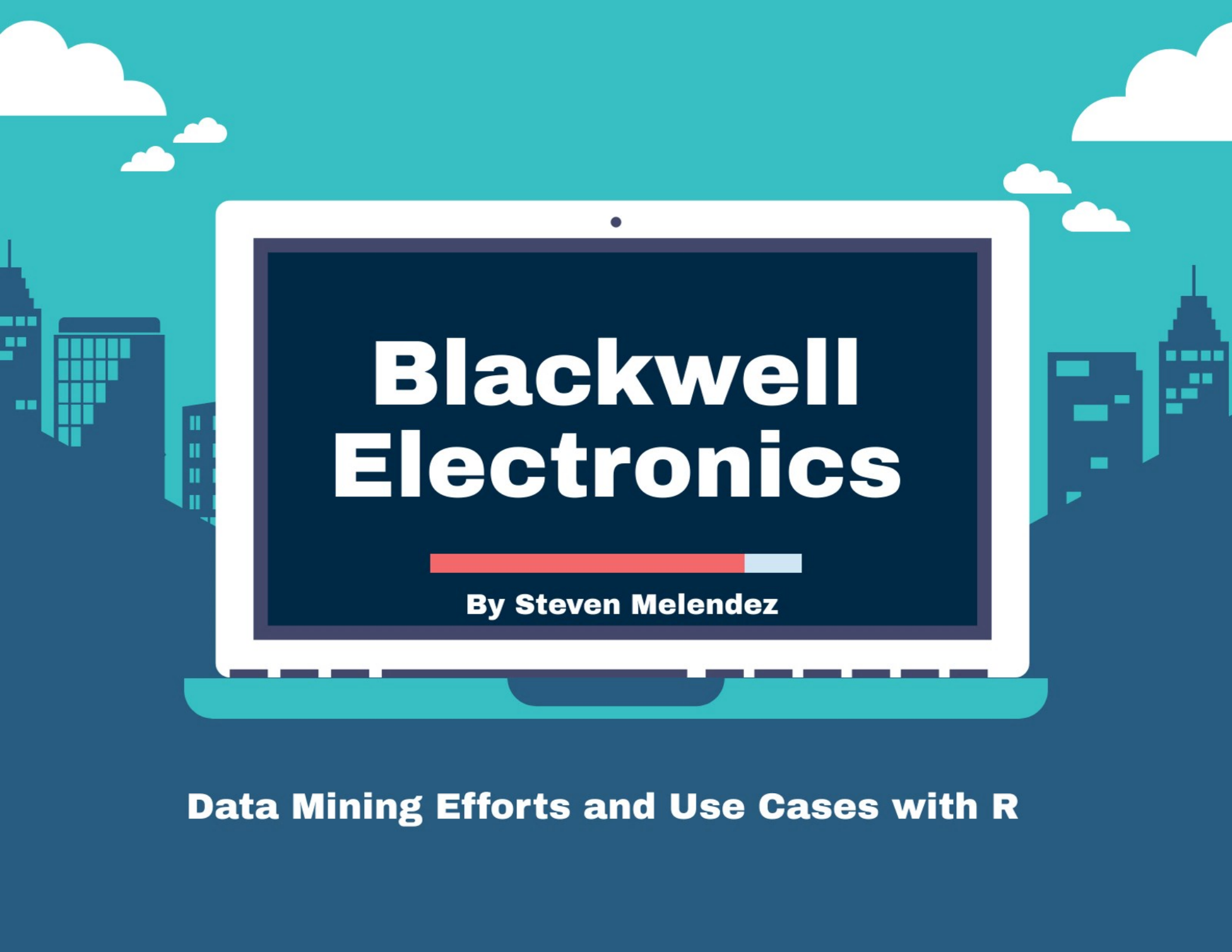
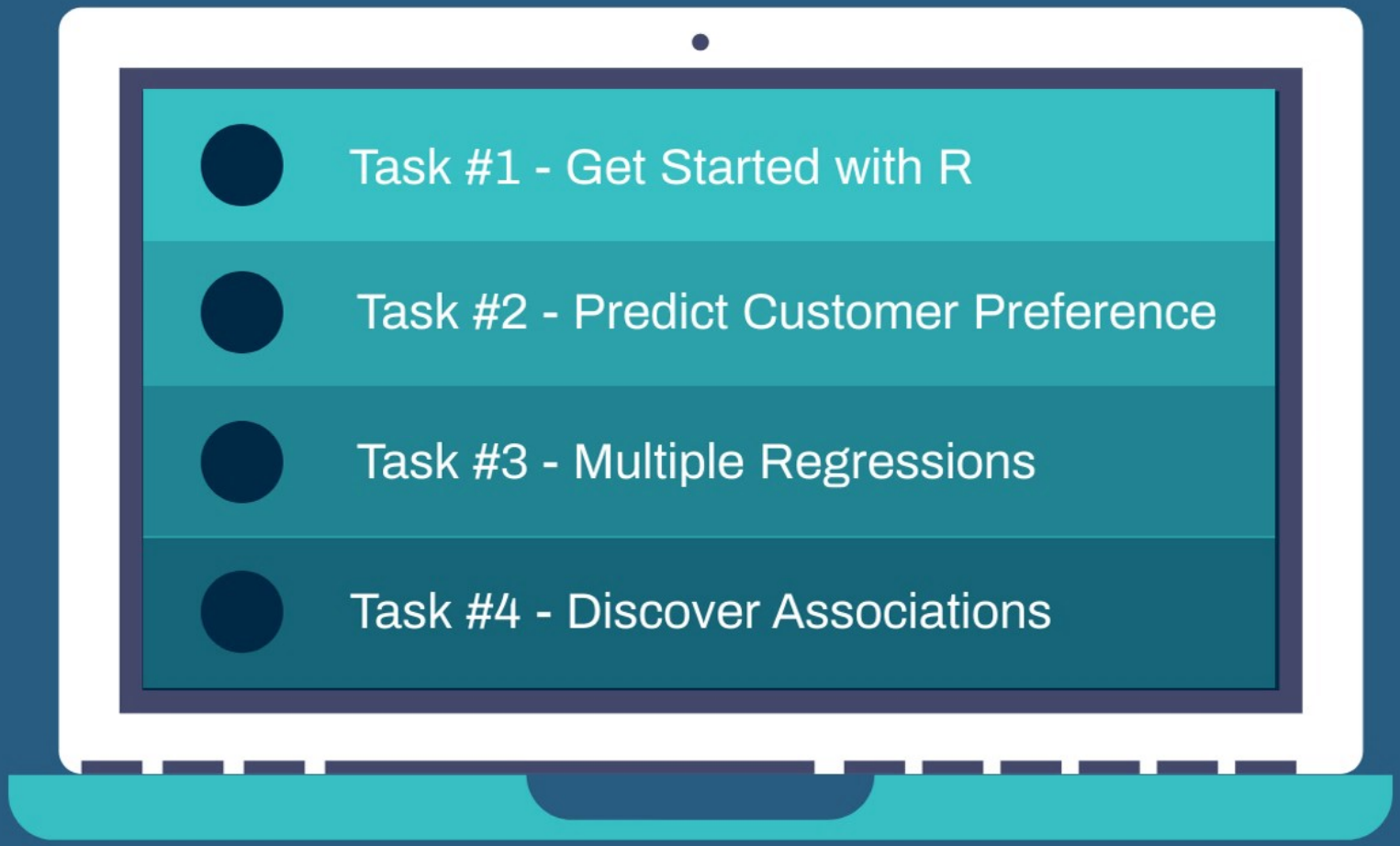

Blackwell Electronics
By Steven Melendez
Data Mining Efforts and Use Cases with R

So you might ask ...

R is free and powerful programming language for statistical computing and data visualization, has a vast community and is cross-platform.

CLASSIFICATION
REGRESSION
ASSOCIATION

R programming language was used to conduct use cases (Task 1,2,3 & 4) to predict customer preferences, predict sales and discover product associations



USE NOTES

Supervised Learning and unsupervised learning algorithms were used to developed these tasks

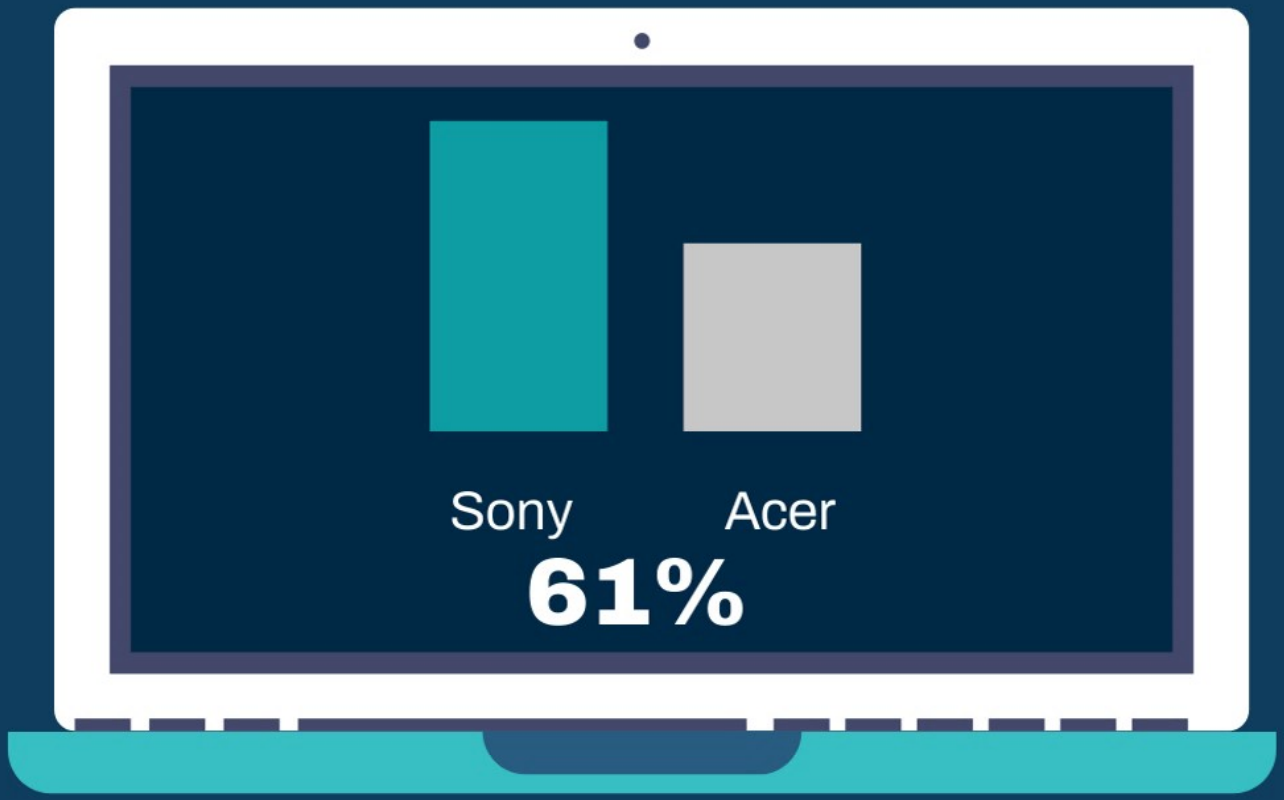
FIX A BROKEN CODE

```
library(readr)
carros <- read.csv("cars.csv")
View(carros)
attributes(carros)
summary(carros)
str(carros)
names(carros)
plot(carros)
hist(carros$speed.of.car)
plot(carros$speed.of.car, carros$distance.of.car)
qqnorm(carros$speed.of.car)
qqnorm(carros$distance.of.car)
carros$speed.of.car<- as.numeric(carros$speed.of.car)
names(carros)<- c("model", "speed", "distance")
set.seed(029)
trainSize <- round(nrow(carros)*0.8)
trainSize
testSize <- nrow(carros)-trainSize
testSize
training_indices<-sample(seq_len(nrow(carros)),size =trainSize)
trainSet <- carros[training_indices,]
testSet <- carros[-training_indices,]
Modelolineal<- lm(distance~speed, trainSet)
summary(Modelolineal)
prediction<-predict(Modelolineal,testSet)
prediction
plot(prediction)
hist(prediction)
plot(Modelolineal)
```

TASK #1

PREDICT CUSTOMER PREFERENCES

Supervised Learning
Labeled Data Set



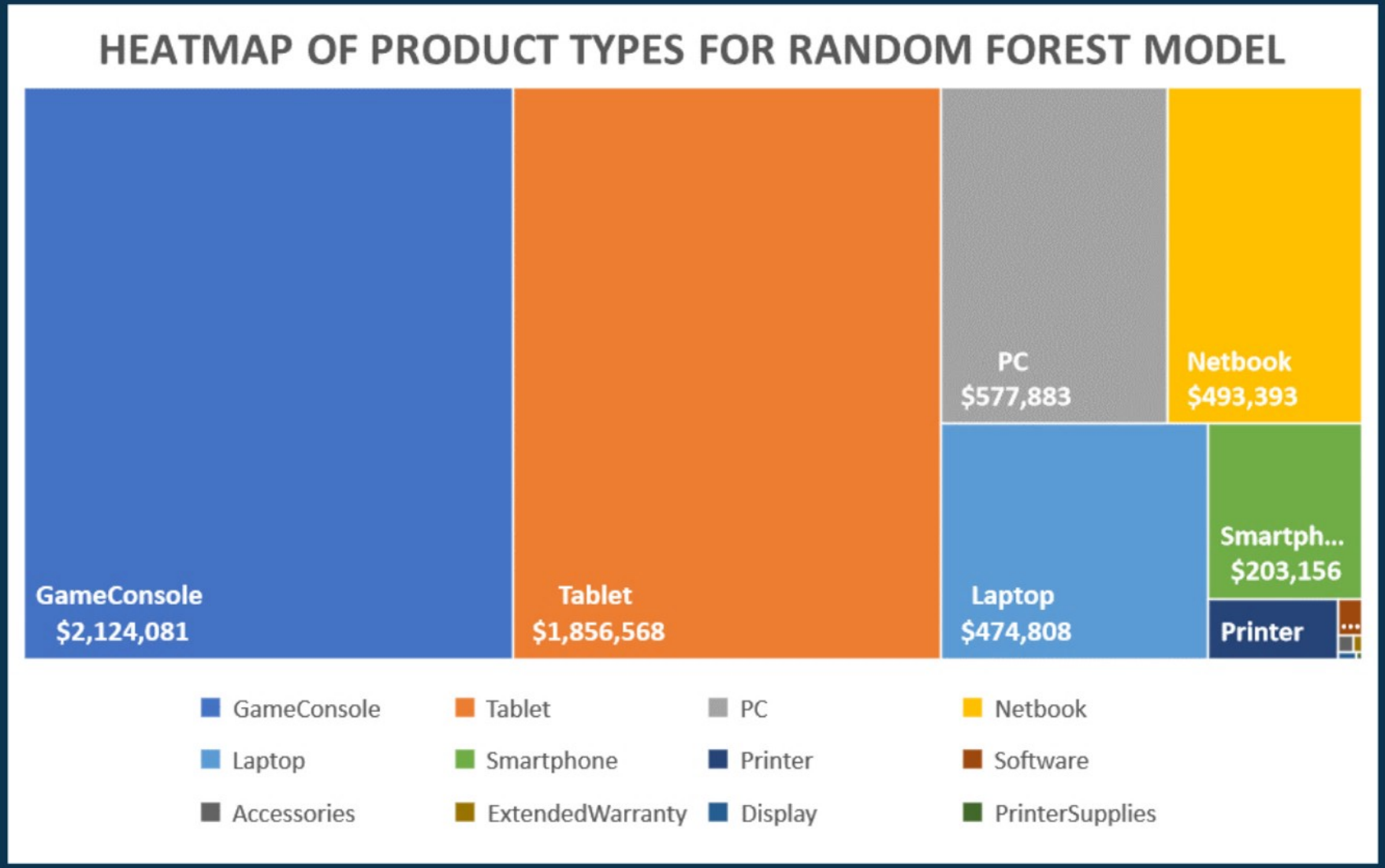
15K Surveys (Data Set)

67% (10K) complete
33% (5K) Incomplete

Train a model (RF, C5.0) with complete surveys and predict incomplete surveys to determine customer preferences over a brand

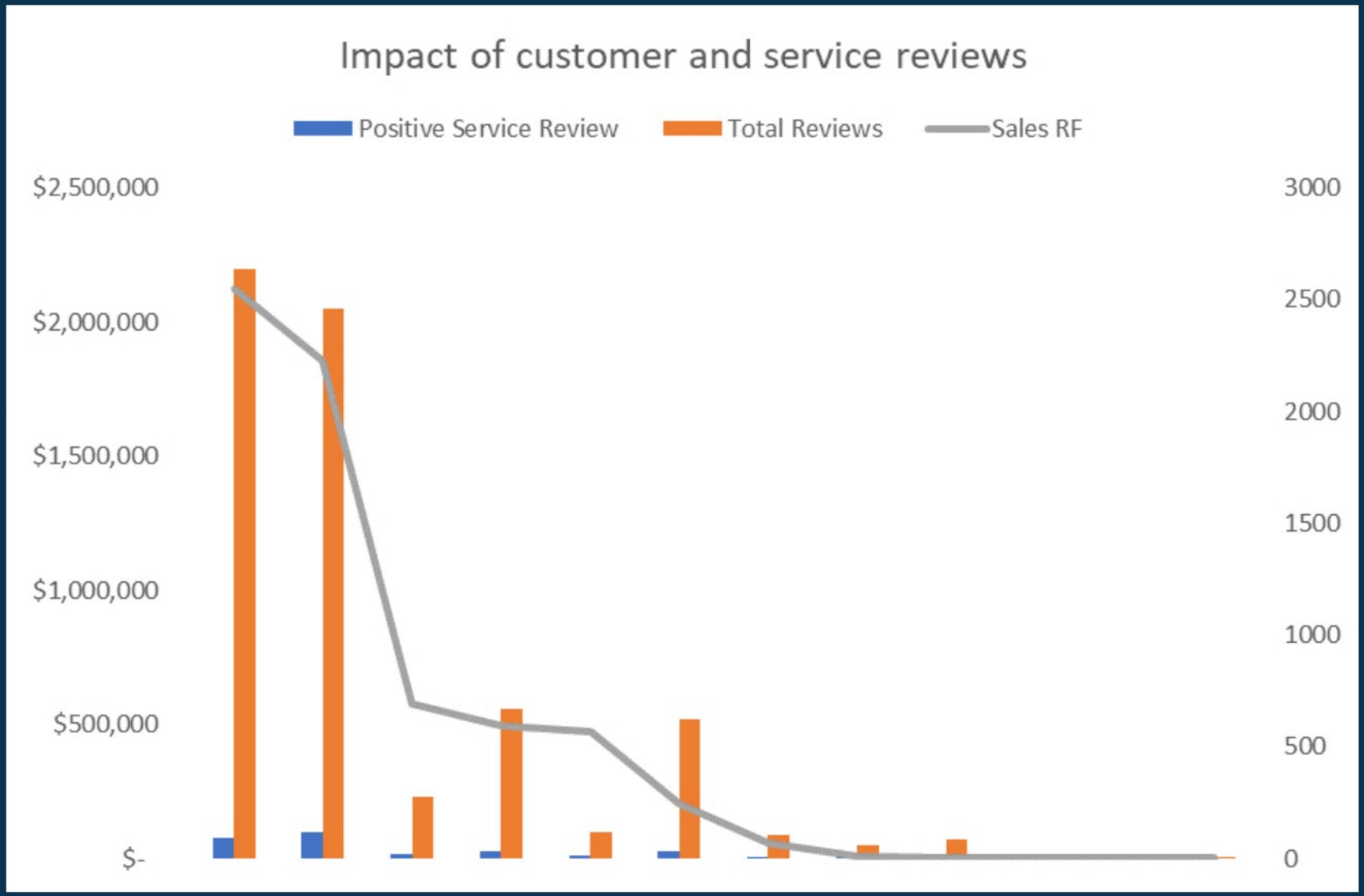
TASK #2

TASK #3



Note

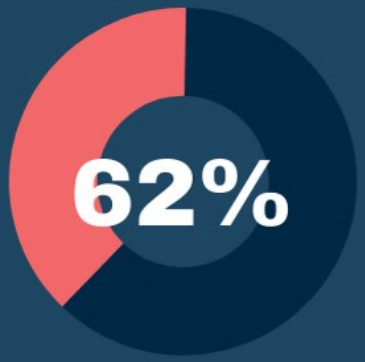
Profitability by product Type - A volume prediction was conducted to identify the most profitable product types



Note

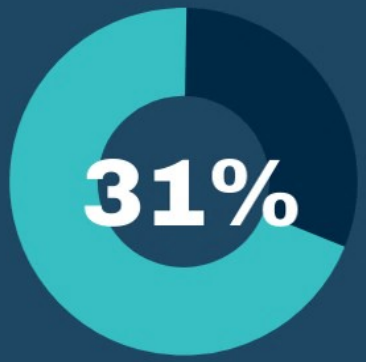
Higher sales tend to have the highest customer and service reviews, while lower sales tend to have the lowest customer and service reviews

TASK #4



1 - 4 items

6,121 transactions

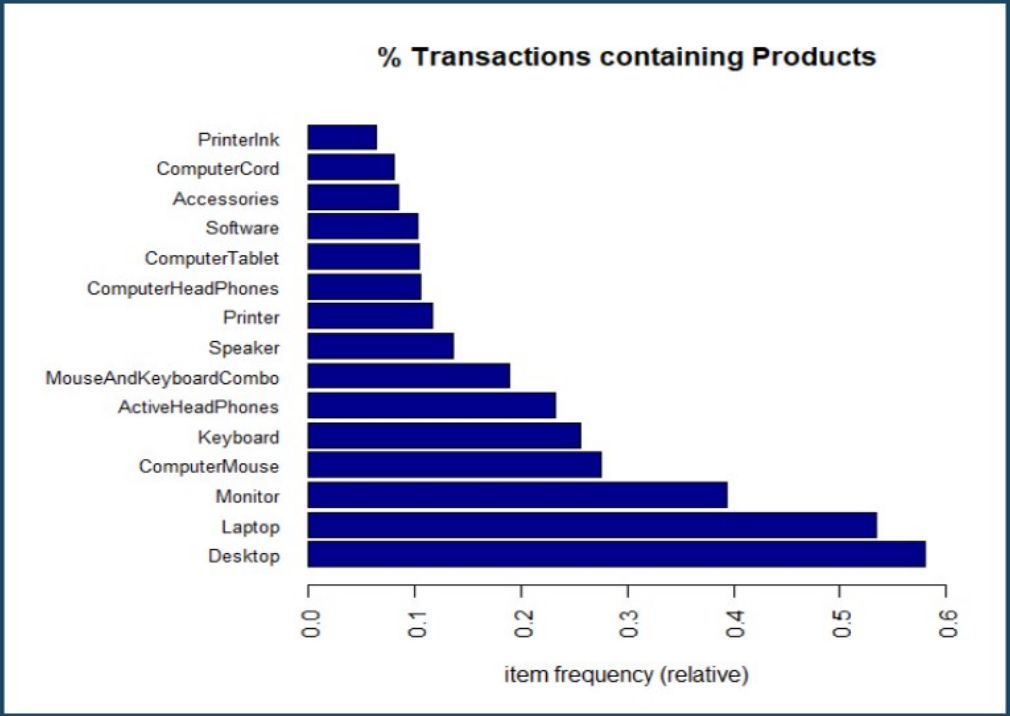


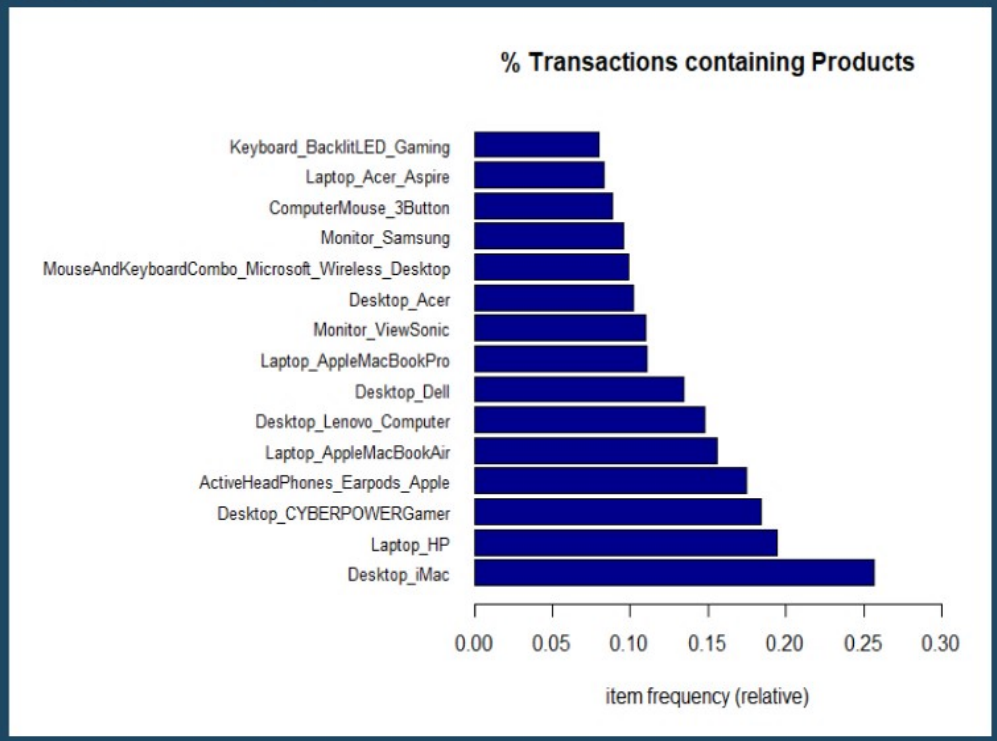
5 - 10 items

3,081 transactions

NUMBER OF ITEMS PER TRANSACTION

Associations






```
> inspect(sort(Productcategory.rules, by='confidence', decreasing = T)[1:10])
     lhs                    rhs                    support    confidence lift     count
[1]  {Desktop,Laptop}    => {Monitor}              0.18254856 0.5689382  1.447069 1795
[2]  {Desktop}           => {Monitor}              0.27865351 0.4803647  1.221786 2740
[3]  {Laptop}            => {Monitor}              0.24051663 0.4499619  1.144458 2365
[4]  {Desktop,Laptop}    => {ComputerMouse}        0.12244483 0.3816165  1.390306 1204
[5]  {Desktop,Laptop}    => {Keyboard}             0.11471575 0.3575277  1.398954 1128
[6]  {Desktop}           => {ComputerMouse}        0.18793857 0.3239832  1.180336 1848
[7]  {Desktop}           => {Keyboard}             0.17827723 0.3073282  1.202530 1753
[8]  {Laptop}            => {ComputerMouse}        0.16332757 0.3055556  1.113200 1606
[9]  {Desktop,Laptop}    => {ActiveHeadPhones}     0.09396929 0.2928685  1.260296  924
[10] {Laptop}            => {Keyboard}             0.14736093 0.2756849  1.078715 1449
```

Note

The items that are associated with product category (Laptop and Desktops) are Monitors, Computer Mouse, Keyboards and Active head phones

```
> inspect(sort(imac.association.rules, by='confidence', decreasing = T)[1:10])
     lhs                 rhs                                                 support    confidence lift      count
[1]  {Desktop_iMac} => {Monitor_ViewSonic}                                   0.04942540 0.1929337  1.7484950 486
[2]  {Desktop_iMac} => {ActiveHeadPhones_Earpods_Apple}                      0.04027255 0.1572052  0.9013406 396
[3]  {Desktop_iMac} => {ComputerMouse_3Button}                               0.03335706 0.1302104  1.4632673 328
[4]  {Desktop_iMac} => {Keyboard_AppleMagic}                                 0.03234008 0.1262406  1.7607426 318
[5]  {Desktop_iMac} => {Software_MicrosoftOffice_HomeandStudent2016}         0.03101800 0.1210798  1.8204551 305
[6]  {Desktop_iMac} => {Monitor_Samsung}                                     0.03091630 0.1206828  1.2610777 304
[7]  {Desktop_iMac} => {Monitor_ASUS2}                                       0.02806875 0.1095673  1.9001325 276
[8]  {Desktop_iMac} => {Monitor_ASUS}                                        0.02766195 0.1079794  1.9481854 272
[9]  {Desktop_iMac} => {Keyboard_BacklitLED_Gaming}                          0.02756026 0.1075824  1.3475892 271
[10] {Desktop_iMac} => {Monitor_HP}                                          0.02684837 0.1048035  1.4494132 264
```

```
> inspect(sort(hplaptop.association.rules, by='confidence', decreasing = T)[1:10])
     lhs              rhs                                                 support    confidence lift      count
[1]  {Laptop_HP} => {Monitor_ViewSonic}                                   0.04800163 0.2472499  2.2407447 472
[2]  {Laptop_HP} => {ActiveHeadPhones_Earpods_Apple}                      0.03274687 0.1686747  0.9671011 322
[3]  {Laptop_HP} => {Keyboard_AppleMagic}                                 0.02888233 0.1487690  2.0749581 284
[4]  {Laptop_HP} => {Monitor_Samsung}                                     0.02756026 0.1419591  1.4834051 271
[5]  {Laptop_HP} => {Software_MicrosoftOffice_HomeandStudent2016}         0.02339062 0.1204819  1.8114660 230
[6]  {Laptop_HP} => {MouseAndKeyboardCombo_Microsoft_Wireless_Desktop}    0.02318723 0.1194343  1.2119681 228
[7]  {Laptop_HP} => {ComputerMouse_3Button}                               0.02267873 0.1168151  1.3127346 223
[8]  {Laptop_HP} => {Monitor_LG}                                          0.02166175 0.1115767  1.9349808 213
[9]  {Laptop_HP} => {Monitor_HP}                                          0.02105156 0.1084337  1.4996187 207
[10] {Laptop_HP} => {Monitor_ASUS}                                        0.02023797 0.1042431  1.8807743 199
```

```
> inspect(sort(cyberpower.association.rules, by='confidence', decreasing = T)[1:10])
     lhs                          rhs                                                 support    confidence lift     count
[1]  {Desktop_CYBERPOWERGamer} => {ActiveHeadPhones_Earpods_Apple}                   0.03834028 0.20840243 1.194881 377
[2]  {Desktop_CYBERPOWERGamer} => {Monitor_Samsung}                                  0.03101800 0.16860144 1.761804 305
[3]  {Desktop_CYBERPOWERGamer} => {Monitor_ViewSonic}                                0.02430591 0.13211719 1.197335 239
[4]  {Desktop_CYBERPOWERGamer} => {ComputerMouse_3Button}                            0.02094986 0.11387507 1.279695 206
[5]  {Desktop_CYBERPOWERGamer} => {Keyboard_BacklitLED_Gaming}                       0.01972948 0.10724157 1.343320 194
[6]  {Desktop_CYBERPOWERGamer} => {MouseAndKeyboardCombo_Microsoft_Wireless_Desktop} 0.01952609 0.10613599 1.077023 192
[7]  {Desktop_CYBERPOWERGamer} => {Monitor_Acer}                                     0.01922099 0.10447761 1.771256 189
[8]  {Desktop_CYBERPOWERGamer} => {Software_MicrosoftOffice_HomeandStudent2016}      0.01637344 0.08899945 1.338122 161
[9]  {Desktop_CYBERPOWERGamer} => {Accessories_MousePad_Belkin}                      0.01474626 0.08015478 1.368337 145
[10] {Desktop_CYBERPOWERGamer} => {Keyboard_AppleMagic}                              0.01464456 0.07960199 1.110250 144
```

Note

The items that are bought together with Desktops (iMac / Cyberpower) and HP Laptops are monitors from different brands, active headphones, computer mouse, keyboards and MS software

Conclusions

Blackwell can be beneficed of this purchase, since Eletronidex sales are oriented to high end products (Desktop, Laptops), while Blackwell products are oriented to low end products (monitors, warranties, peripheral). As a result, Electronidex's portfolio is complementary to Blackwell's portfolio.

THANK YOU FOR YOUR TIME!