ITC Pt. 2

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```
#dataset
LookUp = read.csv(file = "/Users/fayreooi/Downloads/LookUpUpdate.csv")
LookUp = LookUp[, -c(11,12,13,14,15)]

## clean dataset

# make numbers numerical
LookUp$Customer.Count = as.numeric(gsub(",", "", LookUp$Customer.Count))

# interpreting SAIDI add a column to dataset showing average minutes
LookUp$Avg.Min.PerCustomer.2023 = LookUp$X2023.SAIDI * 60

# adding CAIDI
# LookUp$CAIDI.2023 = LookUp$X2023.SAIDI / LookUp$X2023.SAIFI

# dataset
CircuitOutage = read.csv(file = "/Users/fayreooi/Desktop/circuitWRegions.csv")
CircuitOutage$Outage.Duration..min. = as.numeric(gsub(",", "", CircuitOutage$Outage.Duration..min.))

# add information from circuit outage dataset
# we want to add the CMI from 2024

#add number of circuit outages in 2024
LookUp$Number.Outages.2024 = c(3, 4, 6, 4, 7, 3, 6, 3, 10, 2, 9, 3, 9, 1, 2, 1, 7, 2, 10, 1, 7)

## SAIDI for 2024

LookUp$Avg.Outage.Duration.2024 = c(840.333, 518.25, 919, 470.75, 700.1429, 979, 695.333,
                                    660.333, 759.7, 768.5, 1025, 915.333, 590.6667,
                                    411, 1341.5, 72, 845.4286, 615.5, 681.1, 975,
                                    713.4286)

LookUp$SAIDI.2024 = LookUp$Avg.Outage.Duration.2024 / LookUp$Customer.Count

# SAIFI for 2024

tapply(CircuitOutage$Customers.Affected, CircuitOutage$Circuit.Name, mean)
```

```
##      Adams    Alabama   Blue Jay      Dinan    Gorilla      Grand      Green
##   477.0000  2465.0000  1962.0000  1512.5714  1203.1111   243.0000  1683.1667
##     Hoover  Jefferson    Johnson  Lightning    Lincoln      Logan    Magenta
##   718.5714   883.0000   929.6667  1201.0000   627.1667  1412.2000  1425.1000
##   Monterey     Orange     Oregon  Roosevelt    Thunder Washington     Yellow
```

```
##   497.0000   845.6667   472.7500   246.0000  1658.0000   817.6667   746.7143
```

```
LookUp$Avg.Customers.Affected.2024 = c(846, 2465, 1684, 473 ,747, 818, 628, 930, 1426,
                                       477, 246, 883, 1204, 1962, 1658, 1201, 719,
                                       497,1413, 243, 1513)

LookUp$SAIFI.2024 = LookUp$Number.Outages.2024 / LookUp$Customer.Count

# add column of how many miles are overhead/underground

LookUp$Overhead.miles = LookUp$Circuit.Miles * (LookUp$X..Overhead/100)
LookUp$Underground.miles = LookUp$Circuit.Miles * (LookUp$X..Underground/100)

# adding cause count to Look Up data

LookUp$UG.Equipment.Failure = c(0,3,4,0,0,0,3,0,0,0,4,1,1,0,1,0,4,1,0,0,2)
LookUp$OH.Equipment.Failure = c(0,0,0,1,2,0,0,1,3,0,0,0,4,0,0,0,0,0,4,1,1)
LookUp$Third.Party = c(1,1,0,1,0,1,2,1,1,0,0,1,1,0,1,0,0,0,1,0,2)
LookUp$Weather = c(1,0,1,2,1,1,0,0,3,0,1,0,1,0,0,0,0,0,1,0,0)
LookUp$Other = c(1,0,1,0,1,0,0,0,1,0,1,0,2,0,0,1,1,1,0,0,1)
LookUp$Operation = c(0,0,0,0,2,0,1,0,1,1,2,0,0,0,0,0,1,0,2,0,0)
LookUp$Animal = c(0,0,0,0,0,1,0,0,1,0,1,0,0,1,0,0,1,0,1,0,1)
LookUp$Vegetation = c(0,0,0,0,1,0,0,1,0,1,0,1,0,0,0,0,0,0,1,0,0)

# add average minutes per customer for 2024
LookUp$Avg.Min.PerCustomer.2024 = LookUp$SAIDI.2024 * 60

# make KV into categories
# LookUp$KV = factor(LookUp$KV,
#                       levels = c(4, 12, 16),
#                       labels = c("Four", "Twelve", "Sixteen"))

# add TOTAL outage duration per circuit in 2024

tapply(CircuitOutage$Outage.Duration..min. , CircuitOutage$Circuit.Name, sum)
```

```
##      Adams    Alabama   Blue Jay      Dinan    Gorilla      Grand      Green
##       1537       2073        411       4994       5316        975       5514
##     Hoover  Jefferson    Johnson  Lightning    Lincoln      Logan    Magenta
##       5918       2746       1981         72       4172       6811       7597
##   Monterey     Orange     Oregon  Roosevelt    Thunder Washington     Yellow
##       1231       2521       1883       9225       2683       2937       4901
```

```
LookUp$Total.Outage.Duration = c(2521, 2073, 5514, 1883, 4901, 2937, 4172, 1981,
                                 7597, 1537,9225, 2746, 5316, 411, 2683, 71, 5918,
                                 1231, 6811,975,4994)
```

```
Avg.min.PerCustomer = LookUp[, c("Avg.Min.PerCustomer.2023", "Avg.Min.PerCustomer.2024", "Avg.Outage.Du
Avg.min.PerCustomer
```

```
##    Avg.Min.PerCustomer.2023 Avg.Min.PerCustomer.2024 Avg.Outage.Duration.2024
## 1                     100.8               38.814457                 840.3330
## 2                      34.2                9.020888                 518.2500
## 3                     144.0               20.414661                 919.0000
## 4                      83.4               24.625109                 470.7500
## 5                     132.0               24.624018                 700.1429
```

## 6	107.4	44.771341	979.0000
## 7	144.0	25.532424	695.3330
## 8	54.6	24.143803	660.3330
## 9	226.2	19.257288	759.7000
## 10	64.8	27.996357	768.5000
## 11	819.0	139.455782	1025.0000
## 12	112.8	38.840156	915.3330
## 13	97.8	13.424243	590.6667
## 14	7.8	8.045677	411.0000
## 15	44.4	20.403042	1341.5000
## 16	1.2	1.203008	72.0000
## 17	130.8	19.435140	845.4286
## 18	37.2	15.426065	615.5000
## 19	105.0	12.691304	681.1000
## 20	103.8	117.000000	975.0000
## 21	125.4	16.463737	713.4286