

Data Grouping & Aggregation Exercises

Importing Libraries

```
In [1]: import numpy as np
import pandas as pd

import matplotlib.pyplot as plt
import seaborn as sns

%matplotlib inline
sns.set()
```

Importing Data

```
In [2]: olympics = pd.read_csv('olympics.csv')
```

Inspecting the DataFrame and Identifying the Inconsistent Data

```
In [3]: olympics.head()
```

```
Out[3]:
```

	City	Edition	Sport	Discipline	Athlete	NOC	Gender	Event	Event_gender
0	Athens	1896	Aquatics	Swimming	HAJOS, Alfred	HUN	Men	100m freestyle	
1	Athens	1896	Aquatics	Swimming	HERSCHMANN, Otto	AUT	Men	100m freestyle	
2	Athens	1896	Aquatics	Swimming	DRIVAS, Dimitrios	GRE	Men	100m freestyle for sailors	
3	Athens	1896	Aquatics	Swimming	MALOKINIS, Ioannis	GRE	Men	100m freestyle for sailors	
4	Athens	1896	Aquatics	Swimming	CHASAPIS, Spiridon	GRE	Men	100m freestyle for sailors	

```
In [4]: olympics.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 29216 entries, 0 to 29215
Data columns (total 10 columns):
 #   Column          Non-Null Count  Dtype
---  -
 0   City            29216 non-null  object
 1   Edition         29216 non-null  int64
 2   Sport          29216 non-null  object
 3   Discipline      29216 non-null  object
 4   Athlete        29216 non-null  object
 5   NOC            29216 non-null  object
 6   Gender         29216 non-null  object
 7   Event          29216 non-null  object
 8   Event_gender   29216 non-null  object
 9   Medal          29216 non-null  object
dtypes: int64(1), object(9)
memory usage: 2.2+ MB
```

Q. Find the total number of medals for each city, and indicate the type of medals

```
In [5]: olympics.groupby('City')['Medal'].count().sort_values()
```

```
Out[5]: City
St Louis            470
Amsterdam           710
Berlin              875
Rome                882
Melbourne / Stockholm 885
Stockholm           885
Helsinki            889
Tokyo              1010
Mexico             1031
Munich             1185
Antwerp            1298
Montreal           1305
Moscow             1387
Paris              1396
Seoul              1546
London             1618
Barcelona          1705
Atlanta            1859
Sydney             2015
Beijing            2042
Los Angeles        2074
Athens             2149
Name: Medal, dtype: int64
```

```
In [6]: olympics.groupby('City')['Medal'].value_counts().sort_values(ascending=False)
```

```
Out[6]: City      Medal      count
Athens    Gold        723
          Bronze    719
Beijing   Bronze    710
Athens    Silver    707
Los Angeles Bronze    696
...
Amsterdam Silver    239
          Gold     229
St Louis  Gold     188
          Silver   159
          Bronze   123
Name: count, Length: 66, dtype: int64
```

Q. Find the total number of participants and indicating their gender in each year

```
In [7]: olympics.groupby('Edition')['Gender'].value_counts()
```

```
Out[7]:
```

Edition	Gender	
1896	Men	151
1900	Men	501
	Women	11
1904	Men	458
	Women	12
1908	Men	789
	Women	15
1912	Men	855
	Women	30
1920	Men	1255
	Women	43
1924	Men	833
	Women	51
1928	Men	615
	Women	95
1932	Men	555
	Women	60
1936	Men	791
	Women	84
1948	Men	718
	Women	96
1952	Men	750
	Women	139
1956	Men	739
	Women	146
1960	Men	737
	Women	145
1964	Men	820
	Women	190
1968	Men	819
	Women	212
1972	Men	947
	Women	238
1976	Men	924
	Women	381
1980	Men	958
	Women	429
1984	Men	973
	Women	486
1988	Men	1011
	Women	535
1992	Men	1105
	Women	600
1996	Men	1082
	Women	777
2000	Men	1126
	Women	889
2004	Men	1099
	Women	899
2008	Men	1110
	Women	932

Name: count, dtype: int64

Q. List the medal type regarding the sport of 'Rugby' and the year of '1900'

```
In [8]: olympics.groupby(['Edition', 'Sport']).groups
```

```
Out[8]: {(1896, 'Aquatics'): [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10], (1896, 'Athletics'): [11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47], (1896, 'Cycling'): [48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63], (1896, 'Fencing'): [64, 65, 66, 67, 68, 69, 70, 71], (1896, 'Gymnastics'): [72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116], (1896, 'Shooting'): [117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131], (1896, 'Tennis'): [132, 133, 134, 135, 136, 137, 138, 139, 140, 141], (1896, 'Weightlifting'): [142, 143, 144, 145, 146, 147], (1896, 'Wrestling'): [148, 149, 150], (1900, 'Aquatics'): [151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211], (1900, 'Archery'): [212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229], (1900, 'Athletics'): [230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305], (1900, 'Basque Pelota'): [306, 307, 308, 309], (1900, 'Cricket'): [310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333], (1900, 'Crocket'): [334, 335, 336, 337, 338, 339, 340, 341], (1900, 'Cycling'): [342, 343, 344, 345, 346, 347], (1900, 'Equestrian'): [348, 349, 350, 351, 352, 353, 354, 355, 356], (1900, 'Fencing'): [357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377], (1900, 'Football'): [378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412], (1900, 'Golf'): [413, 414, 415, 416, 417, 418], (1900, 'Gymnastics'): [419, 420, 421], (1900, 'Hockey'): [422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433], (1900, 'Rowing'): [434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501], (1900, 'Rugby'): [502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548], (1900, 'Sailing'): [549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574], (1900, 'Shooting'): [575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626], (1900, 'Tennis'): [627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650], (1900, 'Tug of War'): [651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662], (1904, 'Aquatics'): [663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705], (1904, 'Archery'): [706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735], (1904, 'Athletics'): [736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806,
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807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817], (1904, 'Boxing'): [818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836], (1904, 'Cycling'): [837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857], (1904, 'Fencing'): [858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875], (1904, 'Football'): [876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932], (1904, 'Golf'): [933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956], (1904, 'Gymnastics'): [957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004], (1904, 'Lacrosse'): [1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030], (1904, 'Roque'): [1031, 1032, 1033], (1904, 'Rowing'): [1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078], (1904, 'Tennis'): [1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090], (1904, 'Tug of War'): [1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105], (1904, 'Weightlifting'): [1106, 1107, 1108, 1109, 1110, 1111], (1904, 'Wrestling'): [1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132], (1908, 'Aquatics'): [1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180], (1908, 'Archery'): [1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189], (1908, 'Athletics'): [1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283], (1908, 'Boxing'): [1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298], (1908, 'Cycling'): [1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328], (1908, 'Fencing'): [1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359], (1908, 'Football'): [1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392], (1908, 'Gymnastics'): [1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, ...], (1908, 'Hockey'): [1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533], (1908, 'Jeu de paume'): [1534, 1535, 1536], (1908, 'Lacrosse'):

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Out[9]:	City	Edition	Sport	Discipline	Athlete	NOC	Gender	Event	Event_gender	
0	Paris	1900	Rugby	Rugby	AITOFF, Vladimir	FRA	Men	rugby	M	
1	Paris	1900	Rugby	Rugby	ALBERT, A.	FRA	Men	rugby	M	
2	Paris	1900	Rugby	Rugby	BINOCHE, Jean, LÃ©on	FRA	Men	rugby	M	
3	Paris	1900	Rugby	Rugby	COLLAS, Jean	FRA	Men	rugby	M	
4	Paris	1900	Rugby	Rugby	GAUTIER, Jean Guy	FRA	Men	rugby	M	
5	Paris	1900	Rugby	Rugby	GIROUX, Auguste	FRA	Men	rugby	M	
6	Paris	1900	Rugby	Rugby	GONDOUIN, Charles	FRA	Men	rugby	M	
7	Paris	1900	Rugby	Rugby	HENRIQUEZ DE ZUBIERRA, Constantin	FRA	Men	rugby	M	
8	Paris	1900	Rugby	Rugby	HERVE, Jean	FRA	Men	rugby	M	
9	Paris	1900	Rugby	Rugby	LARDANCHET, Victor	FRA	Men	rugby	M	
10	Paris	1900	Rugby	Rugby	LEFEBVRE, Hubert	FRA	Men	rugby	M	
11	Paris	1900	Rugby	Rugby	OLIVIER, Joseph	FRA	Men	rugby	M	
12	Paris	1900	Rugby	Rugby	PHARAMOND, Alexandre	FRA	Men	rugby	M	
13	Paris	1900	Rugby	Rugby	REICHEL, Frantz	FRA	Men	rugby	M	
14	Paris	1900	Rugby	Rugby	RISCHMANN, Andr�	FRA	Men	rugby	M	
15	Paris	1900	Rugby	Rugby	ROOSEVELT, Albert	FRA	Men	rugby	M	
16	Paris	1900	Rugby	Rugby	SARRADE, Emile	FRA	Men	rugby	M	
17	Paris	1900	Rugby	Rugby	AMRHEIN, Albert	GER	Men	rugby	M	
18	Paris	1900	Rugby	Rugby	BAYLISS, F.C.	GBR	Men	rugby	M	
19	Paris	1900	Rugby	Rugby	BETTING, Hugo	GER	Men	rugby	M	
20	Paris	1900	Rugby	Rugby	BIRTLES, J.Henry	GBR	Men	rugby	M	

	City	Edition	Sport	Discipline	Athlete	NOC	Gender	Event	Event_gender	
21	Paris	1900	Rugby	Rugby	CAUTLON, J.	GBR	Men	rugby	M	
22	Paris	1900	Rugby	Rugby	DARBY, Artur John	GBR	Men	rugby	M	
23	Paris	1900	Rugby	Rugby	DEYKIN, C.P.	GBR	Men	rugby	M	
24	Paris	1900	Rugby	Rugby	HERRMANN, Jacob	GER	Men	rugby	M	
25	Paris	1900	Rugby	Rugby	HOFMEISTER, Willy	GER	Men	rugby	M	
26	Paris	1900	Rugby	Rugby	HOOD, L.	GBR	Men	rugby	M	
27	Paris	1900	Rugby	Rugby	KREUZER, Hermann	GER	Men	rugby	M	
28	Paris	1900	Rugby	Rugby	LANDVOIGT, Arnold	GER	Men	rugby	M	
29	Paris	1900	Rugby	Rugby	LATSCHA, Hans	GER	Men	rugby	M	
30	Paris	1900	Rugby	Rugby	LOGAN, M.L.	GBR	Men	rugby	M	
31	Paris	1900	Rugby	Rugby	LOVEITT, H.A.	GBR	Men	rugby	M	
32	Paris	1900	Rugby	Rugby	LUDWIG, Erich	GER	Men	rugby	M	
33	Paris	1900	Rugby	Rugby	LUDWIG, Richard	GER	Men	rugby	M	
34	Paris	1900	Rugby	Rugby	MÜLLER, Fritz	GER	Men	rugby	M	
35	Paris	1900	Rugby	Rugby	NICOL, N.S.	GBR	Men	rugby	M	
36	Paris	1900	Rugby	Rugby	POPPE, Eduard	GER	Men	rugby	M	
37	Paris	1900	Rugby	Rugby	REITZ, Heinrich	GER	Men	rugby	M	
38	Paris	1900	Rugby	Rugby	SCHMIERER, August	GER	Men	rugby	M	
39	Paris	1900	Rugby	Rugby	SMITH, V.	GBR	Men	rugby	M	
40	Paris	1900	Rugby	Rugby	STOCKHAUSEN, Adolf	GER	Men	rugby	M	
41	Paris	1900	Rugby	Rugby	TALBOT, M.W.	GBR	Men	rugby	M	
42	Paris	1900	Rugby	Rugby	WALLIS, J.G.	GBR	Men	rugby	M	
43	Paris	1900	Rugby	Rugby	WENDEROTH, Georg	GER	Men	rugby	M	
44	Paris	1900	Rugby	Rugby	WHITTINDALE, Claud	GBR	Men	rugby	M	

	City	Edition	Sport	Discipline	Athlete	NOC	Gender	Event	Event_gender	
45	Paris	1900	Rugby	Rugby	WHITTINDALE, Raymond	GBR	Men	rugby	M	
46	Paris	1900	Rugby	Rugby	WILSON, Francis Henry	GBR	Men	rugby	M	

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GOOD LUCK!