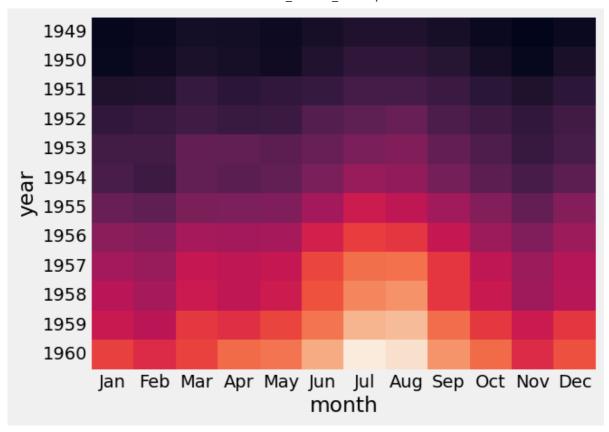
## **Heatmaps**

A heat map is a graphical representation of data where the individual values contined in a matrix are represented as colors.

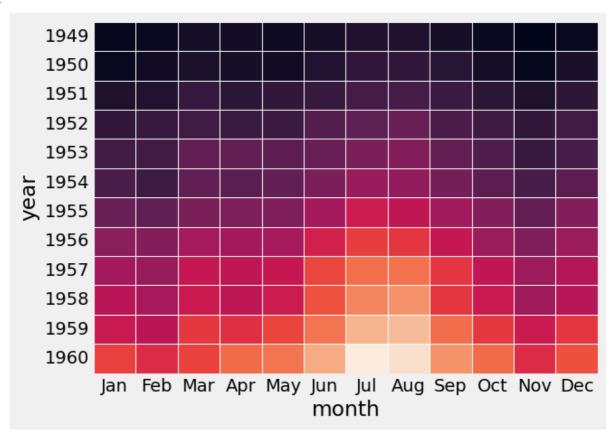
(generally drawn between two categorical data, but sumtime drawn discrete numerical data)

```
import numpy as np
In [23]:
         import pandas as pd
         import matplotlib.pyplot as plt
         import seaborn as sns
         plt.style.use('fivethirtyeight')
In [24]:
         flights=sns.load_dataset('flights')
In [25]:
In [26]:
         flights.head()
Out[26]:
            year month passengers
         0 1949
                    Jan
                               112
         1 1949
                    Feb
                               118
         2 1949
                    Mar
                               132
         3 1949
                               129
                    Apr
         4 1949
                               121
                    May
         x=flights.pivot_table
In [27]:
          (index='year', columns='month',
                                values='passengers', aggfunc='sum')
         sns.heatmap(x, cbar=False)
In [28]:
         <Axes: xlabel='month', ylabel='year'>
Out[28]:
```



In [29]: sns.heatmap(x, cbar=False, linewidths=0.5)

Out[29]: <Axes: xlabel='month', ylabel='year'>



In [30]: sns.heatmap(x, cbar=False, linewidths=0.5, annot=True, fmt='d')

Out[30]: <Axes: xlabel='month', ylabel='year'>

```
1949 112 118 132 129 121 135 148 148 136 119 104 118
                                     |170 |158 |133 |114 |140
  1950 115 126 141 135
                        125
                             149
                                 170
  1951 145 150 178 163 172 178
                                      199 | 184 | 162 | 146 | 166
                                 199
                                      242 209
  1952 171 180 193
                    |181|183
                             218
                                 230
                                              191 | 172 | 194
  1953 196 196 236 235
                         229
                             243
                                 264
                                      272 237
                                              211 | 180 | 201
  1954 204 188
               235
                    227
                         234
                             264
                                      293 259
                                              229 203 229
                                 302
1955 242
                267
           233
                         270
                             315
                                 364
                                      347
                                          312
                                              274 237
                                                       278
                    269
  1956 284 277
                317
                    313
                         318
                             374
                                 413
                                     405
                                          355
                                              306 271
                                                       306
  1957 315 301
                356 348
                         355 422
                                      467
                                          404
                                              347
                                                   305 336
                                 465
  1958 340
           318
                362
                    348
                         363
                             435
                                 491
                                      505
                                          |404
                                              359
                                                  |310|337
  1959 360 342
                406 396
                        |420|472
                                 548 559 463 407
                                                  |362|405
                        472
  1960 417
           391
                419
                    461
                             535 622 606 508 461 390 432
        Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
                             month
```

```
In [31]: sns.heatmap(x, cbar=False, linewidths=0.5, annot=True, fmt='d', cmap='viridis')
```

Out[31]: <Axes: xlabel='month', ylabel='year'>

```
1949 112 118 132 129 121 135 148 148 136 119 104 118
  1950 115 126 141 135
                        125
                            |149|170|170|158|133|114|140
                                     199
  1951 145 150 178
                    |163|172
                            178
                                 199
                                         184 162
                                                  |146|166
  1952 171 180 193
                    181
                        183
                            218
                                 230
                                              191
                                                  172 194
                                     242
                                         209
  1953 196 196 236 235
                        229
                                     272
                                              211
                                                 180 201
                            243
                                 264
                                         237
  1954 204 188
                235
                    227
                        234
                            264
                                 302
                                     293 259
                                              229 203 229
1955 242
                    269
           233
                267
                        270
                            315
                                 364
                                     347
                                         312
                                              274
                                                  237
                                                      278
  1956 284 277
                317
                    313
                        318
                            374
                                 413
                                     405
                                         355
                                              306 271
                                                      306
                        355
  1957 315
           301
                356
                    348
                            422
                                 465
                                     467
                                         404
                                              347
                                                  305
                                                      336
           318
                                              359
  1958 340
                362
                    348
                        363
                             435
                                 491
                                     505
                                         404
                                                  310
                                                      337
  1959 360 342
                                     559
                406
                    396
                        420
                            472
                                 548
                                         463
                                              407
                                                  362
                                                      405
                        472 535 622 606 508 461
  1960 417
           391
                419
                    461
                                                  |390|432
            Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
                             month
```

```
In [32]: sns.heatmap(x, cbar=False, linewidths=0.5, annot=True, fmt='d', cmap='summer')
Out[32]: <Axes: xlabel='month', ylabel='year'>
```

```
1949 112 118 132 129
                        121
                             |135|148|148|136|119|104|118
                                                   114 140
  1950 115 126 141
                        125
                    135
                             149
                                 170
                                     170
                                          158
                                              133
  1951 145
           150
               178
                    163
                        172
                             178
                                 199
                                          184
                                                   146 166
                                      199
                                              162
                        183
  1952 171
            180
                193
                    181
                             218
                                 230
                                      242
                                          209
                                              191
                                                   172
                                                       194
  1953 196
           196
                236
                    235
                         229
                             243
                                 264
                                      272
                                          237
                                              211
                                                   180
                                                       201
  1954 204
            188
                235
                    227
                         234
                             264
                                 302
                                      293
                                          259
                                              229
                                                  203
                                                      229
1955
        242
            233
                267
                    269
                        270
                             315
                                 364
                                      347
                                          312
                                              274
                                                  237
                                                       278
  1956
       284
           277
                317
                    313
                        318
                             374 413
                                          355
                                              306
                                                  271
                                                       306
                                     405
  1957
        315
           301
                356
                    348
                        355
                             422
                                 465
                                     467
                                          404
                                              347
                                                   305
                                                       336
  1958
       340
           318
                362
                    348
                        363
                             435
                                 491 505
                                          404
                                              359
                                                  310
                                                       |337
  1959 360 342
                406 396 420 472 548 559 463 407
                                                  362 405
  1960 417 391 419 461 472 535 622 606 508 461 390 432
            Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
        Jan
                             month
```

In [33]: sns.heatmap(x, cbar=False, linewidths=0.5, annot=True, fmt='d', cmap='winter')

Out[33]: <Axes: xlabel='month', ylabel='year'>

```
1949 112 118 132 129 121 135 148 148 136 119 104 118
  1950 115 126 141 135 125 149 170 170 158 133 114 140
  1951 145 150 178 163 172 178 199 199 184 162 146 166
  1952 171 180 193
                    181 183
                            218 230
                                     242 209 191
                                                 172 194
  1953 196 196 236
                    235
                        229
                            243 264
                                     272 237
                                             211 | 180 | 201
  1954 204 188 235
                    227
                        234
                            264
                                302
                                     293 | 259 |
                                             229 203 229
9 1955 242
           233 267
                    269
                        270
                            315
                                364
                                     347
                                         312
                                             274 237
                                                     278
  1956 284 277
                317
                    313
                        318
                            374
                                413
                                    405 355
                                             306 271
                                                     306
  1957 315
           301
                356
                        355
                            422
                                         404
                                             347
                    348
                                465
                                    467
                                                 305 336
  1958 340 318
                                491
                                             359 310 337
                362
                    348
                        363
                            435
                                     505
                                         404
  1959 360 342
                        420 472
                                548
                                     559 463
               406
                    396
                                             |407|362|405
                                     606 508 461 390 432
  1960 417
           391
               419
                    461 472
                            535 622
           Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
                             month
```

```
In [34]: sns.heatmap(x, cbar=False, linewidths=0.5, annot=True, fmt='d', cmap='autumn')
```

Out[34]: <Axes: xlabel='month', ylabel='year'>

```
| 135 | 148 | 148 | 136 | 119 | 104 | 118
  1949 112 118 132 129 121
  1950 115 126 141 135
                         125
                             149
                                 |170|170|158|133|114|140
  1951 145 150 178 163 172
                             | 178 | 199 | 199 | 184 | 162
                                                   146 166
  1952 171
            180 | 193
                    181
                         183
                             218 230 242
                                          209
                                               191
                                                   172 194
                         229
  1953 196 196 236 235
                             243 264
                                      272
                                          237
                                               211
                                                   180 201
                235
                                      293 259
                                               229 203 229
  1954 204
            188
                     227
                         234 264 302
1955 242
            233
                267
                     269
                         270
                             315
                                  364
                                      347
                                          312
                                               274 237
                                                        278
                                               306 271
  1956 284
            277
                317
                     313
                         318
                             374 413 405
                                          355
                                                        306
  1957 315
            301
                356 348
                         355 | 422 | 465 | 467
                                          404
                                               347
                                                   305
                                                        336
                         363 435 491 505
  1958 340
            318
                362
                     348
                                          404
                                               359
                                                   310 | 337
                406 396 420 472 548 559
  1959 360
            342
                                          463 407
                                                   362 405
  1960 417
            391
                419 461 472 535 622 606 508 461 390 432
        Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
                              month
```

In [35]: sns.heatmap(x, cbar=False, linewidths=0.5, annot=True, fmt='d', cmap='spring')

Out[35]: <Axes: xlabel='month', ylabel='year'>

	1949	112	118	132	129	121	135	148	148	136	119	104	118
	1950	115	126	141	135	125	149	170	170	158	133	114	140
	1951	145	150	178	163	172	178	199	199	184	162	146	166
	1952	171	180	193	181	183	218	230	242	209	191	172	194
	1953	196	196	236	235	229	243	264	272	237	211	180	201
ar	1954	204	188	235	227	234	264	302	293	259	229	203	229
ye	1955	242	233	267	269	270	315	364	347	312	274	237	278
	1956	284	277	317	313	318	374	413	405	355	306	271	306
	1957	315	301	356	348	355	422	465	467	404	347	305	336
	1958	340	318	362	348	363	435	491	505	404	359	310	337
	1959	360	342	406	396	420	472	548	559	463	407	362	405
	1960	417	391	419	461	472	535	622	606	508	461	390	432
		Jan	Feb	Mar	Apr	May	-	Jul nth	Aug	Sep	Oct	Nov	Dec

```
In [36]: sns.heatmap(x, cbar=False, linewidths=0.5, annot=True, fmt='d', cmap='crest')
```

Out[36]: <Axes: xlabel='month', ylabel='year'>

	1949	112	118	132	129	121	135	148	148	136	119	104	118
year	1950	115	126	141	135	125	149	170	170	158	133	114	140
	1951	145	150	178	163	172	178	199	199	184	162	146	166
	1952	171	180	193	181	183	218	230	242	209	191	172	194
	1953	196	196	236	235	229	243	264	272	237	211	180	201
	1954	204	188	235	227	234	264	302	293	259	229	203	229
	1955	242	233	267	269	270	315	364	347	312	274	237	278
	1956	284	277	317	313	318	374	413	405	355	306	271	306
	1957	315	301	356	348	355	422	465	467	404	347	305	336
	1958	340	318	362	348	363	435	491	505	404	359	310	337
	1959	360	342	406	396	420	472	548	559	463	407	362	405
	1960	417	391	419	461	472	535	622	606	508	461	390	432
	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Deo month										Dec		

In [ ]:

In [ ]: