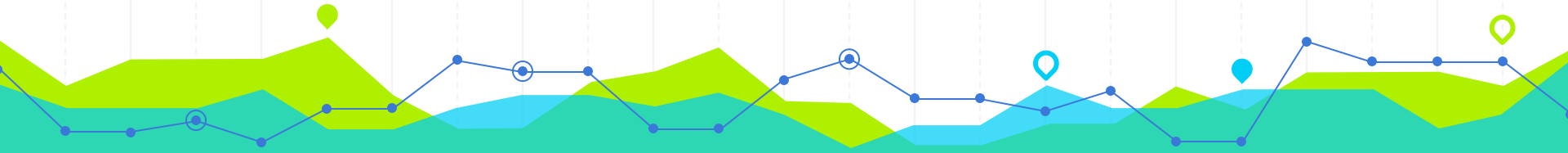

Going Worldwide: A Comparison of National and International NBA Players

By: Hoang Nguyen, Colby Hillers, Calvin Cheung, Javon Maxie, & Jorge Mendoza

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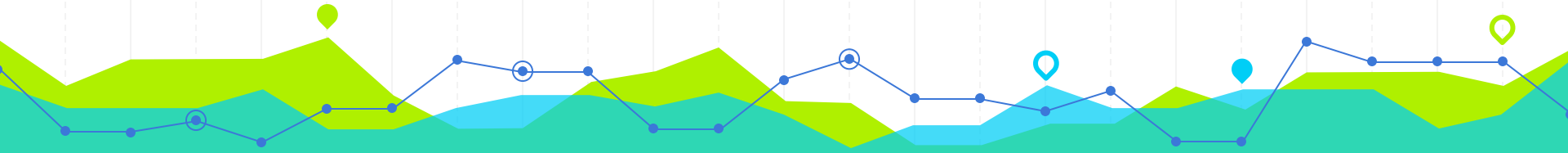
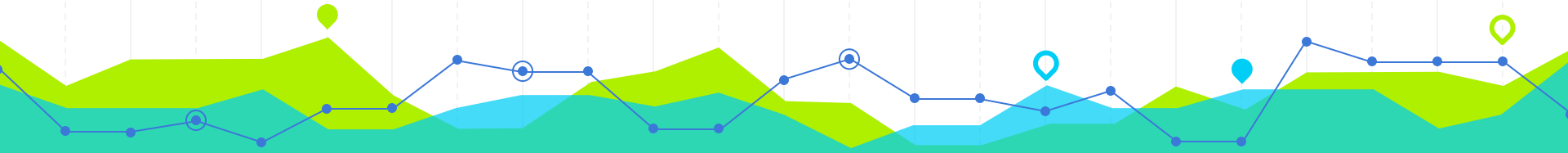
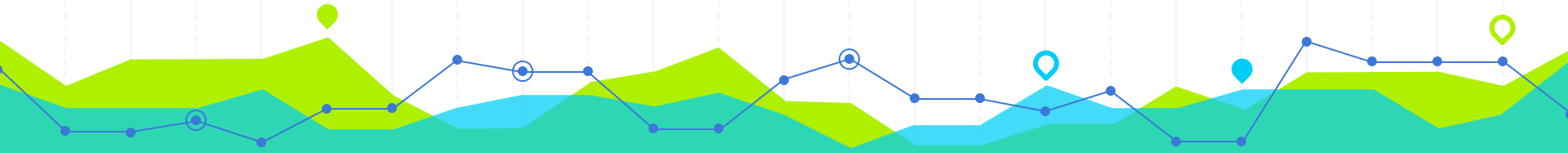




Introduction 1

Introduction

- Aim to determine the difference in performance between national and international NBA players
- Analyze NBA statistics from 1999-2000 season till now for regular season only
- Utilize performance measures such as points, rebounds, assists, steals, blocks, missed field goals and free throws, turnovers, and games played



Research Question/Hypothesis

2

Research Question

In the NBA, over the regular season, do international players have a higher Individual Efficiency Metric (EFF), a metric that takes into account points, rebounds, assists, steals, blocks, missed field goals and free throws, turnovers, and games played, than players born in the United States?

Hypothesis

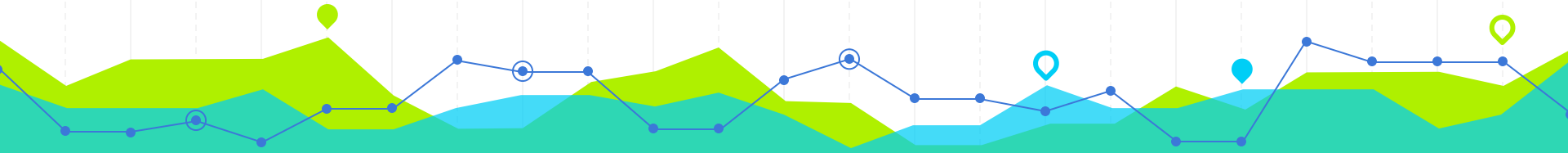
We predict that national players, or players who were born in US, will have higher EFF rating than international players.

Data 3

Dataset

Name: Basketball Players Stats. Extended Analysis

- Found on Kaggle
- Number of observations: 53,949
- Number of observations = number of games played since 1999-2000 season



Methods

4

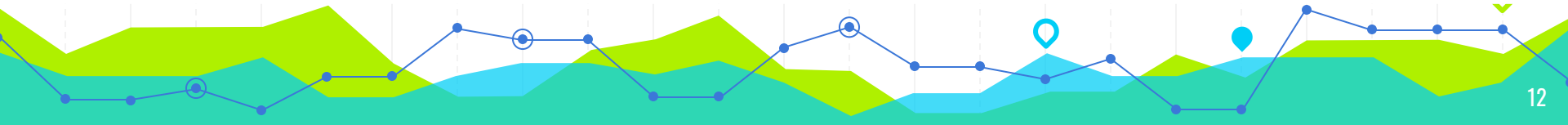
Methods

- Data Cleaning
- Exploratory Data Analysis (EDA)
- Player Efficiency Metric (EFF)
- Analysis

Data Cleaning

- Create three new columns (FG%, FT%, 3PFG%)
- Remove irrelevant features (columns)
  - Team, League, Stage, Birth year, Birth month, Height, & Weight
- Create two different DataFrame for US and international players
- Categorize players as US or international
  - Olympic teams
  - If the string from “nationality” has /, and the US appears in front, then the players would be considered US player
    - Example: Patrick Ewing (US/Jamaica)
  - If other regions beside US appear in front of /, the players would be international

80	1999 - 2000	Patrick Ewing	62	2035.00000	361	775	0	2	207	283	142	196	140	464	604	58	36	84	929	United States / Jamaica



Exploratory Data Analysis (EDA)

- Create visualizations with NBA statistics to compare the performance of US and International players (
  - FG%
  - FT%
  - Turnovers
  - Personal Fouls
  - Rebounds
  - Assists
  - Steals
  - Blocks
  - Points

Two histogram examples (FG% and FT%)

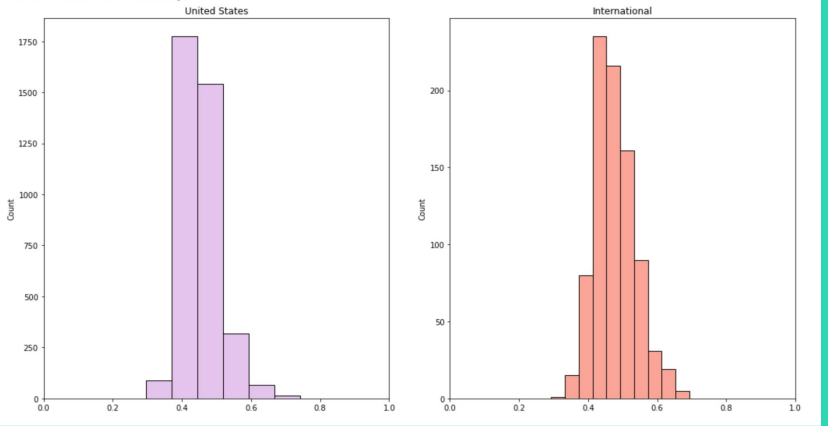
Field Goal Percentage (FGM / FGA)

Effective Field Goal Percentage:

$$\frac{Points}{2 * (FGA + 0.44 * FTA)}$$

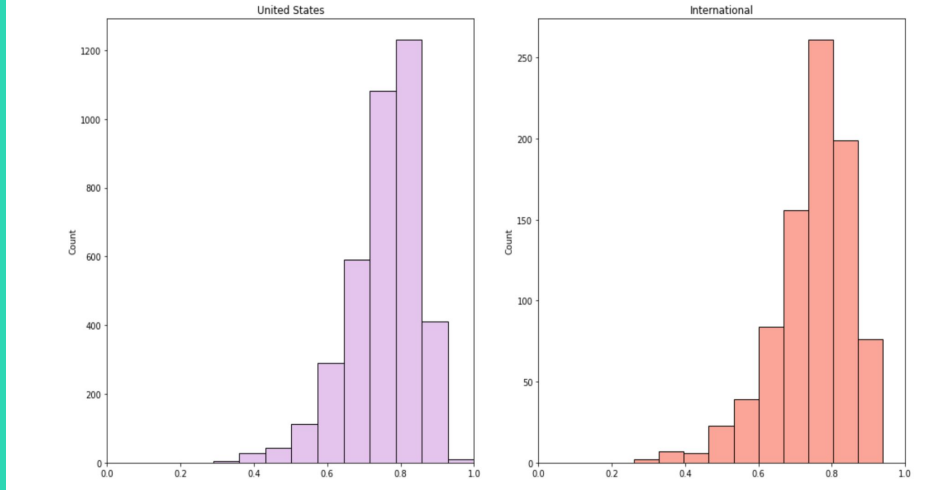
```
print('Standard Field-Goal Percentage')
shooting_eff_data(df_US, df_INT, 'FGM', 'FGA', 10)
```

Standard Field-Goal Percentage



Free Throw Percentage (FTM / FTA)

```
In [ ]: shooting_eff_data(df_US, df_INT, 'FTM', 'FTA', 10)
```

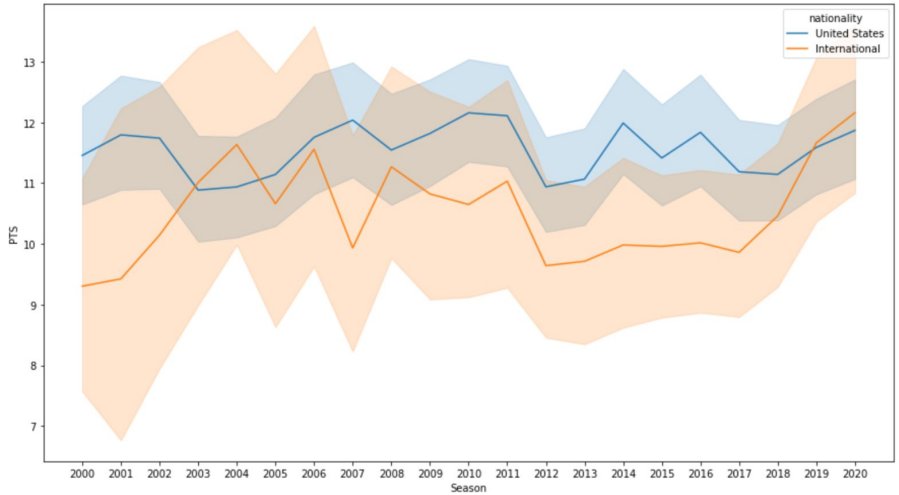


Line plot example:

Points Since 2000

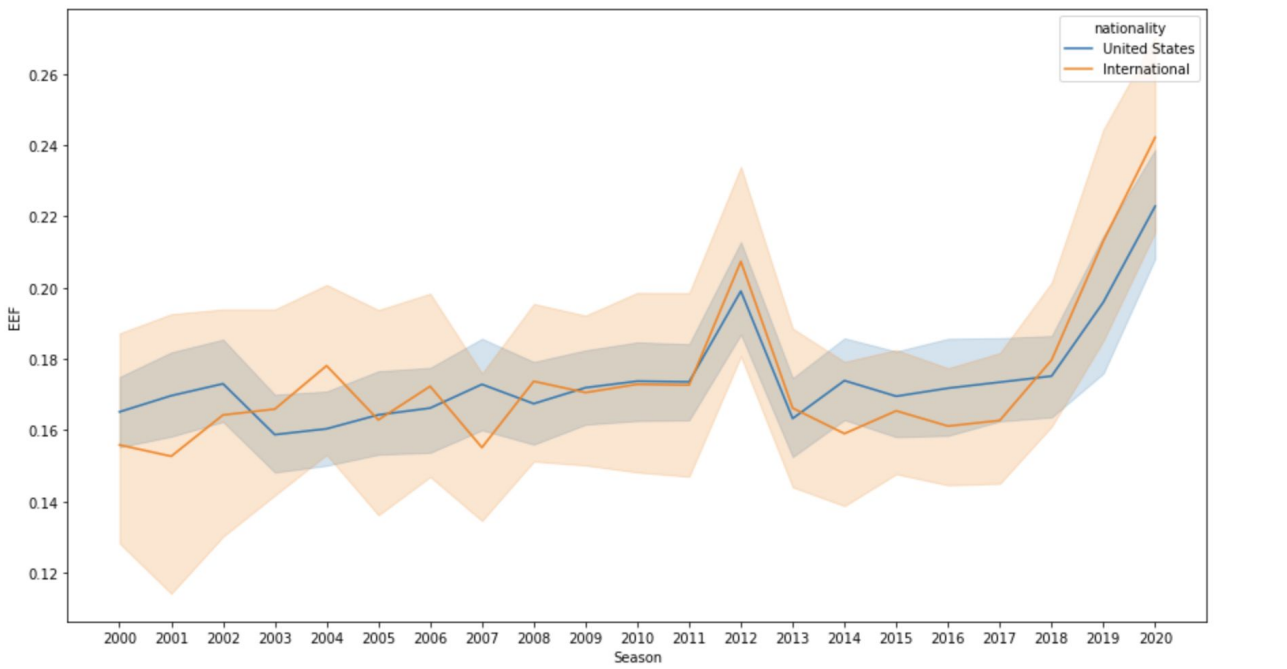
In [ ]:

```
# Calculate avg points by each group over every season
compare_seasons_stat(df, 'PTS')
```



Player Efficiency Metric (EFF)

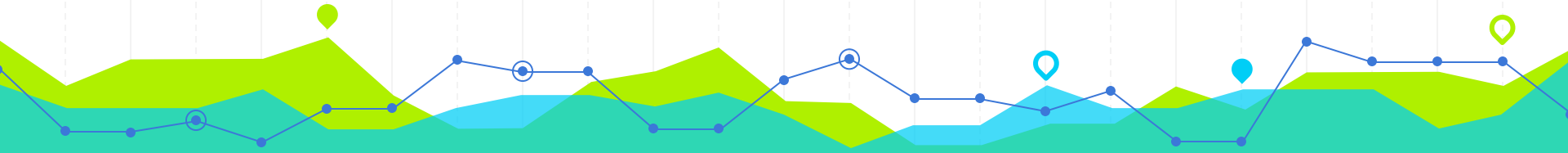
$$\frac{PTS + REB + AST + STL + BLK - MissedFG - MissedFT - TOV}{GamesPlayed}$$


nationality
United States
International
EEF
0.26
0.24
0.22
0.20
0.18
0.16
0.14
0.12
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Season

Analysis

- Welch's T-test
  - Nonparametric univariate test
  - Findings:
    - US players only perform better than international players in FG% and Steals
    - International players perform better than US players in other categories which include PTS, AST, REB, BLK, TOV, PF, FT%, 3PFG%

	Result
PTS	False
AST	False
REB	False
STL	True
BLK	False
TOV	False
PF	False
FG%	True
FT%	False
3PFG%	False



Conclusion

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Conclusion

- After conducting Welch T-test, we can't conclude that US players outperform international players (which goes against our hypothesis)
- US players only perform better in Steals and FG%, out of all the 10 stats
- International players perform better in PTS, AST, REB, BLK, TOV, PF, FT%, 3PFG%
- Limitations:
  - Small sample size for international players

Thank you!