The Future of .NET

Really…

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Our trip today

A study on programming languages taught in the classroom

Evaluations of language usage

Businesses and .NET

The Future

A Study on Programming Languages Taught in the Classroom

You make it sound so important...

The Sample and Response

- U.S.
  - Tier 1 Universities
  - Regional Universities
  - Local Universities
  - Community/Junior Colleges
  - Code Camps (>2 locations)

- World
  - Tier 1 Universities
  - Major Regional Universities

Class	# Sent	# Returned	% Returned
US Universities	223	95	43%
US Colleges	76	34	45%
US Code Camps	43	11	26%
World Universities	117	42	36%
Total	459	182	40%

The .NET Related Questions

- Do you use C# or F# in your introductory programming classes?

- Do you use C# or F# in your intermediate programming classes?

- Do you use C# or F# in your advanced programming classes?

The "Control" Questions

- Do you use Java in your introductory programming classes?

- Do you use Java in your intermediate programming classes?

- Do you use Java in your advanced programming classes?

- Do you use C/C++ in your introductory programming classes?

- Do you use C/C++ in your intermediate programming classes?

- Do you use C/C++ in your advanced programming classes?

Do you use C# or F# in your introductory programming classes?

Response	US Univs	US Colleges	US Code Camps	World Univs	Total #	Total %
Yes	0	3	4	0	7	3.8%
No	74	18	7	35	134	73.6%
I Don't Know	11	9	0	6	26	14.3%
Blank	10	4	0	1	15	8.2%
Total	95	34	11	42	182	100%

Do you use Java in your introductory programming classes?

Response	US Univs	US Colleges	US Code Camps	World Univs	Total #	Total %
Yes	10	11	1	7	29	15.9%
No	63	21	10	31	125	68.7%
I Don't Know	15	1	0	1	17	9.3%
Blank	7	1	0	3	11	6.0%
Total	**95**	**34**	**11**	**42**	**182**	**100%**

Do you use C/C++ in your introductory programming classes?

Response	US Univs	US Colleges	US Code Camps	World Univs	Total #	Total %
Yes	14	8	0	10	32	17.6%
No	71	23	11	23	128	70.3%
I Don't Know	6	3	0	5	14	7.7%
Blank	4	0	0	4	8	4.4%
Total	**95**	**34**	**11**	**42**	**182**	**100%**

Introductory Class Languages

Responders	C# / F#	Java	C/C++	None of These
US Universities	0	10	14	31
US Colleges	3	11	8	2
US Code Camps	4	1	0	6
World Universities	0	7	10	15
Total	**7**	**29**	**32**	**54**

Intermediate Class Languages

Responders	C# / F#	Java	C/C++	None of These
US Universities	2	13	15	23
US Colleges	5	8	9	2
US Code Camps	7	3	0	1
World Universities	5	11	12	9
Total	**19**	**35**	**36**	**43**
Introductory	**7**	**29**	**32**	**54**

Advanced Class Languages

Responders	C# / F#	Java	C/C++	None of These
US Universities	2	13	15	15
US Colleges	5	8	9	0
US Code Camps	7	3	0	1
World Universities	5	11	14	5
Total	**19**	**35**	**38**	**21**
Intermediate	**19**	**35**	**36**	**43**
Introductory	**7**	**29**	**32**	**54**

Conclusions

Out of these options, .NET languages are the least taught in colleges and universities, with C\C++ being the most often taught

.NET is taught 2.5x more in intermediate and advanced classes than in introductory classes

Not really shown in the way this data is presented, but Java and C\C++ are occasionally both taught together, and .NET languages were never listed as being with another one of these languages

Code camps are much more likely to teach C#\F# than teach either Java or C\C++

Intermediate and Advanced course language usage is basically identical

Other Interesting Questions

- Are the decisions about language institutional or by each instructor?

- Do students have a choice in the language(s) they use for projects or other work?

- What other languages do you teach in multiple classes?
  - JavaScript
  - Python
  - Haskell
  - Go \ Golang
  - Ruby
  - PHP

Are the decisions about language institutional or by each instructor?

Response	US Univs	US Colleges	US Code Camps	World Univs	Total #	Total %
Institutional	61	21	11	18	111	61.0%
Instructor	7	5	0	17	29	15.9%
I Don't Know	8	7	0	3	18	9.9%
Blank	19	1	0	4	24	13.2%
Total	**95**	**34**	**11**	**42**	**182**	**100%**

Do students have a choice in the language(s) they use for projects or other work?

Response	US Univs	US Colleges	US Code Camps	World Univs	Total #	Total %
Yes	8	15	0	11	34	18.7%
No	73	16	11	18	118	64.8%
I Don't Know	8	3	0	10	21	11.5%
Blank	8	3	0	10	21	11.5%
Total	**95**	**34**	**11**	**42**	**182**	**100%**

What other languages do you teach in multiple classes?

Response	US Univs	US Colleges	US Code Camps	World Univs	Total #	Total % (182 respondents)
JavaScript	3	8	11	14	36	19.8%
Python	83	28	11	37	159	87.4%
Haskell	0	3	0	2	5	2.7%
Go \ Golang	2	3	0	4	9	4.9%
Ruby	0	0	1	0	1	0.5%
PHP	0	1	2	2	5	2.7%
Total Surveyed	**95**	**34**	**11**	**42**	-	-

Conclusions

Most of the decisions about languages being taught are by the institution, instructor and students have little say other than taking a language-specific course

Python is, by far, the most taught language

JavaScript is taught slightly less often than C\C++ but more than Java

Every Code Camp teaches both Python and JavaScript

Evaluations of Language Usage

Meh, School – What about the real world?

Different Approaches

- TIOBE Programming Community Index

- PYPL PopularitY of Programming Languages Index

- Stack Overflow Developers Survey

- IEEE Spectrum Index

TIOBE – February 2022

Feb 2022	Feb 2021	Change		Programming Language	Ratings	Change
1	3	^		Python	15.33%	+4.47%
2	1	v		C	14.08%	-2.26%
3	2	v		Java	12.13%	+0.84%
4	4			C++	8.01%	+1.13%
5	5			C#	5.37%	+0.93%
6	6			Visual Basic	5.23%	+0.90%
7	7			JavaScript	1.83%	-0.45%
8	8			PHP	1.79%	+0.04%
9	10	^		Assembly language	1.60%	-0.06%
10	9	v		SQL	1.55%	-0.18%

PYPL – February 2022

Rank	Change	Language	Share	Trend
1		Python	28.52 %	-1.7 %
2		Java	18.12 %	+1.2 %
3		JavaScript	8.9 %	+0.4 %
4	↑	C/C++	7.62 %	+1.1 %
5	↓	C#	7.39 %	+0.6 %
6		PHP	5.81 %	-0.3 %
7		R	4.04 %	+0.2 %
8		Objective-C	2.46 %	-1.1 %
9		Swift	2.03 %	+0.0 %
10		TypeScript	1.94 %	+0.2 %

Change and trend is based upon the difference from 2021 results
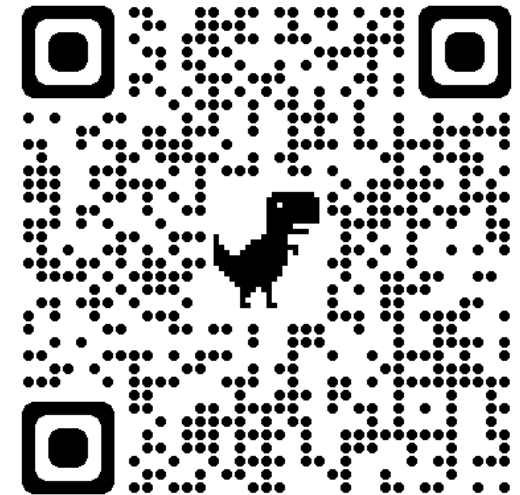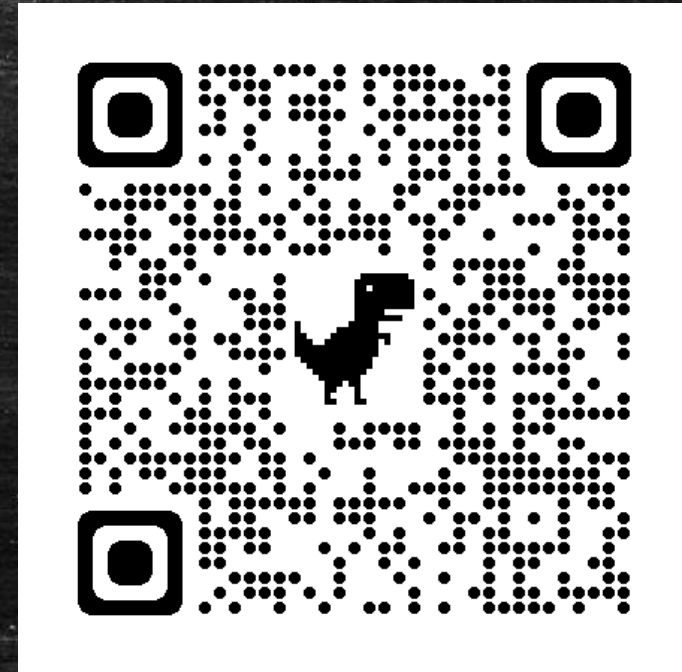
Stack Overflow – May 2021
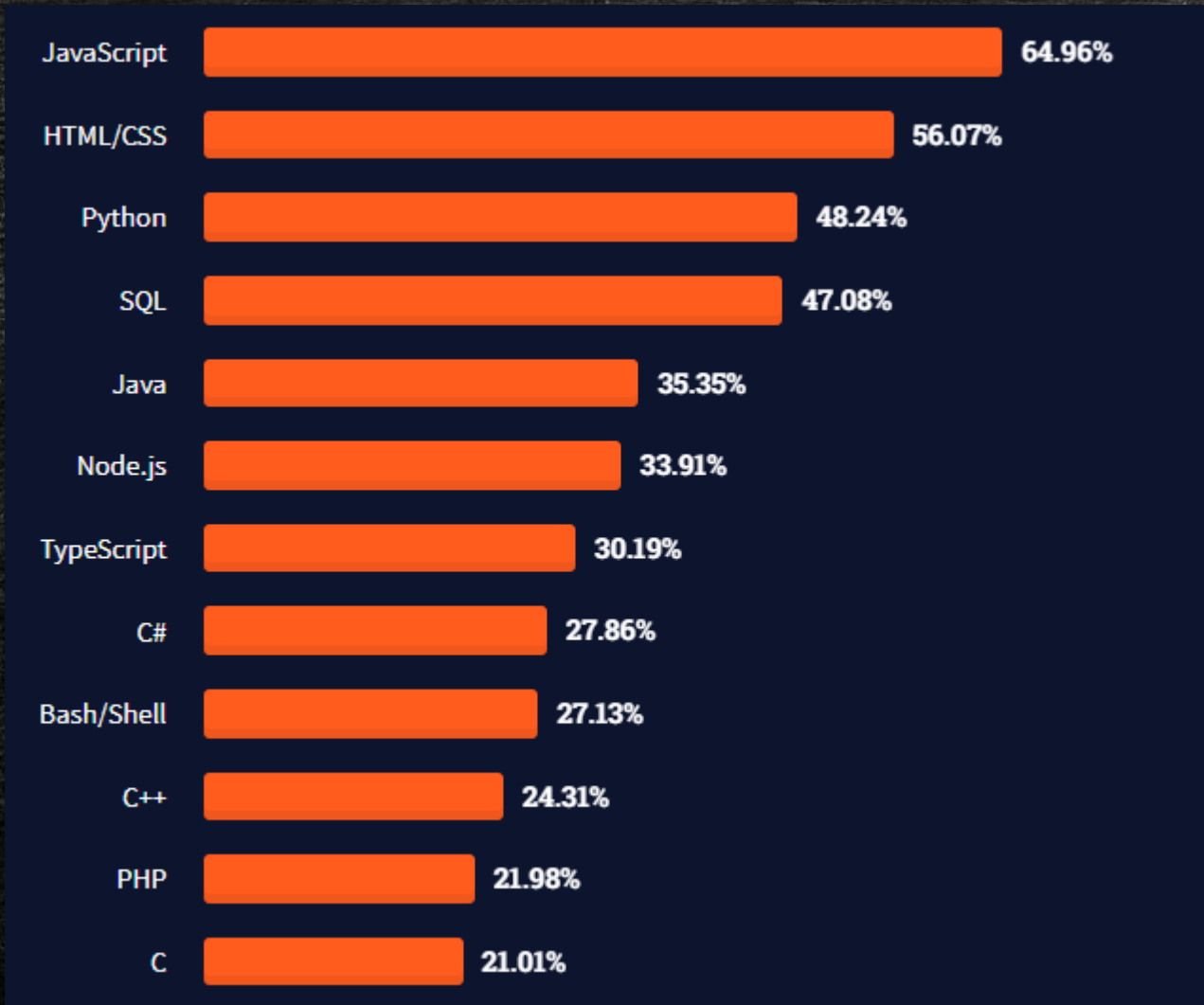
Survey with 83,052 responses

Language	Percentage
JavaScript	64.96%
HTML/CSS	56.07%
Python	48.24%
SQL	47.08%
Java	35.35%
Node.js	33.91%
TypeScript	30.19%
C#	27.86%
Bash/Shell	27.13%
C++	24.31%
PHP	21.98%
C	21.01%
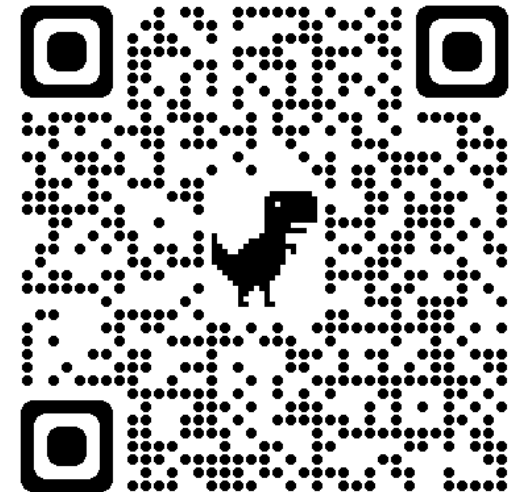
IEEE Spectrum - August 2021

Rank	Language	Type				Score
1	Python˅	🌐		🖥	⚙	100.0
2	Java˅	🌐	📱	🖥		95.4
3	C˅		📱	🖥	⚙	94.7
4	C++˅		📱	🖥	⚙	92.4
5	JavaScript˅	🌐				88.1
6	C#˅	🌐	📱	🖥	⚙	82.4
7	R˅			🖥		81.7
8	Go˅	🌐		🖥		77.7
9	HTML˅	🌐				75.4
10	Swift˅		📱	🖥		70.4

Conclusions

Python is generally agreed upon as the most popular language

Combining C and C++ give similar results to what we saw in the schools

Java and JavaScript are also more popular than C#

C# is generally about 4th to 5th most popular

Business and .NET

Ok, who's got the Benjamin's

The Process

Identified a mix of small, medium, and large companies

Evaluate open developer job positions from the company's job site

- .NET
- Java
- C \ C++

Reviewed jobs every 2 weeks for 10 weeks

Average Postings per Company per 2-Week Cycle

Responders	.NET	Java	C/C++
US Small Businesses	0.8	0.4	0.0
US Mid-size Businesses	3.0	2.1	0.9
US Large Businesses	11.1	16.3	5.1
Intl Businesses	9.5	13.1	4.9

The Future of .NET

All right smart guy, what does this all mean?

What Can We Tell From This?

.NET does not seem to be going away anytime soon

There is no definitive source of .NET usage

Business usage is far superior to educational usage

Is it safe to use .NET on a greenfield project?

Is it safe to use .NET on a greenfield project?

What are your thoughts?

QA

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