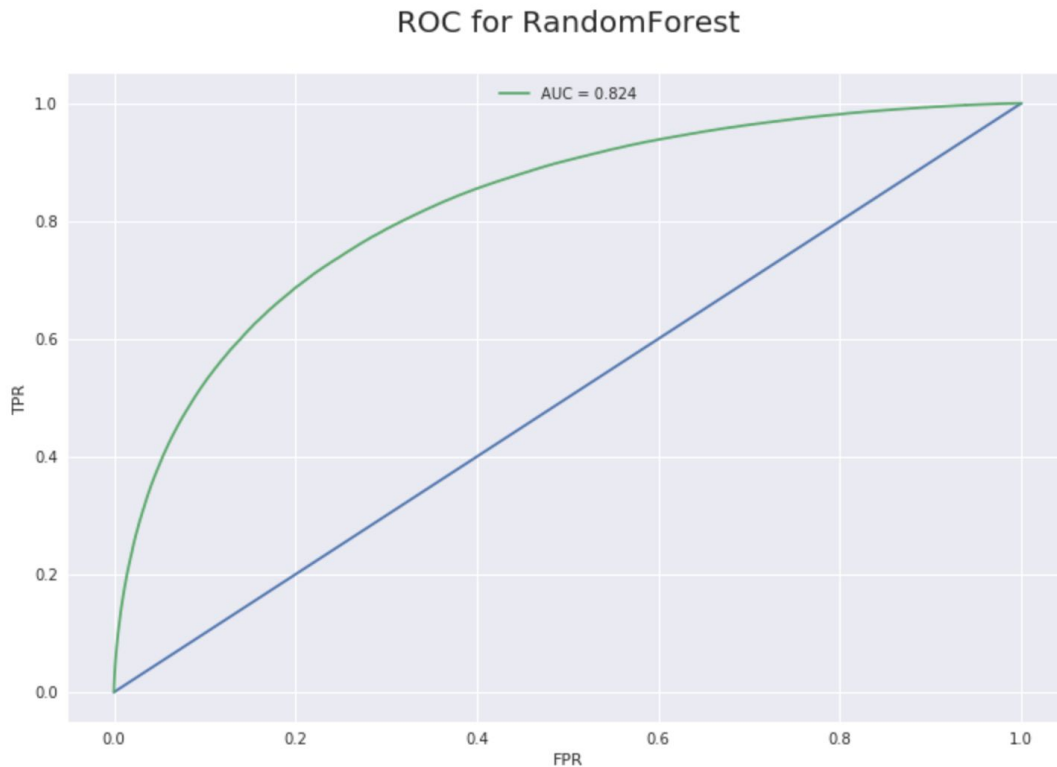
The Results

- *Most important features from Random Forest:*

  - *Share of past occasions product was ordered by user ('fan)*

  - *How many past consecutive user orders included the product ('streak')*

  - *How many days it has been since the user ordered the product ('need')*

Random Forest Feature Importance
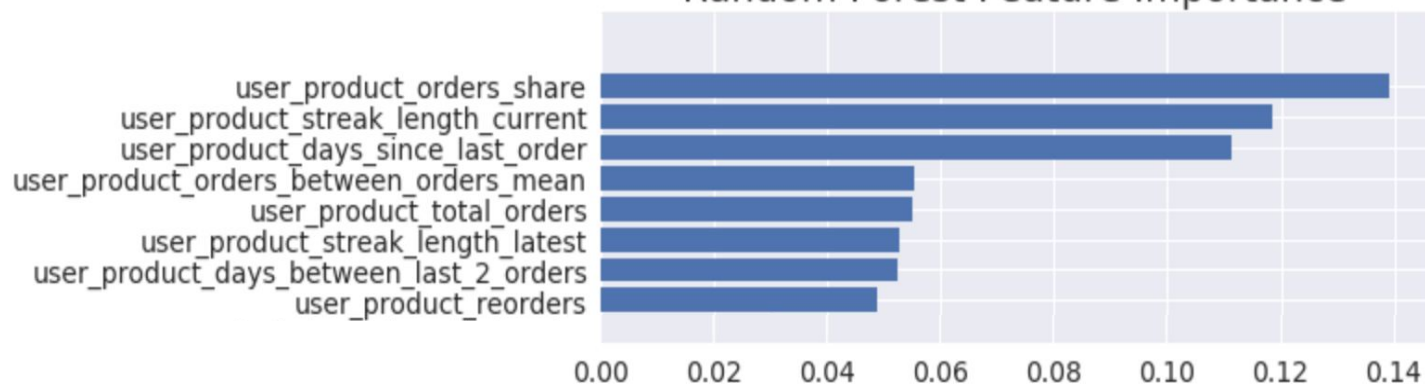
What does this mean?

Now that we know each users' likelihood to repurchase previously ordered products, we know where to focus our efforts!

The Practical Use

Two situations:

- *We expect too high stock of product and need to get rid of it*

- *We want to increase volume over margin, profits **$$$***

One method:

- *→ 'seduce' susceptible people to rebuy it*

The Art of Seduction

Don't focus on:

- *Those with **low** probability of reorder*
- *Those with **high** probability of reorder*

*Focus on the **<u>sweet spot</u>***

The Money

- *Let's assume we're Safeway, and we have*
  - ***200,000*** *local Instacart-routed customers a week*
  - ***100,000*** *of them have bought Odwalla smoothies that way before*
  - *Regular price:* ***$3.50*** *(assume flat cost at $1.00)*
  - *With weekly offer coupon:* ***$3.00***

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- *That is 10,000 in sales as opposed to no-coupon 5,000*

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- *Change in profit: 5,000*($3-$1) - 3,333*($3,50-$1) = $10,000 - $8,325 = **$1,675** per week   (for one product, at hardly any extra cost)*

The Application: a Demo

COUPON TARGETING DASHBOARD

Select Department

- ○ alcohol
- ○ babies
- ○ bakery
- ○ beverages
- ○ breakfast
- ○ bulk
- ○ canned goods
- ○ dairy eggs
- ○ deli
- ○ dry goods pasta
- ○ frozen
- ○ household
- ○ international
- ○ meat seafood
- ○ missing
- ○ other
- ○ pantry
- ○ personal care
- ○ pets
- ○ produce
- ● snacks

Select Aisle

- ○ coffee
- ○ cold flu allergy
- ○ condiments
- ○ cookies cakes
- ○ crackers
- ○ cream
- ○ deodorants
- ○ diapers wipes
- ○ digestion
- ○ dish detergents
- ○ dog food care
- ○ doughs gelatins bake mixes
- ○ dry pasta
- ○ eggs
- ● energy granola bars
- ○ energy sports drinks
- ○ eye ear care
- ○ facial care
- ○ feminine care
- ○ first aid
- ○ food storage
- ○ fresh dips tapenades
- ○ fresh fruits
- ○ fresh herbs
- ○ fresh pasta

Select Product

- ○ 1 Apple + 1 Mango Fruit Bar
- ○ 1 Apple + 1 Pear Fruit Bar
- ○ 100% Fruit Bar, Blueberry
- ○ Pomegranate
- ○ 153; Double Chocolate Brownie
- ○ Bites 5.3 Oz
- ○ 90 Calorie Chocolate Caramel &
- ○ Pretzel Chewy Bars
- ○ 90 Calorie Chocolate Chewy Bars
- ○ 90 Calorie Chocolate Peanut
- ○ Butter Brownies
- ○ 90 Calorie Lemon Bars
- ○ Acai Berry Chia Bar
- ○ Acai Berry Chia Bars
- ○ Active Greens Food Bar
- ○ Advanced Nutrition Dark
- ○ Chocolate Sea Salt Meal
- ○ Replacement Bars
- ○ All Natural Bar Peach
- ○ All Natural Cookies & Cream
- ○ Muscle Brownie
- ○ All Natural Peanut Butter Oat Bar
- ● Almond & Apricot Bar
- ○ Almond & Apricot Fruit & Nut Bars

Select Coupon Type

- ● $0.25 off
- ○ $0.50 off
- ○ $0.75 off
- ○ $1 off
- ○ 25% off
- ○ 30% off
- ○ 1 + 1 at 50% off
- ○ $2 off $10
- ○ $5 off $50
- ○ $10 off 80

781,400
targets

$0.936
extra revenue/conversion

18%
conversion rate

+ $131,687
est. revenue change

Pilot and Further Research

- *Finetune target audience slicing*

  - *If targeting too liberally you'll (1) lose out on those who would've been willing to pay regular price, (2) cause death by coupons*

- *Further finetune targeting for different product characteristics / types*

- *Expand with data on price (and price sensitivity) → dashboard*

- *Learn to select targets for **new** 'spur of the moment' purchases*