

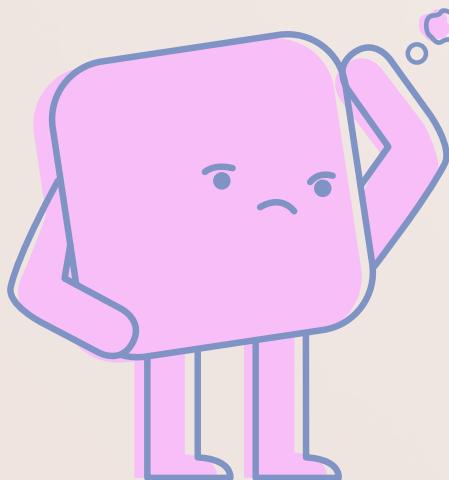
דירוג
אוניברסיטאות
בעולם

שראל אוסקר
גל כלב



שאלת דמיה

האם ניתן להזות את 100
האוניברסיטאות הכי טובות
בעולם? ואם ניתן לאפירן?





Round University Ranking

<https://roundranking.com/ranking/world-university-rankings.html#world-2010>

RUR World University Rankings evaluate performance of 1000+ world's leading higher education institutions by 20 indicators grouped into 4 key areas of university activity: Teaching, Research, International Diversity, Financial Sustainability. You can view the rankings for the period of 2010-2022 by selecting the year on the timeline and by choosing the ranking type in the menu below.

Please click here for methodological details.

Years: 2012

University Search

Ranking: World University Ranking

Location: Location

Save

Rank	University	Score	Country	Flag	League
1	California Institute of Technology (Caltech)	100.000	USA	🇺🇸	Diamond League
2	Harvard University	98.500	USA	🇺🇸	Diamond League
3	Stanford University	96.610	USA	🇺🇸	Diamond League
4	Massachusetts Institute of Technology (MIT)	95.174	USA	🇺🇸	Diamond League
5	Columbia University	94.710	USA	🇺🇸	Diamond League
6	University of Chicago	94.456	USA	🇺🇸	Diamond League
7	Northwestern University	93.265	USA	🇺🇸	Diamond League
8	Princeton University	93.214	USA	🇺🇸	Diamond League
9	Yale University	93.159	USA	🇺🇸	Diamond League
10	ETH Zurich (Swiss Federal Institute of Technology)	93.054	Switzerland	🇨🇭	Diamond League
11	University College London	92.830	UK	🇬🇧	Diamond League
12	Karolinska Institute	92.742	Sweden	🇸🇪	Diamond League
13	University of Pennsylvania	91.678	USA	🇺🇸	Diamond League
14	University of Cambridge	91.518	UK	🇬🇧	Diamond League
15	Washington University in St. Louis	91.243	USA	🇺🇸	Diamond League
16	University of Oxford	91.119	UK	🇬🇧	Diamond League



Round University Ranking is a ranking of leading world universities.

Years ▼

University ▼

Show
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Ranking
World University Ranking
▼

Subject
All Subjects
▼

**California Institute of Technology
(Caltech)**

USA
California Institute of Technology, 1200 East California Boulevard,
Pasadena, CA 91125, United States

WORLD RANK
1

COUNTRY RANK
1

Rankings

	Rank	Score
World University Ranking	1	100.000
Teaching Ranking	1	100.000
Research Ranking	2	99.858
International Diversity Ranking	73	81.163
Financial Sustainability Ranking	1	100.000

Additional Rankings

	Rank	Score
Reputation Rankings	11	98.333
Academic Rankings	1	100.000

Overview

Caltech is a world-renowned research and education institution focused on science and engineering, where faculty and students pursue new knowledge about our world and search for the kinds of bold and innovative advances that will transform our future. The scientific, engineering,

דוגמא לאוניברסיטה

TEACHING RANKING

	World Rank	Country rank	Score	League
Academic staff per students	1	1	100.000	Diamond League
Academic staff per bachelor degrees awarded	30	30	95.429	
Doctoral degrees awarded per academic staff	20	20	97.000	
Doctoral degrees awarded per bachelor degrees awarded	12	12	98.286	
World teaching reputation	11	11	98.429	

Group Weight

Name

Weight	Rank	Score
8%	35	94.668
8%	30	95.429
8%	20	97.000
8%	12	98.286
8%	11	98.429

RESEARCH RANKING

	World Rank	Country rank	Score	League
Citations per academic and research staff	2	2	99.835	
Doctoral degrees awarded per admitted PhD	108	108	83.167	
Normalized citation impact	3	3	99.668	
Papers per academic and research staff	3	3	99.668	
World research reputation	11	11	98.429	

Group Weight

Name

Weight	Rank	Score
8%	2	99.835
8%	108	83.167
8%	3	99.668
8%	3	99.668
8%	11	98.429

INTERNATIONAL DIVERSITY RANKING

	World Rank	Country rank	Score	League
Share of international academic staff	73	4	81.163	
Share of international students	75	4	116	
Share of international co-authored papers	82.042	4	10	
International teaching reputation	98.572	4	153	
Share of international bachelor degrees awarded	76.001	4	19	

Group Weight

Name

Weight	Rank	Score
2%	346	45.689
2%	75	88.251
2%	116	82.042
2%	10	98.572
2%	153	76.001

FINANCIAL SUSTAINABILITY RANKING

	World Rank	Country rank	Score	League
Institutional income per academic staff	1	1	100.000	
Institutional income per students	15	15	97.835	
Papers per research income	414	414	35.084	
Research income per academic and research staff	5	5	99.334	
Research income per institutional income	12	12	98.286	

Group Weight

Name

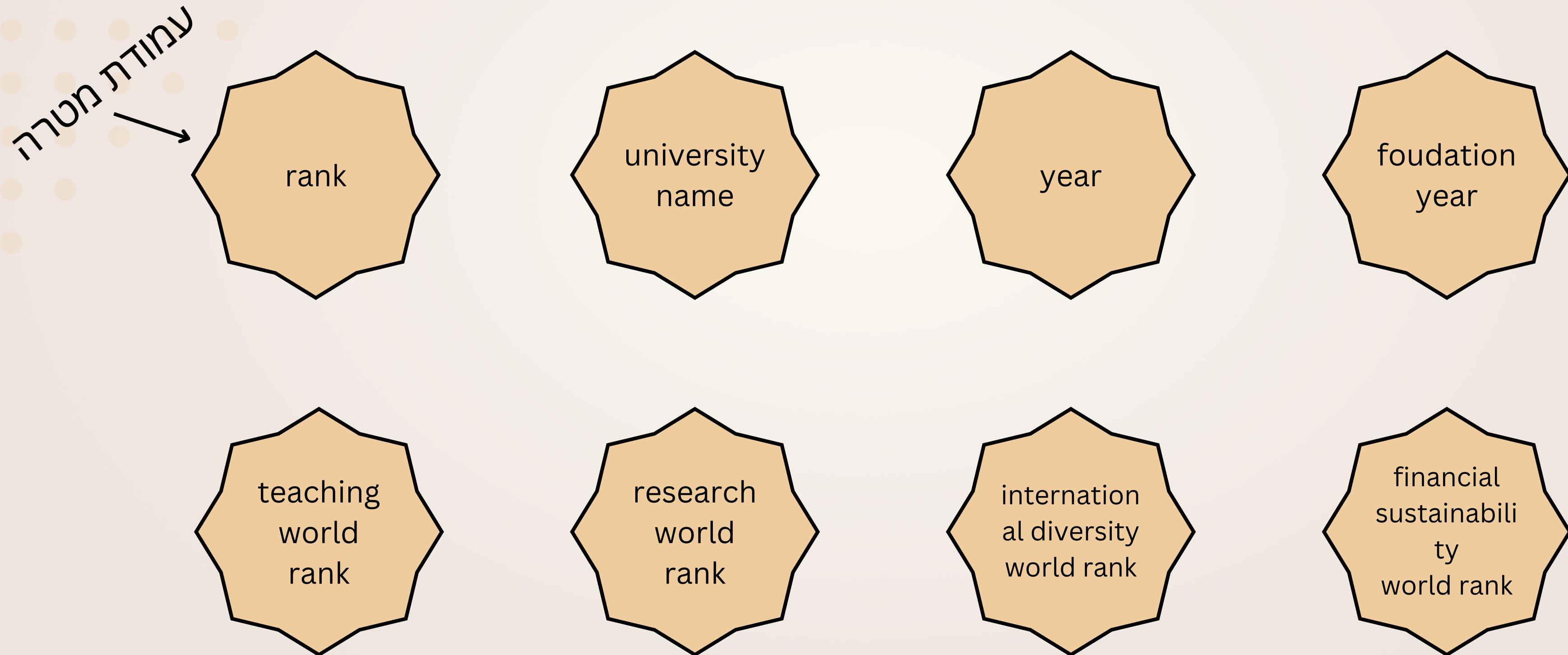
Weight	Rank	Score
2%	19	97.167
2%	15	97.835
2%	414	35.084
2%	5	99.334
2%	12	98.286

Mission Statement

The mission of the California Institute of Technology is to expand human knowledge and benefit society through research integrated with education. We investigate the most challenging, fundamental problems in science and technology in a singularly collegial, interdisciplinary atmosphere, while

הרכבת נתונים

חילוץ הנתונים אשר רלוונטיים עבורנו מהאתר בוצע ע"י שימוש ב-selenium.
דוגמאות לנדרנים שחילצנו

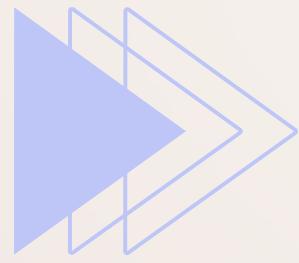


הרכשת הנתונים

- לאחר הרכשת הנתונים העברנו את הנתונים לCSV והתקבל

df_original										
	ranks	university_name	year	total_score	country	foundation_year	short_name	university_type	number_of_students	lat
0	1	Harvard University	2010	100.000	USA	1636	Harvard	Private	19330	42.3606
1	2	California Institute of Technology (Caltech)	2010	99.077	USA	1891	Caltech	Private	2130	34.0522
2	3	Massachusetts Institute of Technology (MIT)	2010	97.462	USA	1865	MIT	Public	10080	42.3606
3	4	Stanford University	2010	97.225	USA	1891	Stanford	Private	14810	37.4189
4	5	Columbia University	2010	94.947	USA	1754	Columbia	Private	22020	40.7589
5	6	Ecole Polytechnique Federale de Lausanne	2010	94.936	Switzerland	1853	EPFL	Public	6160	46.2278
6	7	University of Chicago	2010	94.682	USA	1890	Uchicago	Private	1280	41.8819

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ביקורי בתורים

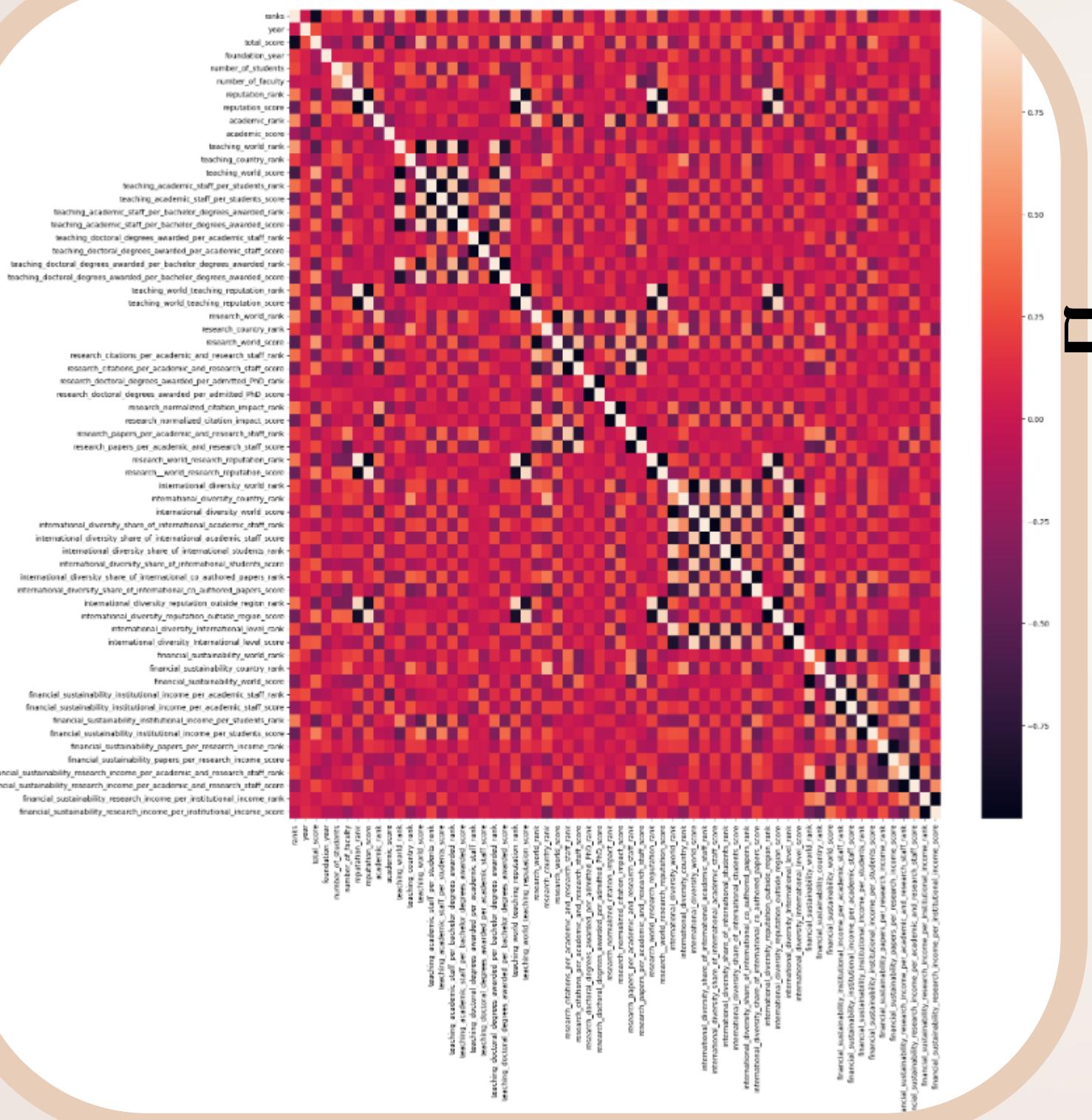


- החליף דה-Nan-ים הממוצע של אותה העמודה

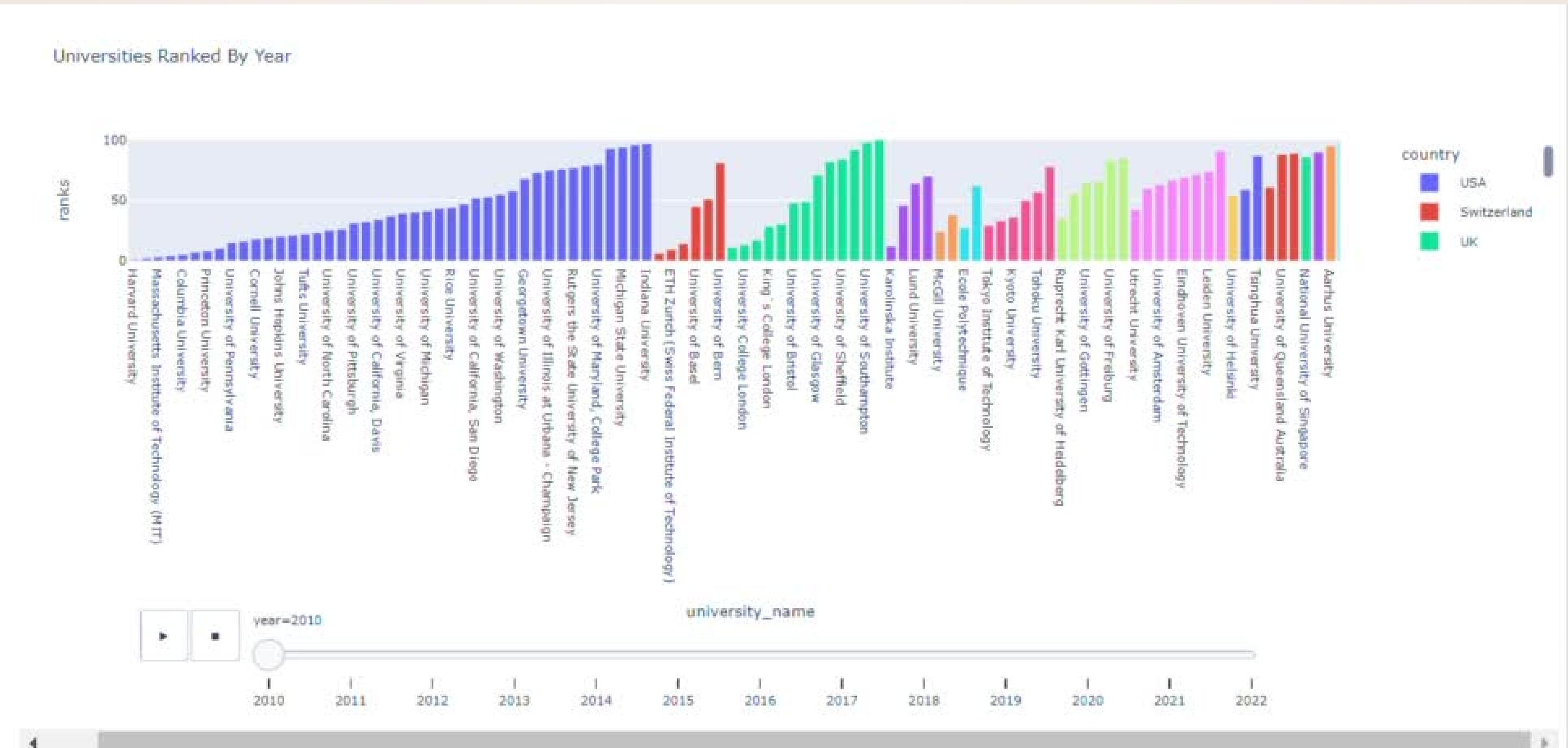
- מחיקת עמודות לא רלוונטיות

ריזואליזציה וEDA

יצירת מפת חום המרה קורילציה בין המשתנים



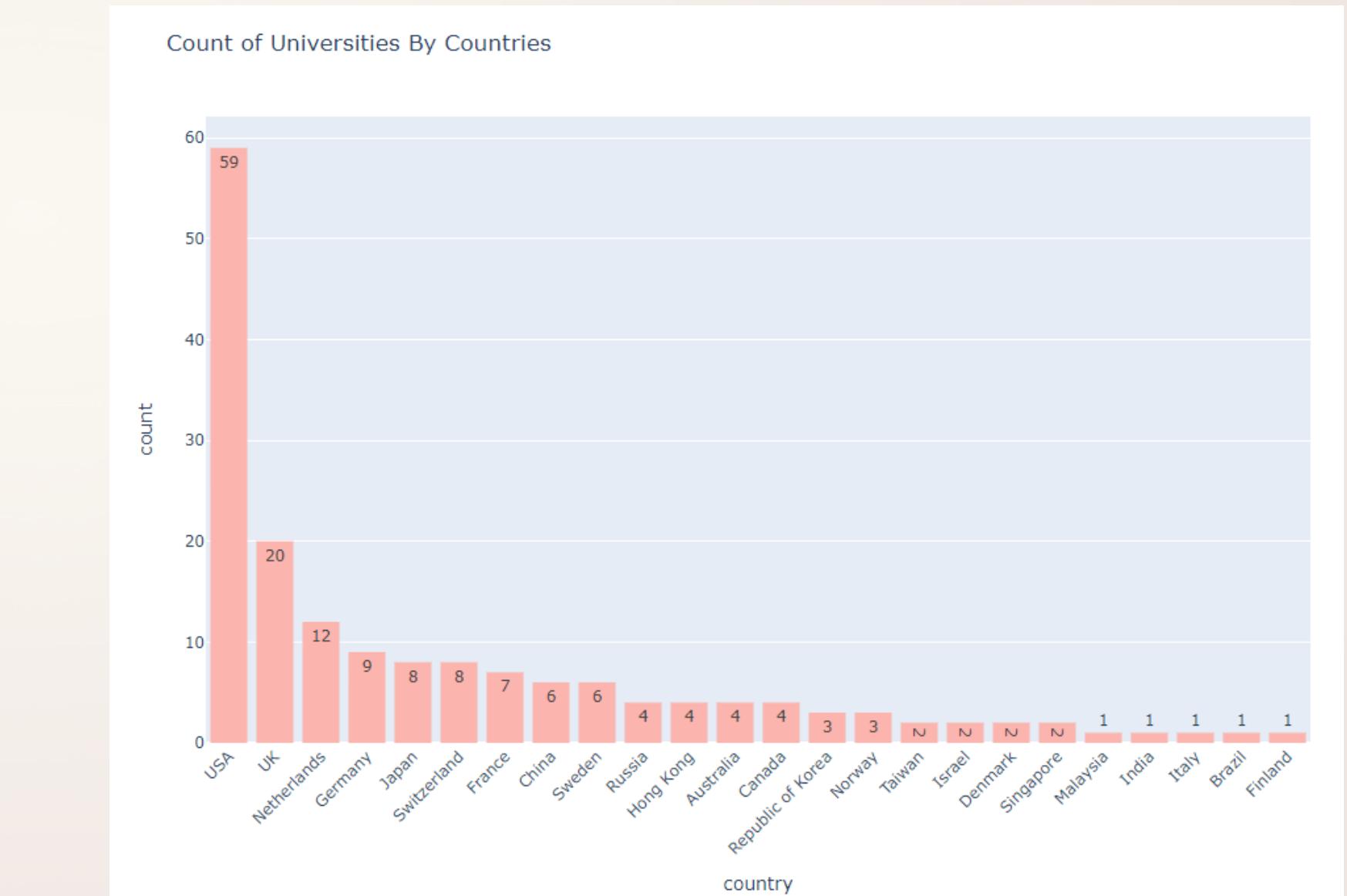
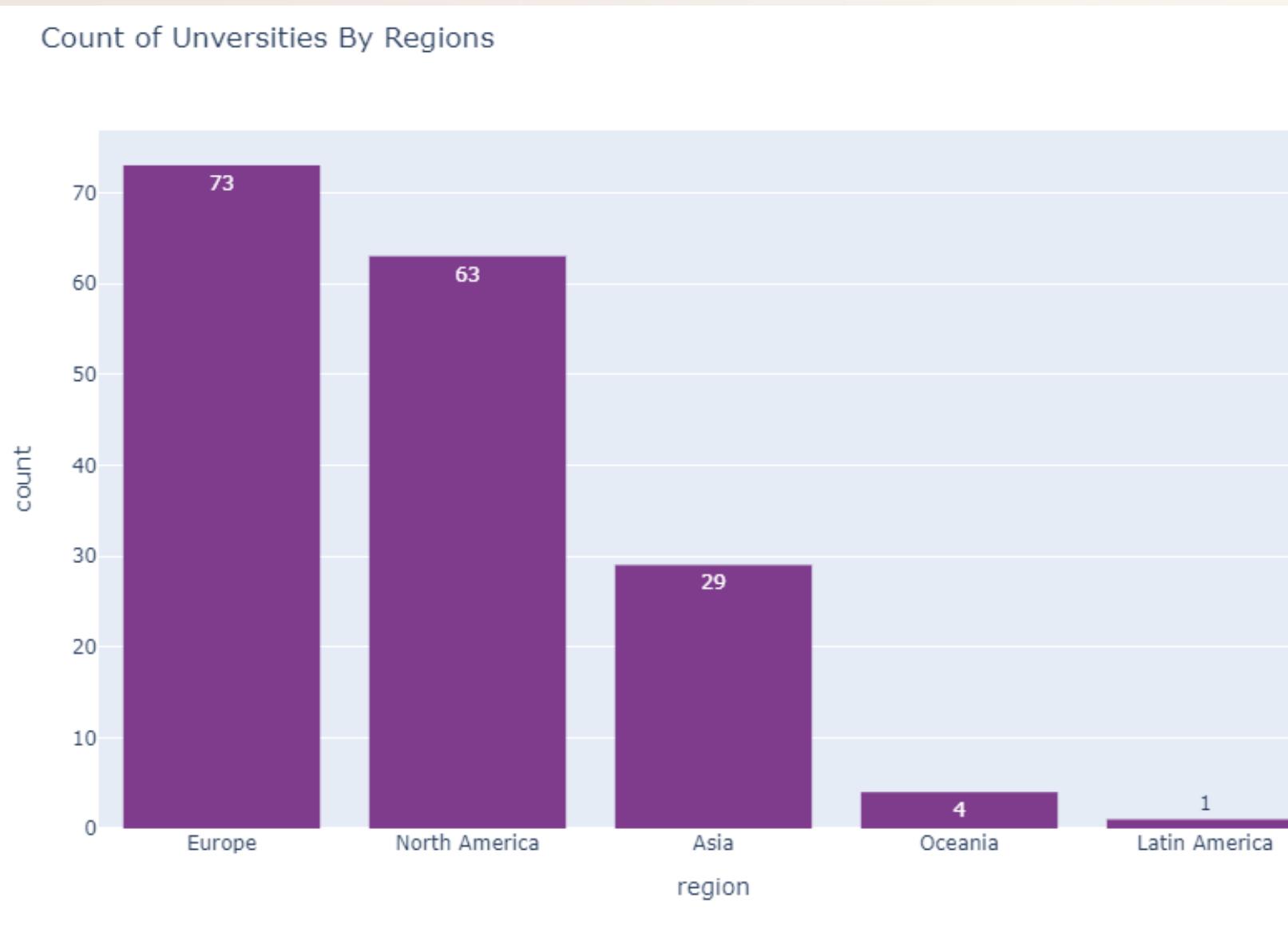
דרוג האוניברסיטאות במשך השנים



התפלגות האוניברסיטאות

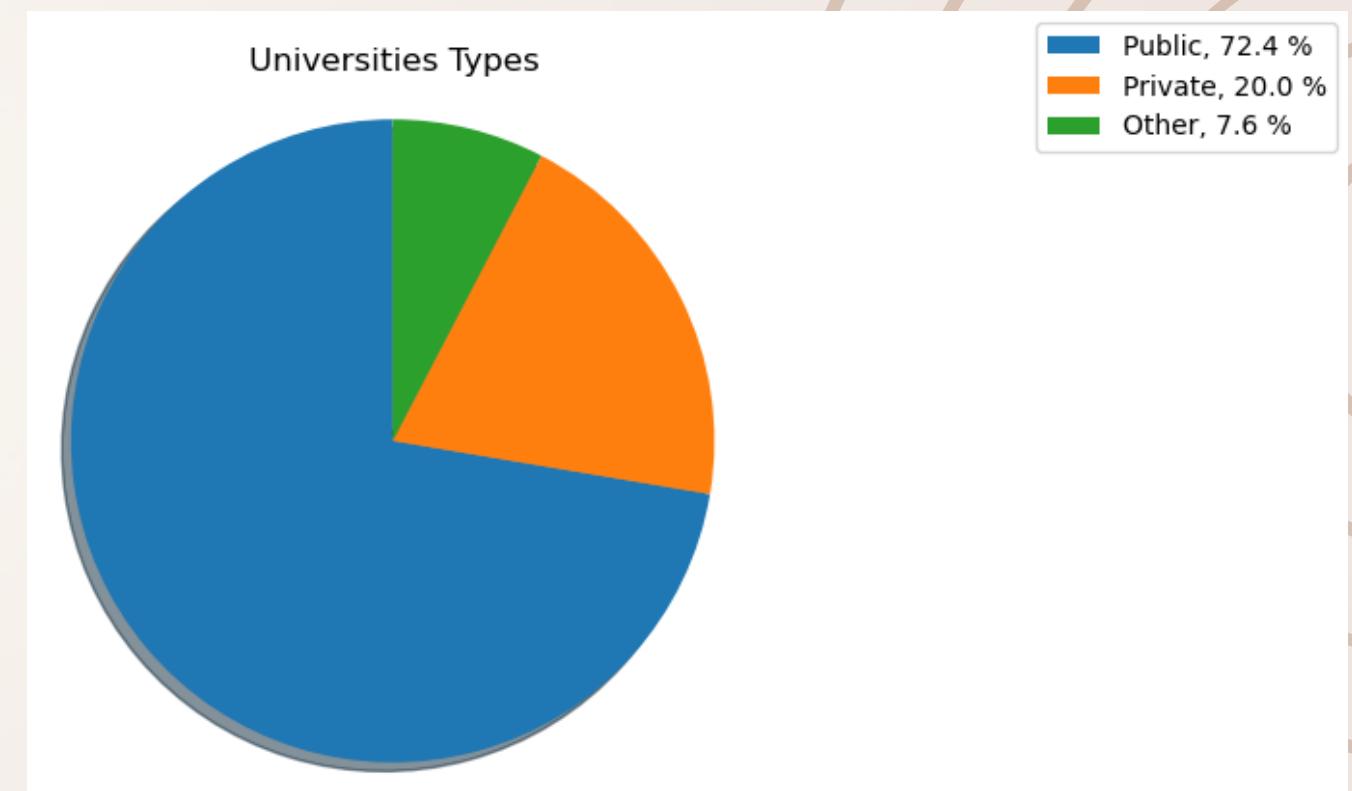
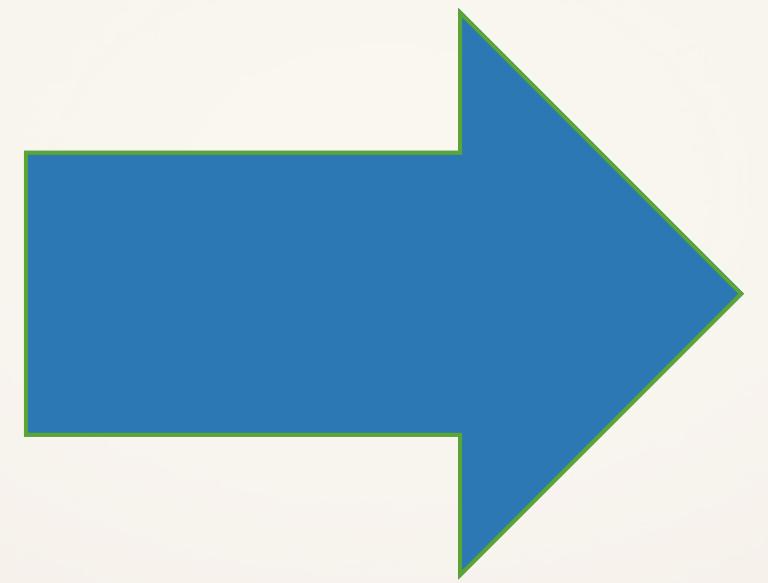
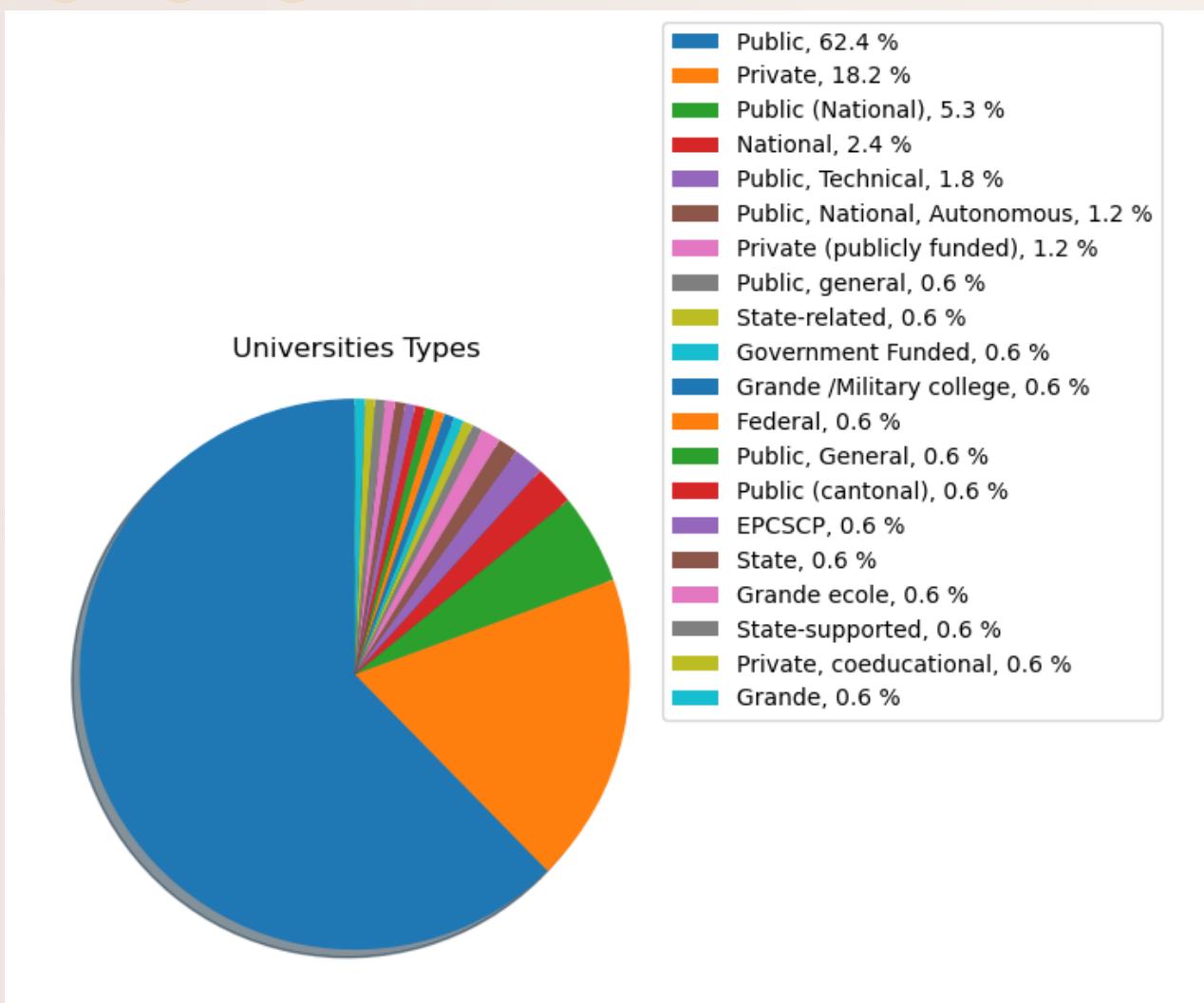
לפי יבשת

לפי מדינה



התפלגות האוניברסיטאות

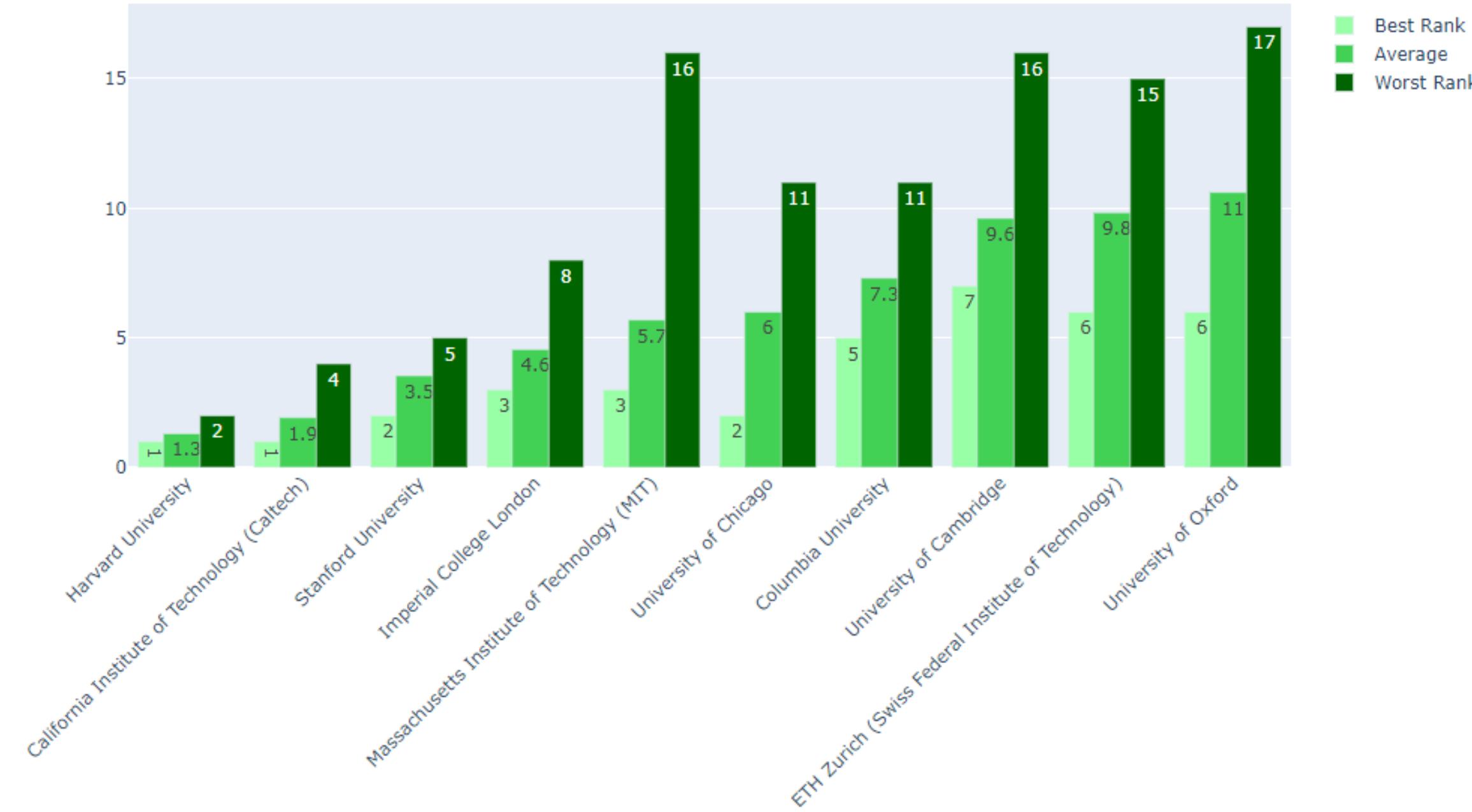
לפי סוג האוניברסיטה



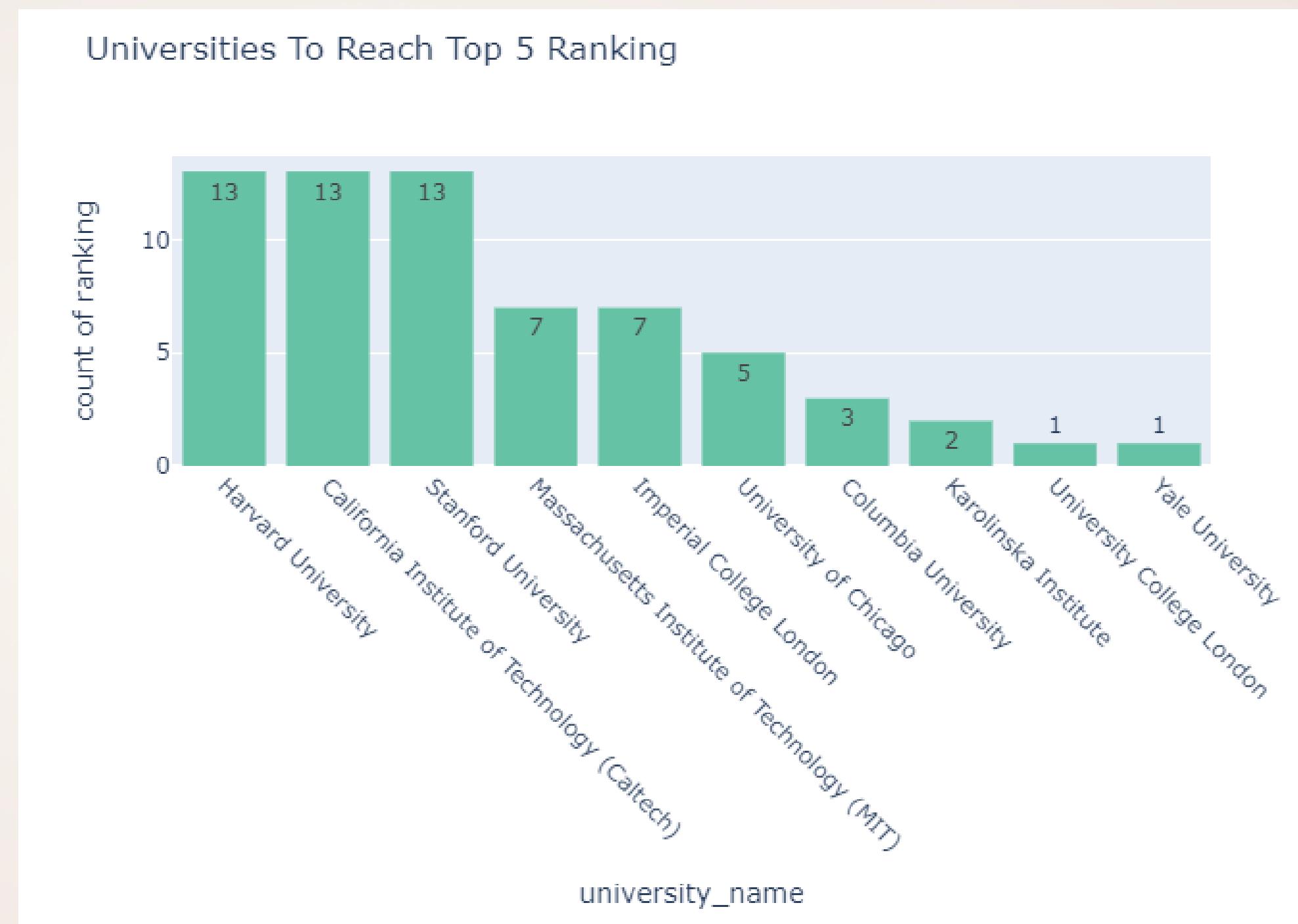
האוניברסיטאות עם ממוצע הדירוגים הטוב ביותר ביתר



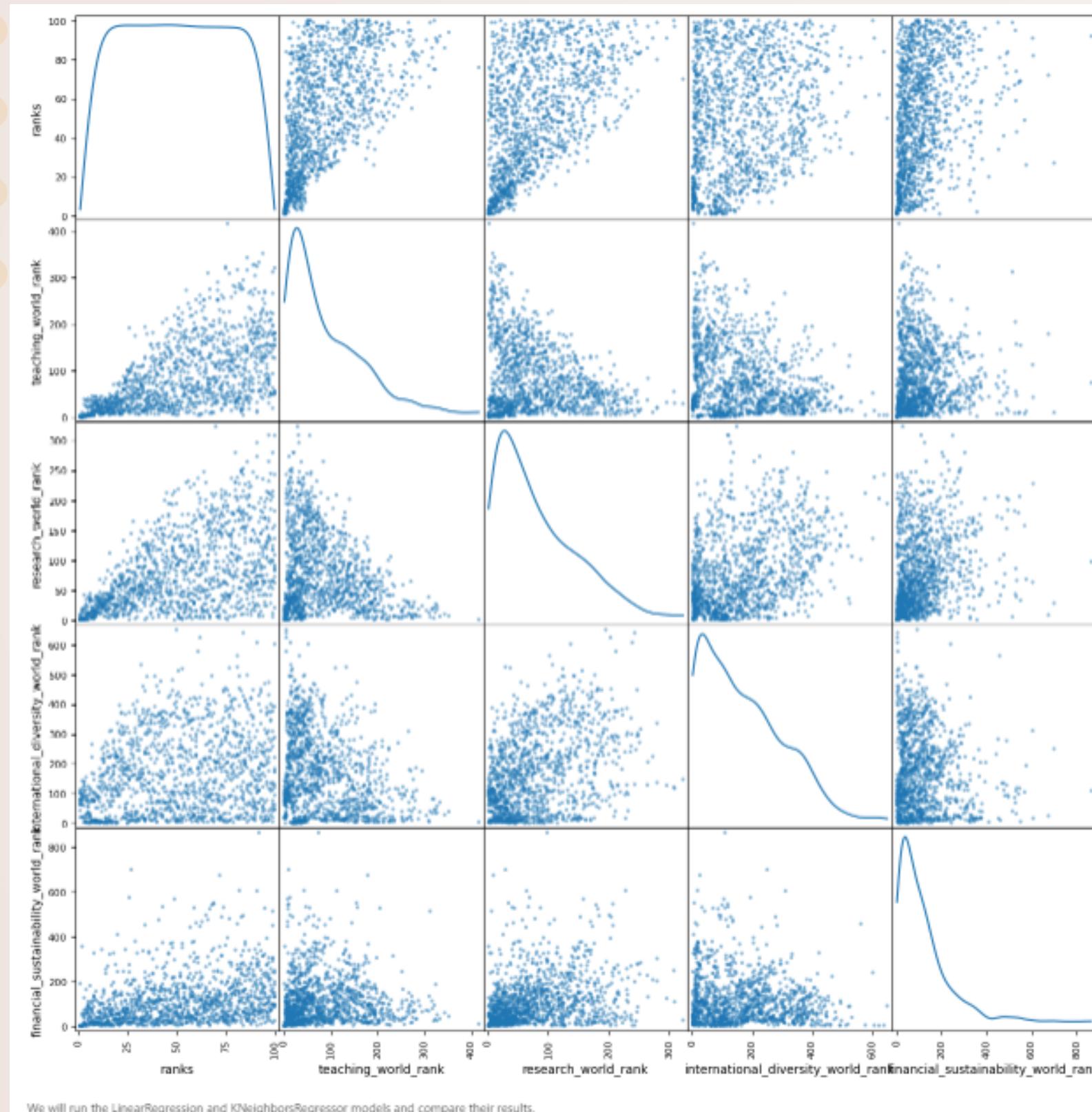
Top 10 Average Ranking Universities and Their Best and Worst Rank



האוניברסיטאות שהגיעו למחשת הדירוגים הגבוהים ביותר



למידת מכונה



We will run the LinearRegression and KNeighborsRegressor models and compare their results.

עמודת המטרה - משתנה רציף

בעירית רגסיה
רגסיה ליניארית
knn regressor

למידת מכונה

gresiah LINIAH

```
def linear_reg(data,target):
    X_train, X_test, y_train, y_test = split_x_y(data,target)
    scaler = StandardScaler()
    scaler.fit(X_train)
    X_train = scaler.transform(X_train)
    X_test = scaler.transform(X_test)
    model = LinearRegression()
    model.fit(X_train, y_train)
    y_pred = model.predict(X_test)
    mse = mean_squared_error(y_test,y_pred)
    rmse = np.sqrt(mse)
    print("linear, rmse:",rmse)
    print("linear, train score: ",model.score(X_train,y_train))
    print("linear, test score: ",model.score(X_test,y_test))
```

```
linear, rmse: 6.702164481330533
linear, train score: 0.9525301827766344
linear, test score: 0.9457208584189793
```

knn regressor

```
def KNN(data,target):
    X_train, X_test, y_train, y_test=split_x_y(data,target)
    scaler = StandardScaler()
    scaler.fit(X_train)
    X_train = scaler.transform(X_train)
    X_test = scaler.transform(X_test)
    rmse_val = []
    score_train = []
    score_test = []
    for K in range(20):
        K = K+1
        model = neighbors.KNeighborsRegressor(n_neighbors = K)

        model.fit(X_train, y_train)
        pred=model.predict(X_test)
        error = np.sqrt(mean_squared_error(y_test,pred))
        rmse_val.append(error)
        score_train.append(model.score(X_train,y_train))
        score_test.append(model.score(X_test,y_test))
    print("knn, rmse: ",min(rmse_val))
    k_best_ind=rmse_val.index(min(rmse_val))
    print("knn, train score: ",score_train[k_best_ind])
    print("knn, test score: ",score_test[k_best_ind])
```

```
knn, rmse: 11.641396625174119
knn, train score: 0.9599694249294498
knn, test score: 0.8362380583296212
```

סיכום

- על מנת לענות על שאלת המחקר ביצענו ניקוי נחוניים, ויזואלייזציה וניתוח נתונים מתקדם. בשלב למדת המכונה, הגיעו למסקנה שניתן לחזות בצורה טובה מאוד את 100 האוניברסיטאות הטובות ביותר בעולם.



מסקנות

- מתוך 170 אוניברסיטאות 73 מאירופאה ו 59 מאחר"ב.
- רוב האוניברסיטאות הן ציבוריות - 72%.
- רישום אוניברסיטאות בולטות בהישגיהן כמו Harvard, California, Stanford ועוד ניתן להסיק מכך שהסטודנטים שליהן להיות בראשים גם בשנים הבאות גבוהים.