

Case Example 6:

Programming Languages

For reasons that are mainly sociological, the software industry now has over 3,000 programming languages. SRM supports sizing and estimating for 89 of the most common languages, including combinations such as Java and HTML or Ruby and SQL.

This example shows three languages. One is COBOL, a low-level programming language. The second is Java, a mid-level programming language. The third is Objective-C, a high-level language used by Apple for all of their software.

The concept of “language levels” was first quantified by IBM circa 1973. The original definition was the number of assembly language statements needed to produce one statement in a target language. For example Java is a “level 6” language because it takes about 6 assembly statements to create the functionality of 1 Java statements. After IBM developed function point metrics the definition of language levels was expanded to source code statements per function point.

Total code size		106,667	53,333	26,667	
Activity Staffing					
Requirements		2.41	2.29	2.13	
Design		3.44	3.26	3.00	
Coding		12.90	6.50	3.28	Code staff relates to language levels
Testing		11.44	5.79	2.95	Test staff relates to language levels
Documentation		1.45	1.40	1.31	
Quality Assurance		1.26	1.22	1.15	
Management		1.37	1.31	1.24	
Totals		11.35	6.82	4.55	
Activity Effort Months					
Requirements		11.01	10.32	9.34	
Design		15.59	14.62	13.24	
Coding		98.73	44.17	19.30	Code effort relates to language levels
Testing		68.08	32.47	15.65	Test effort relates to language levels
Documentation		3.40	3.19	2.89	
Quality Assurance		4.25	3.99	3.61	
Management		14.97	14.03	12.71	
Totals		216.04	122.77	76.74	
Activity \$ Costs					
Requirements		\$110,065	\$103,175	\$93,446	
Design		\$155,925	\$146,164	\$132,381	
Coding		\$987,321	\$441,680	\$193,033	Code cost relates to language levels
Testing		\$680,836	\$324,650	\$156,472	Test cost relates to language levels
Documentation		\$34,020	\$31,890	\$28,883	

11	Chill	106.67	3.00		
12	COBOL	106.67	3.00		
13	Coral	106.67	3.00		
14	Fortran	106.67	3.00		
15	Jovial	106.67	3.00		
16	GW Basic	98.46	3.25		
17	Pascal	91.43	3.50		
18	PL/S	91.43	3.50		
19	ABAP	80.00	4.00		
20	Modula	80.00	4.00		
21	PL/I	80.00	4.00		
22	ESPL/I	71.11	4.50		
23	Javascript	71.11	4.50		
24	Basic (interprete	64.00	5.00		
25	Forth	64.00	5.00		
26	haXe	64.00	5.00		
27	Lisp	64.00	5.00		
28	Prolog	64.00	5.00		
29	SH (shell scripts	64.00	5.00		
30	Quick Basic	60.95	5.25		
31	Zimbu	58.18	5.50		
32	C++	53.33	6.00		
33	Go	53.33	6.00		
34	Java	53.33	6.00		
35	PHP	53.33	6.00		
36	Python	53.33	6.00		
37	C#	51.20	6.25		
38	X10	51.20	6.25		
39	Ada 95	49.23	6.50		
40	Ceylon	49.23	6.50		
41	Fantom	49.23	6.50		
42	Dart	47.41	6.75		
43	RPG III	47.41	6.75		
44	CICS	45.71	7.00		

45	DTABL	45.71	7.00		
46	F#	45.71	7.00		
47	Groovy	45.71	7.00		
48	Ruby	45.71	7.00		
49	Simula	45.71	7.00		
50	ColdFusion	42.67	7.50		
51	Erlang	42.67	7.50		
52	DB2	40.00	8.00		
53	LiveScript	40.00	8.00		
54	Oracle	40.00	8.00		
55	R	40.00	8.00		
56	Elixir	37.65	8.50		
57	Haskell	37.65	8.50		
58	Mixed Language	37.65	8.50		
59	Ruby on Rails	37.65	8.50		
60	Julia	35.56	9.00		
61	M	35.56	9.00		
62	OPA	35.56	9.00		
63	Perl	35.56	9.00		
64	APL	32.00	10.00		
65	Delphi	29.09	11.00		
66	Matlab	26.67	12.00		
67	Objective C	26.67	12.00		
68	Swift	26.67	12.00		
69	Visual Basic	26.67	12.00		
70	ASP NET	24.62	13.00		
71	Visual J++	24.62	13.00		
72	Eiffel	22.86	14.00		
73	WebDNA	22.86	14.00		
74	Smalltalk	21.33	15.00		
75	IBM ADF	20.00	16.00		
76	MUMPS	18.82	17.00		
77	Forte	17.78	18.00		
78	APS	16.84	19.00		

79	TELON	16.00	20.00		
80	Mathematica9	12.80	25.00		
81	QBE	12.80	25.00		
82	SQL	12.80	25.00		
83	TranscriptSQL	12.80	25.00		
84	X	12.80	25.00		
85	Mathematica 10	9.14	35.00		
86	BPM	7.11	45.00		
87	Generators	7.11	45.00		
88	Excel	6.40	50.00		
89	IntegraNova	5.33	60.00		
	Average	99.10	10.42		