



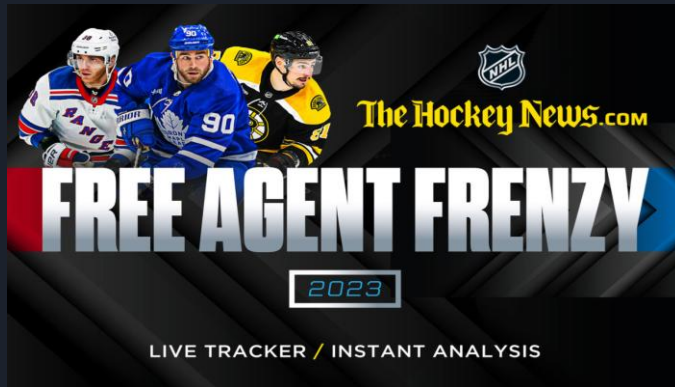
# NHL Free Agency Suggestions

Trevor Hogland, Dylan Pham

# Initial Goals



- Find best FA for every team
- Base this calculation on:
  - Algorithm for individual efficiency
  - Cap Space of team



# Data Gathering

- BeautifulSoup for scraping
- MySQL for saving data
- Moneypuck and CapFriendly

BeautifulSoup



	Name	Pos↕	Games Played↕	Icetime (Minutes)↕	Expected Goals↕	Goals↕	Assists↕	Points↕	Primary Assists↕	Secondary Assists↕
1	 Zach Hyman	L	78	1526	51.6	53	22	75	11	11
2	 Auston Matthews	C	79	1657	49.2	69	38	107	24	14
3	 Sam Reinhart	C	81	1642	42.9	55	37	92	22	15
4	 Brady Tkachuk	L	79	1513	40.6	37	36	73	28	8
5	 John Tavares	C	78	1396	40.3	27	36	63	18	18
6	 Joel Eriksson Ek	C	75	1540	39	30	33	63	15	18
7	 Sidney Crosby	C	80	1606	39	41	49	90	31	18
8	 Jake Guentzel	C	67	1341	38.6	30	47	77	33	14



# Sample Scraping Code

```
cnx = mysql.connector.connect(...)
cursor = cnx.cursor(buffered = True)
FAurl = requests.get("https://www.capfriendly.com/browse/free-agents/2025?stats-
season=2024&pg=14")
capfriend = BeautifulSoup(FAurl.text, 'html.parser')
table = capfriend.find('table', attrs = {'id' : 'brwt'}).find('tbody')
rows = table.find_all('tr')
for row in rows:
    columns = row.find_all('td')
    if len(columns) > 0:
        name = columns[0].find('a').text
        age = int(columns[2].text)
        capHit = int(columns[21].text.replace('$','').replace(',',''))
        sal = int(columns[22].text.replace('$','').replace(',',''))
        values = [name, age, capHit, sal]
        statement = "INSERT INTO nhl_salaries (name, age, capHit, sal) values (%s, %s,
%s, %s)"
        cursor.execute(statement, values)
    cnx.commit()
```

# Data Interpreting



- Found a statistic called “Player Score”
  - Individual player rating
- Found all FAs’ salaries
- Found each team’s salary cap space and decided which player each team should sign in order of most to least cap space available



# Player Suggestion: Detroit Red Wings

- For the Red Wings, our program suggest they sign current Carolina Hurricanes defenseman Jalen Chatfield
- Why? Because the program identifies defensemen as the weakest position group on the team and Chatfield as the best available defensemen at Detroit's cap space slot

team	position	gameScore
DET	C	22.821667
DET	D	17.774286
DET	W	33.711429



# Player Suggestion: New Jersey Devils

name	projSpace
NJD	21490000

- For the Devils, our program suggest they sign current Arizona Coyotes defenseman Sean Durzi
- Why? Because the program has identified Defense as the weakest position group on the team and accounting for New Jersey's middle of the pack \$21.4 million in cap space, Durzi is the best available defenseman that may fit their price range
- The program assumes that some of the \$21.4 million will go to re-signing players or other FA's so New Jersey may not have the extra money to bid on one of the top FA defensemen, but it projects Durzi to be a good player to target in the med-high price range that can bolster New Jersey's defense

team	position	gameScore
NJD	C	39.610000
NJD	D	20.952500
NJD	W	31.530000





# Complete List of Model Player Suggestions

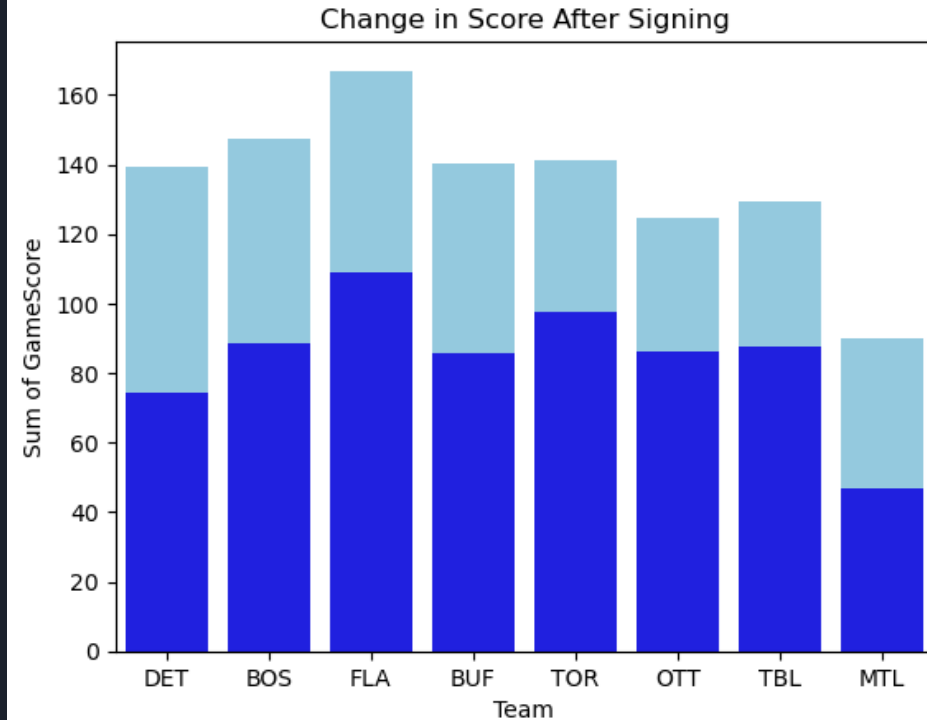
- This represents the complete list of our models player suggestions for all 32 NHL teams as of April 15, 2024
- The model generated this list in descending order of cap space, assuming that the teams with the most cap space would be willing to spend more for high quality players at their position of need

```
['ARI: Brady Skjei',  
'SJS: Filip Hronek',  
'CHI: Noah Hanifin',  
'ANA: Brandon Montour',  
'CAR: Jonathan Marchessault',  
'DET: Jalen Chatfield',  
'VAN: Sean Walker',  
'LAK: Sam Reinhart',  
'CBJ: Matt Roy',  
'BOS: Shayne Gostisbehere',  
'FLA: Jordan Martinook',  
'BUF: Oliver Ekman-Larsson',  
'NJD: Sean Durzi',  
'SEA: Brett Pesce',  
'TOR: Erik Gustafsson',  
'NSH: Dylan DeMelo',  
'CGY: Dmitry Kulikov',  
'DAL: J.J. Moser',  
'EDM: Jonathan Drouin',  
'WPG: Nils Lundkvist',  
'STL: Timothy Liljegren',  
'PIT: Alexandre Carrier',  
'OTT: Justin Schultz',  
'NYR: Michael Kesselring',  
'TBL: TJ Brodie',  
'VGK: Tyler Myers',  
'COL: Warren Foegele',  
'MIN: Mike Reilly',  
'MTL: Kevin Shattenkirk',  
'NYI: Stefan Noesen',  
'WSH: Colin Miller',  
'PHI: Jack Johnson']
```



# Visualizing the Signing

- This Graph displays the change in the total GameScore for each Atlantic Division team if the team makes the algorithms suggested player signing



# Limitations

- Goaltenders aren't accounted for
- Focus is purely on the next season with no regard for rebuilding teams
- Doesn't account for teams re-signing players.
- Cap Space is likely inaccurate, as are salary amounts
- The GameScore base:
  - We noticed that defensemen tended to have lower GameScore's resulting in a higher than expected number of teams looking for defensemen



# Best Use and Improvements

## Best Use:

- As it currently stands, the algorithm is effective in providing a suggested player, but is limited in that we don't know how much cap space teams will actually have
- As a result the model would be best used as Free Agency begins when cap space the list of players available is the most accurate

## Potential Improvements:

- Adding a way to project upcoming salaries
- Accounting for players who will likely be re-signed
- Projecting more than 1 player per team



Thank You





# Citations

<https://moneypuck.com/>

<https://www.capfriendly.com/browse/free-agents>