




# NHL STATS 2021-22

Zach Lindewirth

# Data Used

- Found individual statistics on nhl.com
- Copy and Paste into individual stats of every player into .csv file



```
1 Name, Age, Team, POS, GP, G, A, PTS, +/-, PIM, Shots, S%, ATOI, BLK, HIT, FO%
2 Nicholas Abruzzese, 22, TOR, C, 7, 0, 0, 0, -2, 2, 4, 0, 9:48, 3, 5, 33.3
3 Noel Acciari, 30, FLA, C, 17, 2, 5, 7, 4, 6, 25, 8, 11:17, 13, 44, 52
4 Calen Addison, 21, MIN, D, 15, 2, 2, 4, -4, 2, 17, 11.8, 13:47, 6, 12,
5 Andrew Agozzino, 31, OTT, LW, 1, 0, 0, 0, 0, 0, 1, 0, 6:52, 0, 4, 33.3
6 Jack Ahcan, 24, BOS, D, 5, 1, 0, 1, -2, 0, 4, 25, 14:48, 3, 6,
7 Sebastian Aho, 24, CAR, F, 77, 36, 43, 79, 18, 38, 215, 16.7, 19:02, 23, 75, 52.3
8 Sebastian Aho, 25, NYI, D, 34, 2, 10, 12, -7, 10, 33, 6.1, 16:23, 42, 29,
9 Alexander Alexeyev, 22, WSH, D, 1, 0, 0, 0, 0, 2, 0, , 10:35, 0, 1,
10 Wade Allison, 24, PHI, RW, 1, 0, 0, 0, -1, 0, 2, 0, 8:16, 0, 1,
11 Michael Amadio, 25, TOT, C, 53, 10, 7, 17, 0, 13, 60, 16.7, 12:09, 16, 37, 39.7
12 Jaret Anderson-Dolan, 22, LAK, C, 7, 0, 0, 0, -3, 4, 5, 0, 13:47, 3, 12, 56.3
13 Joey Anderson, 23, TOR, RW, 4, 0, 0, 0, -1, 0, 8, 0, 7:47, 0, 2,
14 Josh Anderson, 27, MTL, RW, 67, 19, 10, 29, -28, 65, 146, 13, 17:12, 34, 151, 43.6
15 Michael Anderson, 22, LAK, D, 55, 2, 5, 7, 5, 6, 56, 3.6, 20:05, 66, 127,
16 Lias Andersson, 23, LAK, C, 19, 0, 1, 1, -6, 12, 24, 0, 10:40, 2, 23, 44.7
17 Rasmus Andersson, 25, CGY, D, 79, 4, 44, 48, 28, 26, 136, 2.9, 22:39, 121, 59,
18 Andy Andreoff, 30, NYI, LW, 6, 1, 0, 1, -1, 0, 6, 16.7, 9:59, 1, 11, 52.9
19 Anthony Angello, 25, PIT, C, 4, 0, 0, 0, 0, 2, 2, 0, 6:38, 0, 13, 0
20 Mason Appleton, 26, TOT, C, 65, 7, 12, 19, -3, 30, 93, 7.5, 14:44, 20, 62, 31.8
21 Josh Archibald, 29, EDM, RW, 7, 0, 1, 1, -3, 7, 3, 0, 8:26, 2, 23, 66.7
22 Joel Armia, 28, MTL, RW, 60, 6, 8, 14, -15, 14, 103, 5.8, 13:43, 27, 104, 17.6
23 Viktor Arvidsson, 28, LAK, LW, 65, 20, 28, 48, 0, 22, 227, 8.8, 16:59, 45, 22, 36.4
24 Rasmus Asplund, 24, BUF, F, 78, 8, 19, 27, -6, 10, 126, 6.3, 14:18, 14, 29, 42.6
25 Zach Aston-Reese, 27, TOT, C, 67, 4, 10, 14, 7, 26, 77, 5.2, 13:01, 39, 226, 50
26 Andreas Athanasiou, 27, LAK, C, 26, 10, 5, 15, 5, 4, 65, 15.4, 15:03, 8, 10, 66.7
27 Cam Atkinson, 32, PHI, RW, 73, 23, 27, 50, -2, 10, 215, 10.7, 18:15, 45, 20, 29.4
28 Ronald Attard, 22, PHI, D, 13, 2, 2, 4, -1, 6, 15, 13.3, 15:58, 16, 22,
29 Nicolas Aube-Kubel, 25, TOT, RW, 71, 11, 11, 22, 11, 47, 84, 13.1, 9:46, 17, 132, 27.3
30 Mikael Backlund, 32, CGY, C, 79, 12, 26, 38, 20, 26, 208, 5.8, 17:13, 27, 62, 50.6
31 Nicklas Backstrom, 34, WSH, C, 45, 6, 25, 31, -8, 10, 66, 9.1, 17:29, 16, 16, 46.3
32 Brandon Baddock, 26, MTL, LW, 1, 0, 0, 0, 0, 0, 0, , 8:24, 0, 6,
33 Sven Baertschi, 29, VEG, LW, 1, 0, 0, 0, -1, 0, 1, 0, 13:54, 0, 0,
34 Kevin Bahl, 21, NJD, D, 14, 1, 3, 4, -3, 8, 12, 8.3, 15:22, 12, 27,
35 Josh Bailey, 32, NYI, C, 71, 12, 28, 40, -5, 6, 80, 15, 16:54, 24, 19, 38.9
36 Justin Bailey, 26, VAN, RW, 14, 0, 0, 0, -5, 6, 16, 0, 9:05, 6, 12, 0
37 Rudolf Balcars, 24, SJS, LW, 58, 11, 12, 23, -2, 20, 96, 11.5, 15:05, 39, 111, 40
38 Alexander Barabanov, 27, SJS, F, 67, 10, 29, 39, -4, 14, 97, 10.3, 17:12, 39, 52, 0
39 Ivan Barbashev, 26, STL, C, 79, 26, 34, 60, 7, 40, 110, 23.6, 16:28, 27, 158, 39.9
40 Riley Barber, 27, DET, RW, 4, 0, 0, 0, -2, 2, 4, 0, 8:27, 1, 3,
```

# Code

.Using csv reader and numpy to arrange array into a form that is easy to loop through

.Create while with constraints

```
1 import csv
2 import numpy as np
3
4 with open('nhlplayerstats_2021_22.csv') as file:
5     data = list(csv.reader(file))
6     data_arr = np.array(data)
7     data_arr_t = np.transpose(data_arr)
8     name = data_arr_t[0][1:].astype(str)
9     age = data_arr_t[1][1:].astype(int)
10    team = data_arr_t[2][1:].astype(str)
11    position = data_arr_t[3][1:].astype(str)
12    gamesplayed = data_arr_t[4][1:].astype(int)
13    goals = data_arr_t[5][1:].astype(int)
14    assists = data_arr_t[6][1:].astype(int)
15    points = data_arr_t[7][1:].astype(int)
16    plusminus = data_arr_t[8][1:].astype(int)
17    penaltyminutes = data_arr_t[9][1:].astype(int)
18    shots = data_arr_t[10][1:].astype(int)
19    shootingpercentage = data_arr_t[11][1:].astype(str)
20    averagetimeonice = data_arr_t[12][1:].astype(str)
21    blocks = data_arr_t[13][1:].astype(int)
22    hits = data_arr_t[14][1:].astype(int)
23    faceoffpercentage = data_arr_t[15][1:].astype(str)
```

```
player = input("Type 'Leaders' to see ML stat leaders or Player name to see individual stats.")
while True:
    if player in name:
        count = 0
        for player in name:
            if player == players:
                print("Entered player: {player}")
                print(f"Player is {age[count]} years old, plays {position[count]}, and plays for {team[count]}")
                print(f"Goals: {goals[count]}")
                print(f"Assists: {assists[count]}")
                print(f"Plus/Minus: {plusminus[count]}")
                print(f"Penalty Minutes: {penaltyminutes[count]}")
                print(f"Shots: {shots[count]}")
                print(f"Shooting Percentage: {shootingpercentage[count]}")
                print(f"Average Time on Ice per Game: {averagetimeonice[count]} minutes per game")
                print(f"Blocks: {blocks[count]}")
                print(f"Hits: {hits[count]}")
                print(f"Face-off Percentage: {faceoffpercentage[count]}")
                goalspergame = goals[count]/gamesplayed[count]
                assistspergame = assists[count]/gamesplayed[count]
                pointspergame = points[count]/gamesplayed[count]
                shotspergame = shots[count]/gamesplayed[count]
                blockspergame = blocks[count]/gamesplayed[count]
                hitspergame = hits[count]/gamesplayed[count]
                projectedgoalsperyear = round(goalspergame * 82)
                projectedassistsperyear = round(assistspergame * 82)
                projectedpointperyear = round(pointspergame * 82)
                projectedshotsperyear = round(shotspergame * 82)
                projectedhitsperyear = round(hitspergame * 82)
                projectedfaceoffperyear = round(faceoffpercentage * (count/shootingpercentage)*100)
                print()
                print(f"Player: {player} Projected Stats over 82 game season")
                print(f"Goals: {projectedgoalsperyear}")
                print(f"Assists: {projectedassistsperyear}")
                print(f"Points: {projectedpointperyear}")
                print(f"Shots: {projectedshotsperyear}")
                print(f"Blocks: {projectedblocksperyear}")
                print(f"Hits: {projectedhitsperyear}")
            break
    if player == 'Leaders':
        max_goals = np.max(goals)
        max_assists = np.max(assists)
        max_points = np.max(points)
        max_plusminus = np.max(plusminus)
        max_penaltyminutes = np.max(penaltyminutes)
        max_shots = np.max(shots)
        max_shootingpercentage = np.max(shootingpercentage)
        max_time = np.max(averagetimeonice)
        max_hits = np.max(hits)
        max_blocks = np.max(blocks)
        print("ML Individual Stat Leaders")
        print(f"Leader in Goals: {name[goals==max_goals]} with {max_goals} goals")
        print(f"Leader in Assists: {name[assists==max_assists]} with {max_assists} assists")
        print(f"Leader in Points: {name[points==max_points]} with {max_points} points")
        print(f"Leader in Plus/Minus: {name[plusminus==max_plusminus]} with {max_plusminus} plus/minus")
        print(f"Leader in Penalty Minutes: {name[penaltyminutes==max_penaltyminutes]} with {max_penaltyminutes} minutes")
        print(f"Leader in Shots: {name[shots==max_shots]} with {max_shots} shots")
        print(f"Leader in Blocks: {name[blocks==max_blocks]} with {max_blocks} blocks")
        print(f"Leader in Hits: {name[hits==max_hits]} with {max_hits} hits")
        break
    if player not in name or player != 'Leaders':
        player = input("Type 'Leaders' to see ML stat leaders or Player name to see individual stats.")
        continue
```

# Projections



.Created projections by determining the frequency a stat occurred per game and then multiplied by the length of a season (82)


```
goalspergame = goals[count]/gamesplayed[count]
assistspergame = assists[count]/gamesplayed[count]
pointspergame = points[count]/gamesplayed[count]
shotspergame = shots[count]/gamesplayed[count]
blkspgame = blocks[count]/gamesplayed[count]
hitspergame = hits[count]/gamesplayed[count]
projectedgoalsperyear = round(goalspergame * 82)
projectedassistsperyear = round(assistspergame * 82)
projectedpointsperyear = round(pointspergame * 82)
projectedshotsperyear = round(shotspergame * 82)
projectedblockspyear = round(blkspgame * 82)
projectedhitsperyear = round(hitspergame * 82)
```

# Output

•If command Leaders is entered, the leaders of all categories are printed

•A players name must be spelled correctly and will continue to prompt user to enter new player until done correctly

•In this example, Sidney Crosby is



```
[zlw@cslab21 final]$ python3 final2.py
Type "Leaders" to see NHL stat Leaders or Player name to see individual stats:Leaders
NHL Individual Stat Leaders:
Leader in goals: Auston Matthews with 58 goals
Leader in assists: Jonathan Huberdeau with 85 assists
Leader in points: Connor McDavid with 118 points
Leader in Plus/Minus: Johnny Gaudreau with a 61 plus/minus
Leader in Penalty Minutes: Mark Borowiecki with 139 minutes
Leader in shots: Auston Matthews with 341 shots
Leader in blocks: Brayden McNabb with 173 blocks
Leader in hits: Radko Gudas with 354 hits
[zlw@cslab21 final]$ python3 final2.py
Type "Leaders" to see NHL stat Leaders or Player name to see individual stats:hahaha
Type "Leaders" to see NHL stat Leaders or Player name to see individual stats:sid
Type "Leaders" to see NHL stat Leaders or Player name to see individual stats:Sidney Crosby

Entered player: Sidney Crosby
Sidney Crosby is 34 years old, plays C, and plays for PIT
Games Played: 67
Goals: 31
Assists: 53
Points: 84
Plus/Minus: 20
Penalty minutes: 28 minutes
Shots: 202
Shooting Percentage: 15.3%
Average Time on Ice per Game: 19:59 minutes per game
Blocks: 36
Hits: 50
Face-off Percentage: 51.8%

Sidney Crosby's Projected Stats over 82 game Season
Goals: 38
Assists: 65
Points: 103
Shots: 247
Blocks: 44
Hits: 61
[zlw@cslab21 final]$
```

entered. All of his