RWorksheet_Suero#4c

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1. Use the dataset mpg Download and open the mpg file. Upload it to your OWN environment

1a. Show your solutions on how to import a csv file into the environment.

```r
library(readr)

mpg<- read.csv("mpg.csv")
mpg
```

```
##       X manufacturer                model displ year cyl       trans drv cty
## 1     1         audi                   a4   1.8 1999   4   auto(l5)   f  18
## 2     2         audi                   a4   1.8 1999   4 manual(m5)   f  21
## 3     3         audi                   a4   2.0 2008   4 manual(m6)   f  20
## 4     4         audi                   a4   2.0 2008   4   auto(av)   f  21
## 5     5         audi                   a4   2.8 1999   6   auto(l5)   f  16
## 6     6         audi                   a4   2.8 1999   6 manual(m5)   f  18
## 7     7         audi                   a4   3.1 2008   6   auto(av)   f  18
## 8     8         audi            a4 quattro   1.8 1999   4 manual(m5)   4  18
## 9     9         audi            a4 quattro   1.8 1999   4   auto(l5)   4  16
## 10   10         audi            a4 quattro   2.0 2008   4 manual(m6)   4  20
## 11   11         audi            a4 quattro   2.0 2008   4   auto(s6)   4  19
## 12   12         audi            a4 quattro   2.8 1999   6   auto(l5)   4  15
## 13   13         audi            a4 quattro   2.8 1999   6 manual(m5)   4  17
## 14   14         audi            a4 quattro   3.1 2008   6   auto(s6)   4  17
## 15   15         audi            a4 quattro   3.1 2008   6 manual(m6)   4  15
## 16   16         audi            a6 quattro   2.8 1999   6   auto(l5)   4  15
## 17   17         audi            a6 quattro   3.1 2008   6   auto(s6)   4  17
## 18   18         audi            a6 quattro   4.2 2008   8   auto(s6)   4  16
## 19   19    chevrolet   c1500 suburban 2wd   5.3 2008   8   auto(l4)   r  14
## 20   20    chevrolet   c1500 suburban 2wd   5.3 2008   8   auto(l4)   r  11
## 21   21    chevrolet   c1500 suburban 2wd   5.3 2008   8   auto(l4)   r  14
## 22   22    chevrolet   c1500 suburban 2wd   5.7 1999   8   auto(l4)   r  13
## 23   23    chevrolet   c1500 suburban 2wd   6.0 2008   8   auto(l4)   r  12
## 24   24    chevrolet             corvette   5.7 1999   8 manual(m6)   r  16
## 25   25    chevrolet             corvette   5.7 1999   8   auto(l4)   r  15
## 26   26    chevrolet             corvette   6.2 2008   8 manual(m6)   r  16
## 27   27    chevrolet             corvette   6.2 2008   8   auto(s6)   r  15
## 28   28    chevrolet             corvette   7.0 2008   8 manual(m6)   r  15
## 29   29    chevrolet       k1500 tahoe 4wd   5.3 2008   8   auto(l4)   4  14
## 30   30    chevrolet       k1500 tahoe 4wd   5.3 2008   8   auto(l4)   4  11
## 31   31    chevrolet       k1500 tahoe 4wd   5.7 1999   8   auto(l4)   4  11
## 32   32    chevrolet       k1500 tahoe 4wd   6.5 1999   8   auto(l4)   4  14
## 33   33    chevrolet               malibu   2.4 1999   4   auto(l4)   f  19
## 34   34    chevrolet               malibu   2.4 2008   4   auto(l4)   f  22
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## 35 35    chevrolet             malibu 3.1 1999 6   auto(14) f 18
## 36 36    chevrolet             malibu 3.5 2008 6   auto(14) f 18
## 37 37    chevrolet             malibu 3.6 2008 6   auto(s6) f 17
## 38 38        dodge         caravan 2wd 2.4 1999 4   auto(l3) f 18
## 39 39        dodge         caravan 2wd 3.0 1999 6   auto(14) f 17
## 40 40        dodge         caravan 2wd 3.3 1999 6   auto(14) f 16
## 41 41        dodge         caravan 2wd 3.3 1999 6   auto(14) f 16
## 42 42        dodge         caravan 2wd 3.3 2008 6   auto(14) f 17
## 43 43        dodge         caravan 2wd 3.3 2008 6   auto(14) f 17
## 44 44        dodge         caravan 2wd 3.3 2008 6   auto(14) f 11
## 45 45        dodge         caravan 2wd 3.8 1999 6   auto(14) f 15
## 46 46        dodge         caravan 2wd 3.8 1999 6   auto(14) f 15
## 47 47        dodge         caravan 2wd 3.8 2008 6   auto(16) f 16
## 48 48        dodge         caravan 2wd 4.0 2008 6   auto(16) f 16
## 49 49        dodge    dakota pickup 4wd 3.7 2008 6 manual(m6) 4 15
## 50 50        dodge    dakota pickup 4wd 3.7 2008 6   auto(14) 4 14
## 51 51        dodge    dakota pickup 4wd 3.9 1999 6   auto(14) 4 13
## 52 52        dodge    dakota pickup 4wd 3.9 1999 6 manual(m5) 4 14
## 53 53        dodge    dakota pickup 4wd 4.7 2008 8   auto(15) 4 14
## 54 54        dodge    dakota pickup 4wd 4.7 2008 8   auto(15) 4 14
## 55 55        dodge    dakota pickup 4wd 4.7 2008 8   auto(15) 4  9
## 56 56        dodge    dakota pickup 4wd 5.2 1999 8 manual(m5) 4 11
## 57 57        dodge    dakota pickup 4wd 5.2 1999 8   auto(14) 4 11
## 58 58        dodge         durango 4wd 3.9 1999 6   auto(14) 4 13
## 59 59        dodge         durango 4wd 4.7 2008 8   auto(15) 4 13
## 60 60        dodge         durango 4wd 4.7 2008 8   auto(15) 4  9
## 61 61        dodge         durango 4wd 4.7 2008 8   auto(15) 4 13
## 62 62        dodge         durango 4wd 5.2 1999 8   auto(14) 4 11
## 63 63        dodge         durango 4wd 5.7 2008 8   auto(15) 4 13
## 64 64        dodge         durango 4wd 5.9 1999 8   auto(14) 4 11
## 65 65        dodge ram 1500 pickup 4wd 4.7 2008 8 manual(m6) 4 12
## 66 66        dodge ram 1500 pickup 4wd 4.7 2008 8   auto(15) 4  9
## 67 67        dodge ram 1500 pickup 4wd 4.7 2008 8   auto(15) 4 13
## 68 68        dodge ram 1500 pickup 4wd 4.7 2008 8   auto(15) 4 13
## 69 69        dodge ram 1500 pickup 4wd 4.7 2008 8 manual(m6) 4 12
## 70 70        dodge ram 1500 pickup 4wd 4.7 2008 8 manual(m6) 4  9
## 71 71        dodge ram 1500 pickup 4wd 5.2 1999 8   auto(14) 4 11
## 72 72        dodge ram 1500 pickup 4wd 5.2 1999 8 manual(m5) 4 11
## 73 73        dodge ram 1500 pickup 4wd 5.7 2008 8   auto(15) 4 13
## 74 74        dodge ram 1500 pickup 4wd 5.9 1999 8   auto(14) 4 11
## 75 75         ford       expedition 2wd 4.6 1999 8   auto(14) r 11
## 76 76         ford       expedition 2wd 5.4 1999 8   auto(14) r 11
## 77 77         ford       expedition 2wd 5.4 2008 8   auto(16) r 12
## 78 78         ford         explorer 4wd 4.0 1999 6   auto(15) 4 14
## 79 79         ford         explorer 4wd 4.0 1999 6 manual(m5) 4 15
## 80 80         ford         explorer 4wd 4.0 1999 6   auto(15) 4 14
## 81 81         ford         explorer 4wd 4.0 2008 6   auto(15) 4 13
## 82 82         ford         explorer 4wd 4.6 2008 8   auto(16) 4 13
## 83 83         ford         explorer 4wd 5.0 1999 8   auto(14) 4 13
## 84 84         ford      f150 pickup 4wd 4.2 1999 6   auto(14) 4 14
## 85 85         ford      f150 pickup 4wd 4.2 1999 6 manual(m5) 4 14
## 86 86         ford      f150 pickup 4wd 4.6 1999 8 manual(m5) 4 13
## 87 87         ford      f150 pickup 4wd 4.6 1999 8   auto(14) 4 13
## 88 88         ford      f150 pickup 4wd 4.6 2008 8   auto(14) 4 13
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## 89   89        ford     f150 pickup 4wd  5.4 1999  8   auto(14)  4  11
## 90   90        ford     f150 pickup 4wd  5.4 2008  8   auto(14)  4  13
## 91   91        ford             mustang  3.8 1999  6 manual(m5)  r  18
## 92   92        ford             mustang  3.8 1999  6   auto(14)  r  18
## 93   93        ford             mustang  4.0 2008  6 manual(m5)  r  17
## 94   94        ford             mustang  4.0 2008  6   auto(15)  r  16
## 95   95        ford             mustang  4.6 1999  8   auto(14)  r  15
## 96   96        ford             mustang  4.6 1999  8 manual(m5)  r  15
## 97   97        ford             mustang  4.6 2008  8 manual(m5)  r  15
## 98   98        ford             mustang  4.6 2008  8   auto(15)  r  15
## 99   99        ford             mustang  5.4 2008  8 manual(m6)  r  14
## 100 100       honda               civic  1.6 1999  4 manual(m5)  f  28
## 101 101       honda               civic  1.6 1999  4   auto(14)  f  24
## 102 102       honda               civic  1.6 1999  4 manual(m5)  f  25
## 103 103       honda               civic  1.6 1999  4 manual(m5)  f  23
## 104 104       honda               civic  1.6 1999  4   auto(14)  f  24
## 105 105       honda               civic  1.8 2008  4 manual(m5)  f  26
## 106 106       honda               civic  1.8 2008  4   auto(15)  f  25
## 107 107       honda               civic  1.8 2008  4   auto(15)  f  24
## 108 108       honda               civic  2.0 2008  4 manual(m6)  f  21
## 109 109     hyundai              sonata  2.4 1999  4   auto(14)  f  18
## 110 110     hyundai              sonata  2.4 1999  4 manual(m5)  f  18
## 111 111     hyundai              sonata  2.4 2008  4   auto(14)  f  21
## 112 112     hyundai              sonata  2.4 2008  4 manual(m5)  f  21
## 113 113     hyundai              sonata  2.5 1999  6   auto(14)  f  18
## 114 114     hyundai              sonata  2.5 1999  6 manual(m5)  f  18
## 115 115     hyundai              sonata  3.3 2008  6   auto(15)  f  19
## 116 116     hyundai             tiburon  2.0 1999  4   auto(14)  f  19
## 117 117     hyundai             tiburon  2.0 1999  4 manual(m5)  f  19
## 118 118     hyundai             tiburon  2.0 2008  4 manual(m5)  f  20
## 119 119     hyundai             tiburon  2.0 2008  4   auto(14)  f  20
## 120 120     hyundai             tiburon  2.7 2008  6   auto(14)  f  17
## 121 121     hyundai             tiburon  2.7 2008  6 manual(m6)  f  16
## 122 122     hyundai             tiburon  2.7 2008  6 manual(m5)  f  17
## 123 123        jeep   grand cherokee 4wd  3.0 2008  6   auto(15)  4  17
## 124 124        jeep   grand cherokee 4wd  3.7 2008  6   auto(15)  4  15
## 125 125        jeep   grand cherokee 4wd  4.0 1999  6   auto(14)  4  15
## 126 126        jeep   grand cherokee 4wd  4.7 1999  8   auto(14)  4  14
## 127 127        jeep   grand cherokee 4wd  4.7 2008  8   auto(15)  4   9
## 128 128        jeep   grand cherokee 4wd  4.7 2008  8   auto(15)  4  14
## 129 129        jeep   grand cherokee 4wd  5.7 2008  8   auto(15)  4  13
## 130 130        jeep   grand cherokee 4wd  6.1 2008  8   auto(15)  4  11
## 131 131  land rover          range rover  4.0 1999  8   auto(14)  4  11
## 132 132  land rover          range rover  4.2 2008  8   auto(s6)  4  12
## 133 133  land rover          range rover  4.4 2008  8   auto(s6)  4  12
## 134 134  land rover          range rover  4.6 1999  8   auto(14)  4  11
## 135 135     lincoln        navigator 2wd  5.4 1999  8   auto(14)  r  11
## 136 136     lincoln        navigator 2wd  5.4 1999  8   auto(14)  r  11
## 137 137     lincoln        navigator 2wd  5.4 2008  8   auto(16)  r  12
## 138 138     mercury     mountaineer 4wd  4.0 1999  6   auto(15)  4  14
## 139 139     mercury     mountaineer 4wd  4.0 2008  6   auto(15)  4  13
## 140 140     mercury     mountaineer 4wd  4.6 2008  8   auto(16)  4  13
## 141 141     mercury     mountaineer 4wd  5.0 1999  8   auto(14)  4  13
## 142 142      nissan              altima  2.4 1999  4 manual(m5)  f  21
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## 143 143        nissan              altima 2.4 1999   4   auto(l4)  f  19
## 144 144        nissan              altima 2.5 2008   4   auto(av)  f  23
## 145 145        nissan              altima 2.5 2008   4 manual(m6)  f  23
## 146 146        nissan              altima 3.5 2008   6 manual(m6)  f  19
## 147 147        nissan              altima 3.5 2008   6   auto(av)  f  19
## 148 148        nissan              maxima 3.0 1999   6   auto(l4)  f  18
## 149 149        nissan              maxima 3.0 1999   6 manual(m5)  f  19
## 150 150        nissan              maxima 3.5 2008   6   auto(av)  f  19
## 151 151        nissan       pathfinder 4wd 3.3 1999   6   auto(l4)  4  14
## 152 152        nissan       pathfinder 4wd 3.3 1999   6 manual(m5)  4  15
## 153 153        nissan       pathfinder 4wd 4.0 2008   6   auto(l5)  4  14
## 154 154        nissan       pathfinder 4wd 5.6 2008   8   auto(s5)  4  12
## 155 155       pontiac          grand prix 3.1 1999   6   auto(l4)  f  18
## 156 156       pontiac          grand prix 3.8 1999   6   auto(l4)  f  16
## 157 157       pontiac          grand prix 3.8 1999   6   auto(l4)  f  17
## 158 158       pontiac          grand prix 3.8 2008   6   auto(l4)  f  18
## 159 159       pontiac          grand prix 5.3 2008   8   auto(s4)  f  16
## 160 160        subaru        forester awd 2.5 1999   4 manual(m5)  4  18
## 161 161        subaru        forester awd 2.5 1999   4   auto(l4)  4  18
## 162 162        subaru        forester awd 2.5 2008   4 manual(m5)  4  20
## 163 163        subaru        forester awd 2.5 2008   4 manual(m5)  4  19
## 164 164        subaru        forester awd 2.5 2008   4   auto(l4)  4  20
## 165 165        subaru        forester awd 2.5 2008   4   auto(l4)  4  18
## 166 166        subaru         impreza awd 2.2 1999   4   auto(l4)  4  21
## 167 167        subaru         impreza awd 2.2 1999   4 manual(m5)  4  19
## 168 168        subaru         impreza awd 2.5 1999   4 manual(m5)  4  19
## 169 169        subaru         impreza awd 2.5 1999   4   auto(l4)  4  19
## 170 170        subaru         impreza awd 2.5 2008   4   auto(s4)  4  20
## 171 171        subaru         impreza awd 2.5 2008   4   auto(s4)  4  20
## 172 172        subaru         impreza awd 2.5 2008   4 manual(m5)  4  19
## 173 173        subaru         impreza awd 2.5 2008   4 manual(m5)  4  20
## 174 174        toyota         4runner 4wd 2.7 1999   4 manual(m5)  4  15
## 175 175        toyota         4runner 4wd 2.7 1999   4   auto(l4)  4  16
## 176 176        toyota         4runner 4wd 3.4 1999   6   auto(l4)  4  15
## 177 177        toyota         4runner 4wd 3.4 1999   6 manual(m5)  4  15
## 178 178        toyota         4runner 4wd 4.0 2008   6   auto(l5)  4  16
## 179 179        toyota         4runner 4wd 4.7 2008   8   auto(l5)  4  14
## 180 180        toyota               camry 2.2 1999   4 manual(m5)  f  21
## 181 181        toyota               camry 2.2 1999   4   auto(l4)  f  21
## 182 182        toyota               camry 2.4 2008   4 manual(m5)  f  21
## 183 183        toyota               camry 2.4 2008   4   auto(l5)  f  21
## 184 184        toyota               camry 3.0 1999   6   auto(l4)  f  18
## 185 185        toyota               camry 3.0 1999   6 manual(m5)  f  18
## 186 186        toyota               camry 3.5 2008   6   auto(s6)  f  19
## 187 187        toyota        camry solara 2.2 1999   4   auto(l4)  f  21
## 188 188        toyota        camry solara 2.2 1999   4 manual(m5)  f  21
## 189 189        toyota        camry solara 2.4 2008   4 manual(m5)  f  21
## 190 190        toyota        camry solara 2.4 2008   4   auto(s5)  f  22
## 191 191        toyota        camry solara 3.0 1999   6   auto(l4)  f  18
## 192 192        toyota        camry solara 3.0 1999   6 manual(m5)  f  18
## 193 193        toyota        camry solara 3.3 2008   6   auto(s5)  f  18
## 194 194        toyota             corolla 1.8 1999   4   auto(l3)  f  24
## 195 195        toyota             corolla 1.8 1999   4   auto(l4)  f  24
## 196 196        toyota             corolla 1.8 1999   4 manual(m5)  f  26
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## 197 197        toyota              corolla 1.8 2008  4 manual(m5)  f  28
## 198 198        toyota              corolla 1.8 2008  4   auto(l4)  f  26
## 199 199        toyota land cruiser wagon 4wd 4.7 1999  8   auto(l4)  4  11
## 200 200        toyota land cruiser wagon 4wd 5.7 2008  8   auto(s6)  4  13
## 201 201        toyota    toyota tacoma 4wd 2.7 1999  4 manual(m5)  4  15
## 202 202        toyota    toyota tacoma 4wd 2.7 1999  4   auto(l4)  4  16
## 203 203        toyota    toyota tacoma 4wd 2.7 2008  4 manual(m5)  4  17
## 204 204        toyota    toyota tacoma 4wd 3.4 1999  6 manual(m5)  4  15
## 205 205        toyota    toyota tacoma 4wd 3.4 1999  6   auto(l4)  4  15
## 206 206        toyota    toyota tacoma 4wd 4.0 2008  6 manual(m6)  4  15
## 207 207        toyota    toyota tacoma 4wd 4.0 2008  6   auto(l5)  4  16
## 208 208    volkswagen                  gti 2.0 1999  4 manual(m5)  f  21
## 209 209    volkswagen                  gti 2.0 1999  4   auto(l4)  f  19
## 210 210    volkswagen                  gti 2.0 2008  4 manual(m6)  f  21
## 211 211    volkswagen                  gti 2.0 2008  4   auto(s6)  f  22
## 212 212    volkswagen                  gti 2.8 1999  6 manual(m5)  f  17
## 213 213    volkswagen                jetta 1.9 1999  4 manual(m5)  f  33
## 214 214    volkswagen                jetta 2.0 1999  4 manual(m5)  f  21
## 215 215    volkswagen                jetta 2.0 1999  4   auto(l4)  f  19
## 216 216    volkswagen                jetta 2.0 2008  4   auto(s6)  f  22
## 217 217    volkswagen                jetta 2.0 2008  4 manual(m6)  f  21
## 218 218    volkswagen                jetta 2.5 2008  5   auto(s6)  f  21
## 219 219    volkswagen                jetta 2.5 2008  5 manual(m5)  f  21
## 220 220    volkswagen                jetta 2.8 1999  6   auto(l4)  f  16
## 221 221    volkswagen                jetta 2.8 1999  6 manual(m5)  f  17
## 222 222    volkswagen           new beetle 1.9 1999  4 manual(m5)  f  35
## 223 223    volkswagen           new beetle 1.9 1999  4   auto(l4)  f  29
## 224 224    volkswagen           new beetle 2.0 1999  4 manual(m5)  f  21
## 225 225    volkswagen           new beetle 2.0 1999  4   auto(l4)  f  19
## 226 226    volkswagen           new beetle 2.5 2008  5 manual(m5)  f  20
## 227 227    volkswagen           new beetle 2.5 2008  5   auto(s6)  f  20
## 228 228    volkswagen               passat 1.8 1999  4 manual(m5)  f  21
## 229 229    volkswagen               passat 1.8 1999  4   auto(l5)  f  18
## 230 230    volkswagen               passat 2.0 2008  4   auto(s6)  f  19
## 231 231    volkswagen               passat 2.0 2008  4 manual(m6)  f  21
## 232 232    volkswagen               passat 2.8 1999  6   auto(l5)  f  16
## 233 233    volkswagen               passat 2.8 1999  6 manual(m5)  f  18
## 234 234    volkswagen               passat 3.6 2008  6   auto(s6)  f  17
##     hwy fl    class
## 1    29  p  compact
## 2    29  p  compact
## 3    31  p  compact
## 4    30  p  compact
## 5    26  p  compact
## 6    26  p  compact
## 7    27  p  compact
## 8    26  p  compact
## 9    25  p  compact
## 10   28  p  compact
## 11   27  p  compact
## 12   25  p  compact
## 13   25  p  compact
## 14   25  p  compact
## 15   25  p  compact
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## 16    24   p    midsize
## 17    25   p    midsize
## 18    23   p    midsize
## 19    20   r        suv
## 20    15   e        suv
## 21    20   r        suv
## 22    17   r        suv
## 23    17   r        suv
## 24    26   p    2seater
## 25    23   p    2seater
## 26    26   p    2seater
## 27    25   p    2seater
## 28    24   p    2seater
## 29    19   r        suv
## 30    14   e        suv
## 31    15   r        suv
## 32    17   d        suv
## 33    27   r    midsize
## 34    30   r    midsize
## 35    26   r    midsize
## 36    29   r    midsize
## 37    26   r    midsize
## 38    24   r    minivan
## 39    24   r    minivan
## 40    22   r    minivan
## 41    22   r    minivan
## 42    24   r    minivan
## 43    24   r    minivan
## 44    17   e    minivan
## 45    22   r    minivan
## 46    21   r    minivan
## 47    23   r    minivan
## 48    23   r    minivan
## 49    19   r     pickup
## 50    18   r     pickup
## 51    17   r     pickup
## 52    17   r     pickup
## 53    19   r     pickup
## 54    19   r     pickup
## 55    12   e     pickup
## 56    17   r     pickup
## 57    15   r     pickup
## 58    17   r        suv
## 59    17   r        suv
## 60    12   e        suv
## 61    17   r        suv
## 62    16   r        suv
## 63    18   r        suv
## 64    15   r        suv
## 65    16   r     pickup
## 66    12   e     pickup
## 67    17   r     pickup
## 68    17   r     pickup
## 69    16   r     pickup
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## 70   12   e      pickup
## 71   15   r      pickup
## 72   16   r      pickup
## 73   17   r      pickup
## 74   15   r      pickup
## 75   17   r         suv
## 76   17   r         suv
## 77   18   r         suv
## 78   17   r         suv
## 79   19   r         suv
## 80   17   r         suv
## 81   19   r         suv
## 82   19   r         suv
## 83   17   r         suv
## 84   17   r      pickup
## 85   17   r      pickup
## 86   16   r      pickup
## 87   16   r      pickup
## 88   17   r      pickup
## 89   15   r      pickup
## 90   17   r      pickup
## 91   26   r subcompact
## 92   25   r subcompact
## 93   26   r subcompact
## 94   24   r subcompact
## 95   21   r subcompact
## 96   22   r subcompact
## 97   23   r subcompact
## 98   22   r subcompact
## 99   20   p subcompact
## 100  33   r subcompact
## 101  32   r subcompact
## 102  32   r subcompact
## 103  29   p subcompact
## 104  32   r subcompact
## 105  34   r subcompact
## 106  36   r subcompact
## 107  36   c subcompact
## 108  29   p subcompact
## 109  26   r     midsize
## 110  27   r     midsize
## 111  30   r     midsize
## 112  31   r     midsize
## 113  26   r     midsize
## 114  26   r     midsize
## 115  28   r     midsize
## 116  26   r subcompact
## 117  29   r subcompact
## 118  28   r subcompact
## 119  27   r subcompact
## 120  24   r subcompact
## 121  24   r subcompact
## 122  24   r subcompact
## 123  22   d         suv
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## 124  19  r        suv
## 125  20  r        suv
## 126  17  r        suv
## 127  12  e        suv
## 128  19  r        suv
## 129  18  r        suv
## 130  14  p        suv
## 131  15  p        suv
## 132  18  r        suv
## 133  18  r        suv
## 134  15  p        suv
## 135  17  r        suv
## 136  16  p        suv
## 137  18  r        suv
## 138  17  r        suv
## 139  19  r        suv
## 140  19  r        suv
## 141  17  r        suv
## 142  29  r    compact
## 143  27  r    compact
## 144  31  r    midsize
## 145  32  r    midsize
## 146  27  p    midsize
## 147  26  p    midsize
## 148  26  r    midsize
## 149  25  r    midsize
## 150  25  p    midsize
## 151  17  r        suv
## 152  17  r        suv
## 153  20  p        suv
## 154  18  p        suv
## 155  26  r    midsize
## 156  26  p    midsize
## 157  27  r    midsize
## 158  28  r    midsize
## 159  25  p    midsize
## 160  25  r        suv
## 161  24  r        suv
## 162  27  r        suv
## 163  25  p        suv
## 164  26  r        suv
## 165  23  p        suv
## 166  26  r subcompact
## 167  26  r subcompact
## 168  26  r subcompact
## 169  26  r subcompact
## 170  25  p    compact
## 171  27  r    compact
## 172  25  p    compact
## 173  27  r    compact
## 174  20  r        suv
## 175  20  r        suv
## 176  19  r        suv
## 177  17  r        suv
```

```
## 178  20  r       suv
## 179  17  r       suv
## 180  29  r    midsize
## 181  27  r    midsize
## 182  31  r    midsize
## 183  31  r    midsize
## 184  26  r    midsize
## 185  26  r    midsize
## 186  28  r    midsize
## 187  27  r    compact
## 188  29  r    compact
## 189  31  r    compact
## 190  31  r    compact
## 191  26  r    compact
## 192  26  r    compact
## 193  27  r    compact
## 194  30  r    compact
## 195  33  r    compact
## 196  35  r    compact
## 197  37  r    compact
## 198  35  r    compact
## 199  15  r       suv
## 200  18  r       suv
## 201  20  r     pickup
## 202  20  r     pickup
## 203  22  r     pickup
## 204  17  r     pickup
## 205  19  r     pickup
## 206  18  r     pickup
## 207  20  r     pickup
## 208  29  r    compact
## 209  26  r    compact
## 210  29  p    compact
## 211  29  p    compact
## 212  24  r    compact
## 213  44  d    compact
## 214  29  r    compact
## 215  26  r    compact
## 216  29  p    compact
## 217  29  p    compact
## 218  29  r    compact
## 219  29  r    compact
## 220  23  r    compact
## 221  24  r    compact
## 222  44  d subcompact
## 223  41  d subcompact
## 224  29  r subcompact
## 225  26  r subcompact
## 226  28  r subcompact
## 227  29  r subcompact
## 228  29  p    midsize
## 229  29  p    midsize
## 230  28  p    midsize
## 231  29  p    midsize
```

```
## 232  26  p    midsize
## 233  26  p    midsize
## 234  26  p    midsize
```

1.b Which variables from mpg dataset are categorical?

```
is_cont <- sapply(mpg, is.character)
cont_vars <- names(mpg)[is_cont]
cont_vars
```

```
## [1] "manufacturer" "model"        "trans"        "drv"          "fl"
## [6] "class"
```

1.c Which are continuous variables?

```
is_cont <- sapply(mpg, is.numeric)
cont_vars <- names(mpg)[is_cont]
cont_vars
```

```
## [1] "X"     "displ" "year"  "cyl"   "cty"   "hwy"
```

2. Which manufacturer has the most models in this data set? Which model has the most variations? Show your answer.

```
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
MostModels <- summarise(group_by(mpg, manufacturer), numModels = n_distinct(model))
MostModels <- arrange(MostModels, desc(numModels))
MostModels <- head(MostModels, 1)


MostVariations <- summarise(group_by(mpg, model), numVariations = n())
MostVariations <- arrange(MostVariations, desc(numVariations))
MostVariations <- head(MostVariations, 1)


cat("Manufacturer with the most models: ", MostModels$manufacturer, "with ", MostModels$numModels, " mod
```

```
## Manufacturer with the most models:  toyota with  6  models
```

```
cat("Model with the most variations: ", MostVariations$model, " with ", MostVariations$numVariations, "
```

```
## Model with the most variations:  caravan 2wd  with  11  variations
```

2.a Group the manufacturers and find the unique models. Show your codes and result.

```
library(dplyr)
```

```
manufacturersModels <- data.frame(Manufacturer = mpg$manufacturer, Model = mpg$model)
manufacturersModels
```

```
##    Manufacturer                     Model
## 1          audi                        a4
## 2          audi                        a4
## 3          audi                        a4
## 4          audi                        a4
## 5          audi                        a4
## 6          audi                        a4
## 7          audi                        a4
## 8          audi                 a4 quattro
## 9          audi                 a4 quattro
## 10         audi                 a4 quattro
## 11         audi                 a4 quattro
## 12         audi                 a4 quattro
## 13         audi                 a4 quattro
## 14         audi                 a4 quattro
## 15         audi                 a4 quattro
## 16         audi                 a6 quattro
## 17         audi                 a6 quattro
## 18         audi                 a6 quattro
## 19    chevrolet       c1500 suburban 2wd
## 20    chevrolet       c1500 suburban 2wd
## 21    chevrolet       c1500 suburban 2wd
## 22    chevrolet       c1500 suburban 2wd
## 23    chevrolet       c1500 suburban 2wd
## 24    chevrolet                  corvette
## 25    chevrolet                  corvette
## 26    chevrolet                  corvette
## 27    chevrolet                  corvette
## 28    chevrolet                  corvette
## 29    chevrolet           k1500 tahoe 4wd
## 30    chevrolet           k1500 tahoe 4wd
## 31    chevrolet           k1500 tahoe 4wd
## 32    chevrolet           k1500 tahoe 4wd
## 33    chevrolet                    malibu
## 34    chevrolet                    malibu
## 35    chevrolet                    malibu
## 36    chevrolet                    malibu
## 37    chevrolet                    malibu
## 38        dodge               caravan 2wd
## 39        dodge               caravan 2wd
## 40        dodge               caravan 2wd
## 41        dodge               caravan 2wd
## 42        dodge               caravan 2wd
## 43        dodge               caravan 2wd
## 44        dodge               caravan 2wd
## 45        dodge               caravan 2wd
## 46        dodge               caravan 2wd
## 47        dodge               caravan 2wd
## 48        dodge               caravan 2wd
## 49        dodge         dakota pickup 4wd
## 50        dodge         dakota pickup 4wd
## 51        dodge         dakota pickup 4wd
## 52        dodge         dakota pickup 4wd
## 53        dodge         dakota pickup 4wd
```

```
## 54       dodge       dakota pickup 4wd
## 55       dodge       dakota pickup 4wd
## 56       dodge       dakota pickup 4wd
## 57       dodge       dakota pickup 4wd
## 58       dodge            durango 4wd
## 59       dodge            durango 4wd
## 60       dodge            durango 4wd
## 61       dodge            durango 4wd
## 62       dodge            durango 4wd
## 63       dodge            durango 4wd
## 64       dodge            durango 4wd
## 65       dodge    ram 1500 pickup 4wd
## 66       dodge    ram 1500 pickup 4wd
## 67       dodge    ram 1500 pickup 4wd
## 68       dodge    ram 1500 pickup 4wd
## 69       dodge    ram 1500 pickup 4wd
## 70       dodge    ram 1500 pickup 4wd
## 71       dodge    ram 1500 pickup 4wd
## 72       dodge    ram 1500 pickup 4wd
## 73       dodge    ram 1500 pickup 4wd
## 74       dodge    ram 1500 pickup 4wd
## 75        ford         expedition 2wd
## 76        ford         expedition 2wd
## 77        ford         expedition 2wd
## 78        ford           explorer 4wd
## 79        ford           explorer 4wd
## 80        ford           explorer 4wd
## 81        ford           explorer 4wd
## 82        ford           explorer 4wd
## 83        ford           explorer 4wd
## 84        ford        f150 pickup 4wd
## 85        ford        f150 pickup 4wd
## 86        ford        f150 pickup 4wd
## 87        ford        f150 pickup 4wd
## 88        ford        f150 pickup 4wd
## 89        ford        f150 pickup 4wd
## 90        ford        f150 pickup 4wd
## 91        ford                mustang
## 92        ford                mustang
## 93        ford                mustang
## 94        ford                mustang
## 95        ford                mustang
## 96        ford                mustang
## 97        ford                mustang
## 98        ford                mustang
## 99        ford                mustang
## 100      honda                  civic
## 101      honda                  civic
## 102      honda                  civic
## 103      honda                  civic
## 104      honda                  civic
## 105      honda                  civic
## 106      honda                  civic
## 107      honda                  civic
```

```
## 108       honda                civic
## 109     hyundai               sonata
## 110     hyundai               sonata
## 111     hyundai               sonata
## 112     hyundai               sonata
## 113     hyundai               sonata
## 114     hyundai               sonata
## 115     hyundai               sonata
## 116     hyundai              tiburon
## 117     hyundai              tiburon
## 118     hyundai              tiburon
## 119     hyundai              tiburon
## 120     hyundai              tiburon
## 121     hyundai              tiburon
## 122     hyundai              tiburon
## 123        jeep   grand cherokee 4wd
## 124        jeep   grand cherokee 4wd
## 125        jeep   grand cherokee 4wd
## 126        jeep   grand cherokee 4wd
## 127        jeep   grand cherokee 4wd
## 128        jeep   grand cherokee 4wd
## 129        jeep   grand cherokee 4wd
## 130        jeep   grand cherokee 4wd
## 131  land rover          range rover
## 132  land rover          range rover
## 133  land rover          range rover
## 134  land rover          range rover
## 135     lincoln        navigator 2wd
## 136     lincoln        navigator 2wd
## 137     lincoln        navigator 2wd
## 138     mercury     mountaineer 4wd
## 139     mercury     mountaineer 4wd
## 140     mercury     mountaineer 4wd
## 141     mercury     mountaineer 4wd
## 142      nissan               altima
## 143      nissan               altima
## 144      nissan               altima
## 145      nissan               altima
## 146      nissan               altima
## 147      nissan               altima
## 148      nissan               maxima
## 149      nissan               maxima
## 150      nissan               maxima
## 151      nissan        pathfinder 4wd
## 152      nissan        pathfinder 4wd
## 153      nissan        pathfinder 4wd
## 154      nissan        pathfinder 4wd
## 155     pontiac           grand prix
## 156     pontiac           grand prix
## 157     pontiac           grand prix
## 158     pontiac           grand prix
## 159     pontiac           grand prix
## 160      subaru         forester awd
## 161      subaru         forester awd
```

```
## 162     subaru            forester awd
## 163     subaru            forester awd
## 164     subaru            forester awd
## 165     subaru            forester awd
## 166     subaru             impreza awd
## 167     subaru             impreza awd
## 168     subaru             impreza awd
## 169     subaru             impreza awd
## 170     subaru             impreza awd
## 171     subaru             impreza awd
## 172     subaru             impreza awd
## 173     subaru             impreza awd
## 174     toyota             4runner 4wd
## 175     toyota             4runner 4wd
## 176     toyota             4runner 4wd
## 177     toyota             4runner 4wd
## 178     toyota             4runner 4wd
## 179     toyota             4runner 4wd
## 180     toyota                   camry
## 181     toyota                   camry
## 182     toyota                   camry
## 183     toyota                   camry
## 184     toyota                   camry
## 185     toyota                   camry
## 186     toyota                   camry
## 187     toyota            camry solara
## 188     toyota            camry solara
## 189     toyota            camry solara
## 190     toyota            camry solara
## 191     toyota            camry solara
## 192     toyota            camry solara
## 193     toyota            camry solara
## 194     toyota                 corolla
## 195     toyota                 corolla
## 196     toyota                 corolla
## 197     toyota                 corolla
## 198     toyota                 corolla
## 199     toyota land cruiser wagon 4wd
## 200     toyota land cruiser wagon 4wd
## 201     toyota        toyota tacoma 4wd
## 202     toyota        toyota tacoma 4wd
## 203     toyota        toyota tacoma 4wd
## 204     toyota        toyota tacoma 4wd
## 205     toyota        toyota tacoma 4wd
## 206     toyota        toyota tacoma 4wd
## 207     toyota        toyota tacoma 4wd
## 208     volkswagen                  gti
## 209     volkswagen                  gti
## 210     volkswagen                  gti
## 211     volkswagen                  gti
## 212     volkswagen                  gti
## 213     volkswagen                jetta
## 214     volkswagen                jetta
## 215     volkswagen                jetta
```

```
## 216       volkswagen                    jetta
## 217       volkswagen                    jetta
## 218       volkswagen                    jetta
## 219       volkswagen                    jetta
## 220       volkswagen                    jetta
## 221       volkswagen                    jetta
## 222       volkswagen               new beetle
## 223       volkswagen               new beetle
## 224       volkswagen               new beetle
## 225       volkswagen               new beetle
## 226       volkswagen               new beetle
## 227       volkswagen               new beetle
## 228       volkswagen                   passat
## 229       volkswagen                   passat
## 230       volkswagen                   passat
## 231       volkswagen                   passat
## 232       volkswagen                   passat
## 233       volkswagen                   passat
## 234       volkswagen                   passat
```

```r
uniqueMods <- unique(manufacturersModels)
uniqueMods
```

```
##       Manufacturer                 Model
## 1             audi                    a4
## 8             audi             a4 quattro
## 16            audi             a6 quattro
## 19       chevrolet     c1500 suburban 2wd
## 24       chevrolet               corvette
## 29       chevrolet         k1500 tahoe 4wd
## 33       chevrolet                 malibu
## 38           dodge            caravan 2wd
## 49           dodge       dakota pickup 4wd
## 58           dodge             durango 4wd
## 65           dodge    ram 1500 pickup 4wd
## 75            ford          expedition 2wd
## 78            ford            explorer 4wd
## 84            ford         f150 pickup 4wd
## 91            ford                 mustang
## 100          honda                  civic
## 109        hyundai                 sonata
## 116        hyundai                tiburon
## 123           jeep     grand cherokee 4wd
## 131      land rover             range rover
## 135        lincoln          navigator 2wd
## 138        mercury        mountaineer 4wd
## 142         nissan                 altima
## 148         nissan                 maxima
## 151         nissan          pathfinder 4wd
## 155        pontiac             grand prix
## 160         subaru           forester awd
## 166         subaru            impreza awd
## 174         toyota             4runner 4wd
## 180         toyota                  camry
## 187         toyota           camry solara
```

```
## 194      toyota             corolla
## 199      toyota land cruiser wagon 4wd
## 201      toyota     toyota tacoma 4wd
## 208  volkswagen             gti
## 213  volkswagen             jetta
## 222  volkswagen         new beetle
## 228  volkswagen             passat
```

```r
uniqueModsFactor <- factoredManufacturer <- as.factor(uniqueMods$Manufacturer)
```

2.b Graph the result by using plot() and ggplot(). Write the codes and its result.

```r
library(ggplot2)
```

```
##
## Attaching package: 'ggplot2'
```

```
## The following object is masked _by_ '.GlobalEnv':
##
##     mpg
```

```r
library(dplyr)
```

```r
uniquePlot <- plot(as.factor(factoredManufacturer),
                main = "Unique Models of Manufacturers",
                xlab = "Manufacturer",
                ylab = "Number of Unique Models",
                cex.names = 0.8, las = 2)
```

Unique Models of Manufacturers
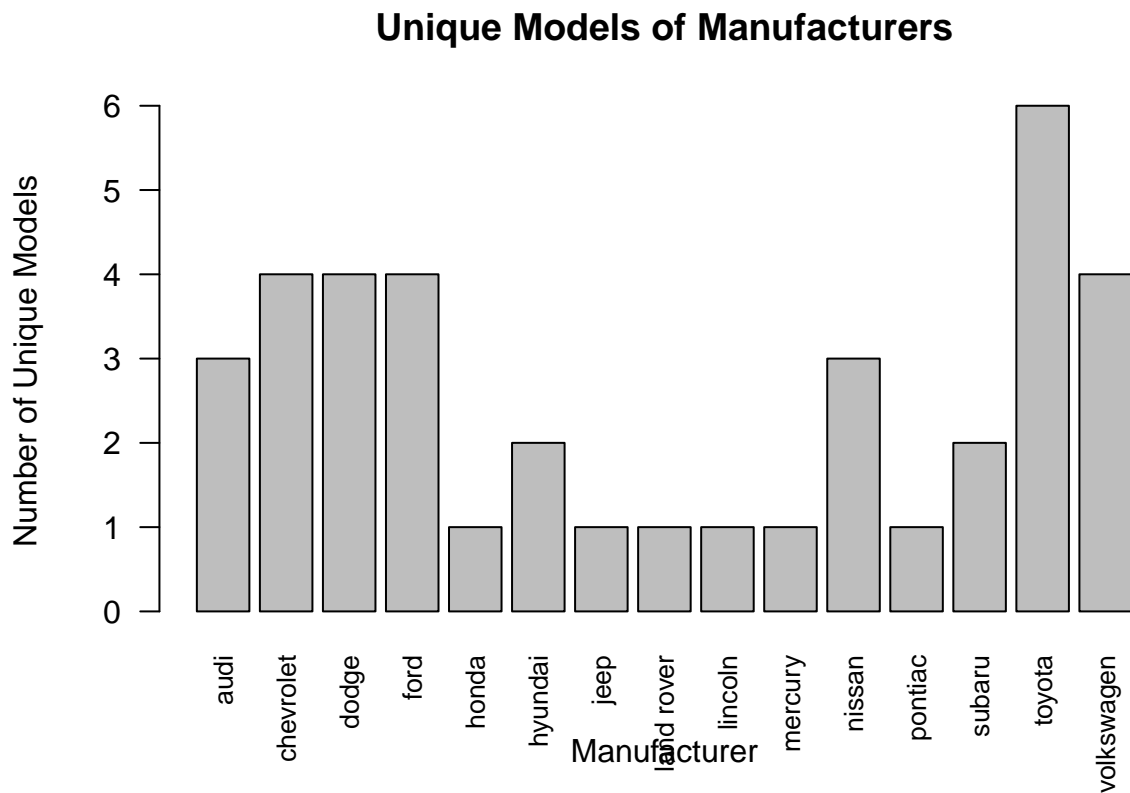

```r
uniqueCount <- uniqueMods %>%
  count(uniqueMods$Manufacturer)
```

```
uniqueCount
```

```
##      uniqueMods$Manufacturer n
## 1                      audi 3
## 2                 chevrolet 4
## 3                     dodge 4
## 4                      ford 4
## 5                     honda 1
## 6                   hyundai 2
## 7                      jeep 1
## 8                land rover 1
## 9                   lincoln 1
## 10                  mercury 1
## 11                   nissan 3
## 12                  pontiac 1
## 13                   subaru 2
## 14                   toyota 6
## 15               volkswagen 4
```

```r
ggplot(uniqueCount, aes(x = `uniqueMods$Manufacturer`, y = n)) +
geom_bar(stat = "identity", fill = "pink") +
  labs(x = "Manufacturer", y = "Number of Unique Models")
```
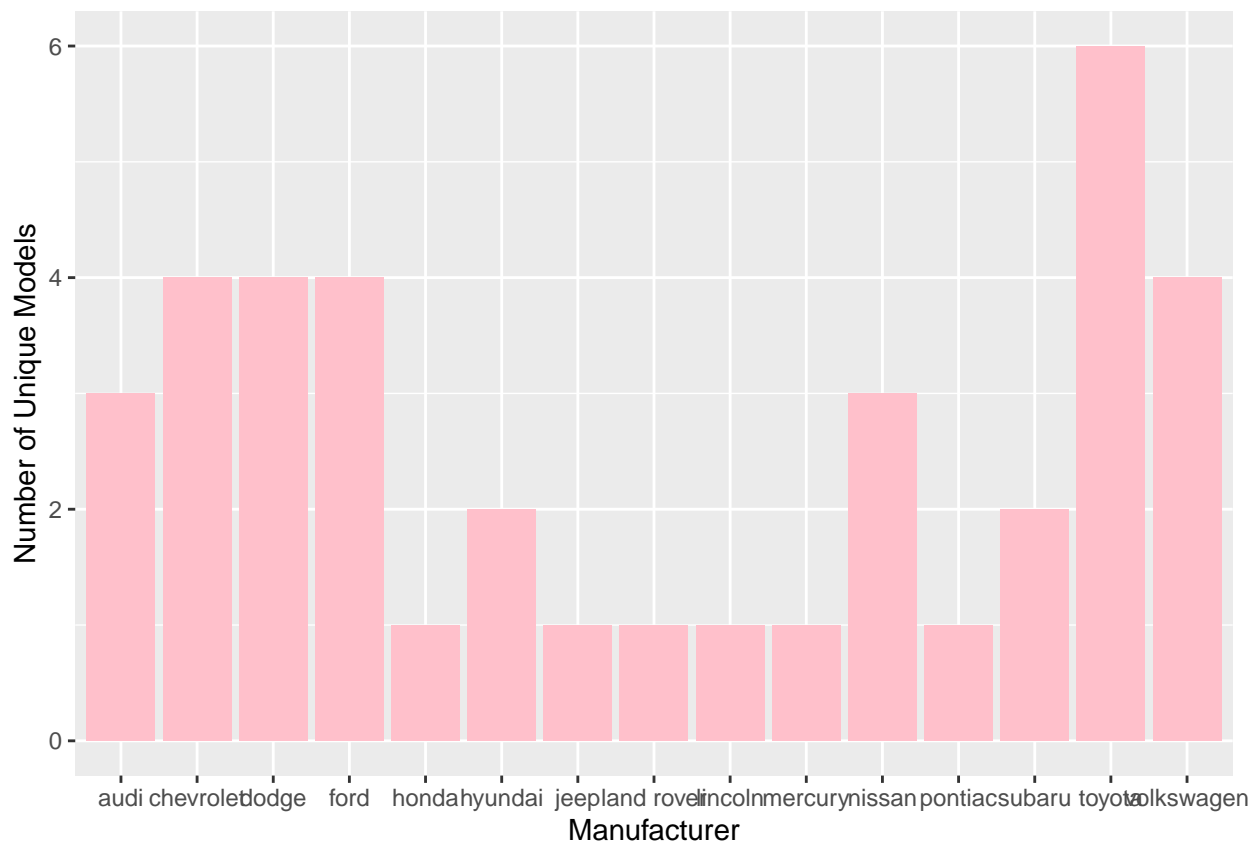

2.1 Same dataset will be used. You are going to show the relationship of the model and the manufacturer.

```r
library(ggplot2)

ggplot(mpg, aes(x = manufacturer, fill = model)) +
```

```r
geom_bar() +
labs(title = "Relationship of Model and Manufacturer",
     x = "Manufacturer",
     y = "Count",
     fill = "Model") +
theme(axis.text.x = element_text(angle = 45, hjust = 1))
```


Relationship of Model and Manufacturer

Legend (Model):
a4, a4 quattro, a6 quattro, altima, c1500 suburban 2wd, camry, camry solara, caravan 2wd, civic, corolla, corvette, dakota pickup 4wd, durango 4wd, expedition 2wd, explorer 4wd, f150 pickup 4wd, forester awd, grand cherokee 4wd, gti, impreza awd, jetta, k1500 tahoe 4wd, land cruiser wagon 4wd, malibu, maxima, mountaineer 4wd, mustang, navigator 2wd, new beetle, passat, pathfinder 4wd, ram 1500 pickup 4wd, range rover, sonata, tiburon, toyota tacoma 4wd

2.1.a What does ggplot(mpg, aes(model, manufacturer)) + geom_point() show?

```r
ggplot(mpg, aes(model, manufacturer)) + geom_point()
```
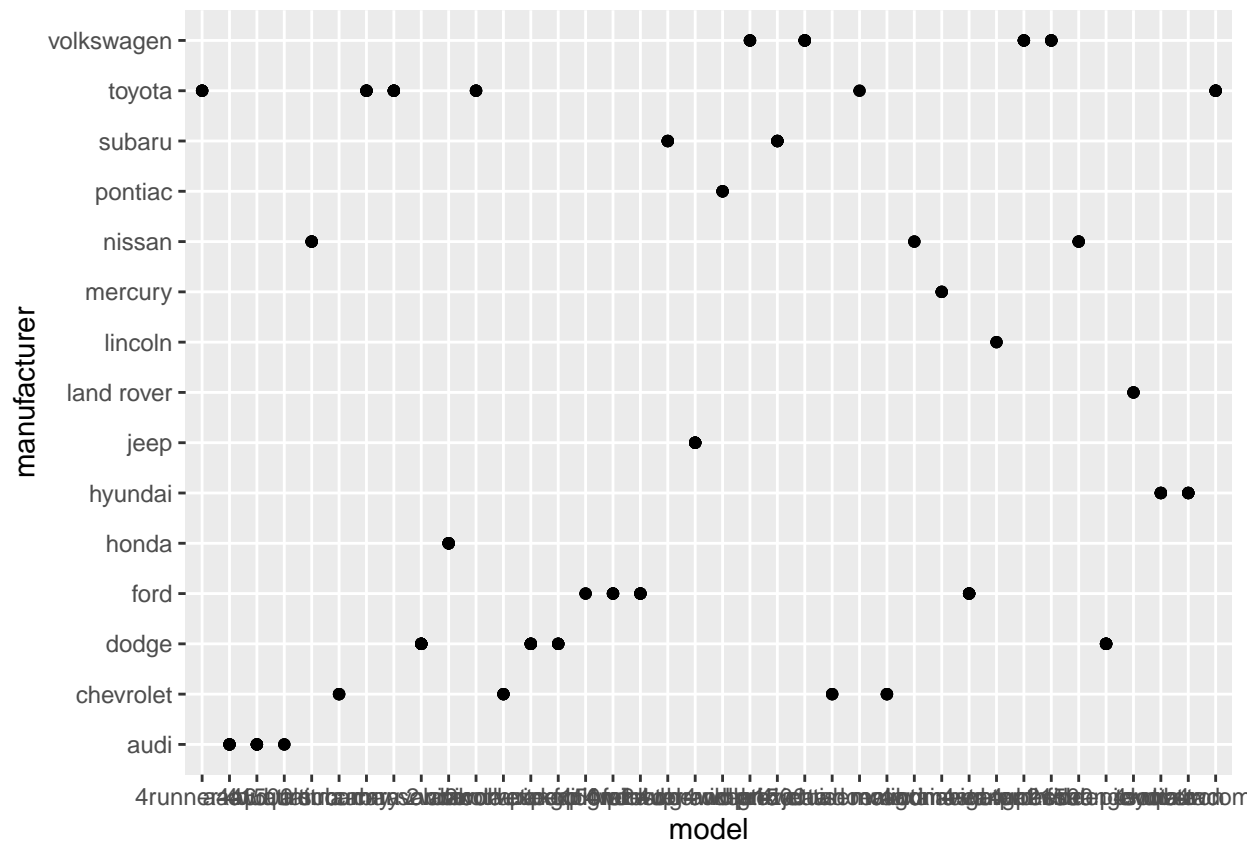
```
#The "model" variable is represented by the x-axis. The variable "manufacturer" is represented by the y

#To add points to the plot, utilize the geom_point() method. You will see a point for every combination
```

2.1.b For you, is it useful? If not, how could you modify the data to make it more informative?

```
ggplot(mpg,aes(x = model, y = manufacturer,color = class)) + geom_point()
```

3.Plot the model and the year using ggplot(). Use only the top 20 observations. Write the codes and its results

```
top_20 <- head(mpg,20)

topPlot20 <- ggplot(top_20, aes(x = model, y = year)) + geom_point() + labs(x = "Model", y = "Year")
topPlot20
```
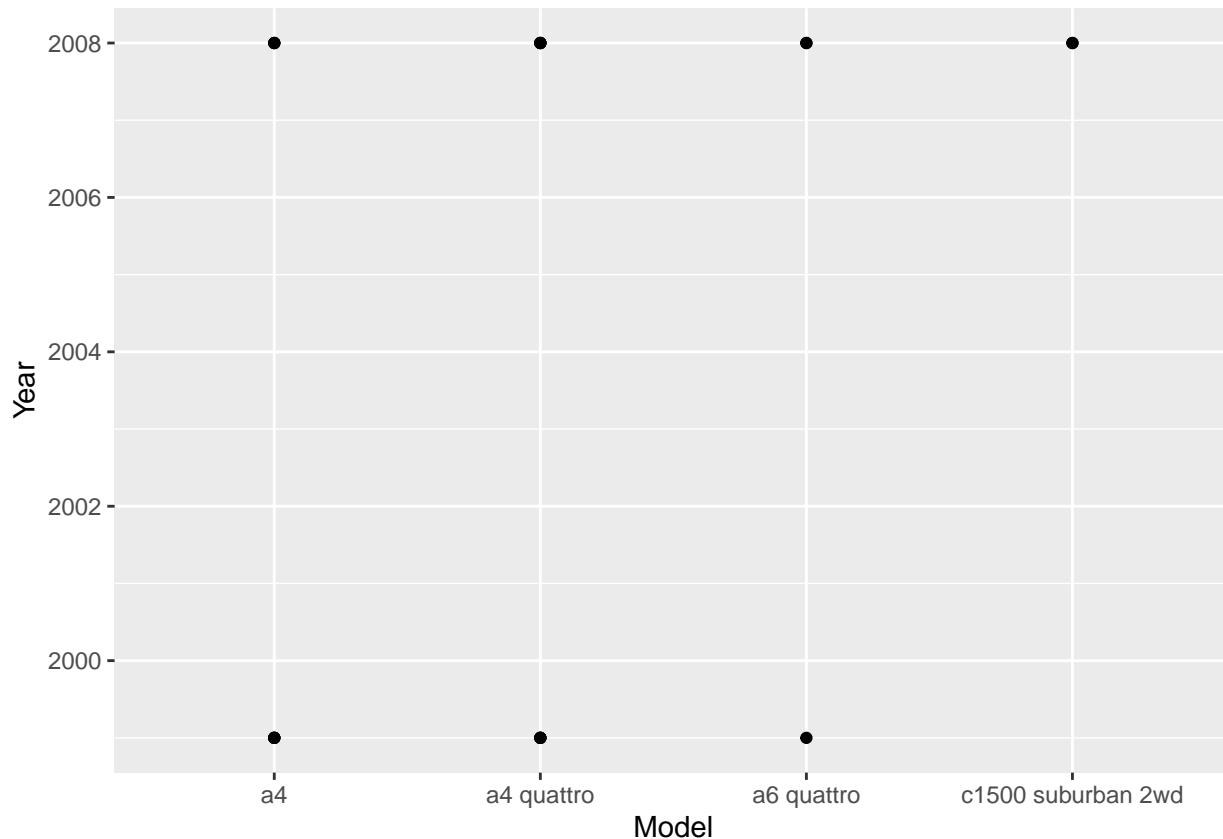
4.Using the pipe (%>%), group the model and get the number of cars per model. Show codes and its result

```r
library(dplyr)

modelCarCount <- mpg %>%
  group_by(model) %>%
  summarize(numberOfCars = n())

modelCarCount
```

```
## # A tibble: 38 x 2
##    model           numberOfCars
##    <chr>                  <int>
##  1 4runner 4wd                6
##  2 a4                        7
##  3 a4 quattro                8
##  4 a6 quattro                3
##  5 altima                    6
##  6 c1500 suburban 2wd        5
##  7 camry                     7
##  8 camry solara             7
##  9 caravan 2wd              11
## 10 civic                     9
## # i 28 more rows
```

4.a Plot the relationship between cyl - number of cylinders and displ - engine displacement using geom_point with aesthetic color = engine displacement. Title should be "Relationship between No. of Cylinders and Engine Displacement".

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```
obs20 <- head(modelCarCount, 20)

top_20 <- ggplot(obs20, aes(x = model, y = numberOfCars, fill = model)) +
  geom_bar(stat = "identity") +
  labs(title = "Number of Cars per Model",
       x = "Model" ,
       y = "Number of cars")

top_20
```
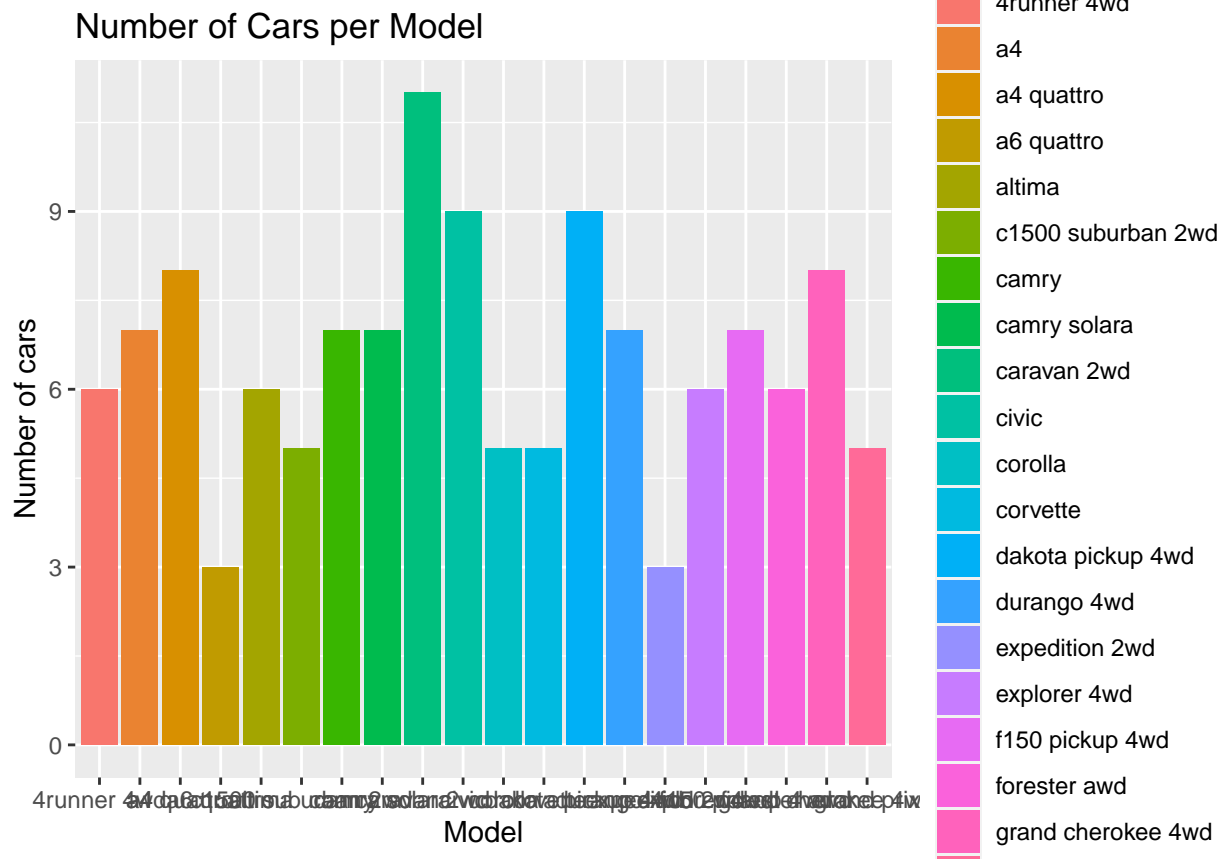

4.b

```
flippedTop20 <- ggplot(obs20, aes(x = model, y = numberOfCars, fill = model)) +
  geom_bar(stat = "identity") + labs(title = "Number of Cars per Model", x = "Model" ,
                                     y = "Number of Cars")+ coord_flip()

flippedTop20
```

Number of Cars per Model
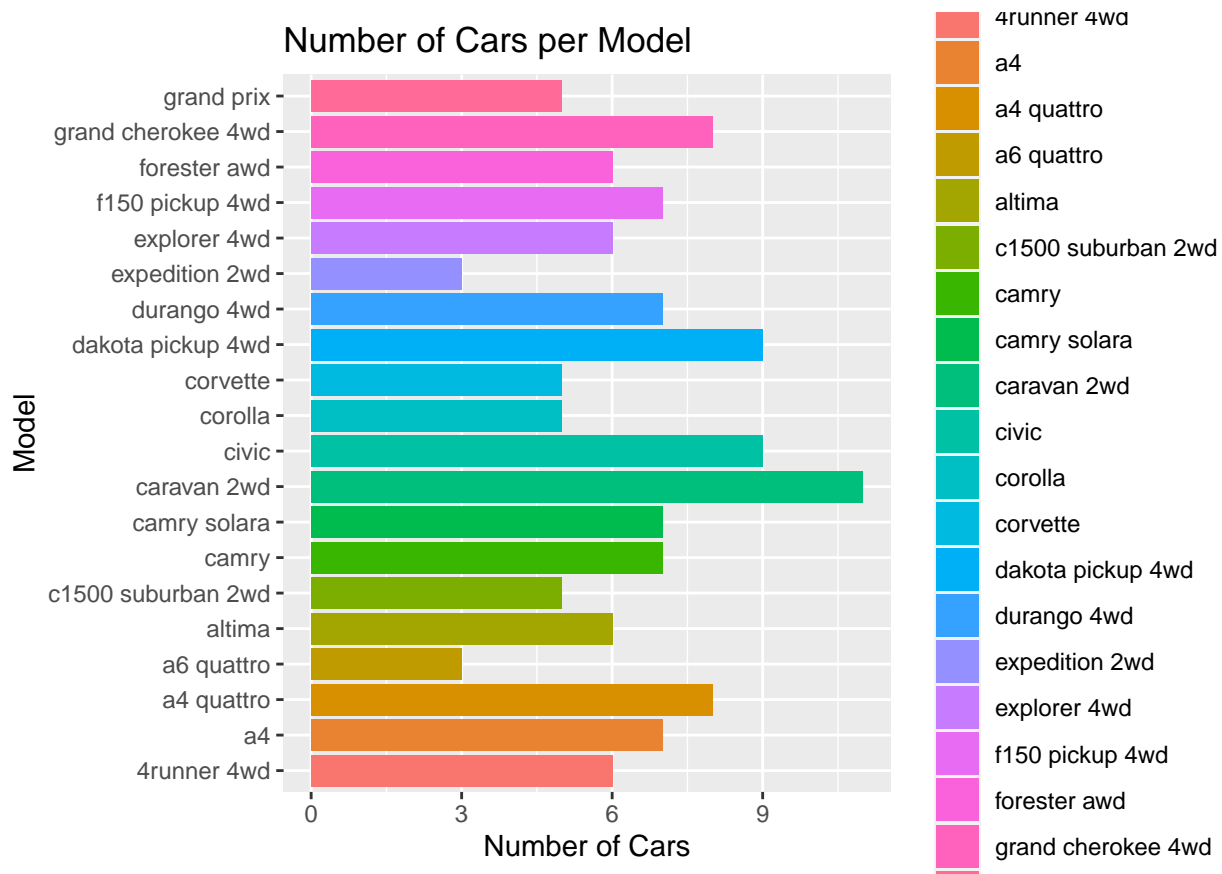
5.Plot the relationship between cyl - number of cylinders and displ - engine displacement using geom_point with aesthetic color = engine displacement. Title should be "Relationship between No. of Cylinders and Engine Displacement".

```
cylDisplayPlot <- ggplot(mpg, aes(x = cyl, y = displ, color = displ)) + geom_point() + labs(title = "Rel

cylDisplayPlot
```

Relationship between No.of Cylinders and Engine Displacement
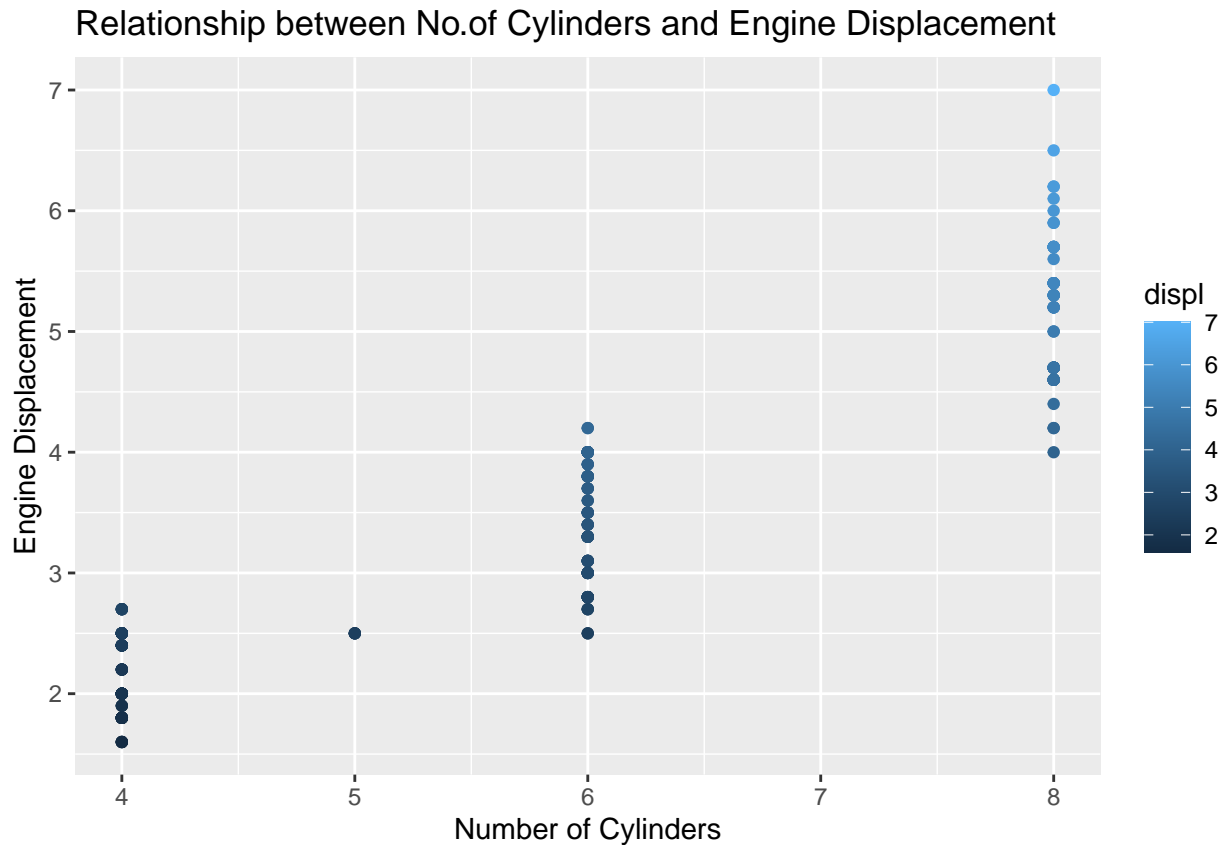
5.a How would you describe its relationship? Show the codes and its result.

```
#This will produce a scatter plot illustrating how the number of cylinders relates to engine displacement

#As cylinder count rises, engine displacement generally follows suit. This indicates a trend where larg
```

6. Plot the relationship between displ (engine displacement) and hwy(highway miles per gallon). Mapped it with a continuous variable you have identified in #1-c. What is its result? Why it produced such output?

```
displayHwyPlot <- ggplot(mpg, aes(x = displ, y = hwy, color = cty)) +
  geom_point() +
  labs(title = "Relationship between Engine Displacement and Highway MPG",
       x = "Engine Displacement",
       y = "Highway MPG")

displayHwyPlot
```

Relationship between Engine Displacement and Highway MPG
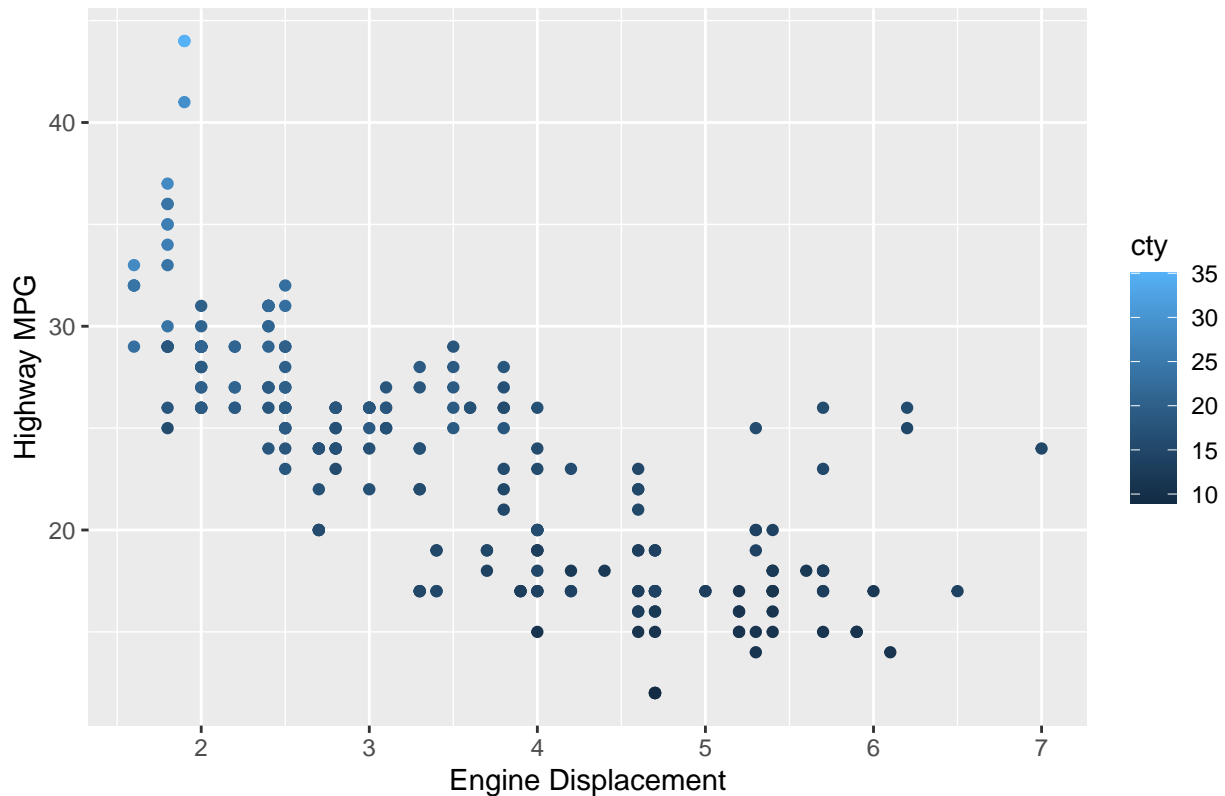
```r
#This scatterplot exhibits engine displacement on the x-axis and highway miles per gallon on the y-axis

#By examining this plot, we gain insight into the correlations among displacement, highway efficiency,

#This analysis helps us grasp how vehicles with diverse engine sizes perform in terms of fuel efficiency
```

6.Import the traffic.csv onto your R environment.

6.a How many numbers of observation does it have? What are the variables of the traffic dataset the Show your answer.

```r
library(readr)
traffic <- read.csv("traffic.csv")

numObservation <- nrow(traffic)
numObservation
```

```
## [1] 48120
```

```r
numVars <- ncol(traffic)
numVars
```

```
## [1] 4
```

```r
variables <- colnames(traffic)
variables
```

```
## [1] "DateTime" "Junction" "Vehicles" "ID"
```

6.b Subset the traffic dataset into junctions. What is the R codes and its output?

```
junctionsSubset1 <- subset(traffic, Junction == 1)

junctionsSubset2 <- subset(traffic, Junction == 2)

junctionsSubset3 <- subset(traffic, Junction == 3)

junctionsSubset4 <- subset(traffic, Junction == 4)
```

6.c Plot each junction in a using geom_line(). Show your solution and output.

```
junction1Plot <- ggplot(junctionsSubset1, aes(x = as.Date(junctionsSubset1$DateTime), y = Vehicles)) +

junction1Plot
```

```
## Warning: Use of `junctionsSubset1$DateTime` is discouraged.
## i Use `DateTime` instead.
```


Junction 1
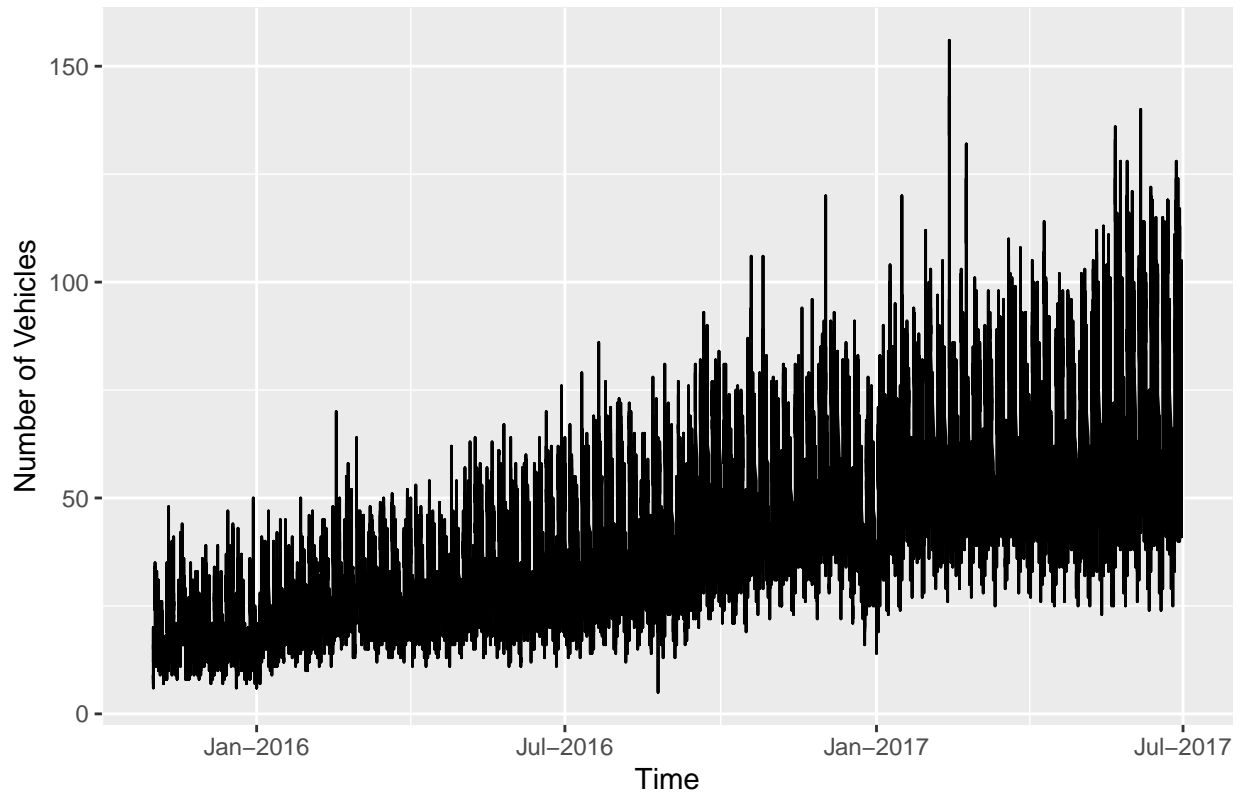
```
junction2Plot <- ggplot(junctionsSubset2, aes(x = as.Date(junctionsSubset2$DateTime), y = Vehicles)) +
scale_x_date(date_labels = "%b-%Y") + theme(legend.position = "none") + labs(title = "Junction 2", x =

junction2Plot
```
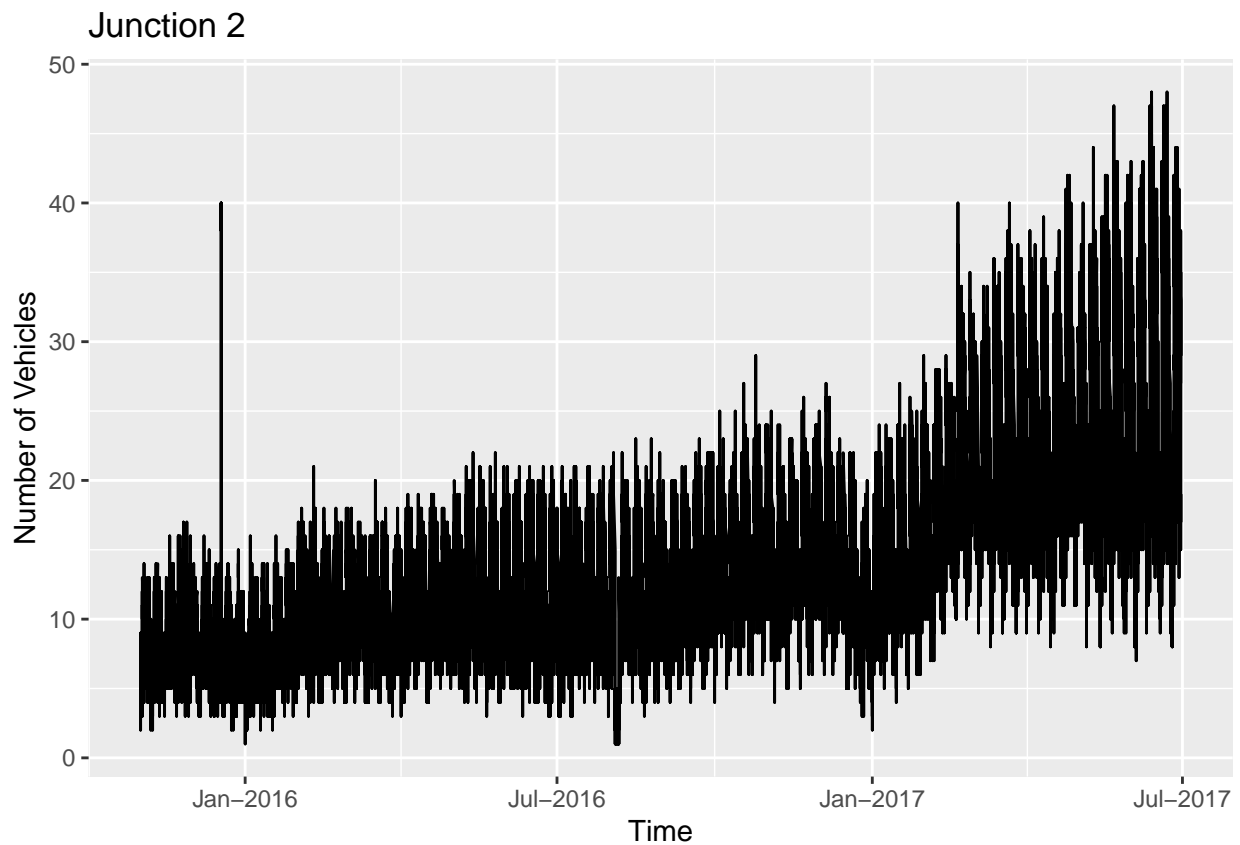
Junction 2


```
junction3Plot <- ggplot(junctionsSubset3, aes(x = as.Date(junctionsSubset3$DateTime), y = Vehicles)) +
scale_x_date(date_labels = "%b-%Y") + theme(legend.position = "none") +
labs(title = "Junction 3", x = "Time", y = "Number of Vehicles")

junction3Plot
```
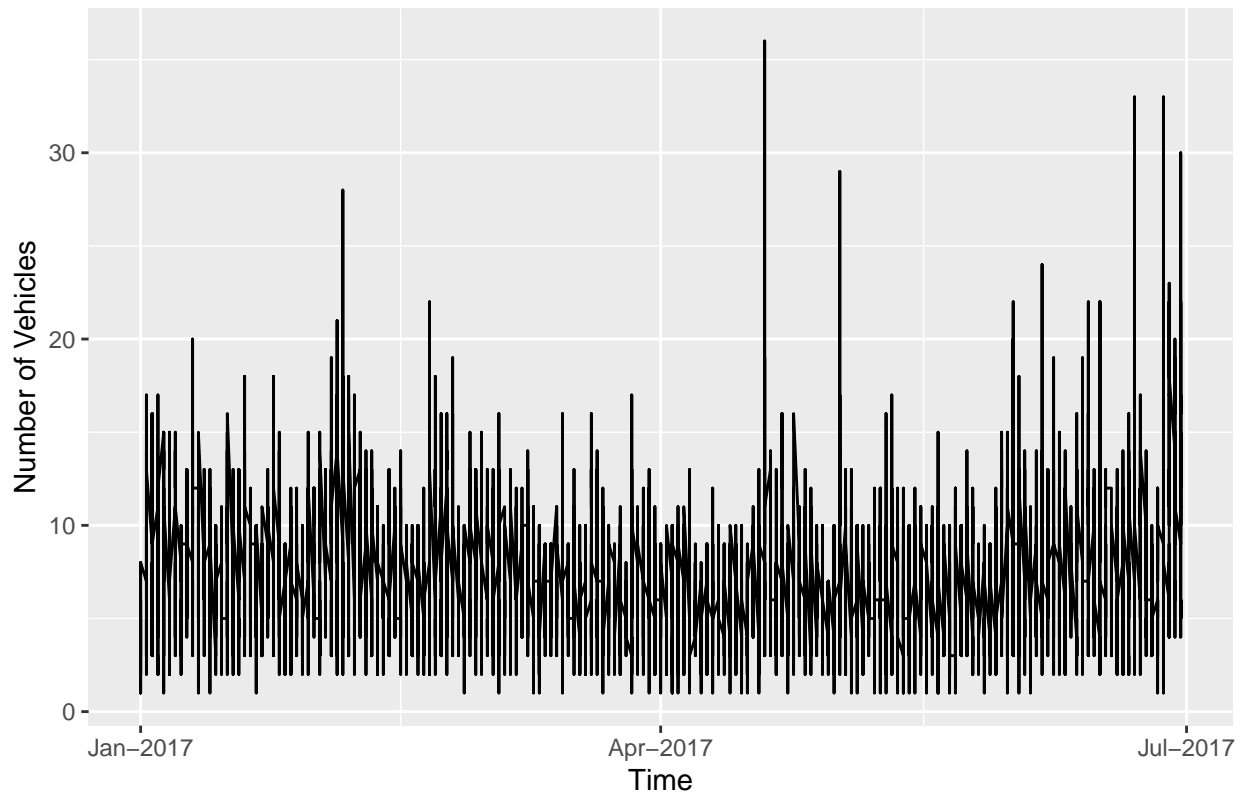
Junction 3
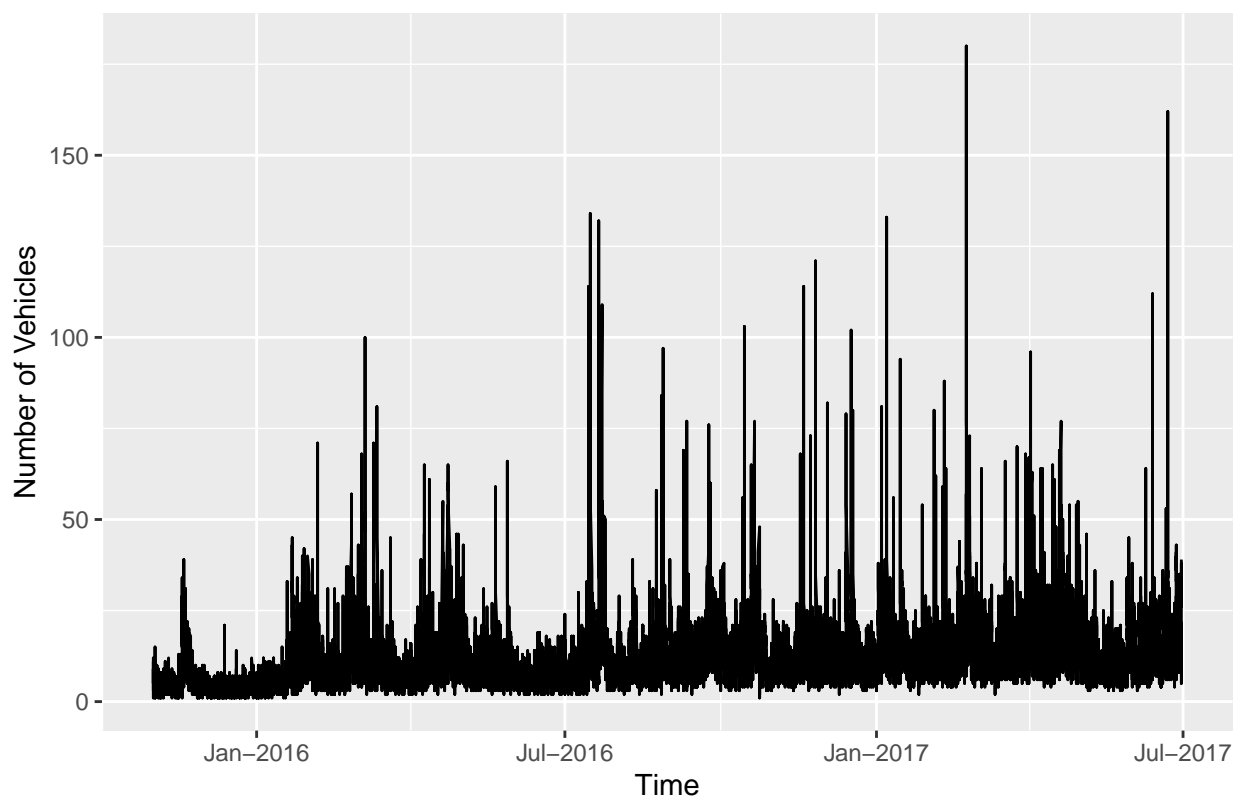

```
junction4Plot <- ggplot(junctionsSubset4, aes(x = as.Date(junctionsSubset4$DateTime), y = Vehicles)) + 
scale_x_date(date_labels = "%b-%Y") + theme(legend.position = "none") + 
labs(title = "Junction 4", x = "Time", y = "Number of Vehicles")

junction4Plot
```

Junction 4

7. From alexa_file.xlsx, import it to your environment

7.a How many observations does alexa_file has? What about the number of columns? Show your solution and answer.

```
library(readxl)

alexaData <- read_excel("/cloud/project/Worksheet_Suero#4/Worksheet_Suero#4c/alexa_file.xlsx")

numObservation <- nrow(alexaData)
numObservation
```

```
## [1] 3150
```

```
numCols <- ncol(alexaData)
numCols
```

```
## [1] 5
```

7.b Group the variations and get the total of each variations. Use dplyr package. Show solution and answer

```
varCounts <- alexaData %>%
  count(variation)

varCounts
```

```
## # A tibble: 16 x 2
##    variation                 n
##    <chr>                 <int>
##  1 Black                   261
##  2 Black  Dot              516
```

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```
##  3 Black  Plus                 270
##  4 Black  Show                 265
##  5 Black  Spot                 241
##  6 Charcoal Fabric             430
##  7 Configuration: Fire TV Stick 350
##  8 Heather Gray Fabric         157
##  9 Oak Finish                   14
## 10 Sandstone Fabric             90
## 11 Walnut Finish                 9
## 12 White                        91
## 13 White  Dot                  184
## 14 White  Plus                  78
## 15 White  Show                  85
## 16 White  Spot                 109
```

7.c Plot the variations using the ggplot() function. What did you observe? Complete the details of the graph. Show solution and answer.

```
alexaPlot <- ggplot(alexaData, aes(x = variation)) +
  geom_bar(fill = "purple") +
  labs(title = "Variations",
       x = "Variation",
       y = "Count")

alexaPlot
```
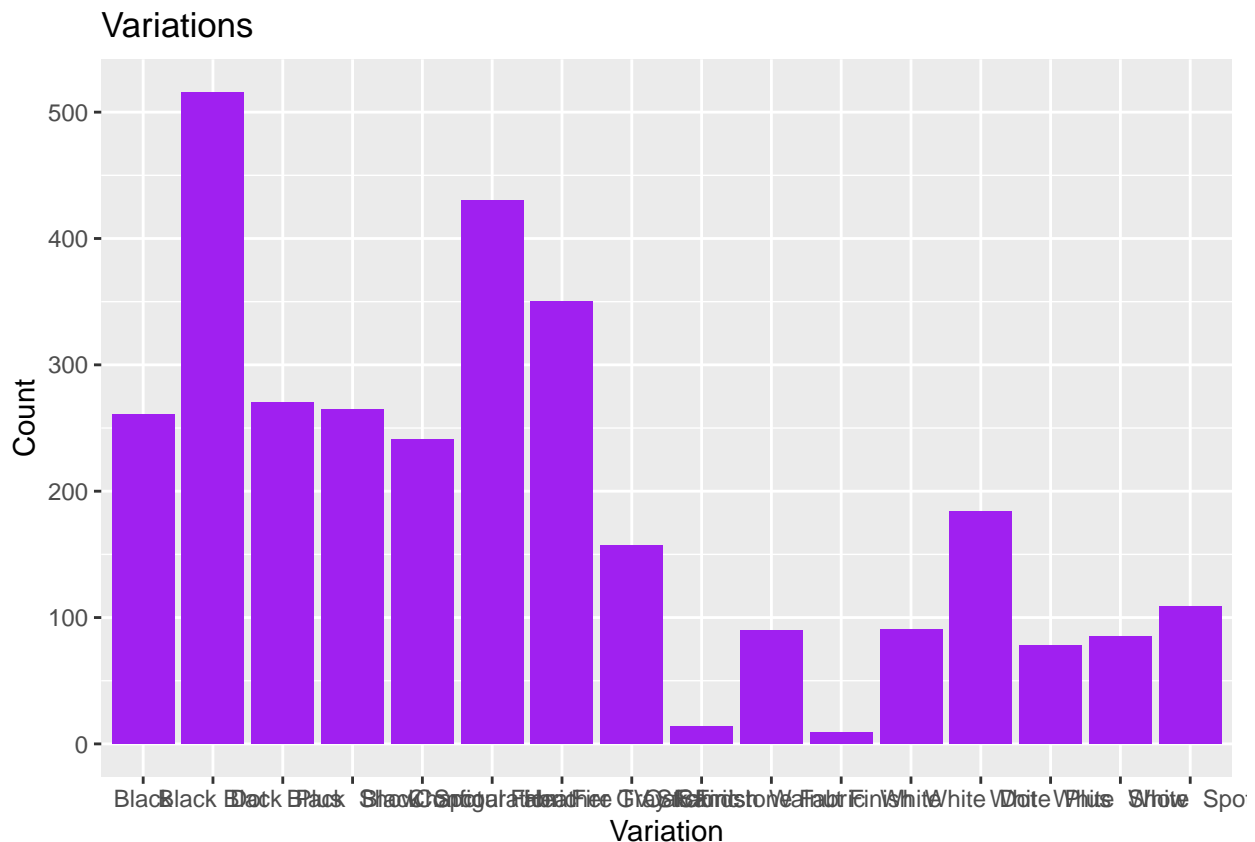

#The visual displays the spread of different variations alongside their corresponding counts. Each bar

7.d Plot a geom_line() with the date and the number of verified reviews. Complete the details of the graphs.

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Show your answer and solution

```r
library(dplyr)

alexaData$date <- as.Date(alexaData$date)

alexaData$month <- format(alexaData$date, "%m")

countMonth <- alexaData %>%
  count(month)
countMonth
```
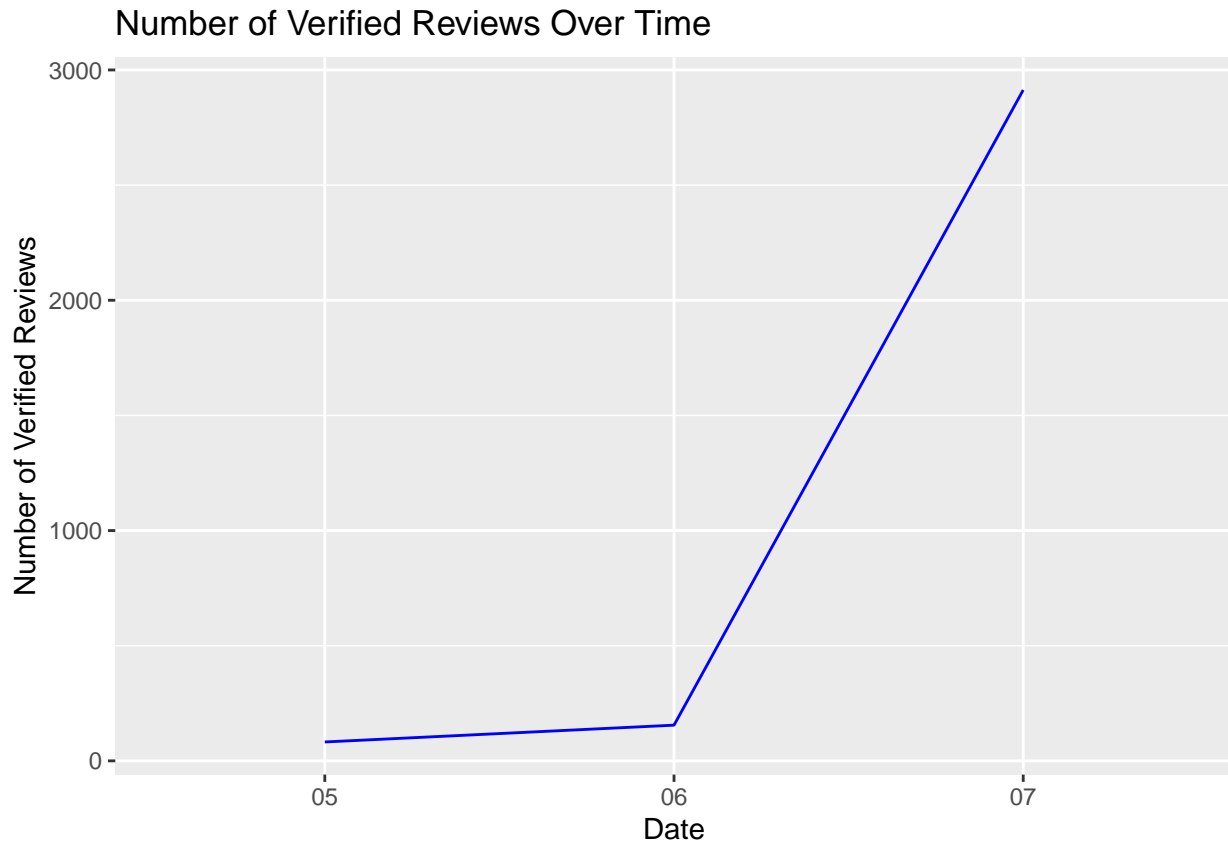
```
## # A tibble: 3 x 2
##   month     n
##   <chr> <int>
## 1 05       82
## 2 06      155
## 3 07     2913
```

```r
monthlyRevCount <- table(countMonth)
monthlyRevCount
```

```
##      n
## month 82 155 2913
##    05  1   0    0
##    06  0   1    0
##    07  0   0    1
```

```r
alexaLine <- ggplot(countMonth, aes(x = month, y = n, group = 1)) +
  geom_line(color = "blue") +
  labs(title = "Number of Verified Reviews Over Time",
       x = "Date",
       y = "Number of Verified Reviews")

alexaLine
```

Number of Verified Reviews Over Time

7.e Get the relationship of variations and ratings. Which variations got the most highest in rating? Plot a graph to show its relationship. Show your solution and answer.

```
variationRatings <- alexaData %>%
  group_by(variation) %>%
  summarise(avgRating = mean(rating))

variationRatings
```

```
## # A tibble: 16 x 2
##    variation                 avgRating
##    <chr>                         <dbl>
##  1 Black                          4.23
##  2 Black  Dot                     4.45
##  3 Black  Plus                    4.37
##  4 Black  Show                    4.49
##  5 Black  Spot                    4.31
##  6 Charcoal Fabric                4.73
##  7 Configuration: Fire TV Stick   4.59
##  8 Heather Gray Fabric            4.69
##  9 Oak Finish                     4.86
## 10 Sandstone Fabric               4.36
## 11 Walnut Finish                  4.89
## 12 White                          4.14
## 13 White  Dot                     4.42
## 14 White  Plus                    4.36
## 15 White  Show                    4.28
## 16 White  Spot                    4.31
```

```
highestRatings <- variationRatings %>%
  filter(avgRating == max(avgRating))

highestRatings
```

```
## # A tibble: 1 x 2
##   variation      avgRating
##   <chr>              <dbl>
## 1 Walnut Finish       4.89
```

```
# The finish variation that has the highest rating is the walnut
```

```
ggplot(variationRatings, aes(x = variation, y = avgRating)) +geom_bar(stat = "identity", fill = "blue")
```

Average Ratings by Variation