

Creation_data

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```
# Load the library
library("dplyr")
```

```
# 6 choice sets for 484 individuals, with 4 choice options each. The fourth alternative
is "none of these".
```

```
R= 484
n_choice_set=6
N= R*n_choice_set
S= 4
A=n_choice_set*S
P= 11
N2= N*S
altern=rep(1:S, time=N)
length(altern)
```

```
## [1] 11616
```

```
table(altern)
```

```
## altern
##      1      2      3      4
## 2904 2904 2904 2904
```

```
# The function "indexes" used to obtain the first and the last observation in each
choice set is taken from the
```

```
# link: http://rpubs.com/jimsavage/using\_decisionmaker\_variables\_in\_mixed\_logit
```

```
indexes <- data_frame(task = rep(1:N, each = S),
                      row = 1:(N*S)) %>%
```

```
  group_by(task) %>%
  summarise(start = first(row),
            end = last(row))
```

```
choice_c=c(rep(1:n_choice_set, each = S, times=R))
length(choice_c)
```

```
## [1] 11616
```

```
# index for respondent
```

```
index= c(rep(1:R, each = A))
table(index)
```

```
## index
##      1      2      3      4      5      6      7      8      9     10     11     12     13     14     15     16     17     18
##    24    24    24    24    24    24    24    24    24    24    24    24    24    24    24    24    24    24
```

```

## 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24
## 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484
## 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24

```

```

# choice made by respondent
choice=c(rep(NA,times=N2))
for(i in 1:N){
a=c(rep(0,times=S))
b=sample(1:S,1)
a[b]=1
choice[indexes$start[i]:indexes$end[i]]=a
}
table(choice)

```

```

## choice
##      0      1
## 8712 2904

```

```

# dummy for each alternative except for the fourth
alt1=c(rep(NA,times=N2))
for (i in 1:N2){
if (altern[i]==1){
alt1[i]=1
}else {alt1[i]=0}
}
table(alt1)

```

```

## alt1
##      0      1
## 8712 2904

```

```

alt2=c(rep(NA,times=N2))
for (i in 1:N2){
  if (altern[i]==2){
    alt2[i]=1
  }else {alt2[i]=0}
}
table(alt2)

```

```

## alt2
##      0      1
## 8712 2904

```

```

alt3=c(rep(NA,times=N2))
for (i in 1:N2){
  if (altern[i]==3){
    alt3[i]=1
  }else {alt3[i]=0}
}
table(alt3)

```

```

## alt3
##      0      1
## 8712 2904

```

```

# matrix of some predictor
X <- matrix(c(alt1, alt2, alt3, rnorm(N2*8)), N2, 11)
# replace the values of fourth row (the row of "none of these") with zero
for (i in 1:N){
X[i*S, ] = 0
}

dd <- data.frame(choice_c, index, choice,altern, X )
class(dd)

```

```
## [1] "data.frame"
```

```
dim(dd)
```

```
## [1] 11616    15
```

```
colnames(dd)[c(8:15)] <- c("X1","X2", "X3", "X4","X5", "X6", "X7","X8")
colnames(dd)
```

```
## [1] "choice_c" "index"    "choice"    "altern"    "X1"        "X2"
## [7] "X3"        "X1"        "X2"        "X3"        "X4"        "X5"
## [13] "X6"        "X7"        "X8"
```

```
head(dd)
```

```
##   choice_c index choice altern X1 X2 X3      X1      X2      X3
## 1      1      1      0      1  1  0  0 -1.4244698  0.09846663  0.2829059
## 2      1      1      0      2  0  1  0  2.2199942  0.88390491 -1.0800553
## 3      1      1      0      3  0  0  1  0.1437515 -1.19741955  1.1085554
## 4      1      1      1      4  0  0  0  0.0000000  0.00000000  0.0000000
## 5      2      1      1      1  1  0  0 -1.1643813  0.56348425  1.5229240
## 6      2      1      0      2  0  1  0  1.1450742  1.59474072  0.4572215
##           X4           X5           X6           X7           X8
## 1 -0.8977270  0.942033563 -0.88693136 -0.91792210  0.11930206
## 2 -0.7606781 -0.277890303 -0.52249561 -0.79554280  1.47421301
## 3 -0.5146127  0.009824837  0.86079912 -0.05191177 -2.10783082
## 4  0.0000000  0.000000000  0.00000000  0.00000000  0.00000000
## 5 -1.6280689 -0.766446936  0.05415652 -0.04839753 -0.03507883
## 6  1.8847650  1.408606310 -0.62603790  1.62309129  1.47403201
```

```

# create a useful y variable for the three models
y= dd[dd$choice== 1, "altern"]
table(y)

```

```
## y
##  1  2  3  4
## 696 739 744 725
```

```
# extract the respondent index for the alternative choice
id = dd[dd$choice == 1, "index"]
table(id)
```

```
## id
##  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
## 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432
##  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6  6
```

```

## 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450
##   6   6   6   6   6   6   6   6   6   6   6   6   6   6   6   6   6   6
## 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468
##   6   6   6   6   6   6   6   6   6   6   6   6   6   6   6   6   6   6
## 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484
##   6   6   6   6   6   6   6   6   6   6   6   6   6   6   6

```