September Company Co	Model	Language	Technique 1	Technique 2	OR	p-value
Taylor Character 19 S. Character 19 S. Character 19		R	Fine-tuning – Code Generation			<0.001 <0.001
Och Baller 1 10. March 1000 Controlled State	DeepSeek Coder 33B	R	Baseline	Fine-tuning – Code Generation	1.61	<0.001 <0.001 0.805
Speech S				Baseline	1.21	0.001 < 0.001
Content	-					$\substack{<0.001 \\ <0.001}$
Company	Code Llama 13B	Racket	Fine-tuning – Code Generation	Baseline	2.78	< 0.001 < 0.001
Section Sect	DeepSeek Coder 7B	R	In-context Learning – Few-shot Examples	Baseline	1.17	0.629 0.012
Charles Char	Code Llama 7B	\mathbf{R}	In-context Learning – Few-shot Examples	Baseline	1.13	0.087
September Sept	GitHub Copilot	\mathbf{R}	In-context Learning – Few-shot Examples	Baseline	1.65	< 0.001
Prof. Prof	DeepSeek Coder 7B	Racket	In-context Learning – Few-shot Examples	Baseline	1.80	< 0.001
STATE Company Compan	Code Llama 7B	Racket	In-context Learning – Few-shot Examples	Baseline	1.71	< 0.001
Section 1978 2	GitHub Copilot	Racket	In-context Learning – Few-shot Examples	Baseline	1.18	0.059
Contact Normal Cont	DeepSeek Coder 7B	\mathbf{R}	In-context Learning – Translation Rules	Baseline	1.05	0.508
Common	Code Llama 7B	R	Baseline	In-context Learning – Translation Rules	1.34	< 0.001
Displace 15	GitHub Copilot	\mathbf{R}	In-context Learning – Translation Rules	Baseline	1.08	0.508
March Marc	DeepSeek Coder 7B	Racket	Baseline	In-context Learning – Translation Rules	1.04	0.508
College Coll	Code Llama 7B		Baseline	In-context Learning – Translation Rules	1.03	$0.775 \\ 0.116$
Supplied Supplied Supplied Supplied Supplied Suppli						0.508
Section 1. Company	DeepSeek Coder 7B	\mathbf{R}		Baseline	1.38	$< 0.001 \\ < 0.001$
Despite Action 15 Stock Committee Lamping - Transplant Catagog C						$< 0.001 \\ < 0.001$
September Sept	-					$< 0.001 \\ 0.003$
Secretary Secr						< 0.001 < 0.001
Deposits Cheer 2011 Company Co	Code Llama 13B	Racket	In-context Learning – Translation Examples	Baseline	1.28	0.001 <0.001
Despite Color 19 10 10 10 10 10 10 10	DeepSeek Coder 1B	R	Pre-training & Fine-tuning – Code Translation and Generation	Baseline	1.28	0.531 <0.001
Section Sect	DeepSeek Coder 33B	R	Baseline	Pre-training & Fine-tuning – Code Translation and Generation	1.53	<0.001 <0.001
Decided Code 17	Code Llama 13B	\mathbf{R}	Baseline	Pre-training & Fine-tuning – Code Translation and Generation	1.06	0.044
Content 17. Content Conten	DeepSeek Coder 7B	Racket	Pre-training & Fine-tuning – Code Translation and Generation	Baseline	2.18	<0.001 <0.001
Image: Content of the Content of t	Code Llama 7B	Racket	Pre-training & Fine-tuning – Code Translation and Generation	Baseline	4.76	<0.001 <0.001
Depoiled (1988) R. December of Francisco and Controlled (1989) R. Proceedings of Proceedings of Procedings of Proc	DeepSeek Coder 1B	R	Fine-tuning – Code Generation	Pre-training & Fine-tuning – Code Translation and Generation	1.38	< 0.001
Cach Burst 188	DeepSeek Coder 33B	\mathbf{R}	Pre-training & Fine-tuning – Code Translation and Generation	Fine-tuning – Code Generation	1.08	0.237
Depote Caper The Caper	Code Llama 13B	R	Fine-tuning – Code Generation	Pre-training & Fine-tuning – Code Translation and Generation	1.46	< 0.001
Code Description Code Temperature Code Transmittion and Grounding Code Temperature Code Temperature Code Committee Code Cod	DeepSeek Coder 7B	Racket	Fine-tuning – Code Generation	Pre-training & Fine-tuning – Code Translation and Generation	1.44	< 0.001
Incorporate Carbon 1	Code Llama 7B	Racket	Fine-tuning – Code Generation	Pre-training & Fine-tuning – Code Translation and Generation	1.79	< 0.001
Despite Code 100	DeepSeek Coder 1B	R	Fine-tuning – Code Generation	In-context Learning – Few-shot Examples	1.69	< 0.001
Carlo Horse 1871	DeepSeek Coder 33B	\mathbf{R}	In-context Learning – Few-shot Examples	Fine-tuning – Code Generation	3.06	< 0.001
December Code Linear III Code Contraction Code Contraction Code Linear III Code Contraction Code Contraction Code Contraction Code	Code Llama 13B	\mathbf{R}	In-context Learning – Few-shot Examples	Fine-tuning – Code Generation	1.48	< 0.001
Despite Content February February Code Content Content Code C	DeepSeek Coder 7B	Racket	Fine-tuning – Code Generation	In-context Learning – Few-shot Examples	1.90	<0.001 <0.001
Despekts Cacher 18	Code Llama 7B	Racket	Fine-tuning – Code Generation	In-context Learning – Few-shot Examples	5.75	$< 0.001 \\ < 0.001$
Code Lama 13	-		Pre-training & Fine-tuning – Code Translation and Generation	In-context Learning – Few-shot Examples		<0.001 <0.001
Despite Code 10	-		In-context Learning – Few-shot Examples	Pre-training & Fine-tuning – Code Translation and Generation	2.79	< 0.001 0.629
Decision Content Lorential France Lorential	${\bf DeepSeek~Coder~1B}$	Racket	Pre-training & Fine-tuning – Code Translation and Generation	In-context Learning – Few-shot Examples	5.76	< 0.001 < 0.001
Code Dempires Code Territoria & Fine-tuning - Code Translation and Generation Fee-chain & Recognity 158 2000	DeepSeek Coder 33B	Racket	In-context Learning – Few-shot Examples	Pre-training & Fine-tuning – Code Translation and Generation	2.47	< 0.001 < 0.001
DeepSeal Coder 7 18	Code Llama 13B	Racket	Pre-training & Fine-tuning – Code Translation and Generation	In-context Learning – Few-shot Examples	1.98	< 0.001
Code Linan 718	DeepSeek Coder 7B	R	In-context Learning – Translation Rules	Fine-tuning – Code Generation	1.41	< 0.001
DeepSeck Coder 17	Code Llama 7B	R	Fine-tuning – Code Generation	In-context Learning – Translation Rules	1.21	0.001
Despite Code 1317 Radet	${\bf DeepSeek~Coder~1B}$	Racket	Fine-tuning – Code Generation	In-context Learning – Translation Rules	9.35	< 0.001
Code Lama 138	DeepSeek Coder 33B	Racket	In-context Learning – Translation Rules	Fine-tuning – Code Generation	2.03	< 0.001
Despised Coder 3B R	Code Llama 13B	Racket	Fine-tuning – Code Generation	In-context Learning – Translation Rules	3.10	< 0.001
Code Lamar 18	DeepSeek Coder 7B	\mathbf{R}	In-context Learning – Few-shot Examples	In-context Learning – Translation Rules	1.10	0.103
Girth Copies Fig. Recent	Code Llama 7B	R	In-context Learning – Few-shot Examples	In-context Learning – Translation Rules	1.42	< 0.001
Despeck Coder 71	GitHub Copilot	R	In-context Learning – Few-shot Examples	In-context Learning – Translation Rules	1.56	< 0.001
Code Llama T8	DeepSeek Coder 7B	Racket	In-context Learning – Few-shot Examples	In-context Learning – Translation Rules	1.72	<0.001 0.475
Gill Hu Copilot R	Code Llama 7B Code Llama 13B	Racket Racket	In-context Learning – Few-shot Examples	In-context Learning – Translation Rules	1.58 1.06	< 0.001 0.475
DeepSeek Coder 78 R Incontext Learning - Translation Examples Incontext Learning - Translation Rules 1.57	GitHub Copilot	Racket	In-context Learning – Few-shot Examples	In-context Learning – Translation Rules	1.23	0.009 0.277
Code Llama Tilb R In-context Learning - Translation Examples In-context Learning - Translation Rules In-context Learning - Translation Examples In-context Learning - Translation Rules In-context Learning - Transl	DeepSeek Coder 7B DeepSeek Coder 33B	R R	In-context Learning – Translation Examples In-context Learning – Translation Examples	In-context Learning – Translation Rules In-context Learning – Translation Rules	$1.28 \\ 1.57$	$\substack{<0.001 \\ <0.001}$
DeepSeck Coder 18 Racket Decontext Learning - Translation Examples DeepSeck Coder 338 Racket Decontext Learning - Translation Examples DeepSeck Coder 338 Racket Decontext Learning - Translation Examples DeepSeck Coder 338 Racket Decontext Learning - Translation Examples DeepSeck Coder 338 Racket Decontext Learning - Translation Examples DeepSeck Coder 338 Racket Decontext Learning - Translation Examples DeepSeck Coder 338 Racket Decontext Learning - Translation Examples DeepSeck Coder 338 Racket Decontext Learning - Translation Racket DeepSeck Coder 338 Racket Decontext Learning - Translation Racket DeepSeck Coder 338 Racket Decontext Learning - Translation Racket DeepSeck Coder 338 Racket DeepSeck Coder 348 Racket Decontext Learning - Translation Racket DeepSeck Coder 348 Racket Decontext Learning - Translation Racket DeepSeck Coder 348	Code Llama 13B	R	In-context Learning – Translation Examples	In-context Learning – Translation Rules	1.31	<0.001 <0.001
DeepSeck Coder 33B Racket In-context Learning - Translation Examples In-context Learning - Translation Rules In-context Learning - Translation Rul	DeepSeek Coder 1B	Racket	In-context Learning – Translation Examples	In-context Learning – Translation Rules	1.79	<0.001 <0.001
Gold Liman 13B Racket In-context Learning - Translation Rules 1.6 0.000 Giffith Copid Racket In-context Learning - Translation Rules 1.15 0.11 DeepSeek Coder 7B R In-context Learning - Translation Rules In-context Learning - In-context	DeepSeek Coder 33B	Racket	In-context Learning – Translation Examples	In-context Learning – Translation Rules	1.06	0.302
DeepSeek Coder TB R	Code Llama 13B	Racket	In-context Learning – Translation Examples	In-context Learning – Translation Rules	1.46	< 0.001
DeepSeek Coder 3B Racket Pre-training & Fine-tuning — Code Translation and Generation Pre-training & Fine-tuning — Code Generation Pre-training — P	DeepSeek Coder 1B	R	Pre-training & Fine-tuning – Code Translation and Generation	In-context Learning – Translation Rules	1.45	< 0.001
DeepSeek Coder 1B Racket Pre-training & Fine-tuning — Code Translation and Generation Pre-training & Fine-tuning — Code Translation and Generation Pre-training & Fine-tuning — Code Translation and Generation Pre-training & Fine-tuning — Code Translation Rules Pre-training & Fine-tuning — Code Generation Pre-training & Fine-tuning — Co	DeepSeek Coder 33B	R	In-context Learning – Translation Rules	Pre-training & Fine-tuning – Code Translation and Generation	2.03	< 0.001
DeepSeek Coder 7B Racket Pre-training & Fine-tuning - Code Translation Rules 1-91	Code Llama 13B	\mathbf{R}	In-context Learning – Translation Rules	Pre-training & Fine-tuning – Code Translation and Generation	1.38	<0.001 <0.001 <0.001
Code Llama 7B Code Llama 13B Racket Pre-training & Fine-tuning — Code Translation and Generation DeepSeck Coder 1B R Fine-tuning — Code Generation In-context Learning — Translation Examples In-cont	DeepSeek Coder 7B	Racket	Pre-training & Fine-tuning – Code Translation and Generation	In-context Learning – Translation Rules	1.91	<0.001 <0.001 <0.001
DeepSeek Coder 1B R Fine-tuning - Code Generation In-context Learning - Translation Examples In-context	Code Llama 7B	Racket	Pre-training & Fine-tuning – Code Translation and Generation	In-context Learning – Translation Rules	4.33	<0.001 <0.001 <0.001
DeepSeek Coder 13B R In-context Learning — Translation Examples Fine-tuning — Code Generation 1.33 0.000	DeepSeek Coder 1B	R	Fine-tuning – Code Generation	In-context Learning – Translation Examples	1.71	<0.001 <0.001 <0.001
DeepSeek Coder 1B Racket Fine-tuning - Code Generation Code Generation In-context Learning - Translation Examples In-context Learning - Translation Examples Code Code Translation Examples Code Generation In-context Learning - Translation Examples Code Code Translation Examples Code Generation In-context Learning - Translation Examples Code Generation In-context Learning - Translation Examples Code Generation Code Generation In-context Learning - Translation Examples Code Code Ilama 13B Racket Fine-tuning - Code Generation In-context Learning - Translation Examples Code Ilama 13B Racket In-context Learning - Translation Examples In-context	DeepSeek Coder 33B Code Llama 7B	R R	In-context Learning – Translation Examples In-context Learning – Translation Examples	Fine-tuning – Code Generation Fine-tuning – Code Generation	2.95	$\begin{array}{c} < \! 0.001 \\ < \! 0.001 \end{array}$
DeepSeek Coder 7B Racket Fine-tuning - Code Generation In-context Learning - Translation Examples 2.31 <0.000	Code Llama 13B	R Racket	In-context Learning – Translation Examples Fine-tuning – Code Generation	Fine-tuning – Code Generation	$\begin{array}{c} 1.35 \\ 6.15 \end{array}$	$< 0.001 \\ < 0.001$
Code Llama 13B Racket Fine-tuning - Code Generation In-context Learning - Translation Examples 1.08 0.001	DeepSeek Coder 7B DeepSeek Coder 33B	Racket Racket	Fine-tuning – Code Generation In-context Learning – Translation Examples	In-context Learning – Translation Examples Fine-tuning – Code Generation	$2.31 \\ 2.17$	$\begin{array}{c} < \! 0.001 \\ < \! 0.001 \end{array}$
DeepSeek Coder 7B R In-context Learning – Translation Examples In-context Learning – Few-shot Examples In-context Learning – Translation Examples In-context Learning & Fine-tuning – Code Translation and Generation In-context Learning & Fine-tuning – Translation Examples In-context Learning & Fine-tuning – Code Translation and Generation In-context Learning – Translation Examples In-context Learning – Translat	Code Llama 13B	Racket	Fine-tuning – Code Generation	In-context Learning – Translation Examples	2.29	<0.001 <0.001
Code Llama 7B Code Llama 13B R In-context Learning – Few-shot Examples In-context Learning – Few-shot Examples In-context Learning – Few-shot Examples In-context Learning – Translation Examples In-	DeepSeek Coder 7B	R	In-context Learning – Translation Examples	In-context Learning – Few-shot Examples	1.17	0.416 0.018
GitHub Copilot R Racket In-context Learning – Few-shot Examples In-context Learning – Translation Examples 1.32 0.018 DeepSeek Coder 7B Racket In-context Learning – Few-shot Examples In-context Learning – Translation Examples 1.32 0.018 DeepSeek Coder 33B Racket In-context Learning – Translation Examples 1.34 0.000 Code Llama 7B Racket In-context Learning – Translation Examples 1.00 0.000 Code Llama 13B Racket In-context Learning – Few-shot Examples 1.00 0.000 DeepSeek Coder 1B R Pre-training & Fine-tuning – Code Translation Examples 1.000 DeepSeek Coder 7B Racket In-context Learning – Translation Examples 1.000 Code Llama 13B Racket In-context Learning – Translation Examples 1.000 DeepSeek Coder 7B Racket In-context Learning – Translation Examples 1.000 DeepSeek Coder 1B Racket In-context Learning – Translation Examples 1.000 DeepSeek Coder 1B Racket In-context Learning – Translation Examples 1.000 DeepSeek Coder 1B Racket In-context Learning – Translation Examples 1.000 DeepSeek Coder 1B Racket In-context Learning – Translation Examples 1.000 DeepSeek Coder 1B Racket Pre-training & Fine-tuning – Code Translation Examples 1.000 DeepSeek Coder 1B Racket Pre-training & Fine-tuning – Code Translation Examples 1.000 DeepSeek Coder 1B Racket Pre-training & Fine-tuning – Code Translation Examples 1.000 DeepSeek Coder 1B Racket Pre-training & Fine-tuning – Code Translation Examples 1.000 DeepSeek Coder 7B Racket Pre-training & Fine-tuning – Code Translation Examples 1.000 DeepSeek Coder 7B Racket Pre-training & Fine-tuning – Code Translation and Generation 1.000 DeepSeek Coder 7B Racket Pre-training & Fine-tuning – Code Translation Examples 1.000 DeepSeek Coder 7B Racket Pre-training & Fine-tuning – Code Translation Examples 1.000 DeepSeek Coder 7B Racket Pre-training & Fine-tuning – Code Translation Examples 1.000 DeepSeek Coder 7B Racket Pre-training & Fine-tuning – Code Translation Examples 1.000 DeepSeek Coder 7B Racket Pre-training & Fine-tuning – Code Translation Examples 1.000 DeepSeek Coder 7B Racket Pre-trai	Code Llama 7B	R	In-context Learning – Translation Examples	In-context Learning – Few-shot Examples	1.26	<0.001 0.003
DeepSeek Coder 7B Racket In-context Learning – Few-shot Examples In-context Learning – Translation Examples In-context Learning – Translation Examples In-context Learning – Few-shot Examples In-context Learning – Few-shot Examples In-context Learning – Few-shot Examples In-context Learning – Translation Examples In-context Learning – Translation Examples In-context Learning – Few-shot Examples In-context Learning – Translation Examples In-context Learning – Few-shot Examples In-context Learning – Translation Examples In-context Learning & Fine-tuning – Code Translation and Generation In-context Learning – Translation Examples In-context Learning – Translation Ex	GitHub Copilot	\mathbf{R}	In-context Learning – Few-shot Examples	In-context Learning – Translation Examples	1.03	0.087 0.769
Code Llama 7B Racket In-context Learning – Few-shot Examples In-context Learning – Translation Examples In-context Learning – Few-shot Examples In-context Learning – Translation Examples In-context Learning & Fine-tuning & Fine-tun	DeepSeek Coder 7B	Racket	In-context Learning – Few-shot Examples	In-context Learning – Translation Examples	1.37	0.018 <0.001
GitHub Copilot Racket In-context Learning – Few-shot Examples In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation and Generation In-context Learning – Translation and Generation In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation and Generation In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation and Generation In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation and Generation In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation and Generation In-context Learning – Translation Examples In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation Examples In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation Examples In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation Examples In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation and Generation In-context Learning – Translation Examples In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation and Generation In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation and Generation In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation and Generation In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation Examples Pre-training & Fine-tuning – Co	Code Llama 7B	Racket	In-context Learning – Few-shot Examples	In-context Learning – Translation Examples	1.28	0.769 0.046
DeepSeek Coder 7B R In-context Learning - Translation Examples Pre-training & Fine-tuning - Code Translation and Generation DeepSeek Coder 33B R In-context Learning - Translation Examples Pre-training & Fine-tuning - Code Translation and Generation Code Llama 7B R In-context Learning - Translation Examples Pre-training & Fine-tuning - Code Translation and Generation In-context Learning - Translation Examples Pre-training & Fine-tuning - Code Translation and Generation In-context Learning - Translation Examples Pre-training & Fine-tuning - Code Translation and Generation In-context Learning - Translation Examples Pre-training & Fine-tuning - Code Translation and Generation In-context Learning - Translation Examples In-context Learning - Translation Examples Pre-training & Fine-tuning - Code Translation Examples In-context Learning - Translation Examples Pre-training & Fine-tuning - Code Translation Examples In-context Learning - Translation Examples Pre-training & Fine-tuning - Code Translation Examples In-context Learning - Translation Examp	GitHub Copilot	Racket	In-context Learning – Few-shot Examples	In-context Learning – Translation Examples	1.11	0.277
Code Llama 7B R In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation and Generation Code Llama 13B R In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation and Generation DeepSeek Coder 1B Racket Pre-training & Fine-tuning – Code Translation and Generation DeepSeek Coder 7B Racket Pre-training & Fine-tuning – Code Translation and Generation DeepSeek Coder 33B Racket In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation Examples Code Llama 7B Racket Pre-training & Fine-tuning – Code Translation and Generation In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation Examples In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation and Generation In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation Examples In-context Learning – Translation Examples In-contex	DeepSeek Coder 7B	\mathbf{R}	In-context Learning – Translation Examples	Pre-training & Fine-tuning – Code Translation and Generation	1.84	< 0.001
DeepSeek Coder 1B Racket Pre-training & Fine-tuning – Code Translation and Generation DeepSeek Coder 7B Racket DeepSeek Coder 33B Racket Code Llama 7B Racket Pre-training & Fine-tuning – Code Translation Examples In-context Learning – Translation and Generation Pre-training & Fine-tuning – Code Translation and Generation In-context Learning – Translation Examples In-	Code Llama 7B	R	In-context Learning – Translation Examples	Pre-training & Fine-tuning – Code Translation and Generation	1.14	0.032
DeepSeek Coder 33B Racket In-context Learning – Translation Examples Pre-training & Fine-tuning – Code Translation and Generation Code Llama 7B Racket Pre-training & Fine-tuning – Code Translation and Generation In-context Learning – Translation Examples 4.68 < 0.001	DeepSeek Coder 1B	Racket	Pre-training & Fine-tuning – Code Translation and Generation	In-context Learning – Translation Examples	8.94	< 0.001
	DeepSeek Coder 33B	Racket	In-context Learning – Translation Examples	Pre-training & Fine-tuning – Code Translation and Generation	2.67	<0.001 <0.001 <0.001
						<0.001