## Initial Analysis - 1/26/2016

## William W. Chiang January 26, 2016

```
# Load Walmart dataset
data <- read.csv("TempOps-Analysis.csv", header=FALSE)</pre>
# Remove unnecessary rows
data <- data[-1:-6, ]
data <- data[-20:-132, ]
# Remove unnecessary columns
data <- data[ ,c(-1,-9,-21,-35)]
# Rename columns
colnames(data) <- c("StoreNumber", "CustomerSatisfaction", "CustomerGoal", "RxCount",</pre>
"RxCountChange", "RollingRxChange", "ReturnToStockRate", "PercentInstore", "AverageIn
storePerformance", "AverageInstoreResolution", "OnTimeInstore", "AverageInstoreOps",
"PercentExpectationsMet", "PartialFillRate", "OutOfStockRate", "EasyPay", "InputRerou
ting", "InputQuality", "RxSales", "OTCSales", "OTCSalesIncrease", "OTCSalesIncreaseFi
scal", "Outs", "OTCRetail", "OTCRetailInc", "RxCost", "RxCostInc", "InventoryTurnover
Rate", "MTMRate", "DiscountCardUtilized", "DiscountCardLoss", "OverallRank")
# More cleaning of row data, e.g. Removal of unnecessary rows and naming rows in nume
rical order
data <- data[-1:-2, ]
row.names(data) <- c(1:17)
data <- data[-12:-17, ]
data <- data[ , -3]
# Convert data frame from factors to numeric values
indx <- sapply(data, is.factor)</pre>
data[indx] <- lapply(data[indx], function(x) as.numeric(as.character(x)))</pre>
# Create new columns containing data from Internet sources
# Average temperature and its range (difference of average high and low temps) were c
ollected from www.wunderground.com by searching city by Week 49 data
# Texas city for each store was located using Google Maps
# Average household income and population data were acquired from Wikipedia search
data$AverageTemperature <- c(44,44,40,44,45,45,44,44,45,44,44)
data$AverageTemperatureRange <- c(53-36,54-34,45-35,54-33,55-35,55-35,54-34,53-36,55-
35,54-34,54-34)
data$TexasTown <- c("Denison", "Bonham", "Gainesville", "Bowie", "Wichita Falls", "Wichita
```

```
Falls", "Denton", "Sherman", "Wichita Falls", "Denton", "Cross Roads")
data$AverageHouseholdIncome <- c(31474,27277,30571,33846,32554,32554,44415,34211,3255
4,44415,77031)
data$Population <- c(22816,10127,16002,5219,104553,104553,113383,38521,104553,113383,
1563)
# Identify index positions of unneeded columns for removal (After more thoughts, remo
ved data is not needed for the analysis)
data <- data[ ,c(-which(colnames(data)=="RollingRxChange"))]</pre>
data <- data[ ,c(-which(colnames(data)=="OTCSalesIncreaseFiscal"))]</pre>
data <- data[ ,c(-which(colnames(data)=="OverallRank"))]</pre>
data <- data[ ,c(-which(colnames(data)=="Outs"):-which(colnames(data)=="RxCostInc"))]</pre>
# Reorder columns with Store Number being the first column, followed by location, wea
ther, and demographic data, and then by Operations Data
\# After line 40 is executed, data structure should still be "11 observations by 28 va
riables"
data <- data[c(1,24:28,2:23)]
data \leftarrow data[c(1,4,6,5,2,3,7:28)]
# Write cleaned data set to csv file for ease of loading into MS Excel or Apple's Num
bers Application
write.table(data, file = "data cleaned.csv", sep = ",", row.names = FALSE)
```

```
library(ggplot2)
ggplot(aes(x = ordered(as.factor(StoreNumber)), y = CustomerSatisfaction), data = dat
a, fill=StoreNumber) +
  geom_bar(stat="identity", fill="orange", width=0.75) +
  coord_cartesian(ylim=c(8,10)) +
  geom_hline(yintercept=mean(data$CustomerSatisfaction)) +
  xlab("Store Number") +
  ylab("Customer Satisfaction Score") +
  ggtitle("Customer Satisfaction Survey Results by Store Number")
```



# Create correlation matrix listing correleations of the entire dataset
cor\_test <- cor(data[,c(3:28)], use="pairwise", method="spearman")
cor\_test</pre>

##	Population	${\tt AverageHouseholdIncome}$
## Population	1.000000000	0.209302326
## AverageHouseholdIncome	0.209302326	1.000000000
## AverageTemperature	0.409764538	0.010783277
## AverageTemperatureRange	0.005341792	0.347216476
## CustomerSatisfaction	-0.478192509	-0.147136157
## RxCount	0.294272314	-0.551760588
## RxCountChange	-0.289674309	-0.022990024
## ReturnToStockRate	0.915002975	0.188518201
## PercentInstore	0.721886769	0.142538152
<pre>## AverageInstorePerformance</pre>	-0.124429248	-0.322594347
<pre>## AverageInstoreResolution</pre>	-0.117516512	-0.315681611
## OnTimeInstore	0.317262338	0.473594505
## AverageInstoreOps	0.046084907	-0.442415104
## PercentExpectationsMet	0.197714211	0.501182534

I .		
## PartialFillRate	-0.110352118	-0.009196010
## OutOfStockRate	0.280478299	0.482790514
## EasyPay	-0.234498250	-0.464398495
## InputRerouting	-0.129930744	0.009280767
## InputQuality	0.041382044	-0.142538152
## RxSales	0.032186034	-0.583946622
## OTCSales	0.468996500	0.009196010
## OTCSalesIncrease	-0.229900245	0.386232411
## InventoryTurnoverRate	0.188518201	-0.593142632
## MTMRate	-0.142538152	0.602338642
## DiscountCardUtilized	0.197714211	-0.262086279
## DiscountCardLoss	-0.078166083	0.602338642
##		AverageTemperatureRange
## Population	0.40976454	0.005341792
## AverageHouseholdIncome	0.01078328	0.347216476
## AverageTemperature	1.00000000	0.433455229
## AverageTemperatureRange	0.43345523	1.00000000
## CustomerSatisfaction	0.45838154	0.406617047
## RxCount	0.26650090	-0.480547420
	-0.08528029	0.121457040
## RxCountChange		
## ReturnToStockRate	0.45838154	-0.084491854
## PercentInstore	0.09594032	-0.052807409
## AverageInstorePerformance		0.068806187
## AverageInstoreResolution	0.23505561	-0.111148456
## OnTimeInstore	-0.29848100	-0.010561482
## AverageInstoreOps	0.35258342	-0.185247427
## PercentExpectationsMet	-0.29848100	0.301002230
## PartialFillRate	0.42640143	0.633688905
## OutOfStockRate	-0.36244122	-0.153141485
## EasyPay	0.35178118	-0.184825931
## InputRerouting	0.20440745	0.282458853
## InputQuality	0.06396021	-0.147860745
## RxSales	0.55432186	-0.211229635
## OTCSales	-0.07462025	-0.686496314
## OTCSalesIncrease	0.13858047	0.211229635
## InventoryTurnoverRate	0.04264014	0.042245927
## MTMRate	-0.17056057	0.565039274
## DiscountCardUtilized	-0.42640143	-0.860760763
## DiscountCardLoss	0.10660036	0.860760763
##	CustomerSatisfaction	n RxCount RxCountChange
## Population	-0.4781925	1 0.29427231 -0.289674309
## AverageHouseholdIncome	-0.1471361	6 -0.55176059 -0.022990024
## AverageTemperature	0.4583815	4 0.26650090 -0.085280287
## AverageTemperatureRange	0.4066170	5 -0.48054742 0.121457040
## CustomerSatisfaction	1.0000000	
## RxCount	0.0454545	
## RxCountChange	0.4818181	

## Dalassa ## 011-Dala	0 25454545 0 27272727	0 126262626
## ReturnToStockRate	-0.35454545 0.37272727	
## PercentInstore	-0.44545455 0.14545455	0.009090909
## AverageInstorePerformanc		-0.473805329
## AverageInstoreResolution		-0.446470407
## OnTimeInstore	-0.20909091 -0.02727273	0.30000000
## AverageInstoreOps	-0.05011403 0.12300715	-0.387244740
## PercentExpectationsMet	-0.08181818 -0.23636364	0.309090909
## PartialFillRate	0.50909091 -0.14545455	0.30000000
## OutOfStockRate	-0.69090909 -0.15454545	0.072727273
## EasyPay	0.65454545 0.54545455	0.163636364
## InputRerouting	0.17431926 -0.30276504	-0.091746980
## InputQuality	-0.09090909 -0.20909091	-0.072727273
## RxSales	0.38181818 0.81818182	-0.081818182
## OTCSales	-0.47272727 0.48181818	-0.454545455
## OTCSalesIncrease	0.49090909 -0.19090909	0.363636364
## InventoryTurnoverRate	0.0000000 0.50000000	0.318181818
## MTMRate	0.28181818 -0.53636364	0.272727273
## DiscountCardUtilized	-0.69090909 0.39090909	-0.118181818
## DiscountCardLoss	0.30909091 -0.72727273	0.136363636
##	ReturnToStockRate PercentInstore	0.10000000
## Population	0.91500297 0.721886769	
## AverageHouseholdIncome	0.18851820 0.142538152	
## AverageTemperature	0.45838154 0.095940322	
<pre>## AverageTemperatureRange ## CustomerSatisfaction</pre>	-0.08449185 -0.052807409	
	-0.35454545 -0.445454545	
## RxCount	0.37272727 0.145454545	
## RxCountChange	-0.13636364 0.009090909	
## ReturnToStockRate	1.00000000 0.809090909	
## PercentInstore	0.80909091 1.000000000	
## AverageInstorePerformanc		
## AverageInstoreResolution		
## OnTimeInstore	0.30000000 0.581818182	
## AverageInstoreOps	0.10933969 -0.054669846	
## PercentExpectationsMet	0.11818182 0.390909091	
## PartialFillRate	0.09090909 0.172727273	
## OutOfStockRate	0.34545455 0.500000000	
## EasyPay	-0.16363636 -0.500000000	
## InputRerouting	-0.26606624 -0.486258996	
## InputQuality	0.00000000 0.218181818	
## RxSales	0.10909091 -0.218181818	
## OTCSales	0.55454545 0.409090909	
## OTCSalesIncrease	-0.18181818 -0.509090909	
## InventoryTurnoverRate	0.07272727 0.254545455	
## MTMRate	-0.22727273 -0.127272727	
## DiscountCardUtilized	0.23636364 0.245454545	
## DiscountCardLoss	-0.16363636 -0.009090909	
##	AverageInstorePerformance	
""	or a gorno cor or rormanoc	

:	##	Population	-0.12442925	5
	##	AverageHouseholdIncome	-0.32259435	5
	##	AverageTemperature	0.26176648	3
	##	AverageTemperatureRange	0.06880619	)
	##	CustomerSatisfaction	-0.03644656	5
	##	RxCount	-0.04100238	3
	##	RxCountChange	-0.47380533	3
		ReturnToStockRate	-0.11389551	
		PercentInstore	-0.39180056	
		AverageInstorePerformance	1.00000000	
		AverageInstoreResolution	0.95890411	
		OnTimeInstore	-0.91571992	
		AverageInstoreOps	0.75342466	
		PercentExpectationsMet	-0.81093604	
		PartialFillRate	0.20501192	
		OutOfStockRate	-0.20045610	
		EasyPay	0.10933969	
		InputRerouting	0.33564017	
		InputQuality	-0.07289313	
		RxSales	0.30068415	
		OTCSales	-0.11845133	
		OTCSalesIncrease	0.05466985	
		InventoryTurnoverRate	-0.24601431	
		MTMRate	-0.45102623	
	##	DiscountCardUtilized	0.01366746	
1	##	DiscountCardLoss	-0.23234684	
	##		AverageInstoreResolution	OnTimeInstore
	##	Population		
		Population AverageHouseholdIncome	-0.31568161	0.47359450
	##	-	-0.31568161	
:	## ##	AverageHouseholdIncome	-0.31568161 0.23505561	0.47359450 -0.29848100 -0.01056148
	## ## ##	AverageHouseholdIncome AverageTemperature	-0.31568161 0.23505561	0.47359450 -0.29848100 -0.01056148
	## ## ## ##	AverageHouseholdIncome AverageTemperature AverageTemperatureRange	-0.31568161 0.23505561 -0.11114846	0.47359450 -0.29848100 -0.01056148
	## ## ## ##	AverageHouseholdIncome AverageTemperature AverageTemperatureRange CustomerSatisfaction	-0.31568161 0.23505561 -0.11114846 -0.09111641	0.47359450 -0.29848100 -0.01056148 -0.20909091 -0.02727273
	## ## ## ## ##	AverageHouseholdIncome AverageTemperature AverageTemperatureRange CustomerSatisfaction RxCount	-0.31568161 0.23505561 -0.11114846 -0.09111641 0.05011403	0.47359450 -0.29848100 -0.01056148 -0.20909091 -0.02727273 0.300000000
	## ## ## ## ##	AverageHouseholdIncome AverageTemperature AverageTemperatureRange CustomerSatisfaction RxCount RxCountChange	-0.31568161 0.23505561 -0.11114846 -0.09111641 0.05011403 -0.44647041	0.47359450 -0.29848100 -0.01056148 -0.20909091 -0.02727273 0.30000000 0.30000000
	## ## ## ## ## ##	AverageHouseholdIncome AverageTemperature AverageTemperatureRange CustomerSatisfaction RxCount RxCountChange ReturnToStockRate	-0.31568161 0.23505561 -0.11114846 -0.09111641 0.05011403 -0.44647041 -0.06378149	0.47359450 -0.29848100 -0.01056148 -0.20909091 -0.02727273 0.30000000 0.30000000
	## ## ## ## ## ##	AverageHouseholdIncome AverageTemperature AverageTemperatureRange CustomerSatisfaction RxCount RxCountChange ReturnToStockRate PercentInstore	-0.31568161 0.23505561 -0.11114846 -0.09111641 0.05011403 -0.44647041 -0.06378149 -0.34168654	-0.29848100 -0.01056148 -0.20909091 -0.02727273 0.30000000 0.30000000 0.58181818
	################	AverageHouseholdIncome AverageTemperature AverageTemperatureRange CustomerSatisfaction RxCount RxCountChange ReturnToStockRate PercentInstore AverageInstorePerformance	-0.31568161 0.23505561 -0.11114846 -0.09111641 0.05011403 -0.44647041 -0.06378149 -0.34168654 0.95890411	0.47359450 -0.29848100 -0.01056148 -0.20909091 -0.02727273 0.30000000 0.30000000 0.58181818 -0.91571992
	#############	AverageHouseholdIncome AverageTemperature AverageTemperatureRange CustomerSatisfaction RxCount RxCountChange ReturnToStockRate PercentInstore AverageInstorePerformance AverageInstoreResolution	-0.31568161 0.23505561 -0.11114846 -0.09111641 0.05011403 -0.44647041 -0.06378149 -0.34168654 0.95890411 1.000000000	0.47359450 -0.29848100 -0.01056148 -0.20909091 -0.02727273 0.30000000 0.30000000 0.58181818 -0.91571992 -0.87471753
	#################	AverageHouseholdIncome AverageTemperature AverageTemperatureRange CustomerSatisfaction RxCount RxCountChange ReturnToStockRate PercentInstore AverageInstorePerformance AverageInstoreResolution OnTimeInstore	-0.31568161 0.23505561 -0.11114846 -0.09111641 0.05011403 -0.44647041 -0.06378149 -0.34168654 0.95890411 1.00000000 -0.87471753	0.47359450 -0.29848100 -0.01056148 -0.20909091 -0.02727273 0.30000000 0.30000000 0.58181818 -0.91571992 -0.87471753 1.00000000 -0.71526381
	######################################	AverageHouseholdIncome AverageTemperature AverageTemperatureRange CustomerSatisfaction RxCount RxCountChange ReturnToStockRate PercentInstore AverageInstorePerformance AverageInstoreResolution OnTimeInstore AverageInstoreOps	-0.31568161 0.23505561 -0.11114846 -0.09111641 0.05011403 -0.44647041 -0.06378149 -0.34168654 0.95890411 1.00000000 -0.87471753 0.85159817	0.47359450 -0.29848100 -0.01056148 -0.20909091 -0.02727273 0.30000000 0.30000000 0.58181818 -0.91571992 -0.87471753 1.00000000 -0.71526381
	######################################	AverageHouseholdIncome AverageTemperature AverageTemperatureRange CustomerSatisfaction RxCount RxCountChange ReturnToStockRate PercentInstore AverageInstorePerformance AverageInstoreResolution OnTimeInstore AverageInstoreOps PercentExpectationsMet	-0.31568161 0.23505561 -0.11114846 -0.09111641 0.05011403 -0.44647041 -0.06378149 -0.34168654 0.95890411 1.00000000 -0.87471753 0.85159817 -0.90205245	0.47359450 -0.29848100 -0.01056148 -0.20909091 -0.02727273 0.30000000 0.30000000 0.58181818 -0.91571992 -0.87471753 1.000000000 -0.71526381 0.88181818
	######################################	AverageHouseholdIncome AverageTemperature AverageTemperatureRange CustomerSatisfaction RxCount RxCountChange ReturnToStockRate PercentInstore AverageInstorePerformance AverageInstoreResolution OnTimeInstore AverageInstoreOps PercentExpectationsMet PartialFillRate OutOfStockRate	-0.31568161 0.23505561 -0.11114846 -0.09111641 0.05011403 -0.44647041 -0.06378149 -0.34168654 0.95890411 1.00000000 -0.87471753 0.85159817 -0.90205245 0.14578626	0.47359450 -0.29848100 -0.01056148 -0.20909091 -0.02727273 0.30000000 0.30000000 0.58181818 -0.91571992 -0.87471753 1.00000000 -0.71526381 0.88181818 -0.10909091
	#################	AverageHouseholdIncome AverageTemperature AverageTemperatureRange CustomerSatisfaction RxCount RxCountChange ReturnToStockRate PercentInstore AverageInstorePerformance AverageInstoreResolution OnTimeInstore AverageInstoreOps PercentExpectationsMet PartialFillRate OutOfStockRate	-0.31568161 0.23505561 -0.11114846 -0.09111641 0.05011403 -0.44647041 -0.06378149 -0.34168654 0.95890411 1.00000000 -0.87471753 0.85159817 -0.90205245 0.14578626 -0.10933969	0.47359450 -0.29848100 -0.01056148 -0.20909091 -0.02727273 0.30000000 0.30000000 0.58181818 -0.91571992 -0.87471753 1.00000000 -0.71526381 0.88181818 -0.10909091 0.40000000 -0.37272727
	##################	AverageHouseholdIncome AverageTemperature AverageTemperatureRange CustomerSatisfaction RxCount RxCountChange ReturnToStockRate PercentInstore AverageInstorePerformance AverageInstoreResolution OnTimeInstore AverageInstoreOps PercentExpectationsMet PartialFillRate OutOfStockRate EasyPay	-0.31568161 0.23505561 -0.11114846 -0.09111641 0.05011403 -0.44647041 -0.06378149 -0.34168654 0.95890411 1.00000000 -0.87471753 0.85159817 -0.90205245 0.14578626 -0.10933969 0.07289313	0.47359450 -0.29848100 -0.01056148 -0.20909091 -0.02727273 0.30000000 0.30000000 0.58181818 -0.91571992 -0.87471753 1.00000000 -0.71526381 0.88181818 -0.10909091 0.40000000 -0.37272727 -0.52295779
	###########################	AverageHouseholdIncome AverageTemperature AverageTemperatureRange CustomerSatisfaction RxCount RxCountChange ReturnToStockRate PercentInstore AverageInstorePerformance AverageInstoreResolution OnTimeInstore AverageInstoreOps PercentExpectationsMet PartialFillRate OutOfStockRate EasyPay InputRerouting	-0.31568161 0.23505561 -0.11114846 -0.09111641 0.05011403 -0.44647041 -0.06378149 -0.34168654 0.95890411 1.00000000 -0.87471753 0.85159817 -0.90205245 0.14578626 -0.10933969 0.07289313 0.17011899	0.47359450 -0.29848100 -0.01056148 -0.20909091 -0.02727273 0.30000000 0.30000000 0.58181818 -0.91571992 -0.87471753 1.00000000 -0.71526381 0.88181818 -0.10909091 0.40000000 -0.37272727 -0.52295779 -0.04545455

ı				
	##	OTCSales	0.0045558	32 0.26363636
	##	OTCSalesIncrease	0.0273349	92 -0.11818182
	##	InventoryTurnoverRate	-0.2961283	33 0.13636364
	##	MTMRate	-0.5968124	18 0.49090909
	##	DiscountCardUtilized	0.1776770	0.00000000
	##	DiscountCardLoss	-0.3963563	38 0.3000000
	##		AverageInstoreOps Perce	entExpectationsMet
	##	Population	0.04608491	0.197714211
		AverageHouseholdIncome	-0.44241510	0.501182534
		AverageTemperature	0.35258342	-0.298481003
		AverageTemperatureRange	-0.18524743	0.301002230
		CustomerSatisfaction	-0.05011403	-0.081818182
		RxCount	0.12300715	-0.236363636
		RxCountChange	-0.38724474	0.309090909
		ReturnToStockRate	0.10933969	0.118181818
		PercentInstore	-0.05466985	0.390909091
		AverageInstorePerformance	0.75342466	-0.810936045
		AverageInstoreResolution	0.85159817	-0.902052454
		OnTimeInstore	-0.71526381	0.881818182
		AverageInstoreOps	1.0000000	-0.888384993
		PercentExpectationsMet	-0.88838499	1.00000000
		PartialFillRate	0.18678864	-0.009090909
	##	OutOfStockRate	-0.21412356	0.272727273
	##	EasyPay	0.02733492	-0.309090909
	##	InputRerouting	-0.01839124	-0.201843357
	##	InputQuality	0.46924951	-0.272727273
	##	RxSales	0.35079818	-0.536363636
	##	OTCSales	0.06378149	-0.018181818
	##	OTCSalesIncrease	-0.17767700	0.018181818
	##	InventoryTurnoverRate	-0.11845133	0.154545455
	##	MTMRate	-0.73804292	0.763636364
	##	DiscountCardUtilized	0.21867938	-0.281818182
	##	DiscountCardLoss	-0.45102623	0.590909091
	##		PartialFillRate OutOfS	tockRate EasyPay
		Population	-0.110352118 0.2	28047830 -0.23449825
		AverageHouseholdIncome		18279051 -0.46439849
		AverageTemperature		36244122 0.35178118
		AverageTemperatureRange		15314149 -0.18482593
		CustomerSatisfaction		59090909 0.65454545
		RxCount		15454545 0.54545455
		RxCountChange		0.16363636
		ReturnToStockRate		34545455 -0.16363636
		PercentInstore		50000000 -0.50000000
		AverageInstorePerformance		20045610 0.10933969
		AverageInstoreResolution		10933969 0.07289313
		OnTimeInstore		10000000 -0.37272727
	##	AverageInstoreOps	0.186788640 -0.2	21412356 0.02733492

## PercentExpectationsMet	-0.009090909	0.27272727 -0.30909091
## PartialFillRate	1.000000000	-0.14545455 -0.06363636
## OutOfStockRate	-0.145454545	1.00000000 -0.73636364
## EasyPay	-0.063636364	-0.73636364 1.00000000
## InputRerouting	-0.229367451	-0.22936745 0.28441564
## InputQuality	-0.127272727	-0.01818182 -0.29090909
## RxSales	0.045454545	-0.49090909 0.73636364
## OTCSales	-0.381818182	0.18181818 0.06363636
## OTCSalesIncrease	0.118181818	-0.24545455 0.39090909
## InventoryTurnoverRate	-0.018181818	-0.09090909 0.09090909
## MTMRate	0.181818182	-0.07272727 -0.09090909
## DiscountCardUtilized	-0.627272727	0.50909091 -0.15454545
## DiscountCardLoss	0.454545455	-0.05454545 -0.30909091
##	InputRerouting 1	
## Population	-0.129930744	0.04138204 0.03218603
## AverageHouseholdIncome	0.009280767	-0.14253815 -0.58394662
## AverageTemperature	0.204407454	0.06396021 0.55432186
	0.282458853	-0.14786074 -0.21122964
<pre>## AverageTemperatureRange ## CustomerSatisfaction</pre>	0.174319263	-0.09090909 0.38181818
## RxCount	-0.302765035	-0.20909091 0.81818182
## RxCountChange	-0.091746980	-0.07272727 -0.08181818
## ReturnToStockRate	-0.266066243	0.00000000 0.10909091
## PercentInstore	-0.486258996	0.21818182 -0.21818182
## AverageInstorePerformance	0.335640166	-0.07289313
## AverageInstoreResolution	0.170118988	0.04555820 0.34168654
## OnTimeInstore	-0.522957788	-0.04545455 -0.43636364
## AverageInstoreOps	-0.018391242	0.46924951 0.35079818
## PercentExpectationsMet	-0.201843357	-0.27272727 -0.53636364
## PartialFillRate	-0.229367451	-0.12727273 0.04545455
## OutOfStockRate	-0.229367451	-0.01818182 -0.49090909
## EasyPay	0.284415639	-0.29090909 0.73636364
## InputRerouting	1.000000000	0.00000000 -0.01834940
## InputQuality	0.00000000	1.00000000 -0.16363636
## RxSales	-0.018349396	-0.16363636 1.00000000
## OTCSales	-0.486258996	-0.13636364 0.23636364
## OTCSalesIncrease	0.275240941	-0.40000000 -0.08181818
## InventoryTurnoverRate	-0.036698792	0.11818182 0.30000000
## MTMRate	0.082572282	-0.41818182 -0.54545455
## DiscountCardUtilized	-0.165144565	0.22727273 0.04545455
## DiscountCardLoss	0.183493961	-0.12727273 -0.56363636
##	OTCSales OTCS	SalesIncrease
## Population	0.46899650	-0.22990024
## AverageHouseholdIncome	0.00919601	0.38623241
## AverageTemperature	-0.07462025	0.13858047
## AverageTemperatureRange	-0.68649631	0.21122964
## CustomerSatisfaction	-0.47272727	0.49090909
## RxCount	0.48181818	-0.19090909

## RxCountChange	-0.45454545	0.36363636
## ReturnToStockRate	0.55454545	-0.18181818
## PercentInstore	0.40909091	-0.50909091
## AverageInstorePerformance	-0.11845133	0.05466985
## AverageInstoreResolution	0.00455582	0.02733492
## OnTimeInstore	0.26363636	-0.11818182
## AverageInstoreOps	0.06378149	-0.17767700
## PercentExpectationsMet	-0.01818182	0.01818182
## PartialFillRate	-0.38181818	0.11818182
## OutOfStockRate	0.18181818	-0.24545455
## EasyPay	0.06363636	0.39090909
## InputRerouting	-0.48625900	0.27524094
## InputQuality	-0.13636364	-0.4000000
## RxSales	0.23636364	-0.08181818
## OTCSales	1.00000000	-0.24545455
## OTCSalesIncrease	-0.24545455	1.00000000
## InventoryTurnoverRate	-0.21818182	-0.50909091
## MTMRate	-0.31818182	0.52727273
## DiscountCardUtilized	0.52727273	-0.39090909
## DiscountCardLoss	-0.54545455	0.30909091
##	InventoryTurn	noverRate MTMRate
## Population	0.	.18851820 -0.14253815
## AverageHouseholdIncome	-0.	.59314263 0.60233864
## AverageTemperature	0.	.04264014 -0.17056057
## AverageTemperatureRange		.04224593 0.56503927
## CustomerSatisfaction		.00000000 0.28181818
## RxCount		.50000000 -0.53636364
## RxCountChange		.31818182 0.27272727
## ReturnToStockRate		.07272727 -0.22727273
## PercentInstore		.25454545 -0.12727273
		.24601431 -0.45102623
## AverageInstorePerformance		
## AverageInstoreResolution		.29612833 -0.59681248
## OnTimeInstore		.13636364 0.49090909
## AverageInstoreOps		.11845133 -0.73804292
## PercentExpectationsMet		.15454545 0.76363636
## PartialFillRate	-0.	.01818182 0.18181818
## OutOfStockRate	-0.	.09090909 -0.07272727
## EasyPay	0.	.09090909 -0.09090909
## InputRerouting	-0.	.03669879 0.08257228
## InputQuality	0.	.11818182 -0.41818182
## RxSales	0.	.30000000 -0.54545455
## OTCSales	-0.	.21818182 -0.31818182
## OTCSalesIncrease	-0.	.50909091 0.52727273
## InventoryTurnoverRate		.00000000 -0.24545455
## MTMRate		.24545455 1.00000000
## DiscountCardUtilized		.12727273 -0.67272727
## DiscountCardLoss		.20909091 0.84545455
"" DISCOUTECATULOSS	-0.	.2070707I 0.04343433

##		DiscountCardUtilized	DiscountCardLoss
	Population	0.19771421	
	AverageHouseholdIncome	-0.26208628	
	AverageTemperature	-0.42640143	
	AverageTemperatureRange	-0.86076076	
	CustomerSatisfaction	-0.69090909	
	RxCount	0.39090909	
	RxCountChange	-0.11818182	
	ReturnToStockRate	0.23636364	
	PercentInstore	0.23636364	
		0.24545455	
	AverageInstorePerformance		
	AverageInstoreResolution	0.17767700	
	OnTimeInstore	0.00000000	
	AverageInstoreOps	0.21867938	
	PercentExpectationsMet	-0.28181818	
	PartialFillRate	-0.62727273	
	OutOfStockRate	0.50909091	
	EasyPay	-0.15454545	
	InputRerouting	-0.16514456	
	InputQuality	0.22727273	
	RxSales	0.04545455	
##	OTCSales	0.52727273	-0.545454545
##	OTCSalesIncrease	-0.39090909	0.309090909
##	InventoryTurnoverRate	0.12727273	-0.209090909
##	MTMRate	-0.67272727	0.845454545
##	DiscountCardUtilized	1.00000000	-0.827272727
##	DiscountCardLoss	-0.82727273	1.000000000

# Create linear regression model with the dependent variable as CustomerSatisfaction # and the independent variables as the measures highly correlated with Customer Satis faction scores

SatisfactionReg <- lm(CustomerSatisfaction ~ OutOfStockRate + EasyPay + DiscountCardU
tilized + PartialFillRate + OTCSalesIncrease, data= data)
summary(SatisfactionReg)</pre>

```
##
## Call:
## lm(formula = CustomerSatisfaction ~ OutOfStockRate + EasyPay +
##
       DiscountCardUtilized + PartialFillRate + OTCSalesIncrease,
##
       data = data)
##
## Residuals:
##
                       2
                                 3
                                                       5
                                                                  6
## -1.094e-01 8.905e-02 5.181e-02 -8.260e-02 3.795e-05 8.804e-02
##
           7
                       8
                                           10
## -4.590e-02 -9.310e-02 -2.493e-02 4.276e-02
                                              8.419e-02
##
## Coefficients:
##
                        Estimate Std. Error t value Pr(>|t|)
                        8.881e+00 3.624e-01 24.505 2.11e-06 ***
## (Intercept)
                       -1.101e+01 6.815e+00 -1.615 0.16724
## OutOfStockRate
                        2.734e-03 2.491e-03 1.097 0.32250
## EasyPay
## DiscountCardUtilized 4.810e-05 2.284e-04
                                               0.211 0.84152
## PartialFillRate
                        5.094e+01 1.493e+01
                                               3.412 0.01900 *
## OTCSalesIncrease
                        2.780e+00 6.814e-01 4.079 0.00955 **
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## Residual standard error: 0.1072 on 5 degrees of freedom
## Multiple R-squared: 0.9328, Adjusted R-squared: 0.8655
## F-statistic: 13.87 on 5 and 5 DF, p-value: 0.005918
```

```
# Create linear regression model with the dependent variable as RxSales
# and the independent variables as the measures highly correlated with RxSales
RxSalesReg <- lm(RxSales ~ AverageHouseholdIncome + AverageTemperature + RxCount + Ea
syPay + DiscountCardLoss, data= data)
summary(RxSalesReg)</pre>
```

```
##
## Call:
## lm(formula = RxSales ~ AverageHouseholdIncome + AverageTemperature +
##
       RxCount + EasyPay + DiscountCardLoss, data = data)
##
## Residuals:
##
           1
             -2597.58
                                           -2975.41 10982.53 -13454.56
##
   -8650.25
                        1995.20
                                  8805.44
##
           8
                     9
                                       11
                             10
     3573.29
               -26.33
                        -575.68
                                  2923.35
##
##
## Coefficients:
##
                           Estimate Std. Error t value Pr(>|t|)
## (Intercept)
                         -2.399e+05 1.590e+05 -1.509
                                                         0.1916
## AverageHouseholdIncome -2.184e-01 2.643e-01 -0.826
                                                         0.4462
                                               1.737
## AverageTemperature
                          5.613e+03 3.232e+03
                                                       0.1430
## RxCount
                          5.444e+01 1.530e+01 3.558
                                                         0.0163 *
## EasyPay
                          4.637e+02 1.930e+02
                                                 2.403
                                                         0.0614 .
## DiscountCardLoss
                          2.660e+00 2.828e+00
                                                 0.941
                                                         0.3900
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 9952 on 5 degrees of freedom
## Multiple R-squared: 0.932, Adjusted R-squared: 0.8641
## F-statistic: 13.71 on 5 and 5 DF, p-value: 0.006073
```