

# HW 6 Hints

## Load Data

Load the data from the Kaggle digits data set. There is a train and test data set. For this example, I only use the train data set but run crossvalidation. Also note: this data set is large and so I reduce it by “percent” – see below.

```
#First load the training data in csv format, and then convert "label" to nominal variable.
filename <- "digit_train.csv"
DigitTotalDF <- read.csv(filename, header = TRUE, stringsAsFactors = TRUE)
DigitTotalDF$label<-as.factor(DigitTotalDF$label)
dim(DigitTotalDF)
```

```
## [1] 42000    785
```

```
head(DigitTotalDF)
```

```
##   label pixel0 pixel1 pixel2 pixel3 pixel4 pixel5 pixel6 pixel7 pixel8
## 1     1      0      0      0      0      0      0      0      0      0
## 2     0      0      0      0      0      0      0      0      0      0
## 3     1      0      0      0      0      0      0      0      0      0
## 4     4      0      0      0      0      0      0      0      0      0
## 5     0      0      0      0      0      0      0      0      0      0
## 6     0      0      0      0      0      0      0      0      0      0
##   pixel9 pixel10 pixel11 pixel12 pixel13 pixel14 pixel15 pixel16 pixel17
## 1      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0      0
##   pixel18 pixel19 pixel20 pixel21 pixel22 pixel23 pixel24 pixel25 pixel26
## 1      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0      0
##   pixel27 pixel28 pixel29 pixel30 pixel31 pixel32 pixel33 pixel34 pixel35
## 1      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0      0
##   pixel36 pixel37 pixel38 pixel39 pixel40 pixel41 pixel42 pixel43 pixel44
## 1      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0      0
```

|      |          |          |          |          |          |          |          |          |         |
|------|----------|----------|----------|----------|----------|----------|----------|----------|---------|
| ##   | pixel45  | pixel46  | pixel47  | pixel48  | pixel49  | pixel50  | pixel51  | pixel52  | pixel53 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ##   | pixel54  | pixel55  | pixel56  | pixel57  | pixel58  | pixel59  | pixel60  | pixel61  | pixel62 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ##   | pixel63  | pixel64  | pixel65  | pixel66  | pixel67  | pixel68  | pixel69  | pixel70  | pixel71 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ##   | pixel72  | pixel73  | pixel74  | pixel75  | pixel76  | pixel77  | pixel78  | pixel79  | pixel80 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ##   | pixel81  | pixel82  | pixel83  | pixel84  | pixel85  | pixel86  | pixel87  | pixel88  | pixel89 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ##   | pixel90  | pixel91  | pixel92  | pixel93  | pixel94  | pixel95  | pixel96  | pixel97  | pixel98 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ##   | pixel99  | pixel100 | pixel101 | pixel102 | pixel103 | pixel104 | pixel105 | pixel106 |         |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ##   | pixel107 | pixel108 | pixel109 | pixel110 | pixel111 | pixel112 | pixel113 | pixel114 |         |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel115 | pixel116 | pixel117 | pixel118 | pixel119 | pixel120 | pixel121 | pixel122 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 18       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 1        | 25       |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel123 | pixel124 | pixel125 | pixel126 | pixel127 | pixel128 | pixel129 | pixel130 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 30       | 137      | 137      | 192      | 86       | 72       | 1        | 0        |
| ## 3 | 0        | 3        | 141      | 139      | 3        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 130      | 155      | 254      | 254      | 254      | 157      | 30       | 2        |
| ## 6 | 0        | 3        | 141      | 202      | 254      | 193      | 44       | 0        |
| ##   | pixel131 | pixel132 | pixel133 | pixel134 | pixel135 | pixel136 | pixel137 | pixel138 |
| ## 1 | 0        | 188      | 255      | 94       | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel139 | pixel140 | pixel141 | pixel142 | pixel143 | pixel144 | pixel145 | pixel146 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 220      |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel147 | pixel148 | pixel149 | pixel150 | pixel151 | pixel152 | pixel153 | pixel154 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 13       | 86       | 250      | 254      | 254      | 254      | 254      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 9        | 254      | 254      |
| ## 4 | 179      | 6        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 8        | 103      | 253      | 253      | 253      | 253      | 253      |
| ## 6 | 0        | 0        | 0        | 0        | 5        | 165      | 254      | 179      |
| ##   | pixel155 | pixel156 | pixel157 | pixel158 | pixel159 | pixel160 | pixel161 | pixel162 |
| ## 1 | 0        | 0        | 0        | 0        | 191      | 250      | 253      | 93       |
| ## 2 | 217      | 246      | 151      | 32       | 0        | 0        | 0        | 0        |
| ## 3 | 8        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 9        | 77       | 0        | 0        | 0        | 0        |
| ## 5 | 253      | 253      | 253      | 114      | 2        | 0        | 0        | 0        |
| ## 6 | 163      | 249      | 244      | 72       | 0        | 0        | 0        | 0        |
| ##   | pixel163 | pixel164 | pixel165 | pixel166 | pixel167 | pixel168 | pixel169 | pixel170 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel171 | pixel172 | pixel173 | pixel174 | pixel175 | pixel176 | pixel177 | pixel178 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 16       | 179      | 254      | 254      |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 28       | 247      | 17       | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 11       | 208      | 253      | 253      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel179 | pixel180 | pixel181 | pixel182 | pixel183 | pixel184 | pixel185 | pixel186 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 123      |
| ## 2 | 254      | 254      | 254      | 254      | 254      | 254      | 254      | 231      |
| ## 3 | 0        | 9        | 254      | 254      | 8        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 27       | 202      |
| ## 5 | 253      | 253      | 253      | 253      | 253      | 253      | 253      | 253      |
| ## 6 | 135      | 254      | 150      | 0        | 0        | 189      | 254      | 243      |
| ##   | pixel187 | pixel188 | pixel189 | pixel190 | pixel191 | pixel192 | pixel193 | pixel194 |
| ## 1 | 248      | 253      | 167      | 10       | 0        | 0        | 0        | 0        |
| ## 2 | 54       | 15       | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 107      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 31       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel195 | pixel196 | pixel197 | pixel198 | pixel199 | pixel200 | pixel201 | pixel202 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel203 | pixel204 | pixel205 | pixel206 | pixel207 | pixel208 | pixel209 | pixel210 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 72       | 254      | 254      | 254      | 254      | 254      | 254      | 254      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 9        | 254      | 254      |
| ## 4 | 242      | 155      | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 31       | 253      | 253      | 253      | 253      | 253      | 253      | 253      |
| ## 6 | 0        | 0        | 0        | 82       | 248      | 209      | 5        | 0        |
| ##   | pixel211 | pixel212 | pixel213 | pixel214 | pixel215 | pixel216 | pixel217 | pixel218 |
| ## 1 | 0        | 0        | 80       | 247      | 253      | 208      | 13       | 0        |
| ## 2 | 254      | 254      | 254      | 254      | 254      | 104      | 0        | 0        |
| ## 3 | 106      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 27       | 254      | 63       | 0        | 0        | 0        |
| ## 5 | 253      | 253      | 253      | 253      | 215      | 101      | 3        | 0        |
| ## 6 | 0        | 164      | 236      | 254      | 115      | 0        | 0        | 0        |
| ##   | pixel219 | pixel220 | pixel221 | pixel222 | pixel223 | pixel224 | pixel225 | pixel226 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel227 | pixel228 | pixel229 | pixel230 | pixel231 | pixel232 | pixel233 | pixel234 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 61       | 191      | 254      | 254      | 254      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 160      | 207      | 6        | 0        |
| ## 5 | 0        | 0        | 0        | 23       | 210      | 253      | 253      | 253      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 8        | 211      |
| ##   | pixel235 | pixel236 | pixel237 | pixel238 | pixel239 | pixel240 | pixel241 | pixel242 |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 1 | 0        | 0        | 0        | 0        | 0        | 29       | 207      | 253      |
| ## 2 | 254      | 254      | 109      | 83       | 199      | 254      | 254      | 254      |
| ## 3 | 0        | 9        | 254      | 254      | 184      | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 27       | 254      |
| ## 5 | 248      | 161      | 222      | 222      | 246      | 253      | 253      | 253      |
| ## 6 | 254      | 58       | 0        | 0        | 0        | 0        | 33       | 230      |
| ##   | pixel243 | pixel244 | pixel245 | pixel246 | pixel247 | pixel248 | pixel249 | pixel250 |
| ## 1 | 235      | 77       | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 254      | 243      | 85       | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 65       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 253      | 253      | 39       | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 212      | 6        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel251 | pixel252 | pixel253 | pixel254 | pixel255 | pixel256 | pixel257 | pixel258 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 172      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 136      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel259 | pixel260 | pixel261 | pixel262 | pixel263 | pixel264 | pixel265 | pixel266 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 254      | 254      | 254      | 202      | 147      | 147      | 45       | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 9        | 254      | 254      |
| ## 4 | 127      | 254      | 21       | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 253      | 253      | 253      | 229      | 77       | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 119      | 254      | 156      | 3        | 0        | 0        |
| ##   | pixel267 | pixel268 | pixel269 | pixel270 | pixel271 | pixel272 | pixel273 | pixel274 |
| ## 1 | 54       | 209      | 253      | 253      | 88       | 0        | 0        | 0        |
| ## 2 | 11       | 29       | 200      | 254      | 254      | 254      | 171      | 0        |
| ## 3 | 184      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 20       | 239      | 65       | 0        | 0        | 0        |
| ## 5 | 70       | 218      | 253      | 253      | 253      | 253      | 215      | 91       |
| ## 6 | 0        | 0        | 18       | 230      | 254      | 33       | 0        | 0        |
| ##   | pixel275 | pixel276 | pixel277 | pixel278 | pixel279 | pixel280 | pixel281 | pixel282 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel283 | pixel284 | pixel285 | pixel286 | pixel287 | pixel288 | pixel289 | pixel290 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 1        | 174      | 254      | 254      | 89       | 67       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 77       | 254      | 21       | 0        |
| ## 5 | 0        | 0        | 5        | 214      | 253      | 253      | 253      | 195      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 10       | 212      | 254      |
| ##   | pixel291 | pixel292 | pixel293 | pixel294 | pixel295 | pixel296 | pixel297 | pixel298 |
| ## 1 | 0        | 0        | 0        | 93       | 254      | 253      | 238      | 170      |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 128      | 252      |
| ## 3 | 0        | 9        | 254      | 254      | 184      | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 195      |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 104      | 224      | 253      |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 6 | 35       | 0        | 0        | 0        | 0        | 0        | 33       | 254      |
| ##   | pixel299 | pixel300 | pixel301 | pixel302 | pixel303 | pixel304 | pixel305 | pixel306 |
| ## 1 | 17       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 254      | 254      | 212      | 76       | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 65       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 253      | 253      | 253      | 215      | 29       | 0        | 0        | 0        |
| ## 6 | 254      | 33       | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel307 | pixel308 | pixel309 | pixel310 | pixel311 | pixel312 | pixel313 | pixel314 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 47       | 254      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 116      | 253      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel315 | pixel316 | pixel317 | pixel318 | pixel319 | pixel320 | pixel321 | pixel322 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 23       | 210      |
| ## 2 | 254      | 254      | 29       | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 6        | 185      | 254      |
| ## 4 | 70       | 254      | 21       | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 253      | 253      | 247      | 75       | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 116      | 254      | 154      | 3        | 0        | 0        | 0        |
| ##   | pixel323 | pixel324 | pixel325 | pixel326 | pixel327 | pixel328 | pixel329 | pixel330 |
| ## 1 | 254      | 253      | 159      | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 83       | 254      | 254      | 254      | 153      |
| ## 3 | 184      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 195      | 142      | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 26       | 200      | 253      | 253      | 253      | 253      |
| ## 6 | 0        | 0        | 33       | 254      | 254      | 33       | 0        | 0        |
| ##   | pixel331 | pixel332 | pixel333 | pixel334 | pixel335 | pixel336 | pixel337 | pixel338 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 216      | 4        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel339 | pixel340 | pixel341 | pixel342 | pixel343 | pixel344 | pixel345 | pixel346 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 80       | 254      | 254      | 240      | 24       | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 56       | 251      | 21       | 0        |
| ## 5 | 0        | 0        | 254      | 253      | 253      | 253      | 195      | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 124      | 254      | 115      |
| ##   | pixel347 | pixel348 | pixel349 | pixel350 | pixel351 | pixel352 | pixel353 | pixel354 |
| ## 1 | 0        | 16       | 209      | 253      | 254      | 240      | 81       | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 25       |
| ## 3 | 0        | 0        | 89       | 254      | 184      | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 195      |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 26       |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 160      | 254      |
| ##   | pixel355 | pixel356 | pixel357 | pixel358 | pixel359 | pixel360 | pixel361 | pixel362 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 240      | 254      | 254      | 153      | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 4 | 227      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 200      | 253      | 253      | 253      | 253      | 5        | 0        | 0        |
| ## 6 | 239      | 23       | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel363 | pixel364 | pixel365 | pixel366 | pixel367 | pixel368 | pixel369 | pixel370 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 64       | 254      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 254      | 253      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel371 | pixel372 | pixel373 | pixel374 | pixel375 | pixel376 | pixel377 | pixel378 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 27       | 253      | 253      |
| ## 2 | 254      | 186      | 7        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 4        | 146      | 254      |
| ## 4 | 0        | 222      | 153      | 5        | 0        | 0        | 0        | 0        |
| ## 5 | 253      | 253      | 99       | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 203      | 254      | 35       | 0        | 0        | 0        | 0        |
| ##   | pixel379 | pixel380 | pixel381 | pixel382 | pixel383 | pixel384 | pixel385 | pixel386 |
| ## 1 | 254      | 13       | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 166      | 254      | 254      | 224      |
| ## 3 | 184      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 120      | 240      | 13       | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 25       | 231      | 253      | 253      |
| ## 6 | 0        | 0        | 197      | 254      | 178      | 0        | 0        | 0        |
| ##   | pixel387 | pixel388 | pixel389 | pixel390 | pixel391 | pixel392 | pixel393 | pixel394 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 12       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 253      | 36       | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel395 | pixel396 | pixel397 | pixel398 | pixel399 | pixel400 | pixel401 | pixel402 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 14       | 232      | 254      | 254      | 254      | 29       | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 67       | 251      | 40       |
| ## 5 | 0        | 0        | 254      | 253      | 253      | 253      | 99       | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 23       | 239      | 221      | 11       |
| ##   | pixel403 | pixel404 | pixel405 | pixel406 | pixel407 | pixel408 | pixel409 | pixel410 |
| ## 1 | 20       | 206      | 254      | 254      | 198      | 7        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 9        | 254      | 254      | 184      | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 94       |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 198      | 255      |
| ##   | pixel411 | pixel412 | pixel413 | pixel414 | pixel415 | pixel416 | pixel417 | pixel418 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 75       | 254      | 254      | 254      | 17       | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 255      | 69       | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 223      | 253      | 253      | 253      | 129      | 0        | 0        |
| ## 6 | 123      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel419 | pixel420 | pixel421 | pixel422 | pixel423 | pixel424 | pixel425 | pixel426 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 2 | 0        | 0        | 0        | 0        | 0        | 18       | 254      | 254      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 254      | 253      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel427 | pixel428 | pixel429 | pixel430 | pixel431 | pixel432 | pixel433 | pixel434 |
| ## 1 | 0        | 0        | 0        | 0        | 168      | 253      | 253      | 196      |
| ## 2 | 254      | 254      | 29       | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 9        | 254      | 254      |
| ## 4 | 0        | 0        | 234      | 184      | 0        | 0        | 0        | 0        |
| ## 5 | 253      | 253      | 99       | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 23       | 238      | 178      | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel435 | pixel436 | pixel437 | pixel438 | pixel439 | pixel440 | pixel441 | pixel442 |
| ## 1 | 7        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 48       | 254      | 254      | 254      |
| ## 3 | 184      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 19       | 245      | 69       | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 127      | 253      | 253      |
| ## 6 | 0        | 10       | 219      | 254      | 96       | 0        | 0        | 0        |
| ##   | pixel443 | pixel444 | pixel445 | pixel446 | pixel447 | pixel448 | pixel449 | pixel450 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 17       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 253      | 129      | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel451 | pixel452 | pixel453 | pixel454 | pixel455 | pixel456 | pixel457 | pixel458 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 20       |
| ## 2 | 0        | 2        | 163      | 254      | 254      | 254      | 29       | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 234      | 169      |
| ## 5 | 0        | 0        | 254      | 253      | 253      | 253      | 99       | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 30       | 249      | 204      | 0        |
| ##   | pixel459 | pixel460 | pixel461 | pixel462 | pixel463 | pixel464 | pixel465 | pixel466 |
| ## 1 | 203      | 253      | 248      | 76       | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 9        | 254      | 254      | 184      | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 3        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 25       | 235      | 254      |
| ##   | pixel467 | pixel468 | pixel469 | pixel470 | pixel471 | pixel472 | pixel473 | pixel474 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 48       | 254      | 254      | 254      | 17       | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 199      | 182      | 10       | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 139      | 253      | 253      | 253      | 90       | 0        | 0        |
| ## 6 | 62       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel475 | pixel476 | pixel477 | pixel478 | pixel479 | pixel480 | pixel481 | pixel482 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 94       | 254      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 254      | 253      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |



|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ##   | pixel483 | pixel484 | pixel485 | pixel486 | pixel487 | pixel488 | pixel489 | pixel490 |
| ## 1 | 0        | 0        | 22       | 188      | 253      | 245      | 93       | 0        |
| ## 2 | 254      | 254      | 200      | 12       | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 9        | 254      | 254      |
| ## 4 | 0        | 0        | 154      | 205      | 4        | 0        | 0        | 26       |
| ## 5 | 253      | 253      | 99       | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 26       | 243      | 204      | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel491 | pixel492 | pixel493 | pixel494 | pixel495 | pixel496 | pixel497 | pixel498 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 16       | 209      | 254      | 254      | 150      |
| ## 3 | 184      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 72       | 128      | 203      | 208      | 254      | 254      | 131      | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 78       | 248      | 253      | 253      |
| ## 6 | 0        | 91       | 254      | 248      | 36       | 0        | 0        | 0        |
| ##   | pixel499 | pixel500 | pixel501 | pixel502 | pixel503 | pixel504 | pixel505 | pixel506 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 1        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 253      | 5        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel507 | pixel508 | pixel509 | pixel510 | pixel511 | pixel512 | pixel513 | pixel514 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 103      | 253      |
| ## 2 | 0        | 0        | 15       | 206      | 254      | 254      | 254      | 202      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 61       | 254      |
| ## 5 | 0        | 0        | 254      | 253      | 253      | 253      | 216      | 34       |
| ## 6 | 0        | 0        | 0        | 0        | 33       | 254      | 204      | 0        |
| ##   | pixel515 | pixel516 | pixel517 | pixel518 | pixel519 | pixel520 | pixel521 | pixel522 |
| ## 1 | 253      | 191      | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 66       | 0        | 0        | 0        | 0        | 0        | 21       | 161      |
| ## 3 | 0        | 9        | 254      | 254      | 184      | 0        | 0        | 0        |
| ## 4 | 129      | 113      | 186      | 245      | 251      | 189      | 75       | 56       |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 33       |
| ## 6 | 0        | 0        | 0        | 0        | 67       | 241      | 254      | 133      |
| ##   | pixel523 | pixel524 | pixel525 | pixel526 | pixel527 | pixel528 | pixel529 | pixel530 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 254      | 254      | 245      | 31       | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 136      | 254      | 73       | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 152      | 253      | 253      | 253      | 107      | 1        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel531 | pixel532 | pixel533 | pixel534 | pixel535 | pixel536 | pixel537 | pixel538 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 60       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 206      | 253      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel539 | pixel540 | pixel541 | pixel542 | pixel543 | pixel544 | pixel545 | pixel546 |
| ## 1 | 0        | 89       | 240      | 253      | 195      | 25       | 0        | 0        |
| ## 2 | 212      | 254      | 254      | 254      | 194      | 48       | 48       | 34       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 156      | 254      | 254      |
| ## 4 | 0        | 0        | 15       | 216      | 233      | 233      | 159      | 104      |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 5 | 253      | 253      | 253      | 140      | 0        | 0        | 0        | 0        |
| ## 6 | 33       | 254      | 214      | 7        | 0        | 0        | 0        | 50       |
| ##   | pixel547 | pixel548 | pixel549 | pixel550 | pixel551 | pixel552 | pixel553 | pixel554 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 41       | 48       | 209      | 254      | 254      | 254      | 171      | 0        |
| ## 3 | 184      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 52       | 0        | 0        | 0        | 38       | 254      | 73       | 0        |
| ## 5 | 0        | 30       | 139      | 234      | 253      | 253      | 253      | 154      |
| ## 6 | 242      | 254      | 194      | 24       | 0        | 0        | 0        | 0        |
| ##   | pixel555 | pixel556 | pixel557 | pixel558 | pixel559 | pixel560 | pixel561 | pixel562 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 2        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel563 | pixel564 | pixel565 | pixel566 | pixel567 | pixel568 | pixel569 | pixel570 |
| ## 1 | 0        | 0        | 0        | 0        | 15       | 220      | 253      | 253      |
| ## 2 | 0        | 0        | 0        | 0        | 86       | 243      | 254      | 254      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 16       | 205      | 253      | 253      | 253      | 250      |
| ## 6 | 0        | 0        | 0        | 0        | 5        | 193      | 254      | 78       |
| ##   | pixel571 | pixel572 | pixel573 | pixel574 | pixel575 | pixel576 | pixel577 | pixel578 |
| ## 1 | 80       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 254      | 254      | 254      | 233      | 243      | 254      | 254      | 254      |
| ## 3 | 0        | 185      | 255      | 255      | 184      | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 208      | 106      | 106      | 106      | 200      | 237      | 253      | 253      |
| ## 6 | 0        | 0        | 19       | 128      | 254      | 195      | 36       | 0        |
| ##   | pixel579 | pixel580 | pixel581 | pixel582 | pixel583 | pixel584 | pixel585 | pixel586 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 254      | 254      | 86       | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 18       | 254      | 73       | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 253      | 253      | 209      | 22       | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel587 | pixel588 | pixel589 | pixel590 | pixel591 | pixel592 | pixel593 | pixel594 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 82       |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel595 | pixel596 | pixel597 | pixel598 | pixel599 | pixel600 | pixel601 | pixel602 |
| ## 1 | 94       | 253      | 253      | 253      | 94       | 0        | 0        | 0        |
| ## 2 | 0        | 114      | 254      | 254      | 254      | 254      | 254      | 254      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 185      | 254      | 254      |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 253      | 253      | 253      | 253      | 253      | 253      | 253      | 253      |
| ## 6 | 0        | 103      | 254      | 222      | 74       | 143      | 235      | 254      |
| ##   | pixel603 | pixel604 | pixel605 | pixel606 | pixel607 | pixel608 | pixel609 | pixel610 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 254      | 254      | 254      | 254      | 239      | 86       | 11       | 0        |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 3 | 184      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 18       | 254      | 73       | 0        |
| ## 5 | 253      | 253      | 253      | 253      | 253      | 209      | 22       | 0        |
| ## 6 | 228      | 83       | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel611 | pixel612 | pixel613 | pixel614 | pixel615 | pixel616 | pixel617 | pixel618 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel619 | pixel620 | pixel621 | pixel622 | pixel623 | pixel624 | pixel625 | pixel626 |
| ## 1 | 0        | 0        | 0        | 0        | 89       | 251      | 253      | 250      |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 13       | 182      | 254      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 1        | 91       | 253      | 253      | 253      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 30       | 242      | 254      |
| ##   | pixel627 | pixel628 | pixel629 | pixel630 | pixel631 | pixel632 | pixel633 | pixel634 |
| ## 1 | 131      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 254      | 254      | 254      | 254      | 254      | 254      | 254      | 243      |
| ## 3 | 0        | 185      | 254      | 254      | 184      | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 253      | 253      | 253      | 253      | 253      | 253      | 253      | 213      |
| ## 6 | 254      | 254      | 254      | 252      | 84       | 0        | 0        | 0        |
| ##   | pixel635 | pixel636 | pixel637 | pixel638 | pixel639 | pixel640 | pixel641 | pixel642 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 70       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 5        | 206      | 106      | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 90       | 7        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel643 | pixel644 | pixel645 | pixel646 | pixel647 | pixel648 | pixel649 | pixel650 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel651 | pixel652 | pixel653 | pixel654 | pixel655 | pixel656 | pixel657 | pixel658 |
| ## 1 | 0        | 214      | 218      | 95       | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 8        | 76       | 146      | 254      | 255      | 254      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 63       | 254      | 254      |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 1        | 18       | 129      | 208      | 253      | 253      | 253      | 253      |
| ## 6 | 0        | 0        | 23       | 64       | 158      | 200      | 174      | 61       |
| ##   | pixel659 | pixel660 | pixel661 | pixel662 | pixel663 | pixel664 | pixel665 | pixel666 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 255      | 146      | 19       | 15       | 0        | 0        | 0        | 0        |
| ## 3 | 62       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 186      | 159      | 0        |
| ## 5 | 159      | 129      | 90       | 4        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel667 | pixel668 | pixel669 | pixel670 | pixel671 | pixel672 | pixel673 | pixel674 |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel675 | pixel676 | pixel677 | pixel678 | pixel679 | pixel680 | pixel681 | pixel682 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel683 | pixel684 | pixel685 | pixel686 | pixel687 | pixel688 | pixel689 | pixel690 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel691 | pixel692 | pixel693 | pixel694 | pixel695 | pixel696 | pixel697 | pixel698 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 6        | 209      | 101      | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel699 | pixel700 | pixel701 | pixel702 | pixel703 | pixel704 | pixel705 | pixel706 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel707 | pixel708 | pixel709 | pixel710 | pixel711 | pixel712 | pixel713 | pixel714 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel715 | pixel716 | pixel717 | pixel718 | pixel719 | pixel720 | pixel721 | pixel722 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel723 | pixel724 | pixel725 | pixel726 | pixel727 | pixel728 | pixel729 | pixel730 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |

```

## 6      0      0      0      0      0      0      0      0
## pixel731 pixel732 pixel733 pixel734 pixel735 pixel736 pixel737 pixel738
## 1      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0
## pixel739 pixel740 pixel741 pixel742 pixel743 pixel744 pixel745 pixel746
## 1      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0
## pixel747 pixel748 pixel749 pixel750 pixel751 pixel752 pixel753 pixel754
## 1      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0
## pixel755 pixel756 pixel757 pixel758 pixel759 pixel760 pixel761 pixel762
## 1      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0
## pixel763 pixel764 pixel765 pixel766 pixel767 pixel768 pixel769 pixel770
## 1      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0
## pixel771 pixel772 pixel773 pixel774 pixel775 pixel776 pixel777 pixel778
## 1      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0
## pixel779 pixel780 pixel781 pixel782 pixel783
## 1      0      0      0      0      0
## 2      0      0      0      0      0
## 3      0      0      0      0      0
## 4      0      0      0      0      0
## 5      0      0      0      0      0
## 6      0      0      0      0      0

```

```

#Create a random sample of n% of train data set
percent <- .25
set.seed(275)

```

```
DigitSplit <- sample(nrow(DigitTotalDF), nrow(DigitTotalDF)*percent)
DigitDF <- DigitTotalDF[DigitSplit,]
dim(DigitDF)
```

```
## [1] 10500 785
```

```
##(head(DigitDF))
##(str(DigitDF))
(nrow(DigitDF))
```

```
## [1] 10500
```

Don't use the test data set in this example, but I encourage you to try and see what happens.

```
filename <- "digit_test.csv"
TestTotalDF <- read.csv(filename, header = TRUE, stringsAsFactors = TRUE)
##TestTotalDF$label<-as.factor(TestTotalDF$label)
## Wont use test data, instead crossvalidation on train.
dim(TestTotalDF)
```

```
## [1] 28000 784
```

```
(head(TestTotalDF))
```

```
## pixel0 pixel1 pixel2 pixel3 pixel4 pixel5 pixel6 pixel7 pixel8 pixel9
## 1      0      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0      0      0
## pixel10 pixel11 pixel12 pixel13 pixel14 pixel15 pixel16 pixel17 pixel18
## 1      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0      0
## pixel19 pixel20 pixel21 pixel22 pixel23 pixel24 pixel25 pixel26 pixel27
## 1      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0      0
## pixel28 pixel29 pixel30 pixel31 pixel32 pixel33 pixel34 pixel35 pixel36
## 1      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0      0
## pixel37 pixel38 pixel39 pixel40 pixel41 pixel42 pixel43 pixel44 pixel45
## 1      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0
```

```

## 5      0      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0      0
## pixel46 pixel47 pixel48 pixel49 pixel50 pixel51 pixel52 pixel53 pixel54
## 1      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0      0
## pixel55 pixel56 pixel57 pixel58 pixel59 pixel60 pixel61 pixel62 pixel63
## 1      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0      0
## pixel64 pixel65 pixel66 pixel67 pixel68 pixel69 pixel70 pixel71 pixel72
## 1      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0      0
## pixel73 pixel74 pixel75 pixel76 pixel77 pixel78 pixel79 pixel80 pixel81
## 1      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0      0
## pixel82 pixel83 pixel84 pixel85 pixel86 pixel87 pixel88 pixel89 pixel90
## 1      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0
## 5      0      0      0      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0      0
## pixel91 pixel92 pixel93 pixel94 pixel95 pixel96 pixel97 pixel98 pixel99
## 1      0      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0      0
## 5      0      0      0      0      13      80      175      242      205
## 6      0      0      0      0      0      0      0      0      0
## pixel100 pixel101 pixel102 pixel103 pixel104 pixel105 pixel106 pixel107
## 1      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0
## 3      0      0      0      0      0      0      0      0
## 4      0      0      0      0      0      0      0      0
## 5      93      11      0      0      0      0      0      0
## 6      0      0      0      0      0      0      0      0
## pixel108 pixel109 pixel110 pixel111 pixel112 pixel113 pixel114 pixel115
## 1      0      0      0      0      0      0      0      0
## 2      0      0      0      0      0      0      0      0

```

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel116 | pixel117 | pixel118 | pixel119 | pixel120 | pixel121 | pixel122 | pixel123 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 10       | 17       |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 10       | 171      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel124 | pixel125 | pixel126 | pixel127 | pixel128 | pixel129 | pixel130 | pixel131 |
| ## 1 | 17       | 17       | 17       | 81       | 180      | 180      | 35       | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 254      | 253      | 253      | 253      | 254      | 214      | 30       | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel132 | pixel133 | pixel134 | pixel135 | pixel136 | pixel137 | pixel138 | pixel139 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel140 | pixel141 | pixel142 | pixel143 | pixel144 | pixel145 | pixel146 | pixel147 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel148 | pixel149 | pixel150 | pixel151 | pixel152 | pixel153 | pixel154 | pixel155 |
| ## 1 | 0        | 0        | 139      | 253      | 253      | 253      | 253      | 253      |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 126      | 253      | 249      | 134      | 134      | 212      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel156 | pixel157 | pixel158 | pixel159 | pixel160 | pixel161 | pixel162 | pixel163 |
| ## 1 | 253      | 253      | 48       | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 254      | 253      | 182      | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel164 | pixel165 | pixel166 | pixel167 | pixel168 | pixel169 | pixel170 | pixel171 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel172 | pixel173 | pixel174 | pixel175 | pixel176 | pixel177 | pixel178 | pixel179 |



|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 1 | 0        | 0        | 0        | 0        | 0        | 60       | 228      | 253      |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 29       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 136      | 253      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel180 | pixel181 | pixel182 | pixel183 | pixel184 | pixel185 | pixel186 | pixel187 |
| ## 1 | 253      | 253      | 253      | 253      | 253      | 253      | 207      | 197      |
| ## 2 | 85       | 85       | 85       | 85       | 85       | 85       | 85       | 85       |
| ## 3 | 0        | 6        | 100      | 213      | 254      | 245      | 255      | 149      |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 90       | 0        | 0        | 6        | 133      | 253      | 249      | 18       |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel188 | pixel189 | pixel190 | pixel191 | pixel192 | pixel193 | pixel194 | pixel195 |
| ## 1 | 46       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 71       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 17       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel196 | pixel197 | pixel198 | pixel199 | pixel200 | pixel201 | pixel202 | pixel203 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 73       | 224      |
| ##   | pixel204 | pixel205 | pixel206 | pixel207 | pixel208 | pixel209 | pixel210 | pixel211 |
| ## 1 | 0        | 213      | 253      | 253      | 253      | 253      | 253      | 253      |
| ## 2 | 0        | 107      | 128      | 168      | 250      | 250      | 250      | 252      |
| ## 3 | 0        | 0        | 0        | 0        | 26       | 181      | 233      | 102      |
| ## 4 | 0        | 0        | 0        | 0        | 40       | 0        | 2        | 12       |
| ## 5 | 0        | 0        | 0        | 25       | 0        | 0        | 0        | 0        |
| ## 6 | 254      | 254      | 156      | 156      | 89       | 59       | 14       | 0        |
| ##   | pixel212 | pixel213 | pixel214 | pixel215 | pixel216 | pixel217 | pixel218 | pixel219 |
| ## 1 | 253      | 253      | 253      | 253      | 223      | 52       | 0        | 0        |
| ## 2 | 250      | 250      | 250      | 250      | 231      | 127      | 63       | 0        |
| ## 3 | 40       | 29       | 102      | 166      | 187      | 0        | 0        | 0        |
| ## 4 | 45       | 109      | 109      | 30       | 0        | 0        | 0        | 0        |
| ## 5 | 20       | 218      | 254      | 133      | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel220 | pixel221 | pixel222 | pixel223 | pixel224 | pixel225 | pixel226 | pixel227 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel228 | pixel229 | pixel230 | pixel231 | pixel232 | pixel233 | pixel234 | pixel235 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 66       | 231      | 253      |
| ## 2 | 0        | 0        | 0        | 85       | 168      | 237      | 252      | 250      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 57       |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 149      |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 6 | 0        | 0        | 118      | 253      | 250      | 241      | 254      | 253      |
| ##   | pixel236 | pixel237 | pixel238 | pixel239 | pixel240 | pixel241 | pixel242 | pixel243 |
| ## 1 | 253      | 253      | 108      | 40       | 40       | 115      | 244      | 253      |
| ## 2 | 250      | 250      | 250      | 252      | 250      | 250      | 250      | 250      |
| ## 3 | 236      | 181      | 35       | 0        | 0        | 0        | 0        | 12       |
| ## 4 | 207      | 58       | 116      | 227      | 254      | 253      | 253      | 209      |
| ## 5 | 0        | 0        | 0        | 0        | 47       | 226      | 253      | 193      |
| ## 6 | 253      | 253      | 223      | 215      | 169      | 50       | 2        | 0        |
| ##   | pixel244 | pixel245 | pixel246 | pixel247 | pixel248 | pixel249 | pixel250 | pixel251 |
| ## 1 | 253      | 134      | 3        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 252      | 250      | 209      | 56       | 0        | 0        | 0        | 0        |
| ## 3 | 207      | 13       | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel252 | pixel253 | pixel254 | pixel255 | pixel256 | pixel257 | pixel258 | pixel259 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 127      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 147      | 253      |
| ##   | pixel260 | pixel261 | pixel262 | pixel263 | pixel264 | pixel265 | pixel266 | pixel267 |
| ## 1 | 0        | 0        | 63       | 114      | 114      | 114      | 37       | 0        |
| ## 2 | 250      | 250      | 252      | 250      | 250      | 250      | 250      | 252      |
| ## 3 | 0        | 0        | 27       | 228      | 187      | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 98       | 228      | 254      | 185      | 174      | 91       |
| ## 5 | 0        | 13       | 12       | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 183      | 30       | 78       | 115      | 145      | 174      | 174      | 223      |
| ##   | pixel268 | pixel269 | pixel270 | pixel271 | pixel272 | pixel273 | pixel274 | pixel275 |
| ## 1 | 0        | 0        | 205      | 253      | 253      | 253      | 15       | 0        |
| ## 2 | 250      | 250      | 250      | 250      | 252      | 250      | 250      | 83       |
| ## 3 | 0        | 0        | 0        | 96       | 225      | 9        | 0        | 0        |
| ## 4 | 92       | 111      | 217      | 254      | 156      | 0        | 0        | 0        |
| ## 5 | 5        | 208      | 253      | 109      | 0        | 0        | 0        | 0        |
| ## 6 | 253      | 253      | 181      | 101      | 0        | 0        | 0        | 0        |
| ##   | pixel276 | pixel277 | pixel278 | pixel279 | pixel280 | pixel281 | pixel282 | pixel283 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel284 | pixel285 | pixel286 | pixel287 | pixel288 | pixel289 | pixel290 | pixel291 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 8        | 113      | 252      | 252      | 252      | 247      | 210      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 167      | 230      |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 20       | 141      |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 19       | 30       |
| ## 6 | 0        | 47       | 235      | 253      | 153      | 0        | 0        | 0        |
| ##   | pixel292 | pixel293 | pixel294 | pixel295 | pixel296 | pixel297 | pixel298 | pixel299 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 57       | 253      |
| ## 2 | 210      | 210      | 210      | 177      | 0        | 0        | 0        | 0        |
| ## 3 | 18       | 0        | 0        | 0        | 0        | 0        | 74       | 242      |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 4 | 24       | 9        | 0        | 0        | 0        | 0        | 43       | 253      |
| ## 5 | 0        | 0        | 0        | 0        | 20       | 253      | 235      | 43       |
| ## 6 | 0        | 0        | 0        | 35       | 79       | 196      | 253      | 253      |
| ##   | pixel300 | pixel301 | pixel302 | pixel303 | pixel304 | pixel305 | pixel306 | pixel307 |
| ## 1 | 253      | 253      | 15       | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 43       | 252      | 252      | 83       | 0        | 0        | 0        | 0        |
| ## 3 | 106      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 253      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 152      | 6        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel308 | pixel309 | pixel310 | pixel311 | pixel312 | pixel313 | pixel314 | pixel315 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 43       | 250      | 250      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 33       | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 156      | 253      | 253      |
| ##   | pixel316 | pixel317 | pixel318 | pixel319 | pixel320 | pixel321 | pixel322 | pixel323 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 250      | 250      | 210      | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 83       | 247      | 60       | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 23       | 139      | 104      | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 14       | 133      | 157      | 122      |
| ## 6 | 117      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel324 | pixel325 | pixel326 | pixel327 | pixel328 | pixel329 | pixel330 | pixel331 |
| ## 1 | 0        | 0        | 42       | 253      | 253      | 253      | 15       | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 28       | 194      | 250      | 138      |
| ## 3 | 0        | 67       | 232      | 102      | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 50       | 253      | 253      | 0        | 0        | 0        |
| ## 5 | 230      | 254      | 159      | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 18       | 73       | 230      | 254      | 114      | 0        | 0        |
| ##   | pixel332 | pixel333 | pixel334 | pixel335 | pixel336 | pixel337 | pixel338 | pixel339 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 14       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel340 | pixel341 | pixel342 | pixel343 | pixel344 | pixel345 | pixel346 | pixel347 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 43       | 250      | 250      | 250      | 250      | 210      | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 133      | 211      | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 180      | 246      | 20       |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 156      | 254      | 235      | 15       | 0        | 0        | 0        |
| ##   | pixel348 | pixel349 | pixel350 | pixel351 | pixel352 | pixel353 | pixel354 | pixel355 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 95       | 253      |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 16       | 127      | 225      | 165      | 4        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 166      | 253      |
| ## 5 | 122      | 253      | 253      | 253      | 254      | 187      | 9        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 10       | 209      |
| ##   | pixel356 | pixel357 | pixel358 | pixel359 | pixel360 | pixel361 | pixel362 | pixel363 |
| ## 1 | 253      | 253      | 15       | 0        | 0        | 0        | 0        | 0        |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 2 | 0        | 85       | 250      | 250      | 41       | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 220      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 255      | 76       | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel364 | pixel365 | pixel366 | pixel367 | pixel368 | pixel369 | pixel370 | pixel371 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 43       | 250      | 250      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 107      | 233      | 124      |
| ##   | pixel372 | pixel373 | pixel374 | pixel375 | pixel376 | pixel377 | pixel378 | pixel379 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 137      | 83       | 70       | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 133      | 217      | 0        | 15       | 58       | 140      | 189      |
| ## 4 | 14       | 147      | 72       | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 45       | 204      | 253      | 253      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel380 | pixel381 | pixel382 | pixel383 | pixel384 | pixel385 | pixel386 | pixel387 |
| ## 1 | 0        | 0        | 205      | 253      | 253      | 253      | 15       | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 28       | 167      | 250      |
| ## 3 | 181      | 227      | 24       | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 40       | 243      | 253      | 253      | 0        | 0        | 0        |
| ## 5 | 254      | 178      | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 159      | 253      | 171      | 9        | 7        | 20       |
| ##   | pixel388 | pixel389 | pixel390 | pixel391 | pixel392 | pixel393 | pixel394 | pixel395 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 41       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 5        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel396 | pixel397 | pixel398 | pixel399 | pixel400 | pixel401 | pixel402 | pixel403 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 219      | 250      | 144      | 14       | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 71       | 246      | 225      |
| ## 4 | 0        | 0        | 0        | 0        | 121      | 248      | 52       | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 37       |
| ##   | pixel404 | pixel405 | pixel406 | pixel407 | pixel408 | pixel409 | pixel410 | pixel411 |
| ## 1 | 61       | 99       | 96       | 0        | 0        | 45       | 224      | 253      |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 235      | 253      | 182      | 61       | 231      | 85       | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 47       | 215      | 254      | 216      |
| ## 5 | 0        | 9        | 104      | 247      | 254      | 250      | 108      | 0        |
| ## 6 | 109      | 101      | 175      | 176      | 175      | 175      | 217      | 253      |
| ##   | pixel412 | pixel413 | pixel414 | pixel415 | pixel416 | pixel417 | pixel418 | pixel419 |
| ## 1 | 253      | 195      | 10       | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 127      | 250      | 217      | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 26       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 254      | 187      | 199      | 253      | 58       | 0        | 0        | 0        |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ##   | pixel420 | pixel421 | pixel422 | pixel423 | pixel424 | pixel425 | pixel426 | pixel427 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 11       | 25       |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 254      | 238      | 105      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel428 | pixel429 | pixel430 | pixel431 | pixel432 | pixel433 | pixel434 | pixel435 |
| ## 1 | 105      | 83       | 189      | 189      | 228      | 253      | 251      | 189      |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 73       | 143      | 119      | 58       | 1        | 153      |
| ## 4 | 217      | 215      | 0        | 0        | 0        | 0        | 0        | 40       |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 73       |
| ## 6 | 0        | 0        | 0        | 207      | 253      | 253      | 253      | 229      |
| ##   | pixel436 | pixel437 | pixel438 | pixel439 | pixel440 | pixel441 | pixel442 | pixel443 |
| ## 1 | 189      | 218      | 253      | 253      | 210      | 27       | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 15       | 148      | 252      |
| ## 3 | 212      | 2        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 209      | 253      | 245      | 49       | 0        | 0        | 0        | 0        |
| ## 5 | 255      | 254      | 218      | 14       | 0        | 0        | 0        | 0        |
| ## 6 | 232      | 253      | 253      | 200      | 57       | 19       | 19       | 57       |
| ##   | pixel444 | pixel445 | pixel446 | pixel447 | pixel448 | pixel449 | pixel450 | pixel451 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 252      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 5        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel452 | pixel453 | pixel454 | pixel455 | pixel456 | pixel457 | pixel458 | pixel459 |
| ## 1 | 42       | 116      | 173      | 253      | 253      | 253      | 253      | 253      |
| ## 2 | 0        | 252      | 166      | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 40       | 243      | 67       | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 139      |
| ##   | pixel460 | pixel461 | pixel462 | pixel463 | pixel464 | pixel465 | pixel466 | pixel467 |
| ## 1 | 253      | 253      | 253      | 253      | 253      | 253      | 253      | 253      |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 88       | 254      | 69       | 0        | 0        | 0        |
| ## 4 | 0        | 19       | 146      | 243      | 254      | 225      | 44       | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 145      | 253      | 253      | 110      |
| ## 6 | 185      | 140      | 58       | 23       | 154      | 253      | 185      | 36       |
| ##   | pixel468 | pixel469 | pixel470 | pixel471 | pixel472 | pixel473 | pixel474 | pixel475 |
| ## 1 | 221      | 116      | 7        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 85       | 140      | 250      | 250      | 179      | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel476 | pixel477 | pixel478 | pixel479 | pixel480 | pixel481 | pixel482 | pixel483 |
| ## 1 | 0        | 0        | 0        | 0        | 118      | 253      | 253      | 253      |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 252      | 208      | 63       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 40       |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel484 | pixel485 | pixel486 | pixel487 | pixel488 | pixel489 | pixel490 | pixel491 |
| ## 1 | 253      | 245      | 212      | 222      | 253      | 253      | 253      | 253      |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 40       | 244      | 157      |
| ## 4 | 243      | 131      | 0        | 12       | 154      | 226      | 253      | 246      |
| ## 5 | 0        | 0        | 0        | 19       | 114      | 158      | 12       | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 59       |
| ##   | pixel492 | pixel493 | pixel494 | pixel495 | pixel496 | pixel497 | pixel498 | pixel499 |
| ## 1 | 253      | 253      | 253      | 253      | 253      | 253      | 160      | 15       |
| ## 2 | 0        | 0        | 85       | 127      | 252      | 250      | 250      | 250      |
| ## 3 | 1        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 151      | 43       | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 20       | 253      | 253      | 109      | 0        | 0        | 0        | 0        |
| ## 6 | 239      | 213      | 53       | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel500 | pixel501 | pixel502 | pixel503 | pixel504 | pixel505 | pixel506 | pixel507 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 41       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel508 | pixel509 | pixel510 | pixel511 | pixel512 | pixel513 | pixel514 | pixel515 |
| ## 1 | 254      | 253      | 253      | 253      | 189      | 99       | 0        | 32       |
| ## 2 | 0        | 252      | 250      | 209      | 56       | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 217      | 248      | 181      | 228      |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 13       | 121      | 234      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel516 | pixel517 | pixel518 | pixel519 | pixel520 | pixel521 | pixel522 | pixel523 |
| ## 1 | 202      | 253      | 253      | 253      | 240      | 122      | 122      | 190      |
| ## 2 | 0        | 0        | 141      | 170      | 168      | 168      | 223      | 250      |
| ## 3 | 6        | 212      | 211      | 12       | 0        | 0        | 0        | 0        |
| ## 4 | 253      | 253      | 214      | 72       | 0        | 0        | 0        | 0        |
| ## 5 | 242      | 28       | 0        | 0        | 20       | 253      | 253      | 97       |
| ## 6 | 0        | 0        | 8        | 239      | 243      | 42       | 0        | 0        |
| ##   | pixel524 | pixel525 | pixel526 | pixel527 | pixel528 | pixel529 | pixel530 | pixel531 |
| ## 1 | 253      | 253      | 253      | 174      | 0        | 0        | 0        | 0        |
| ## 2 | 252      | 250      | 250      | 137      | 14       | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel532 | pixel533 | pixel534 | pixel535 | pixel536 | pixel537 | pixel538 | pixel539 |
| ## 1 | 0        | 0        | 0        | 0        | 255      | 253      | 253      | 253      |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 252      | 250      | 250      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel540 | pixel541 | pixel542 | pixel543 | pixel544 | pixel545 | pixel546 | pixel547 |
| ## 1 | 238      | 222      | 222      | 222      | 241      | 253      | 253      | 230      |
| ## 2 | 223      | 210      | 212      | 210      | 210      | 210      | 244      | 252      |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 3 | 0        | 0        | 0        | 0        | 95       | 237      | 46       | 0        |
| ## 4 | 166      | 254      | 254      | 255      | 254      | 172      | 20       | 0        |
| ## 5 | 38       | 194      | 254      | 248      | 49       | 0        | 17       | 68       |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 13       | 183      | 254      |
| ##   | pixel548 | pixel549 | pixel550 | pixel551 | pixel552 | pixel553 | pixel554 | pixel555 |
| ## 1 | 70       | 0        | 0        | 17       | 175      | 229      | 253      | 253      |
| ## 2 | 250      | 250      | 250      | 250      | 252      | 250      | 144      | 14       |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 206      | 254      | 231      | 36       | 0        | 0        | 0        | 0        |
| ## 6 | 135      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel556 | pixel557 | pixel558 | pixel559 | pixel560 | pixel561 | pixel562 | pixel563 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel564 | pixel565 | pixel566 | pixel567 | pixel568 | pixel569 | pixel570 | pixel571 |
| ## 1 | 158      | 253      | 253      | 253      | 253      | 253      | 253      | 253      |
| ## 2 | 0        | 43       | 252      | 252      | 252      | 252      | 254      | 252      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 43       |
| ## 4 | 0        | 0        | 0        | 0        | 3        | 89       | 108      | 109      |
| ## 5 | 0        | 0        | 0        | 37       | 194      | 253      | 253      | 235      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel572 | pixel573 | pixel574 | pixel575 | pixel576 | pixel577 | pixel578 | pixel579 |
| ## 1 | 253      | 205      | 106      | 65       | 0        | 0        | 0        | 0        |
| ## 2 | 252      | 252      | 252      | 255      | 252      | 252      | 252      | 217      |
| ## 3 | 243      | 156      | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 24       | 9        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 196      | 195      | 244      | 253      | 254      | 247      | 93       | 0        |
| ## 6 | 0        | 40       | 253      | 222      | 18       | 0        | 0        | 0        |
| ##   | pixel580 | pixel581 | pixel582 | pixel583 | pixel584 | pixel585 | pixel586 | pixel587 |
| ## 1 | 0        | 62       | 244      | 157      | 0        | 0        | 0        | 0        |
| ## 2 | 177      | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel588 | pixel589 | pixel590 | pixel591 | pixel592 | pixel593 | pixel594 | pixel595 |
| ## 1 | 0        | 0        | 0        | 0        | 6        | 26       | 179      | 179      |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 28       | 166      | 208      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 79       |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel596 | pixel597 | pixel598 | pixel599 | pixel600 | pixel601 | pixel602 | pixel603 |
| ## 1 | 179      | 179      | 179      | 30       | 15       | 10       | 0        | 0        |
| ## 2 | 250      | 250      | 252      | 250      | 250      | 250      | 250      | 238      |
| ## 3 | 0        | 0        | 11       | 213      | 213      | 5        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 254      | 253      | 253      | 253      | 254      | 253      | 253      | 253      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 152      | 253      | 83       |
| ##   | pixel604 | pixel605 | pixel606 | pixel607 | pixel608 | pixel609 | pixel610 | pixel611 |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 14       | 6        |
| ## 2 | 166      | 166      | 166      | 27       | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 6        | 8        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 207      | 75       | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel612 | pixel613 | pixel614 | pixel615 | pixel616 | pixel617 | pixel618 | pixel619 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel620 | pixel621 | pixel622 | pixel623 | pixel624 | pixel625 | pixel626 | pixel627 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 63       | 125      | 125      | 146      | 250      |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 163      | 244      |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 6        | 128      | 211      | 253      | 253      |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel628 | pixel629 | pixel630 | pixel631 | pixel632 | pixel633 | pixel634 | pixel635 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 250      | 165      | 125      | 105      | 0        | 0        | 0        | 0        |
| ## 3 | 35       | 0        | 0        | 0        | 0        | 0        | 0        | 139      |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 224      | 175      | 157      | 97       | 6        | 0        | 0        | 0        |
| ## 6 | 79       | 254      | 231      | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel636 | pixel637 | pixel638 | pixel639 | pixel640 | pixel641 | pixel642 | pixel643 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 208      | 97       | 12       | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel644 | pixel645 | pixel646 | pixel647 | pixel648 | pixel649 | pixel650 | pixel651 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel652 | pixel653 | pixel654 | pixel655 | pixel656 | pixel657 | pixel658 | pixel659 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 14       | 83       | 83       | 27       | 0        | 0        |
| ## 3 | 0        | 60       | 248      | 90       | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 2        | 167      | 253      | 111      | 0        |
| ##   | pixel660 | pixel661 | pixel662 | pixel663 | pixel664 | pixel665 | pixel666 | pixel667 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 16       | 136      | 172      | 168      | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |



|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel668 | pixel669 | pixel670 | pixel671 | pixel672 | pixel673 | pixel674 | pixel675 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel676 | pixel677 | pixel678 | pixel679 | pixel680 | pixel681 | pixel682 | pixel683 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 5        | 195      | 147      | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 88       |
| ##   | pixel684 | pixel685 | pixel686 | pixel687 | pixel688 | pixel689 | pixel690 | pixel691 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 253      | 240      | 40       | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel692 | pixel693 | pixel694 | pixel695 | pixel696 | pixel697 | pixel698 | pixel699 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel700 | pixel701 | pixel702 | pixel703 | pixel704 | pixel705 | pixel706 | pixel707 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel708 | pixel709 | pixel710 | pixel711 | pixel712 | pixel713 | pixel714 | pixel715 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 26       | 237      | 41       | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 118      | 253      | 213      | 0        | 0        |
| ##   | pixel716 | pixel717 | pixel718 | pixel719 | pixel720 | pixel721 | pixel722 | pixel723 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel724 | pixel725 | pixel726 | pixel727 | pixel728 | pixel729 | pixel730 | pixel731 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |

|      |          |          |          |          |          |          |          |          |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel732 | pixel733 | pixel734 | pixel735 | pixel736 | pixel737 | pixel738 | pixel739 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 72       |
| ##   | pixel740 | pixel741 | pixel742 | pixel743 | pixel744 | pixel745 | pixel746 | pixel747 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 185      | 101      | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel748 | pixel749 | pixel750 | pixel751 | pixel752 | pixel753 | pixel754 | pixel755 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel756 | pixel757 | pixel758 | pixel759 | pixel760 | pixel761 | pixel762 | pixel763 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel764 | pixel765 | pixel766 | pixel767 | pixel768 | pixel769 | pixel770 | pixel771 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel772 | pixel773 | pixel774 | pixel775 | pixel776 | pixel777 | pixel778 | pixel779 |
| ## 1 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 2 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 3 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 4 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 5 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ## 6 | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| ##   | pixel780 | pixel781 | pixel782 | pixel783 |          |          |          |          |
| ## 1 | 0        | 0        | 0        | 0        |          |          |          |          |
| ## 2 | 0        | 0        | 0        | 0        |          |          |          |          |
| ## 3 | 0        | 0        | 0        | 0        |          |          |          |          |
| ## 4 | 0        | 0        | 0        | 0        |          |          |          |          |
| ## 5 | 0        | 0        | 0        | 0        |          |          |          |          |
| ## 6 | 0        | 0        | 0        | 0        |          |          |          |          |

# EDA

Investigate the data here ... what do you find???

## Experimental Design

Try running k-fold crossvalidation. See code example below which uses split to determine the fold indexes.

```
# Create k-folds for k-fold cross validation
## Number of observations
N <- nrow(DigitDF)
## Number of desired splits
kfolds <- 10
## Generate indices of holdout observations
## Note if N is not a multiple of folds you will get a warning, but is OK.
holdout <- split(sample(1:N), 1:kfolds)
head(holdout)
```

```
## $`1`
##      [1] 10252   308  1154  2361  1820  4430  7151   981  2438  5578 10045
##      [12]  5840  5644  3102  5041  9116  3644  7889  7595  6253  2337  7283
##      [23]  8459  1621  2832  2915  1399  8129  6232  4222  3121   973  7213
##      [34]  6946  4626 10203  6357 10293  6166 10090  1757  9419  3039  8665
##      [45]  5539  3070  7274  9793  2009  3214  3135   185  6446  3688  9279
##      [56]  4925  9533   235  7035  8217  9147  4710 10222  1690   250  1841
##      [67]  6017  5719  6949  1640  8592  5139  6039  8766  5745  7251  7670
##      [78]  1600  2490   908  4442  5140  1177  2863   127   485  3328  7945
##      [89]  2521  8238  4500  3033  1943  8083    65  9201  1814  4135  1237
##     [100]  6251  6709  3064  7987  3830  4394  8685  4490  2372  7268  1533
##     [111]  9216   246  9616 10495  8982  1668  6778  8684  7098   904  1044
##     [122]  4081  9668  4606  5343  7819  7794  2586  3497  5502  3418  8798
##     [133]  4609 10023 10386  6847  5568  4180  2056    94  9642  3935  9389
##     [144]  5271  8527  9509  4057  6160  1989  8867  7489  5269  6510  8047
##     [155]  5734  5957  3003  5666  3342  3218  4823  4532  5482  2424 10012
##     [166]  4034  2871  7814  2298  9554  2698  7284  3699  7513  7235  5791
##     [177]  1706  4929  4008  5472  1491  9137   429  8550   708  5929  7474
##     [188]  2382  8376  9135  6927  8741 10072    11  3690  9388   367  4942
##     [199]   409  5702  3490  3273 10103  7959  9863  3768  7446  2815  9780
##     [210] 10444  8400   901   971  9112  5345   123  3322  9694  5428  3434
##     [221]  1468  5146 10426  9031  9628  7413  4048  3361  8591  4791  3676
##     [232]  6063  6895  4383   267  2676  5401   371   501  5729  4957  8634
##     [243]  2595  6171  4326  2843  3340  8033  7260  1750  5224  2210  7804
##     [254]  1867  1587  4302   513  7407  9157   511  8827  1631  3971  6321
##     [265]  4831  2153  5157  7432  7381  5974  1161  3558  2789   900  7336
##     [276]  9663  5573  3401   827  9235   564  6964  4584  6556  1038  9743
##     [287]  7603  4885  7801  5095  2528 10404  2921   783   174  6219  4421
##     [298]  4756   229  1130  9139  8771  7845  4278  3331  8653  1190  3593
##     [309]  5555  7321  3282  7696  1837  6710 10410  6225  2297  8058 10160
##     [320]  4002   972   620  3595  2208  1616  2513  8714  1310  7700  2161
##     [331]  4746    87  4485  2583  6328  5199  1909  2427  3968  7287  7439
##     [342]  9114  8121  6326  7827  3823  9194 10463  1008  2956  2348  6534
##     [353]  6693  3155  3009   899  3727  8934  9070    8  8343  9745  4238
##     [364]  7618  1860 10176  3203  9497  2266  8715  1475  8073   843   255
```

|    |       |       |       |       |       |      |       |       |       |      |       |       |
|----|-------|-------|-------|-------|-------|------|-------|-------|-------|------|-------|-------|
| ## | [375] | 2930  | 1367  | 1108  | 9845  | 1980 | 5487  | 4428  | 5594  | 5439 | 3038  | 3035  |
| ## | [386] | 743   | 9174  | 3125  | 4873  | 2275 | 6960  | 6254  | 4560  | 2916 | 7303  | 10338 |
| ## | [397] | 8203  | 725   | 10378 | 8212  | 3525 | 2369  | 3554  | 4549  | 2121 | 5278  | 555   |
| ## | [408] | 798   | 6658  | 7460  | 1265  | 4237 | 1742  | 9260  | 4745  | 9506 | 4251  | 4438  |
| ## | [419] | 4880  | 5843  | 8980  | 7792  | 9738 | 7390  | 8462  | 8824  | 568  | 8162  | 8746  |
| ## | [430] | 6928  | 8014  | 450   | 2296  | 6112 | 4201  | 9874  | 2108  | 9188 | 473   | 5262  |
| ## | [441] | 1042  | 3564  | 3964  | 5058  | 1653 | 1487  | 1007  | 5195  | 2214 | 7178  | 4773  |
| ## | [452] | 2517  | 9601  | 7161  | 1290  | 6735 | 364   | 418   | 7423  | 2271 | 5265  | 5105  |
| ## | [463] | 3271  | 6069  | 197   | 6330  | 8137 | 1601  | 7518  | 1078  | 1199 | 750   | 2209  |
| ## | [474] | 2660  | 2893  | 4277  | 4953  | 5905 | 2884  | 1490  | 2381  | 3186 | 7050  | 8423  |
| ## | [485] | 7836  | 6648  | 9212  | 6829  | 6045 | 8941  | 5320  | 9324  | 1178 | 3834  | 3057  |
| ## | [496] | 2555  | 1519  | 8048  | 270   | 9036 | 9009  | 6593  | 881   | 7863 | 3010  | 8468  |
| ## | [507] | 4836  | 1970  | 5078  | 1887  | 2053 | 5781  | 4622  | 3931  | 7763 | 880   | 2316  |
| ## | [518] | 2590  | 6774  | 2277  | 7815  | 874  | 8429  | 520   | 9573  | 2024 | 3111  | 8031  |
| ## | [529] | 2353  | 8865  | 2613  | 3103  | 7812 | 8840  | 8284  | 7377  | 7674 | 6418  | 2903  |
| ## | [540] | 4827  | 2722  | 5953  | 2198  | 1832 | 10179 | 2051  | 6329  | 3814 | 8750  | 3944  |
| ## | [551] | 5698  | 3687  | 3472  | 7761  | 2111 | 3796  | 1251  | 7688  | 1037 | 8828  | 10196 |
| ## | [562] | 2112  | 10181 | 9246  | 6290  | 7850 | 1460  | 8286  | 4680  | 2179 | 638   | 1609  |
| ## | [573] | 9563  | 3052  | 5459  | 6884  | 9997 | 2720  | 6687  | 2530  | 4892 | 3242  | 2642  |
| ## | [584] | 9160  | 5716  | 3911  | 6085  | 1317 | 5130  | 1667  | 675   | 2027 | 1181  | 10172 |
| ## | [595] | 9719  | 5911  | 330   | 3586  | 5583 | 9106  | 3756  | 4446  | 5332 | 6734  | 4794  |
| ## | [606] | 9203  | 2213  | 2340  | 8759  | 1628 | 8773  | 8333  | 8509  | 8362 | 8041  | 6867  |
| ## | [617] | 1368  | 5169  | 4876  | 8484  | 732  | 2091  | 7209  | 1949  | 7749 | 7660  | 1260  |
| ## | [628] | 5061  | 8499  | 492   | 3317  | 8579 | 10364 | 9278  | 7657  | 1086 | 8643  | 840   |
| ## | [639] | 4219  | 4534  | 1581  | 6466  | 4099 | 3409  | 6268  | 3363  | 6613 | 1172  | 3169  |
| ## | [650] | 9705  | 803   | 10168 | 6029  | 8482 | 9568  | 2654  | 4724  | 9378 | 1339  | 1935  |
| ## | [661] | 9539  | 6948  | 5708  | 3698  | 3521 | 5037  | 3623  | 2206  | 3702 | 2681  | 5215  |
| ## | [672] | 10390 | 508   | 3835  | 8812  | 8801 | 9548  | 7173  | 10221 | 6945 | 9681  | 788   |
| ## | [683] | 10307 | 7208  | 5765  | 1334  | 5155 | 1096  | 5822  | 1804  | 1648 | 4993  | 3951  |
| ## | [694] | 5551  | 4166  | 2816  | 645   | 5062 | 60    | 3181  | 2478  | 1295 | 1845  | 4852  |
| ## | [705] | 8558  | 8066  | 936   | 10447 | 7341 | 4551  | 931   | 9249  | 6583 | 10137 | 4574  |
| ## | [716] | 6143  | 3295  | 7092  | 2374  | 1131 | 1646  | 614   | 4254  | 776  | 5247  | 4515  |
| ## | [727] | 10184 | 4540  | 8747  | 2383  | 3263 | 3306  | 9645  | 7498  | 3892 | 7081  | 6003  |
| ## | [738] | 6334  | 3290  | 2592  | 8838  | 7705 | 6425  | 8616  | 9081  | 7469 | 3724  | 9908  |
| ## | [749] | 10303 | 9128  | 4194  | 6464  | 5489 | 8005  | 10017 | 6782  | 660  | 4553  | 7796  |
| ## | [760] | 440   | 4174  | 3868  | 5977  | 5024 | 2496  | 7858  | 5754  | 3061 | 5103  | 3718  |
| ## | [771] | 7999  | 5706  | 9051  | 4741  | 8553 | 1003  | 1544  | 3838  | 7364 | 7561  | 4573  |
| ## | [782] | 1105  | 8156  | 2127  | 9017  | 7472 | 7692  | 2324  | 509   | 9792 | 7382  | 1299  |
| ## | [793] | 3336  | 2003  | 9893  | 1713  | 5700 | 3019  | 419   | 4525  | 1126 | 10133 | 9247  |
| ## | [804] | 6679  | 1245  | 9617  | 5242  | 4704 | 7480  | 7620  | 10099 | 2607 | 166   | 1879  |
| ## | [815] | 8182  | 5452  | 4963  | 280   | 8345 | 9574  | 9421  | 342   | 1099 | 6184  | 9263  |
| ## | [826] | 9094  | 4504  | 6345  | 3901  | 9097 | 9912  | 751   | 3671  | 1553 | 1257  | 663   |
| ## | [837] | 9044  | 4234  | 249   | 746   | 6641 | 6545  | 7419  | 8726  | 9633 | 8214  | 3744  |
| ## | [848] | 2363  | 1361  | 687   | 4818  | 9387 | 3291  | 5106  | 4043  | 3588 | 7902  | 6554  |
| ## | [859] | 714   | 644   | 6487  | 5961  | 7984 | 4884  | 4498  | 3856  | 8157 | 5810  | 1698  |
| ## | [870] | 1279  | 7058  | 7714  | 5648  | 8471 | 4660  | 1395  | 5756  | 4462 | 1787  | 3887  |
| ## | [881] | 9207  | 8380  | 3171  | 1392  | 7703 | 2514  | 9381  | 1990  | 2188 | 2497  | 9438  |
| ## | [892] | 6379  | 7385  | 3898  | 4356  | 8337 | 3463  | 7204  | 7835  | 7473 | 7168  | 9887  |
| ## | [903] | 7292  | 2809  | 6019  | 6469  | 449  | 2944  | 9305  | 9856  | 7401 | 3885  | 1908  |
| ## | [914] | 633   | 5364  | 9076  | 2342  | 3441 | 10081 | 2038  | 801   | 1196 | 1712  | 1535  |
| ## | [925] | 5422  | 2314  | 3561  | 5402  | 2184 | 779   | 7601  | 6068  | 7935 | 1745  | 8742  |
| ## | [936] | 7156  | 8800  | 1454  | 1458  | 8755 | 3711  | 512   | 3148  | 1179 | 9895  | 5547  |
| ## | [947] | 6072  | 3080  | 2216  | 29    | 4767 | 2148  | 9576  | 4878  | 4367 | 6820  | 3481  |
| ## | [958] | 8972  | 4864  | 7224  | 6022  | 8132 | 7731  | 5747  | 2711  | 5318 | 4231  | 2183  |

```

## [969] 1522 8518 4486 7049 1773 4766 8239 9907 8637 9884 8576
## [980] 5476 6162 3831 1812 7702 1953 3502 211 9613 4637 10151
## [991] 6083 7021 3460 3071 9750 809 9923 6803 4037 4914 7680
## [1002] 4236 6108 8375 5003 1825 5873 2638 3984 3391 2836 2165
## [1013] 10416 3423 8661 2114 8993 5226 3255 10080 9140 466 6104
## [1024] 10321 9409 5513 2243 4142 410 4644 1193 8084 6675 7846
## [1035] 2465 8504 6180 3865 5059 7577 8259 9217 9478 5802 9593
## [1046] 7624 10310 9320 3041 3157
##
## $`2`
## [1] 9085 5462 4050 1048 4983 5624 5222 9682 6935 9298 3001
## [12] 5382 2299 5829 10123 7917 4999 5369 2838 1415 10388 4761
## [23] 2811 7914 9363 7546 4714 2055 7072 160 8524 2523 5150
## [34] 5691 2292 7307 6649 4241 8164 10167 8269 6273 1739 277
## [45] 346 4412 10042 2489 10472 293 5154 1165 1252 4840 8107
## [56] 1689 590 9549 9120 7135 3600 7218 5324 4494 8436 2912
## [67] 3923 2991 1049 2138 9536 3621 1874 1483 8329 1578 5349
## [78] 69 3599 7778 5884 3084 8302 9829 2986 10089 10357 1717
## [89] 4091 886 503 932 10383 1925 2931 2908 1284 9046 8557
## [100] 4996 6102 488 1074 9714 3104 8515 7772 6352 165 10301
## [111] 3312 2909 8410 8775 4066 1065 8281 842 6234 9495 6472
## [122] 5786 2872 8386 10209 2220 3967 9715 3296 2580 9099 793
## [133] 8094 9866 2726 7397 3100 5760 1384 4202 4778 5289 8308
## [144] 156 8614 5406 82 10427 5554 4654 10313 5935 5991 3390
## [155] 9749 2281 1680 4160 7536 3611 3915 4080 8720 2483 4639
## [166] 4125 9325 4632 814 2313 8728 969 4450 6916 664 2533
## [177] 6027 8061 6455 3721 2004 8674 6286 7802 764 3659 6031
## [188] 10008 8797 1356 1101 5274 9646 9599 3224 9595 2322 3916
## [199] 1387 9695 4029 5328 9756 4309 2719 7949 5548 6532 5711
## [210] 6500 5507 6527 2876 1333 8133 771 4300 6216 8969 63
## [221] 6631 2926 10070 632 2404 3308 6170 5009 784 4561 4044
## [232] 5864 9610 2495 1217 6749 405 3187 4521 4988 6835 6151
## [243] 6574 4661 8068 2139 5762 2511 487 8349 913 8939 4829
## [254] 8417 2767 2238 4006 6172 7524 7636 8556 7265 4177 5461
## [265] 10423 957 7376 8697 4989 430 7263 1158 5538 6806 133
## [276] 1560 1227 2687 5759 9101 251 5193 6668 2885 7533 7438
## [287] 1348 2217 6457 2708 6417 8098 6515 6421 2538 6622 3743
## [298] 2151 3613 2246 5304 8918 2254 7645 2833 8488 1827 5342
## [309] 4697 6861 391 2881 5042 3963 6451 10050 8367 2978 628
## [320] 6869 7264 9276 10422 10136 10343 3246 6042 10361 982 9444
## [331] 6579 6023 9965 735 1070 3156 7412 4686 2045 1788 4459
## [342] 3468 10026 8204 9415 9299 3844 6221 10445 5319 828 1062
## [353] 1289 8215 5365 1144 5855 8619 61 1470 9693 6399 3150
## [364] 3240 7444 9341 365 7828 8907 7622 10407 5544 9433 6546
## [375] 1350 7675 6834 1287 5510 6587 7989 7532 5506 7710 6865
## [386] 6860 5229 3758 10190 6595 6448 1561 6296 4049 2882 1432
## [397] 2459 9490 4577 9992 5030 9040 4757 5679 336 7937 3107
## [408] 8174 8503 6669 271 2645 839 4082 265 7544 10271 51
## [419] 2207 2589 9133 9226 9625 1981 6625 2588 9138 4937 8347
## [430] 9685 1622 9327 10165 515 5440 6570 8187 5438 5210 9391
## [441] 9655 10448 2062 578 423 6979 403 7693 3004 3047 3145
## [452] 6748 8019 10371 2899 8255 7998 631 543 7534 7838 8692
## [463] 9008 832 3626 709 5340 1389 6427 7440 7380 1388 1984
## [474] 690 10291 5553 7329 5481 9691 4471 7325 8768 1740 9126

```

```

## [485] 7236 2403 6076 6796 8931 4967 431 10228 4655 9301 7054
## [496] 7150 2629 2358 1786 1063 4568 1762 792 3406 4011 6106
## [507] 4690 2174 8178 4210 9755 3413 101 607 9587 4871 8395
## [518] 4025 2355 4143 3095 3573 2598 4255 554 8884 9012 9323
## [529] 1451 6305 9295 6308 2639 4413 7153 6341 1444 5505 2143
## [540] 10339 1797 730 7570 3670 9161 2788 8427 10174 6789 7930
## [551] 4189 9970 8929 6363 5339 2352 4191 5198 985 7852 5296
## [562] 9934 1433 5393 433 7960 9129 3311 8396 6760 892 396
## [573] 9769 6839 8875 2766 3952 344 2115 3108 3545 2534 5205
## [584] 3510 6665 8029 707 10088 780 8251 5560 6591 5550 7786
## [595] 9302 7539 1839 1497 8615 1604 6542 294 2678 10105 7426
## [606] 3152 4965 5039 9656 5049 7966 6463 3546 4179 1151 3620
## [617] 8585 8081 6788 848 5737 2321 3942 5099 1271 8687 7148
## [628] 7399 6313 4795 3732 704 10446 3495 1281 9550 8729 9732
## [639] 3544 5280 7667 10368 4702 4088 6851 3476 8007 789 4020
## [650] 7641 8480 10028 4600 2187 10067 5986 3339 5370 2064 7640
## [661] 988 1050 3017 6127 8878 1696 6246 2283 1822 6844 10272
## [672] 4904 2649 5516 4119 84 7238 7164 9647 2226 998 9522
## [683] 8013 2467 6336 6058 4837 806 9841 233 657 5327 8738
## [694] 6750 8667 9609 2180 678 4539 8283 5214 5248 4067 16
## [705] 3939 8397 9423 10263 1093 1026 6932 1112 9930 9959 9736
## [716] 4151 6155 4848 1764 9177 2666 5994 5360 4747 8197 8868
## [727] 6514 2808 8242 6518 1104 10484 4074 23 190 4469 9581
## [738] 3260 5126 6201 8967 5084 1565 8640 8896 4285 8103 3486
## [749] 7840 8131 3147 5668 8829 1328 5695 3031 9814 772 4095
## [760] 6739 3632 3180 9358 9664 10227 4276 8572 655 8489 2124
## [771] 5779 7548 4731 2504 7240 2142 3522 7152 1966 126 8897
## [782] 5580 5227 6994 6717 4696 7120 6856 8279 7254 5528 7100
## [793] 7605 6291 2429 6413 7289 1435 1133 7027 823 2257 1699
## [804] 4627 7344 5629 3821 163 10351 8425 10234 4121 6298 6231
## [815] 3082 4545 5484 4964 9019 6892 6909 10397 2021 6585 6502
## [826] 8016 1494 6673 6189 8789 4350 8551 10116 6179 3400 2436
## [837] 2462 219 4181 3398 4351 6398 3439 3371 1472 4984 10442
## [848] 6215 1338 7880 9901 2817 7131 3277 3387 7610 7844 3941
## [859] 3947 6242 5720 8850 3175 3106 41 4294 2057 1137 1386
## [870] 146 5435 3833 8968 2810 502 4736 7181 7202 8891 4834
## [881] 8001 1986 2509 10106 4765 2076 3096 3783 3895 9063 6695
## [892] 3534 8208 6740 1749 6506 570 5251 10385 9744 510 4844
## [903] 2861 1985 4120 1999 3170 5450 5607 10349 1682 181 1523
## [914] 7928 10273 4062 4959 8411 3624 649 9393 3344 10 2158
## [925] 9200 4215 7095 1303 8476 4599 6401 2398 6307 9810 9634
## [936] 10393 2339 2510 5486 3430 7055 773 10065 8143 7207 6780
## [947] 7316 9969 1954 6733 9872 7899 5152 10308 3786 4726 7331
## [958] 356 4797 1495 7729 5674 1552 8017 1174 8587 3307 6293
## [969] 8740 9804 8837 3700 6891 2376 8754 7270 711 2309 3116
## [980] 6025 6621 7734 8245 3324 1001 6823 4381 1202 1580 8758
## [991] 3063 5017 615 8272 7009 3376 8077 6841 8229 8531 7409
## [1002] 5310 1917 1941 1163 9941 1141 6317 1585 5655 9075 3457
## [1013] 1939 4429 1766 3365 8458 1993 9807 7925 1453 1059 8491
## [1024] 1967 7727 4601 5640 7713 9846 9948 2413 2712 1128 6683
## [1035] 4535 91 448 9000 4675 6592 10249 1264 9270 305 1242
## [1046] 9815 4801 7516 4912 8339
##
## $`3`

```

|    |       |       |       |      |       |       |       |       |       |       |       |       |
|----|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| ## | [1]   | 2905  | 8973  | 9455 | 4227  | 10220 | 525   | 3820  | 5794  | 3199  | 6074  | 10074 |
| ## | [12]  | 7030  | 6896  | 3541 | 761   | 3447  | 7387  | 5862  | 7386  | 1406  | 7739  | 1446  |
| ## | [23]  | 4850  | 6471  | 4709 | 6744  | 7547  | 7097  | 10255 | 5208  | 9056  | 7785  | 8307  |
| ## | [34]  | 1025  | 1280  | 7210 | 362   | 7293  | 5190  | 8408  | 10197 | 413   | 4985  | 3961  |
| ## | [45]  | 9933  | 8446  | 5916 | 3812  | 6051  | 7171  | 4922  | 3822  | 10436 | 6126  | 10267 |
| ## | [56]  | 6198  | 7462  | 2982 | 4347  | 9747  | 8112  | 204   | 7781  | 8352  | 6416  | 4242  |
| ## | [67]  | 1567  | 10205 | 9686 | 5789  | 4262  | 9314  | 4803  | 9239  | 8777  | 2641  | 7008  |
| ## | [78]  | 7190  | 338   | 7559 | 7599  | 717   | 5999  | 7334  | 3494  | 1499  | 4159  | 2287  |
| ## | [89]  | 2731  | 864   | 8944 | 6569  | 4472  | 5014  | 7038  | 7056  | 6176  | 3936  | 9876  |
| ## | [100] | 7026  | 8632  | 9362 | 3719  | 79    | 10134 | 6181  | 7241  | 4247  | 9471  | 6129  |
| ## | [111] | 4663  | 8175  | 4281 | 5470  | 4203  | 1584  | 6443  | 9430  | 9644  | 7665  | 5016  |
| ## | [122] | 5558  | 154   | 9763 | 9726  | 2205  | 565   | 460   | 9781  | 1442  | 7972  | 10109 |
| ## | [133] | 3453  | 6422  | 4287 | 2279  | 5104  | 5713  | 7592  | 1463  | 1614  | 4055  | 8060  |
| ## | [144] | 4187  | 9038  | 162  | 8603  | 7096  | 648   | 4190  | 7184  | 2284  | 9515  | 10289 |
| ## | [155] | 1625  | 5066  | 6360 | 2295  | 4789  | 2227  | 9165  | 6169  | 800   | 4968  | 10210 |
| ## | [166] | 7832  | 2461  | 8225 | 5419  | 8995  | 4769  | 4617  | 10213 | 4915  | 2474  | 2546  |
| ## | [177] | 6644  | 4473  | 5767 | 17    | 8594  | 4291  | 895   | 2702  | 6933  | 941   | 7450  |
| ## | [188] | 1056  | 8987  | 132  | 252   | 7448  | 748   | 8871  | 6375  | 8937  | 6183  | 1081  |
| ## | [199] | 5741  | 1520  | 5688 | 3772  | 10284 | 6168  | 6369  | 9854  | 919   | 6047  | 775   |
| ## | [210] | 352   | 9909  | 8412 | 155   | 5346  | 4259  | 1977  | 3560  | 1306  | 1362  | 3628  |
| ## | [221] | 2887  | 1869  | 477  | 6640  | 10326 | 3745  | 5137  | 8885  | 4906  | 5637  | 6825  |
| ## | [232] | 1777  | 2494  | 9142 | 7256  | 10265 | 1711  | 9799  | 8198  | 1302  | 3452  | 8165  |
| ## | [243] | 6550  | 2677  | 4779 | 7010  | 3036  | 8644  | 6885  | 2614  | 4518  | 9064  | 7771  |
| ## | [254] | 9534  | 4130  | 685  | 10474 | 1135  | 3816  | 1276  | 7807  | 2657  | 5784  | 1799  |
| ## | [265] | 2651  | 8088  | 9191 | 3608  | 6187  | 1414  | 186   | 7463  | 7127  | 9842  | 3932  |
| ## | [276] | 10226 | 830   | 8274 | 7165  | 2182  | 6634  | 9855  | 9220  | 8794  | 8287  | 5480  |
| ## | [287] | 7286  | 3704  | 8814 | 9557  | 4090  | 10082 | 5266  | 4562  | 9925  | 10198 | 637   |
| ## | [298] | 4973  | 3516  | 3208 | 9725  | 1697  | 438   | 7554  | 723   | 2262  | 5785  | 8903  |
| ## | [309] | 1186  | 7416  | 7588 | 7230  | 8401  | 5123  | 2394  | 9979  | 4567  | 4086  | 7503  |
| ## | [320] | 3555  | 2974  | 3954 | 10162 | 5584  | 593   | 1976  | 3129  | 786   | 5046  | 3634  |
| ## | [331] | 171   | 7320  | 2554 | 2792  | 6753  | 7476  | 9597  | 4554  | 4289  | 9431  | 7542  |
| ## | [342] | 1684  | 5790  | 5213 | 8858  | 9286  | 4969  | 4492  | 2367  | 6905  | 3616  | 7733  |
| ## | [353] | 6971  | 1315  | 997  | 9380  | 10331 | 39    | 9011  | 1738  | 8046  | 6356  | 9259  |
| ## | [364] | 5272  | 5677  | 6195 | 996   | 4298  | 1247  | 3866  | 3992  | 2565  | 285   | 9451  |
| ## | [375] | 1645  | 7787  | 3809 | 7647  | 4226  | 7752  | 297   | 482   | 9502  | 5161  | 9288  |
| ## | [386] | 7521  | 5796  | 5441 | 7002  | 3647  | 6381  | 7990  | 8056  | 1556  | 1055  | 2945  |
| ## | [397] | 4005  | 9404  | 595  | 6064  | 8097  | 2878  | 1366  | 3066  | 6164  | 3211  | 7445  |
| ## | [408] | 9830  | 2031  | 3411 | 4301  | 647   | 6616  | 3800  | 2671  | 1426  | 8693  | 7685  |
| ## | [419] | 6507  | 7621  | 104  | 2428  | 8808  | 4972  | 2317  | 6878  | 2042  | 1474  | 302   |
| ## | [430] | 778   | 5546  | 686  | 5579  | 1650  | 9710  | 8523  | 258   | 6747  | 1500  | 1465  |
| ## | [441] | 5709  | 1225  | 3927 | 6088  | 6137  | 5730  | 7378  | 5535  | 3427  | 1459  | 7531  |
| ## | [452] | 6403  | 3222  | 2995 | 9862  | 4018  | 5805  | 6920  | 1643  | 3981  | 5795  | 1965  |
| ## | [463] | 9507  | 7842  | 9285 | 9211  | 2675  | 4161  | 1734  | 9313  | 9271  | 3415  | 6886  |
| ## | [474] | 8280  | 6531  | 9850 | 2773  | 8325  | 6480  | 4083  | 2332  | 3487  | 3594  | 5724  |
| ## | [485] | 4108  | 9080  | 3723 | 1678  | 9785  | 72    | 8120  | 9005  | 5326  | 4248  | 1296  |
| ## | [496] | 7077  | 9013  | 2272 | 3272  | 1411  | 2204  | 9493  | 9384  | 2270  | 3991  | 1979  |
| ## | [507] | 6453  | 9577  | 1091 | 876   | 7541  | 8261  | 4418  | 10373 | 9232  | 8681  | 1803  |
| ## | [518] | 1476  | 2359  | 8563 | 2006  | 5055  | 6594  | 7467  | 157   | 5485  | 7631  | 4896  |
| ## | [529] | 7302  | 6249  | 1870 | 5773  | 9658  | 10155 | 968   | 5687  | 3056  | 9062  | 3667  |
| ## | [540] | 6367  | 3955  | 7219 | 8945  | 1383  | 2777  | 10100 | 8180  | 8172  | 3673  | 5971  |
| ## | [551] | 7841  | 7709  | 6302 | 7929  | 6028  | 2691  | 3119  | 2573  | 9858  | 10002 | 3802  |
| ## | [562] | 3512  | 4225  | 6539 | 1761  | 6501  | 4786  | 5932  | 1731  | 7311  | 7019  | 2050  |
| ## | [573] | 921   | 3695  | 7357 | 1353  | 5047  | 6209  | 2307  | 5245  | 10185 | 794   | 1753  |
| ## | [584] | 8456  | 5479  | 6849 | 6557  | 8721  | 2098  | 10354 | 10013 | 550   | 4723  | 5433  |

|    |        |       |       |       |       |       |       |       |       |       |       |       |
|----|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ## | [595]  | 5800  | 9538  | 306   | 7512  | 5697  | 9525  | 10169 | 8495  | 5230  | 1197  | 5082  |
| ## | [606]  | 7023  | 6646  | 7891  | 7025  | 2253  | 1691  | 1756  | 6651  | 5845  | 3384  | 9778  |
| ## | [617]  | 6468  | 2126  | 6490  | 2046  | 10314 | 5645  | 6857  | 3165  | 1606  | 7817  | 2771  |
| ## | [628]  | 3781  | 4700  | 6611  | 3918  | 9922  | 10461 | 9611  | 8170  | 38    | 7776  | 8310  |
| ## | [639]  | 10369 | 1215  | 5492  | 1821  | 3059  | 8139  | 2247  | 4737  | 1170  | 2371  | 2356  |
| ## | [650]  | 8304  | 6412  | 3319  | 9420  | 9888  | 9365  | 6938  | 8416  | 7551  | 4510  | 6014  |
| ## | [661]  | 6005  | 3672  | 868   | 4414  | 6555  | 1220  | 2231  | 8626  | 1607  | 7738  | 979   |
| ## | [672]  | 10406 | 8882  | 2326  | 10435 | 8059  | 582   | 1849  | 4734  | 5083  | 7648  | 6619  |
| ## | [683]  | 5355  | 10216 | 1950  | 10046 | 5990  | 855   | 9449  | 4507  | 92    | 3656  | 8042  |
| ## | [694]  | 10149 | 3183  | 2480  | 10260 | 7004  | 1534  | 5575  | 5380  | 2068  | 10456 | 2033  |
| ## | [705]  | 9273  | 5040  | 9343  | 4172  | 3706  | 7565  | 9886  | 5290  | 8454  | 612   | 4828  |
| ## | [716]  | 2834  | 3374  | 7198  | 8421  | 5532  | 9233  | 6395  | 168   | 5793  | 3804  | 9631  |
| ## | [727]  | 8796  | 4380  | 5836  | 5405  | 2648  | 710   | 8604  | 9294  | 6263  | 3874  | 394   |
| ## | [738]  | 8263  | 8505  | 5420  | 3578  | 8694  | 7249  | 8679  | 4679  | 4919  | 8919  | 7701  |
| ## | [749]  | 8435  | 6602  | 2962  | 5466  | 579   | 7326  | 2118  | 8115  | 9033  | 7143  | 3679  |
| ## | [760]  | 2150  | 5833  | 1004  | 7099  | 7262  | 64    | 3891  | 475   | 4811  | 9015  | 8250  |
| ## | [771]  | 5600  | 594   | 2235  | 6929  | 6897  | 10245 | 6551  | 3130  | 6138  | 6099  | 1754  |
| ## | [782]  | 7201  | 1374  | 4804  | 6682  | 243   | 10095 | 6496  | 1417  | 9280  | 7359  | 9761  |
| ## | [793]  | 5839  | 4832  | 4695  | 3053  | 3110  | 5311  | 6956  | 393   | 826   | 4078  | 5288  |
| ## | [804]  | 3313  | 3321  | 7404  | 7811  | 5129  | 646   | 57    | 9690  | 9853  | 8506  | 2877  |
| ## | [815]  | 3753  | 5333  | 698   | 8582  | 8119  | 4890  | 9385  | 767   | 9709  | 9086  | 10391 |
| ## | [826]  | 10336 | 3496  | 9261  | 5589  | 1524  | 5458  | 524   | 7217  | 9255  | 736   | 4596  |
| ## | [837]  | 4036  | 5133  | 5223  | 3449  | 6937  | 10358 | 841   | 755   | 54    | 8030  | 3552  |
| ## | [848]  | 1610  | 5038  | 870   | 2373  | 7567  | 731   | 9485  | 5872  | 6814  | 3377  | 3675  |
| ## | [859]  | 6987  | 4955  | 6830  | 8847  | 7022  | 9054  | 6804  | 1166  | 2365  | 8240  | 2472  |
| ## | [870]  | 9910  | 9125  | 10269 | 1208  | 5284  | 9558  | 8736  | 5788  | 4602  | 7669  | 8536  |
| ## | [881]  | 5861  | 4069  | 3583  | 2093  | 5772  | 9491  | 10375 | 8853  | 852   | 3461  | 1808  |
| ## | [892]  | 5987  | 3054  | 6444  | 7861  | 3202  | 3207  | 8914  | 4564  | 10016 | 5883  | 3937  |
| ## | [903]  | 3854  | 4329  | 1206  | 5562  | 1052  | 6218  | 3592  | 9091  | 1784  | 2669  | 5404  |
| ## | [914]  | 1994  | 8444  | 4594  | 10287 | 4123  | 2950  | 6260  | 8206  | 5673  | 1793  | 4924  |
| ## | [925]  | 8963  | 6008  | 6339  | 1440  | 8756  | 4706  | 2222  | 2444  | 2095  | 5185  | 1219  |
| ## | [936]  | 412   | 618   | 5596  | 4152  | 7093  | 3473  | 7496  | 10009 | 2620  | 8547  | 845   |
| ## | [947]  | 7800  | 1169  | 9334  | 6558  | 1944  | 5563  | 425   | 4725  | 6233  | 2082  | 5813  |
| ## | [958]  | 7500  | 5672  | 5542  | 2794  | 9879  | 701   | 4410  | 4838  | 9508  | 1292  | 1830  |
| ## | [969]  | 5206  | 5143  | 6755  | 6816  | 8461  | 30    | 4503  | 8268  | 2113  | 5582  | 6371  |
| ## | [980]  | 8573  | 4616  | 6282  | 5792  | 7346  | 7317  | 8881  | 8328  | 9754  | 8267  | 4605  |
| ## | [991]  | 4452  | 4776  | 3206  | 2674  | 9795  | 1419  | 9798  | 7441  | 8213  | 5636  | 9453  |
| ## | [1002] | 8555  | 1573  | 7322  | 7604  | 3250  | 6026  | 10110 | 6484  | 7494  | 10372 | 8309  |
| ## | [1013] | 3940  | 6035  | 1539  | 5889  | 7869  | 810   | 3397  | 8859  | 2680  | 8220  | 10125 |
| ## | [1024] | 4676  | 7839  | 7332  | 266   | 5797  | 7985  | 5943  | 2384  | 521   | 1672  | 6190  |
| ## | [1035] | 6705  | 2252  | 8623  | 5002  | 3092  | 3710  | 9483  | 9758  | 967   | 8027  | 9488  |
| ## | [1046] | 1040  | 8493  | 4019  | 4824  | 3112  |       |       |       |       |       |       |
| ## |        |       |       |       |       |       |       |       |       |       |       |       |
| ## | \$`4`  |       |       |       |       |       |       |       |       |       |       |       |
| ## | [1]    | 1083  | 5184  | 1862  | 1160  | 3731  | 6642  | 6120  | 7481  | 6202  | 217   | 3292  |
| ## | [12]   | 10449 | 9     | 2907  | 799   | 5235  | 7051  | 5540  | 8566  | 6590  | 9356  | 2640  |
| ## | [23]   | 4463  | 7948  | 3617  | 3969  | 2706  | 8422  | 1060  | 3127  | 3354  | 1815  | 4239  |
| ## | [34]   | 2123  | 3238  | 2578  | 1331  | 3341  | 4753  | 46    | 5335  | 7574  | 1933  | 4399  |
| ## | [45]   | 8735  | 3443  | 2334  | 1397  | 3563  | 2421  | 7943  | 5632  | 10127 | 1511  | 6525  |
| ## | [56]   | 3701  | 4508  | 9400  | 1436  | 9053  | 9590  | 7113  | 210   | 5863  | 7024  | 1593  |
| ## | [67]   | 7192  | 8508  | 5693  | 2801  | 10063 | 8823  | 2473  | 10040 | 4839  | 7856  | 5132  |
| ## | [78]   | 6318  | 4156  | 3556  | 4454  | 9282  | 10029 | 9987  | 432   | 8231  | 1946  | 5962  |
| ## | [89]   | 2442  | 3456  | 1545  | 3589  | 1596  | 6719  | 5070  | 9637  | 3368  | 966   | 5338  |
| ## | [100]  | 9861  | 3993  | 2858  | 9020  | 2145  | 4021  | 7133  | 8708  | 4075  | 4947  | 10384 |



|    |       |       |       |       |      |       |       |      |       |       |       |       |
|----|-------|-------|-------|-------|------|-------|-------|------|-------|-------|-------|-------|
| ## | [111] | 5909  | 2378  | 523   | 6087 | 1319  | 4886  | 7904 | 9176  | 8913  | 218   | 4712  |
| ## | [122] | 4229  | 2485  | 3784  | 9771 | 2529  | 3248  | 4698 | 5564  | 4310  | 8893  | 6086  |
| ## | [133] | 1268  | 4319  | 571   | 9169 | 6351  | 7510  | 5496 | 3894  | 720   | 4176  | 6091  |
| ## | [144] | 8038  | 2965  | 5454  | 9527 | 2820  | 6752  | 3189 | 3426  | 9317  | 6439  | 5914  |
| ## | [155] | 8966  | 5837  | 5294  | 7229 | 1608  | 6362  | 6824 | 6924  | 8552  | 7073  | 10114 |
| ## | [166] | 674   | 107   | 10352 | 6730 | 6477  | 2625  | 5189 | 10322 | 7580  | 10353 | 2245  |
| ## | [177] | 254   | 5803  | 6864  | 5051 | 8414  | 3403  | 4393 | 9803  | 640   | 5232  | 4467  |
| ## | [188] | 3288  | 3197  | 6791  | 6702 | 3771  | 3517  | 3450 | 2225  | 5414  | 188   | 6533  |
| ## | [199] | 5842  | 6133  | 1047  | 4228 | 8460  | 877   | 1660 | 867   | 547   | 215   | 9619  |
| ## | [210] | 6779  | 3337  | 3751  | 7961 | 2869  | 1890  | 8382 | 3663  | 8718  | 5638  | 9937  |
| ## | [221] | 5966  | 4479  | 9896  | 282  | 10233 | 7053  | 6727 | 95    | 9839  | 4708  | 9512  |
| ## | [232] | 9500  | 5597  | 2512  | 3048 | 1721  | 9357  | 5520 | 357   | 113   | 5121  | 2259  |
| ## | [243] | 1774  | 1710  | 3182  | 4820 | 6902  | 4113  | 995  | 10387 | 6433  | 9671  | 7793  |
| ## | [254] | 5305  | 1873  | 9123  | 3438 | 1577  | 437   | 2388 | 528   | 8106  | 7626  | 8699  |
| ## | [265] | 5787  | 587   | 3726  | 4188 | 1020  | 8181  | 2742 | 406   | 9808  | 1259  | 5145  |
| ## | [276] | 1741  | 9316  | 3597  | 1769 | 1228  | 670   | 9181 | 10059 | 878   | 117   | 3997  |
| ## | [287] | 1051  | 1763  | 5400  | 2410 | 1675  | 8622  | 298  | 3030  | 10214 | 8064  | 689   |
| ## | [298] | 451   | 1270  | 662   | 8359 | 583   | 10058 | 905  | 8786  | 9526  | 10382 | 6541  |
| ## | [309] | 7545  | 5518  | 1359  | 5238 | 6485  | 2963  | 4325 | 2389  | 1095  | 7343  | 5602  |
| ## | [320] | 5617  | 10494 | 8538  | 1400 | 2919  | 6746  | 1030 | 1897  | 7951  | 7684  | 7057  |
| ## | [331] | 8574  | 1854  | 374   | 8391 | 7900  | 1835  | 4717 | 2401  | 8258  | 782   | 476   |
| ## | [342] | 9474  | 5096  | 2849  | 395  | 2880  | 2415  | 5806 | 3767  | 2132  | 8953  | 7272  |
| ## | [353] | 6921  | 5665  | 683   | 7499 | 4512  | 9035  | 7934 | 9848  | 8196  | 4994  | 3507  |
| ## | [364] | 3014  | 1398  | 1441  | 8481 | 10148 | 9811  | 8510 | 7221  | 9496  | 4782  | 6975  |
| ## | [375] | 9973  | 6426  | 9751  | 9716 | 3682  | 2300  | 1027 | 4493  | 10279 | 977   | 4527  |
| ## | [386] | 6400  | 3580  | 6432  | 5743 | 1375  | 2155  | 1238 | 5493  | 8602  | 4516  | 2049  |
| ## | [397] | 5536  | 2752  | 6244  | 7514 | 8152  | 9667  | 2172 | 813   | 4897  | 408   | 4040  |
| ## | [408] | 10044 | 2999  | 6252  | 7211 | 1413  | 3837  | 8158 | 10241 | 1904  | 4859  | 5660  |
| ## | [419] | 1671  | 7741  | 6842  | 4646 | 2548  | 5913  | 7014 | 10428 | 1390  | 3596  | 5857  |
| ## | [430] | 8028  | 26    | 2979  | 3237 | 2939  | 4208  | 2493 | 6618  | 857   | 9102  | 5924  |
| ## | [441] | 7971  | 2167  | 1023  | 2263 | 1184  | 1973  | 6235 | 4636  | 602   | 3040  | 9762  |
| ## | [452] | 6571  | 8541  | 9864  | 8678 | 7318  | 7890  | 5816 | 3042  | 4304  | 3629  | 4548  |
| ## | [463] | 5753  | 7408  | 910   | 2569 | 3761  | 3985  | 4917 | 3227  | 7453  | 9265  | 8959  |
| ## | [474] | 4315  | 2966  | 557   | 3945 | 6482  | 6843  | 4063 | 9041  | 9403  | 2203  | 3294  |
| ## | [485] | 3204  | 6723  | 6666  | 9649 | 6315  | 203   | 6010 | 279   | 5601  | 5545  | 3270  |
| ## | [496] | 124   | 4163  | 8099  | 4938 | 8316  | 6827  | 3132 | 6065  | 2753  | 6269  | 6316  |
| ## | [507] | 7527  | 3245  | 6240  | 5309 | 10055 | 6696  | 6377 | 383   | 599   | 10453 | 1858  |
| ## | [518] | 9308  | 3754  | 1176  | 4634 | 221   | 6961  | 5048 | 9521  | 6883  | 3824  | 4417  |
| ## | [529] | 2705  | 9967  | 8599  | 9956 | 2813  | 10340 | 4653 | 6054  | 3999  | 458   | 5368  |
| ## | [540] | 5567  | 5025  | 1461  | 4465 | 1057  | 8983  | 1230 | 9484  | 10443 | 2347  | 7089  |
| ## | [551] | 7064  | 9626  | 7805  | 545  | 1167  | 2851  | 8226 | 3174  | 9772  | 6009  | 2933  |
| ## | [562] | 10010 | 2044  | 7881  | 9632 | 623   | 6953  | 4780 | 5188  | 5069  | 2977  | 6384  |
| ## | [573] | 2661  | 7007  | 309   | 566  | 7609  | 6978  | 1272 | 1978  | 573   | 4488  | 4212  |
| ## | [584] | 9618  | 2475  | 1988  | 9171 | 821   | 9413  | 7216 | 7978  | 3226  | 2325  | 319   |
| ## | [595] | 322   | 6228  | 6261  | 5467 | 5156  | 2699  | 4403 | 7080  | 6272  | 98    | 7136  |
| ## | [606] | 8562  | 6958  | 3077  | 2572 | 8147  | 4544  | 3386 | 8256  | 8820  | 3535  | 7200  |
| ## | [617] | 7389  | 10350 | 2946  | 442  | 8072  | 6152  | 4699 | 5922  | 355   | 1171  | 8292  |
| ## | [628] | 5676  | 358   | 5077  | 3229 | 495   | 8190  | 331  | 6007  | 142   | 3326  | 1744  |
| ## | [639] | 7699  | 6697  | 770   | 5692 | 518   | 7011  | 3614 | 4223  | 6565  | 6004  | 3416  |
| ## | [650] | 6373  | 1324  | 7333  | 861  | 8295  | 8832  | 9117 | 8784  | 441   | 10405 | 318   |
| ## | [661] | 1396  | 700   | 3773  | 2425 | 740   | 4526  | 8952 | 3394  | 10087 | 8749  | 9108  |
| ## | [672] | 890   | 2505  | 5399  | 7530 | 9789  | 2969  | 5113 | 4087  | 3079  | 3357  | 3577  |
| ## | [683] | 5299  | 2333  | 6194  | 4114 | 1785  | 5925  | 4888 | 7810  | 1620  | 8210  | 5135  |
| ## | [694] | 2710  | 6437  | 2360  | 1041 | 9972  | 544   | 9340 | 4667  | 10182 | 2054  | 6121  |

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## [705] 7281 2039 3988 4111 7065 10311 6742 1996 10035 7859 950
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## [771] 9523 7887 3705 8463 1776 9623 7154 8889 8757 1747 2696
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## [793] 7854 1456 7868 9958 4683 4133 2393 3825 9067 2368 1079
## [804] 4501 1888 5646 4694 2955 1325 7744 5598 5287 1146 2935
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## [837] 2255 7885 8472 8173 3640 945 7006 14 7962 3065 5622
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## [980] 7760 8008 7138 3298 10235 2037 261 9442 6655 5537 2670
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## [166] 148 8006 5531 1829 5252 10101 9913 7773 7806 8704 8366
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## [188] 323 8306 4735 5967 3983 8935 3893 5984 1618 2338 7360
## [199] 4755 2989 3725 6581 6089 1850 5928 7000 9397 3006 9322
## [210] 9578 3221 6458 2518 5432 7676 3330 283 1983 7130 2646

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| ## | [221] | 2130  | 4363  | 4427  | 2170  | 4799  | 5298  | 9494  | 6346  | 10049 | 4729  | 5312  |
| ## | [232] | 5946  | 5350  | 8024  | 4360  | 6635  | 6976  | 1855  | 3091  | 3680  | 6080  | 9555  |
| ## | [243] | 10161 | 10499 | 1255  | 3760  | 8177  | 5859  | 2992  | 6382  | 3635  | 3217  | 5876  |
| ## | [254] | 3685  | 3027  | 6380  | 3173  | 8163  | 8142  | 6117  | 483   | 6981  | 1642  | 6343  |
| ## | [265] | 106   | 7926  | 4061  | 4620  | 1013  | 3304  | 4719  | 5052  | 3167  | 1572  | 6811  |
| ## | [276] | 1930  | 7253  | 5972  | 6203  | 9917  | 8618  | 7356  | 8751  | 2795  | 1635  | 2667  |
| ## | [287] | 3917  | 7594  | 7526  | 9289  | 3008  | 8398  | 5649  | 5828  | 6966  | 1975  | 8542  |
| ## | [298] | 1253  | 5696  | 9414  | 2258  | 10411 | 2953  | 1168  | 2122  | 9348  | 4643  | 6930  |
| ## | [309] | 9995  | 173   | 5357  | 2628  | 6488  | 3372  | 7003  | 8648  | 9788  | 6479  | 2904  |
| ## | [320] | 749   | 7116  | 6     | 5880  | 1504  | 4470  | 6731  | 9562  | 7762  | 9367  | 67    |
| ## | [331] | 1512  | 7358  | 3367  | 4371  | 2737  | 7277  | 6588  | 9179  | 3044  | 7938  | 7643  |
| ## | [342] | 4260  | 8437  | 2075  | 2653  | 6294  | 3274  | 468   | 8513  | 6726  | 4001  | 5413  |
| ## | [353] | 9399  | 7826  | 530   | 10360 | 10298 | 6295  | 2840  | 2721  | 3943  | 6212  | 8821  |
| ## | [364] | 4436  | 9768  | 4816  | 10254 | 9158  | 8085  | 7427  | 1727  | 2176  | 1080  | 2709  |
| ## | [375] | 4872  | 7492  | 10219 | 542   | 1800  | 6134  | 10094 | 3660  | 4740  | 5491  | 5954  |
| ## | [386] | 4333  | 1687  | 8467  | 3571  | 8122  | 7137  | 390   | 6036  | 9454  | 5654  | 8962  |
| ## | [397] | 2097  | 5371  | 3230  | 7509  | 4004  | 8405  | 8549  | 10124 | 3299  | 10075 | 4615  |
| ## | [408] | 1575  | 6528  | 4533  | 1034  | 5559  | 10348 | 7339  | 6465  | 2012  | 9361  | 5100  |
| ## | [419] | 2305  | 4715  | 2285  | 3810  | 7129  | 8695  | 1431  | 2539  | 3470  | 2948  | 3380  |
| ## | [430] | 4344  | 49    | 1828  | 193   | 9945  | 680   | 9205  | 9629  | 6361  | 10237 | 4346  |
| ## | [441] | 2784  | 8150  | 10408 | 6900  | 9955  | 4423  | 8095  | 10342 | 278   | 5755  | 1005  |
| ## | [452] | 1039  | 9711  | 7933  | 10415 | 9159  | 4570  | 9264  | 3301  | 7250  | 1507  | 8898  |
| ## | [463] | 2718  | 4751  | 3587  | 2029  | 8956  | 8770  | 4340  | 2647  | 1715  | 9531  | 4722  |
| ## | [474] | 7227  | 4656  | 5503  | 5317  | 149   | 9786  | 10424 | 10376 | 240   | 7798  | 3029  |
| ## | [485] | 8605  | 3965  | 5447  | 10207 | 4572  | 9621  | 3488  | 9071  | 2972  | 9338  | 9396  |
| ## | [496] | 7037  | 372   | 9225  | 4566  | 2856  | 9569  | 8690  | 7373  | 8344  | 397   | 6724  |
| ## | [507] | 9752  | 3716  | 4519  | 1183  | 5777  | 6688  | 5893  | 2786  | 567   | 10224 | 3075  |
| ## | [518] | 1321  | 5354  | 3978  | 2993  | 5847  | 4132  | 8609  | 3505  | 3012  | 5757  | 9849  |
| ## | [529] | 622   | 10451 | 5026  | 6738  | 8790  | 2268  | 1332  | 1505  | 5191  | 9546  | 8813  |
| ## | [540] | 3709  | 1921  | 7443  | 10154 | 3581  | 7671  | 6888  | 1834  | 3713  | 345   | 7940  |
| ## | [551] | 8218  | 9186  | 7039  | 5936  | 9892  | 3233  | 6768  | 2782  | 5207  | 3813  | 3136  |
| ## | [562] | 4870  | 6580  | 236   | 3627  | 4481  | 6157  | 9418  | 32    | 4364  | 9870  | 7519  |
| ## | [573] | 665   | 4030  | 5225  | 9542  | 6438  | 2990  | 650   | 693   | 4881  | 719   | 8385  |
| ## | [584] | 9109  | 5291  | 3807  | 6094  | 635   | 9737  | 2616  | 5897  | 5234  | 4487  | 4431  |
| ## | [595] | 4711  | 8810  | 10032 | 4405  | 835   | 7523  | 89    | 131   | 8793  | 7214  | 5386  |
| ## | [606] | 8452  | 8835  | 681   | 7732  | 7315  | 1357  | 6061  | 1790  | 2234  | 4275  | 7506  |
| ## | [617] | 4169  | 4976  | 6686  | 10093 | 7504  | 9392  | 4491  | 8011  | 865   | 4060  | 7694  |
| ## | [628] | 9098  | 5201  | 869   | 9089  | 208   | 3284  | 195   | 6855  | 7790  | 1455  | 5196  |
| ## | [639] | 569   | 5727  | 4817  | 1903  | 9447  | 7650  | 2435  | 1658  | 7932  | 2236  | 3078  |
| ## | [650] | 8795  | 4677  | 499   | 1528  | 8649  | 5209  | 600   | 9964  | 808   | 5021  | 1962  |
| ## | [661] | 10086 | 7352  | 1847  | 2452  | 9221  | 4587  | 78    | 4349  | 2553  | 1783  | 4629  |
| ## | [672] | 8202  | 13    | 10462 | 1201  | 3405  | 8762  | 7824  | 2550  | 999   | 993   | 3900  |
| ## | [683] | 3791  | 5183  | 5689  | 4499  | 6020  | 398   | 9607  | 8037  | 9445  | 1968  | 2889  |
| ## | [694] | 2233  | 3440  | 4464  | 2684  | 3873  | 986   | 9777  | 9971  | 2414  | 310   | 4103  |
| ## | [705] | 9865  | 3352  | 2224  | 10157 | 1771  | 4035  | 7672  | 7244  | 8441  | 4928  | 2567  |
| ## | [716] | 145   | 9847  | 6044  | 9368  | 10345 | 8370  | 5981  | 1011  | 7452  | 7872  | 3790  |
| ## | [727] | 9240  | 9977  | 5615  | 3419  | 7275  | 2971  | 8473  | 8243  | 1269  | 1087  | 4150  |
| ## | [738] | 10163 | 754   | 935   | 5733  | 6132  | 4051  | 2584  | 9379  | 3484  | 553   | 1297  |
| ## | [749] | 4883  | 9622  | 3875  | 5314  | 8950  | 10485 | 8521  | 2690  | 244   | 10034 | 10377 |
| ## | [760] | 9406  | 9900  | 3126  | 6197  | 9231  | 5029  | 2522  | 7267  | 1818  | 4077  | 9477  |
| ## | [771] | 10333 | 9229  | 8241  | 7134  | 4307  | 3886  | 7795  | 1132  | 10306 | 6761  | 4209  |
| ## | [782] | 130   | 316   | 1922  | 1703  | 5526  | 361   | 7349  | 3166  | 10092 | 8785  | 2932  |
| ## | [793] | 5650  | 990   | 9024  | 5686  | 1772  | 4253  | 6714  | 2499  | 4558  | 4624  | 2466  |
| ## | [804] | 1053  | 2841  | 4408  | 2879  | 5114  | 5899  | 5926  | 340   | 2619  | 4014  | 1546  |

|    |        |       |       |       |       |       |       |      |       |       |       |       |
|----|--------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| ## | [815]  | 5681  | 3185  | 6393  | 2769  | 586   | 1936  | 2341 | 8876  | 9039  | 2741  | 6677  |
| ## | [826]  | 1795  | 10057 | 9359  | 6156  | 1450  | 9078  | 1623 | 3318  | 1880  | 1187  | 8526  |
| ## | [837]  | 2617  | 1801  | 6461  | 4293  | 6001  | 4376  | 1305 | 8320  | 1652  | 4316  | 3995  |
| ## | [848]  | 6311  | 7495  | 9827  | 6349  | 4559  | 1998  | 8296 | 9775  | 1014  | 4882  | 9172  |
| ## | [859]  | 8570  | 9121  | 5838  | 3948  | 7820  | 5960  | 9773 | 2549  | 1927  | 1412  | 4682  |
| ## | [870]  | 651   | 6923  | 3694  | 3310  | 6563  | 1058  | 7345 | 2937  | 4721  | 9591  | 1224  |
| ## | [881]  | 2925  | 9434  | 7105  | 1746  | 4743  | 8448  | 303  | 4787  | 8490  | 6903  | 4145  |
| ## | [892]  | 4506  | 6208  | 5455  | 313   | 9251  | 10465 | 8532 | 3777  | 1872  | 5276  | 5599  |
| ## | [903]  | 3154  | 6390  | 5250  | 9007  | 456   | 9480  | 548  | 1974  | 7723  | 1116  | 3548  |
| ## | [914]  | 6837  | 8228  | 10398 | 3256  | 10459 | 6116  | 4821 | 2390  | 10153 | 8533  | 1661  |
| ## | [925]  | 4370  | 9639  | 424   | 679   | 5726  | 517   | 7975 | 1582  | 7623  | 6766  | 5611  |
| ## | [936]  | 8904  | 312   | 1378  | 9326  | 721   | 3276  | 6982 | 9880  | 8839  | 7597  | 5483  |
| ## | [947]  | 8792  | 6513  | 3962  | 9262  | 7740  | 658   | 7327 | 1010  | 7458  | 7735  | 1273  |
| ## | [958]  | 2658  | 9427  | 9592  | 4867  | 2439  | 8670  | 2282 | 619   | 6391  | 7123  | 3467  |
| ## | [969]  | 1514  | 9060  | 5814  | 5703  | 76    | 5728  | 7707 | 1704  | 184   | 9519  | 7437  |
| ## | [980]  | 854   | 703   | 9944  | 10450 | 1767  | 10418 | 5620 | 8079  | 90    | 4524  | 6548  |
| ## | [991]  | 8075  | 8610  | 9812  | 1347  | 6998  | 7652  | 8466 | 2131  | 2814  | 4157  | 3590  |
| ## | [1002] | 3863  | 1092  | 5627  | 4604  | 1723  | 6667  | 1893 | 9310  | 1819  | 9630  | 3249  |
| ## | [1013] | 1153  | 2071  | 3846  | 4866  | 4137  | 7653  | 2364 | 6984  | 7779  | 337   | 5623  |
| ## | [1024] | 6910  | 6079  | 4092  | 7060  | 4031  | 9837  | 4308 | 7434  | 5000  | 9891  | 2476  |
| ## | [1035] | 8355  | 4033  | 169   | 5740  | 4458  | 5783  | 4980 | 5890  | 5007  | 8492  | 6257  |
| ## | [1046] | 9292  | 5750  | 9980  | 1418  | 8701  |       |      |       |       |       |       |
| ## |        |       |       |       |       |       |       |      |       |       |       |       |
| ## | \$`6`  |       |       |       |       |       |       |      |       |       |       |       |
| ## | [1]    | 1346  | 4857  | 1942  | 659   | 5282  | 9369  | 3349 | 5511  | 5431  | 3907  | 1781  |
| ## | [12]   | 9765  | 8113  | 8299  | 2420  | 781   | 4585  | 2346 | 1     | 9877  | 7537  | 9708  |
| ## | [23]   | 9836  | 2157  | 452   | 3748  | 9030  | 7348  | 6526 | 4815  | 9087  | 5915  | 5192  |
| ## | [34]   | 9984  | 6936  | 10097 | 6943  | 6967  | 2192  | 3869 | 272   | 10096 | 2577  | 1248  |
| ## | [45]   | 7865  | 7866  | 7068  | 2460  | 7797  | 7338  | 443  | 4311  | 3553  | 10111 | 10069 |
| ## | [56]   | 6110  | 6289  | 9360  | 5557  | 1916  | 3811  | 2603 | 604   | 8167  | 5993  | 6516  |
| ## | [67]   | 5815  | 5469  | 1995  | 4772  | 10473 | 2543  | 9624 | 4295  | 4411  | 7488  | 2934  |
| ## | [78]   | 3351  | 6917  | 147   | 2319  | 7520  | 2014  | 4671 | 2947  | 4854  | 10395 | 3508  |
| ## | [89]   | 5996  | 1156  | 6821  | 7086  | 6850  | 5780  | 4662 | 341   | 903   | 1686  | 5572  |
| ## | [100]  | 5891  | 2199  | 1824  | 1503  | 2503  | 9479  | 4122 | 8631  | 7851  | 4424  | 5366  |
| ## | [111]  | 8194  | 559   | 1377  | 4280  | 2888  | 1200  | 9168 | 10027 | 6871  | 5138  | 4819  |
| ## | [122]  | 3575  | 5651  | 5774  | 3287  | 8207  | 5453  | 3348 | 5764  | 5148  | 987   | 8288  |
| ## | [133]  | 7809  | 4571  | 10144 | 4927  | 5122  | 3007  | 6712 | 2005  | 1775  | 4282  | 5571  |
| ## | [144]  | 2868  | 494   | 5608  | 2454  | 1344  | 1479  | 5316 | 3437  | 8990  | 8804  | 5297  |
| ## | [155]  | 19    | 4792  | 10239 | 2913  | 8091  | 10041 | 6309 | 2450  | 4170  | 332   | 10480 |
| ## | [166]  | 8659  | 6708  | 4556  | 3228  | 8232  | 2715  | 7507 | 7001  | 2559  | 10400 | 4474  |
| ## | [177]  | 1162  | 7163  | 9107  | 3989  | 7330  | 9304  | 469  | 7110  | 5749  | 2446  | 2688  |
| ## | [188]  | 3074  | 8144  | 7955  | 3737  | 2746  | 320   | 9149 | 8909  | 7126  | 4461  | 6721  |
| ## | [199]  | 1805  | 4542  | 8975  | 3247  | 8650  | 7435  | 324  | 7067  | 8442  | 8977  | 4650  |
| ## | [210]  | 10000 | 1780  | 2190  | 8502  | 8381  | 533   | 5394 | 8449  | 7976  | 9585  | 6165  |
| ## | [221]  | 1300  | 1221  | 8305  | 7140  | 7722  | 1082  | 613  | 9567  | 4477  | 225   | 7451  |
| ## | [232]  | 8111  | 3752  | 1152  | 4256  | 9511  | 335   | 5846 | 10039 | 7644  | 2086  | 9635  |
| ## | [243]  | 4693  | 9575  | 744   | 7090  | 3642  | 6737  | 3414 | 7651  | 175   | 5851  | 2125  |
| ## | [254]  | 9998  | 2988  | 2525  | 882   | 6415  | 245   | 7758 | 6498  | 7188  | 1735  | 4258  |
| ## | [265]  | 5200  | 7566  | 7981  | 6969  | 3464  | 9297  | 8725 | 4263  | 549   | 3925  | 3755  |
| ## | [276]  | 7371  | 4272  | 1360  | 1720  | 7411  | 6862  | 4065 | 2449  | 10481 | 2844  | 7950  |
| ## | [287]  | 5093  | 7059  | 4793  | 2140  | 8323  | 8485  | 3420 | 1326  | 8809  | 7634  | 4502  |
| ## | [298]  | 8457  | 9342  | 9170  | 5856  | 8496  | 7979  | 9926 | 189   | 9868  | 6173  | 9436  |
| ## | [309]  | 1891  | 2456  | 3000  | 6310  | 227   | 3982  | 3097 | 5808  | 2065  | 4144  | 4887  |
| ## | [320]  | 6858  | 2778  | 407   | 10242 | 1043  | 8554  | 9096 | 10130 | 5347  | 9835  | 6509  |

|    |       |       |       |       |       |       |       |       |       |       |       |       |
|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ## | [331] | 3780  | 1140  | 1541  | 6271  | 3770  | 2487  | 5527  | 85    | 951   | 5292  | 7395  |
| ## | [342] | 6939  | 4207  | 8514  | 5879  | 10053 | 3469  | 9134  | 6568  | 9048  | 1542  | 7633  |
| ## | [353] | 4517  | 653   | 3491  | 207   | 6963  | 8146  | 199   | 6790  | 6614  | 10225 | 2839  |
| ## | [364] | 5109  | 10021 | 9344  | 847   | 598   | 6671  | 6191  | 6067  | 5549  | 7291  | 4361  |
| ## | [375] | 4053  | 8022  | 3483  | 1924  | 191   | 161   | 7215  | 5533  | 10466 | 2531  | 3778  |
| ## | [386] | 691   | 2918  | 3715  | 2772  | 563   | 9919  | 924   | 4685  | 4550  | 10215 | 6572  |
| ## | [397] | 5457  | 7036  | 7958  | 4420  | 3378  | 4406  | 7170  | 1863  | 10223 | 6999  | 9432  |
| ## | [408] | 143   | 6499  | 7977  | 2970  | 5685  | 7756  | 2380  | 6372  | 2320  | 2399  | 97    |
| ## | [419] | 6161  | 5980  | 5934  | 7571  | 7044  | 2637  | 7182  | 10488 | 9245  | 3266  | 242   |
| ## | [430] | 2034  | 2011  | 9175  | 2760  | 6508  | 4128  | 9943  | 889   | 5035  | 3163  | 7285  |
| ## | [441] | 2701  | 6059  | 5019  | 4641  | 1195  | 4076  | 1919  | 2886  | 8043  | 8516  | 8191  |
| ## | [452] | 3114  | 8209  | 4970  | 9441  | 2609  | 8237  | 8055  | 422   | 9492  | 9503  | 7746  |
| ## | [463] | 6881  | 10018 | 1957  | 970   | 10143 | 3262  | 9914  | 4716  | 5877  | 5256  | 467   |
| ## | [474] | 8424  | 1036  | 8249  | 1077  | 8932  | 7619  | 10062 | 4770  | 10033 | 3511  | 2212  |
| ## | [485] | 9093  | 6146  | 3805  | 4768  | 2527  | 10381 | 3841  | 10281 | 3789  | 963   | 10312 |
| ## | [496] | 9520  | 6077  | 5951  | 6262  | 8641  | 7298  | 9673  | 10256 | 617   | 6284  | 962   |
| ## | [507] | 606   | 4956  | 7486  | 4625  | 7104  | 2173  | 292   | 3504  | 5053  | 8384  | 1527  |
| ## | [518] | 1657  | 1117  | 1963  | 6491  | 654   | 7197  | 10187 | 4511  | 2221  | 9860  | 6279  |
| ## | [529] | 6822  | 9143  | 27    | 7813  | 6024  | 10483 | 6872  | 2440  | 5515  | 5751  | 4974  |
| ## | [540] | 321   | 5658  | 5064  | 5989  | 8045  | 167   | 9193  | 1109  | 9223  | 9141  | 1871  |
| ## | [551] | 5218  | 3736  | 6462  | 8092  | 8590  | 8577  | 7954  | 6435  | 6582  | 366   | 498   |
| ## | [562] | 5586  | 5501  | 10250 | 3549  | 3498  | 4760  | 8297  | 5931  | 9604  | 10236 | 6150  |
| ## | [573] | 3062  | 7176  | 6122  | 9303  | 5118  | 3973  | 2633  | 5436  | 6283  | 2994  | 5910  |
| ## | [584] | 2084  | 2101  | 896   | 1002  | 8560  | 5179  | 10217 | 8186  | 7611  | 3602  | 7471  |
| ## | [595] | 8787  | 5341  | 2799  | 626   | 1138  | 4630  | 4628  | 6659  | 6111  | 2290  | 3924  |
| ## | [606] | 8780  | 9779  | 7091  | 6911  | 898   | 213   | 1031  | 115   | 5429  | 10107 | 8706  |
| ## | [617] | 2762  | 7720  | 8565  | 1256  | 370   | 2154  | 5799  | 7493  | 3795  | 9898  | 9699  |
| ## | [628] | 8224  | 7288  | 5933  | 4440  | 10061 | 4649  | 9571  | 7656  | 1923  | 10068 | 5033  |
| ## | [639] | 4447  | 4891  | 6492  | 7587  | 949   | 715   | 5301  | 5027  | 5804  | 1666  | 7706  |
| ## | [650] | 7248  | 8989  | 3024  | 8996  | 7973  | 10274 | 624   | 5983  | 3069  | 2829  | 9055  |
| ## | [661] | 6497  | 6200  | 8004  | 5849  | 8216  | 9050  | 2585  | 10259 | 5220  | 7470  | 2469  |
| ## | [672] | 5614  | 8988  | 5281  | 1207  | 6118  | 7454  | 6402  | 7172  | 4575  | 2984  | 3658  |
| ## | [683] | 10429 | 7031  | 2265  | 5556  | 6301  | 4614  | 3712  | 1307  | 3160  | 7691  | 1853  |
| ## | [694] | 1204  | 505   | 3990  | 2626  | 3085  | 8160  | 2632  | 6186  | 4744  | 3776  | 200   |
| ## | [705] | 4762  | 906   | 8189  | 7124  | 9461  | 10126 | 1898  | 5072  | 7910  | 9783  | 8358  |
| ## | [716] | 4505  | 9739  | 4619  | 4497  | 7988  | 3914  | 3615  | 3966  | 6107  | 5577  | 728   |
| ## | [727] | 1540  | 1234  | 6478  | 2406  | 8223  | 1595  | 9318  | 9144  | 8713  | 7550  | 7363  |
| ## | [738] | 6320  | 9878  | 6147  | 2015  | 179   | 8039  | 1424  | 6057  | 4416  | 2119  | 9543  |
| ## | [749] | 1934  | 2315  | 1714  | 7402  | 4377  | 8254  | 4652  | 8877  | 3215  | 3475  | 9570  |
| ## | [760] | 4858  | 4944  | 4217  | 5670  | 6056  | 1232  | 741   | 3532  | 7257  | 4910  | 9412  |
| ## | [771] | 2800  | 2997  | 7775  | 10290 | 2007  | 8651  | 3739  | 3269  | 10455 | 8368  | 2328  |
| ## | [782] | 2693  | 3128  | 3762  | 2954  | 3559  | 5976  | 6992  | 7337  | 7405  | 4397  | 9152  |
| ## | [793] | 5141  | 8252  | 2293  | 4026  | 10098 | 3801  | 7563  | 8845  | 8080  | 9468  | 944   |
| ## | [804] | 3515  | 9890  | 8753  | 5827  | 9132  | 9820  | 402   | 1914  | 4718  | 5449  | 9183  |
| ## | [815] | 474   | 5675  | 6819  | 1372  | 6297  | 5378  | 5018  | 6906  | 2827  | 10001 | 3191  |
| ## | [826] | 1226  | 3396  | 541   | 9983  | 5244  | 4879  | 4750  | 6833  | 5165  | 2739  | 5233  |
| ## | [837] | 4455  | 5662  | 2375  | 328   | 5585  | 4257  | 404   | 10335 | 8992  | 8301  | 8783  |
| ## | [848] | 2515  | 1293  | 7774  | 6226  | 4444  | 2010  | 5067  | 7630  | 9395  | 7963  | 9774  |
| ## | [859] | 3610  | 8915  | 2865  | 446   | 856   | 8184  | 10457 | 531   | 7466  | 9677  | 2659  |
| ## | [870] | 9822  | 8776  | 6410  | 9740  | 5445  | 4140  | 7857  | 3859  | 3568  | 1222  | 4071  |
| ## | [881] | 5022  | 10315 | 2     | 1443  | 4774  | 6055  | 3899  | 9424  | 4330  | 9602  | 1485  |
| ## | [892] | 2728  | 8578  | 5363  | 5270  | 201   | 6259  | 2239  | 8608  | 7867  | 8686  | 10147 |
| ## | [903] | 9565  | 2488  | 529   | 4583  | 3143  | 3648  | 6358  | 6770  | 893   | 6304  | 5367  |
| ## | [914] | 7069  | 8774  | 9131  | 2621  | 5509  | 7635  | 1633  | 5108  | 4603  | 8617  | 4366  |

```
## [925] 3144 3888 2032 375 8833 506 7128 8947 8015 1972 3669
## [936] 4665 3385 9894 2218 9456 5168 7742 10471 3527 7916 5587
## [947] 3259 2673 9957 8689 10146 9661 2035 9800 6428 8327 3025
## [958] 7431 2447 4407 991 4966 5921 5657 8806 385 4451 2689
## [969] 1752 4482 4015 1185 9857 10180 1147 3697 9921 380 2189
## [980] 4387 4107 5902 9021 2602 6596 712 3503 7368 6944 5352
## [991] 9010 9092 4951 8134 9300 2083 5384 8567 4395 462 6517
## [1002] 6397 6922 9306 9004 5748 1571 3735 2434 9840 31 9394
## [1013] 3201 206 1274 1492 7206 6096 1336 2802 1294 6741 9982
## [1024] 6660 5043 6589 5086 5834 4648 5076 6287 7076 961 3021
## [1035] 7782 137 5260 641 4666 4684 6270 5261 4489 2805 7
## [1046] 6210 151 2740 980 636
```

## Crossvalidation results

Build the train and test data sets for each fold. Next, train Naive Bayes Classifier on Train Set and test on Test Set. Lastly, present classification results using table and/or confusion matrix!!

```
#Run training and Testing for each of the k-folds
AllResults<-list()
AllLabels<-list()
for (k in 1:kfolds){

  DigitDF_Test <- DigitDF[holdout[[k]], ]
  DigitDF_Train=DigitDF[-holdout[[k]], ]
  ## View the created Test and Train sets
  (head(DigitDF_Train))
  (table(DigitDF_Test$Label))
  ## Make sure you take the labels out of the testing data
  (head(DigitDF_Test))
  DigitDF_Test_noLabel<-DigitDF_Test[-c(1)]
  DigitDF_Test_justLabel<-DigitDF_Test$label
  (head(DigitDF_Test_noLabel))

  #### Naive Bayes prediction using e1071 package
  #Naive Bayes Train model
  train_naibayes<-naiveBayes(label~., data=DigitDF_Train, na.action = na.pass)
  #train_naibayes
  #summary(train_naibayes)

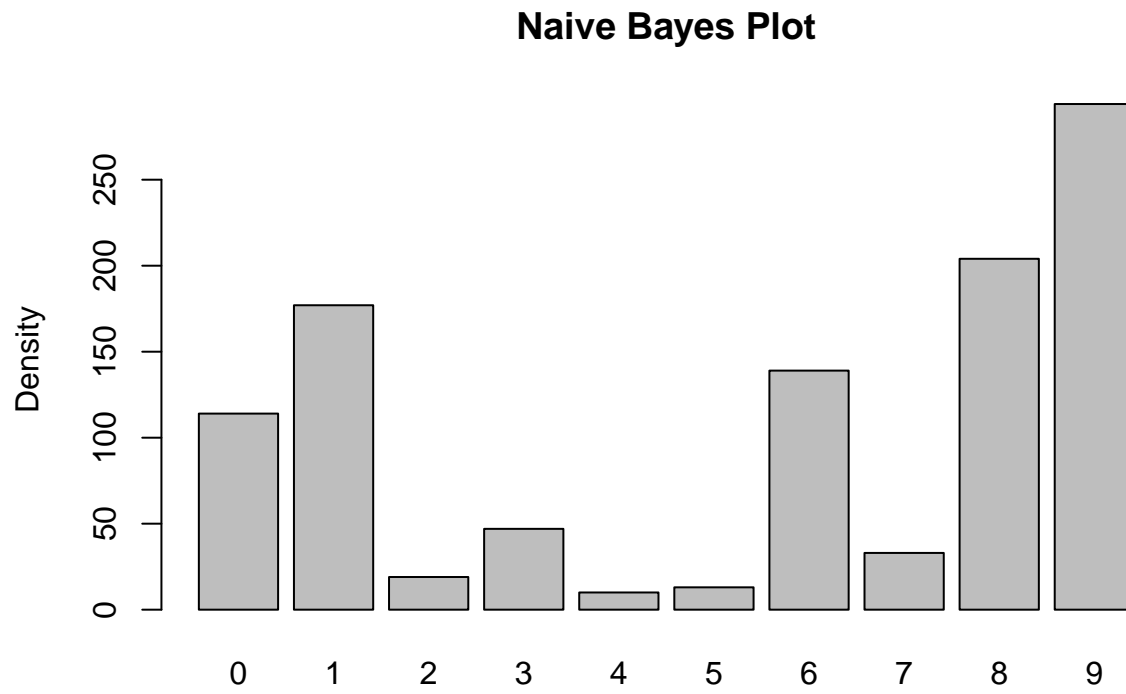
  #Naive Bayes model Prediction
  nb_Pred <- predict(train_naibayes, DigitDF_Test_noLabel)
  #nb_Pred

  #Testing accuracy of naive bayes model with Kaggle train data sub set
  (confusionMatrix(nb_Pred, DigitDF_Test$label))

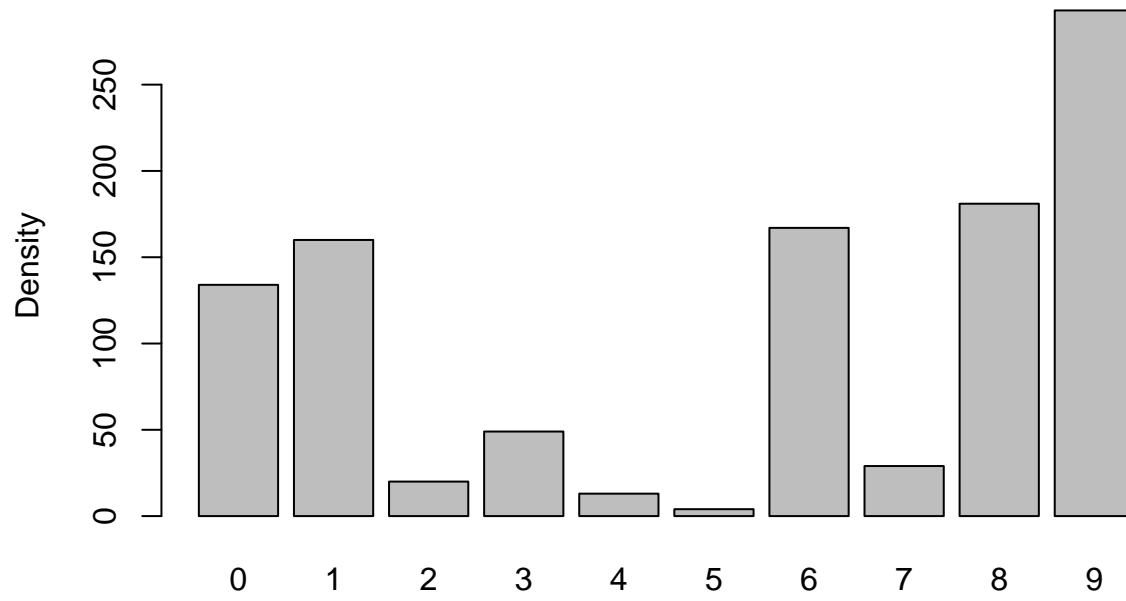
  # Accumulate results from each fold, if you like
  AllResults<- c(AllResults,nb_Pred)
  AllLabels<- c(AllLabels, DigitDF_Test_justLabel)

##Visualize
```

```
plot(nb_Pred, ylab = "Density", main = "Naive Bayes Plot")
}
```

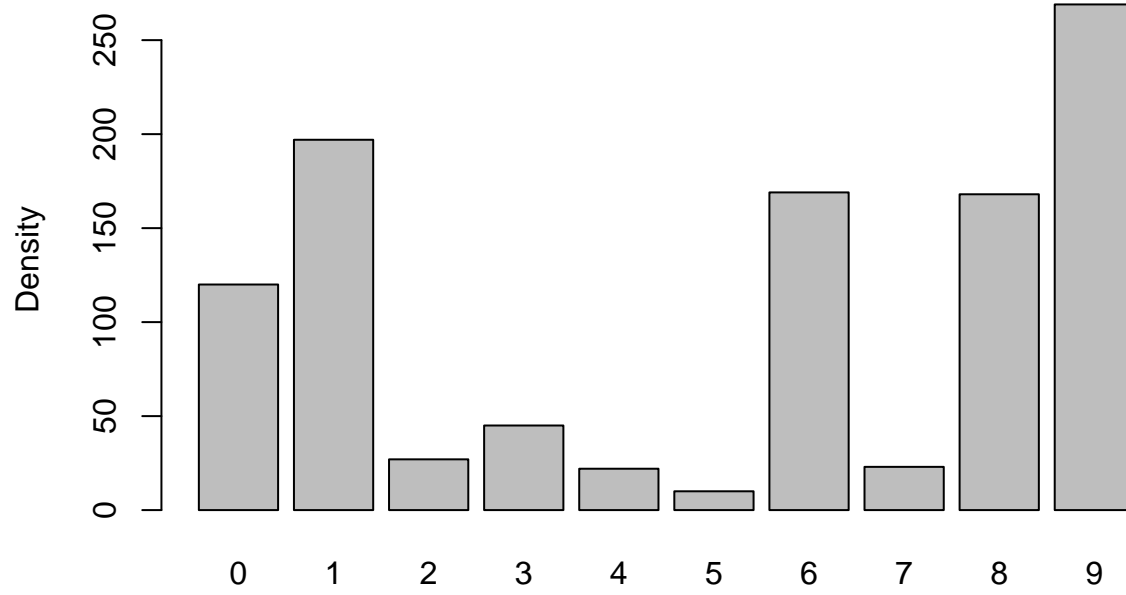


**Naive Bayes Plot**

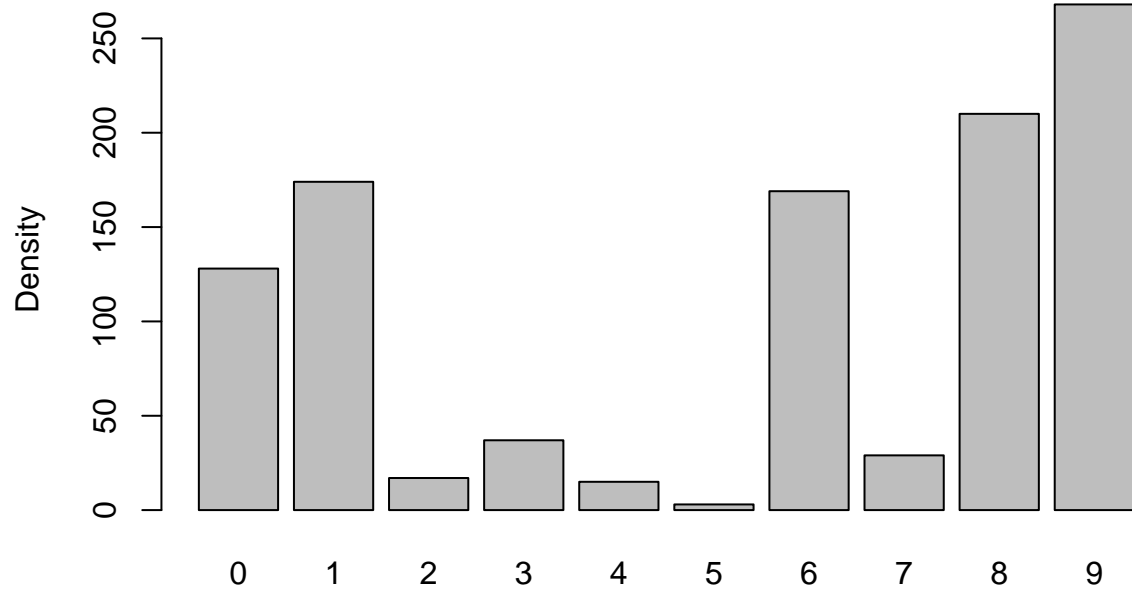


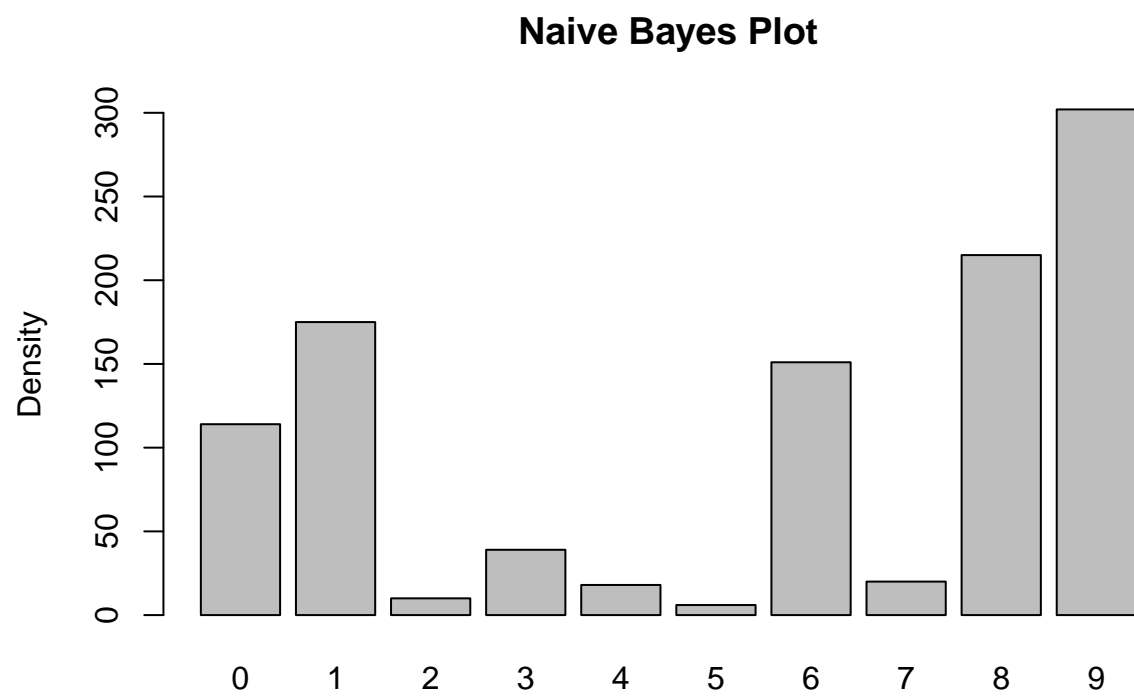


**Naive Bayes Plot**

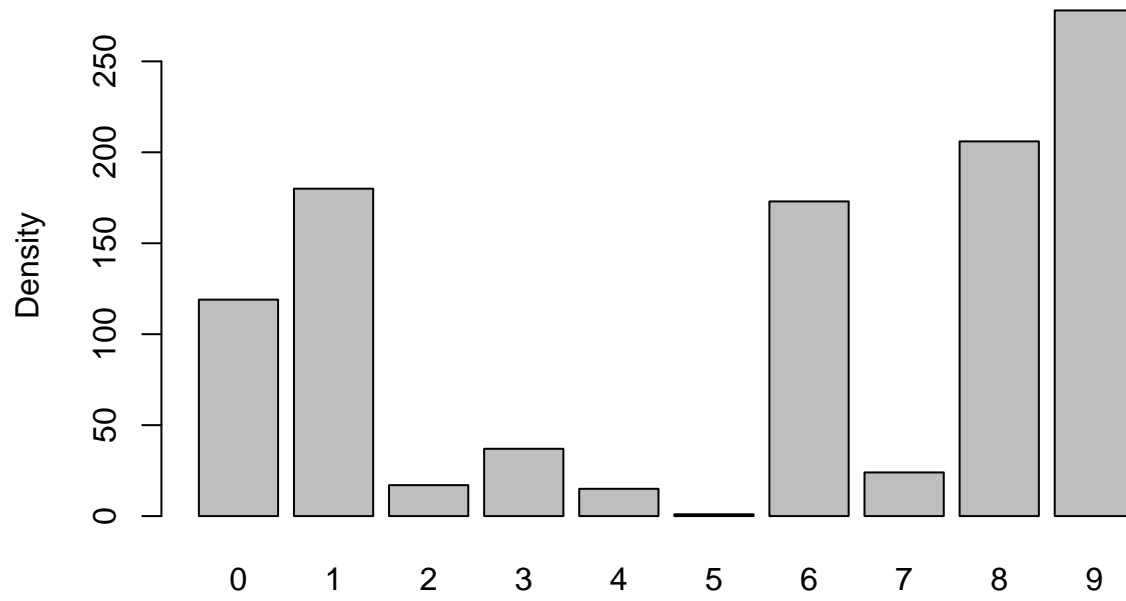


**Naive Bayes Plot**

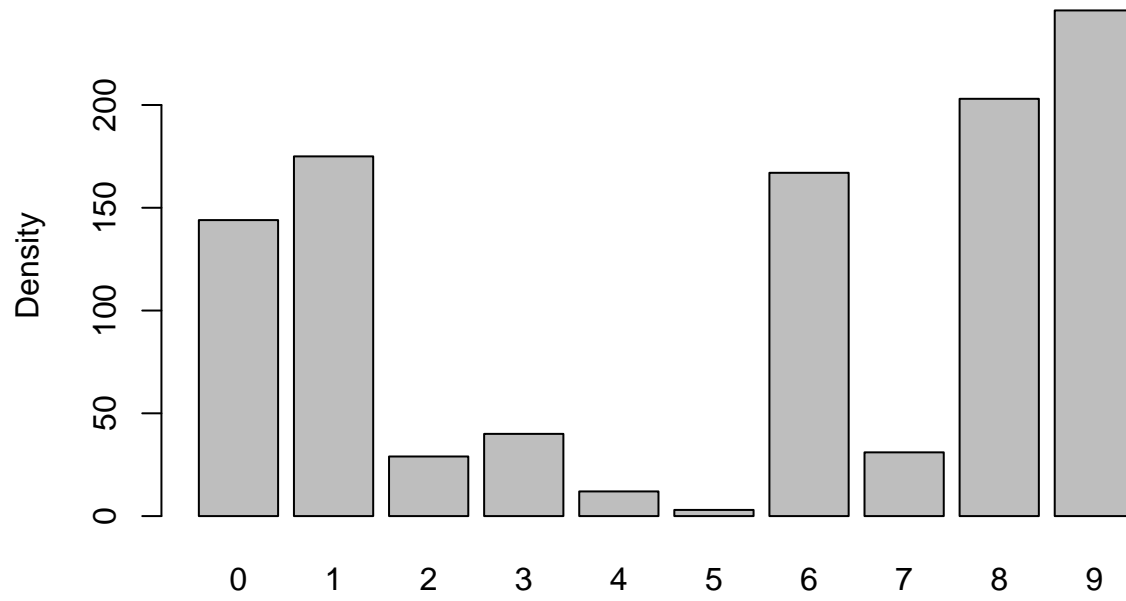




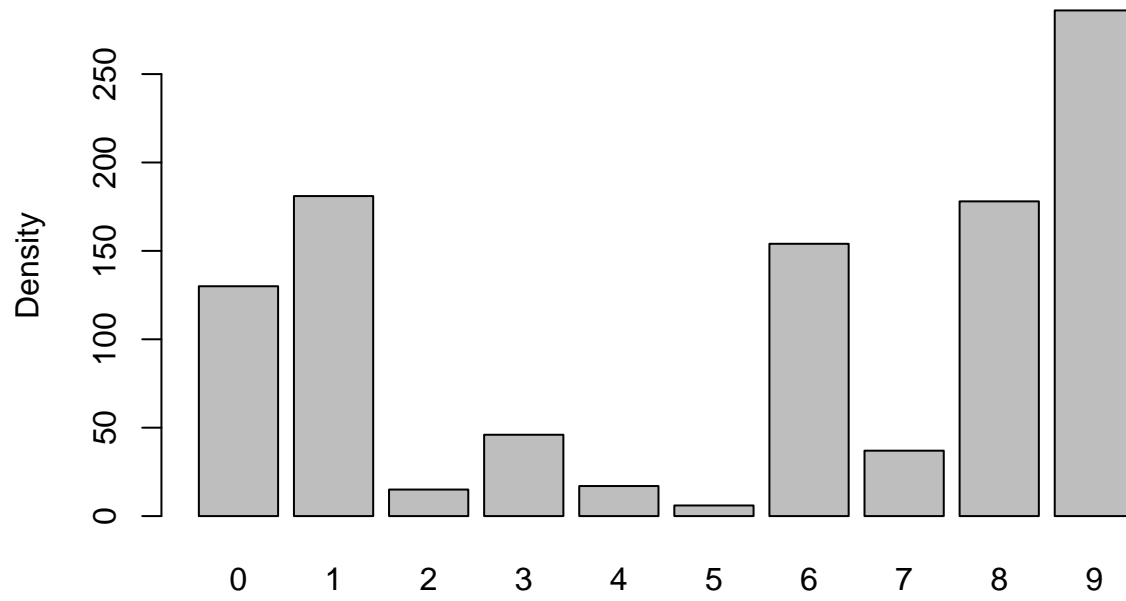
**Naive Bayes Plot**



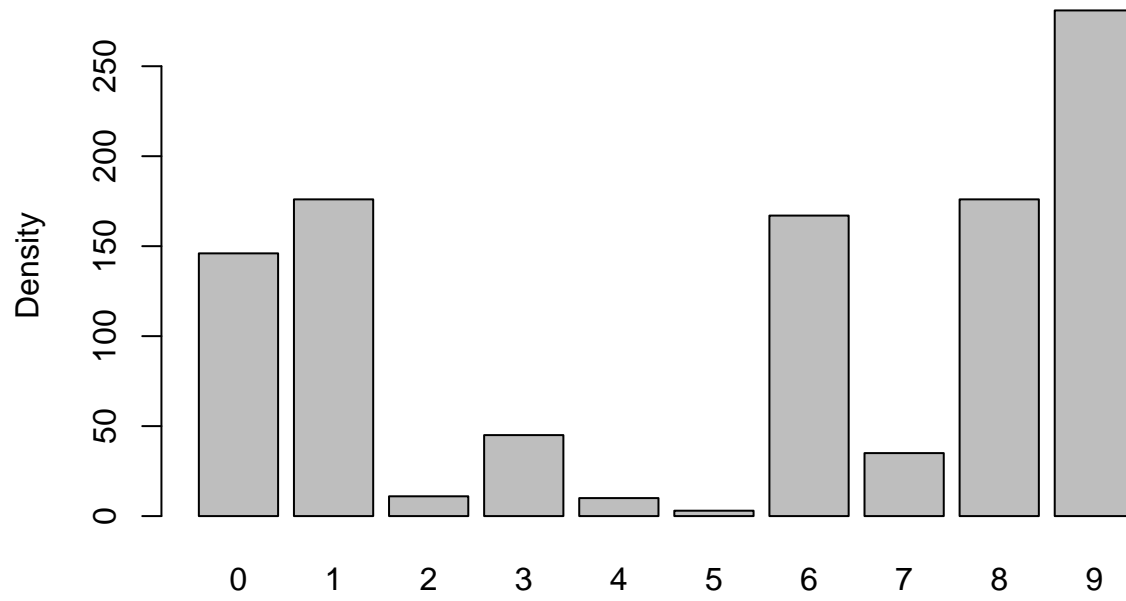
**Naive Bayes Plot**



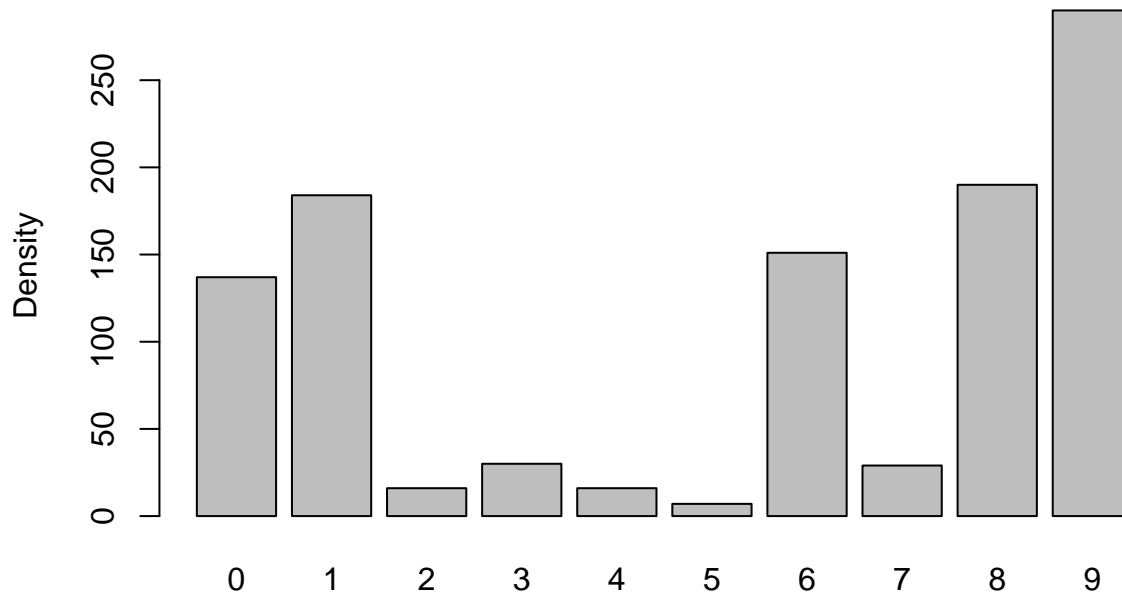
**Naive Bayes Plot**



**Naive Bayes Plot**



## Naive Bayes Plot



## Confusion Matrix (across all folds)

```
### end crossvalidation -- present results for all folds


```

```
##
##      1      2      3      4      5      6      7      8      9     10
##  1  914      0     98     93     26    111     15      7     16      6
##  2      2  1193     60     94     20     62     35     39    213     61
##  3      2      0    163      4      4      3      2      1      2      0
##  4      0      1     92    297      0     12      3      3      6      1
##  5      1      0      7      1    105      5      2      8      4     15
##  6      1      0     15      3      3     29      2      0      2      1
##  7     39      5    326     82     87     73    960     10     21      4
##  8      0      0      4      6      1      2      0    272      2      3
##  9     28     11    271    381    131    509     18     43    517     22
## 10     25      7     29    148    599    118      9    729    191    952
```

```
#####Testing with Kaggle sample#####
#TestTotalDF_noLabel<-TestTotalDF[-c(1)]
#(head(TestTotalDF_noLabel))
```

```
#nb_Pred <- predict(train_naibayes, TestTotalDF_noLabel)
#nb_Pred
```



```
### Export naive Bayesbest result and run through Kaggle

#nbTestPred <- predict(train_naibayes, TestTotalDF, type = 'class')
#nbTestPred <- data.frame(nbTestPred)
#colnames(nbTestPred)[1] <- 'Label'
#nbTestPred$ImageId <- 1:nrow(nbTestPred)
#nbTestPred <- nbTestPred %>% select(ImageId, Label)

#write.csv(nbTestPred, 'Naive Bayes Classifier.csv', row.names = FALSE)
```

Next: Try running a similar cross validation experiment using Decision Trees!!! Compare the results ... which classifier performed best???