





The Affects of Structural Code Quality on AI Code Translation

By: Riddhi Thakur

What is AI Code Translation?

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What is AI Code Translation?



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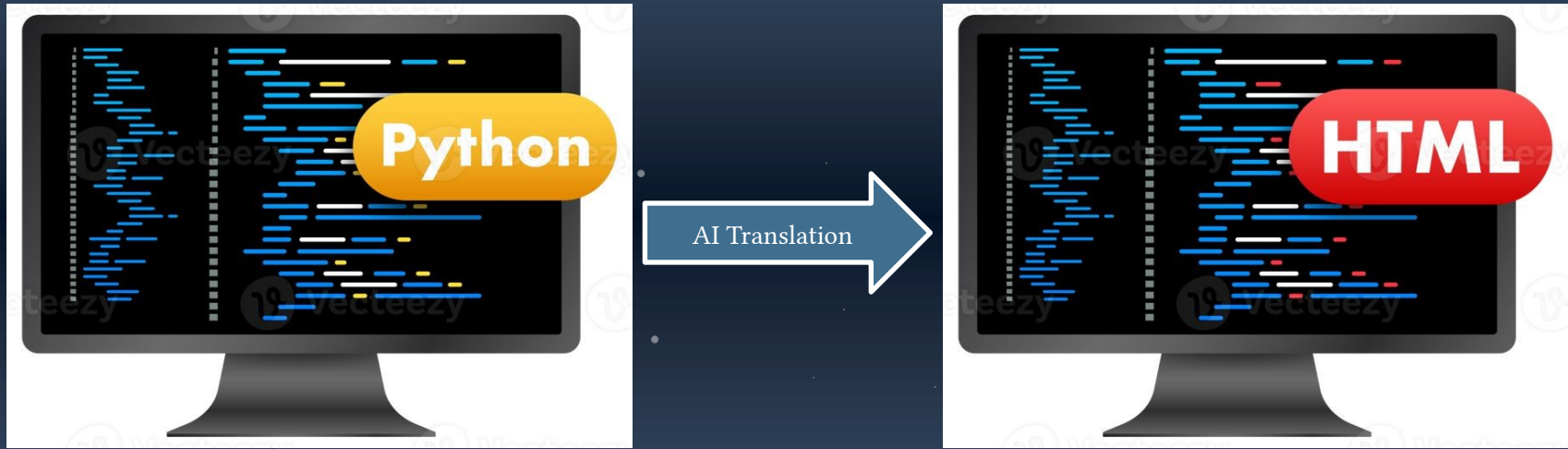
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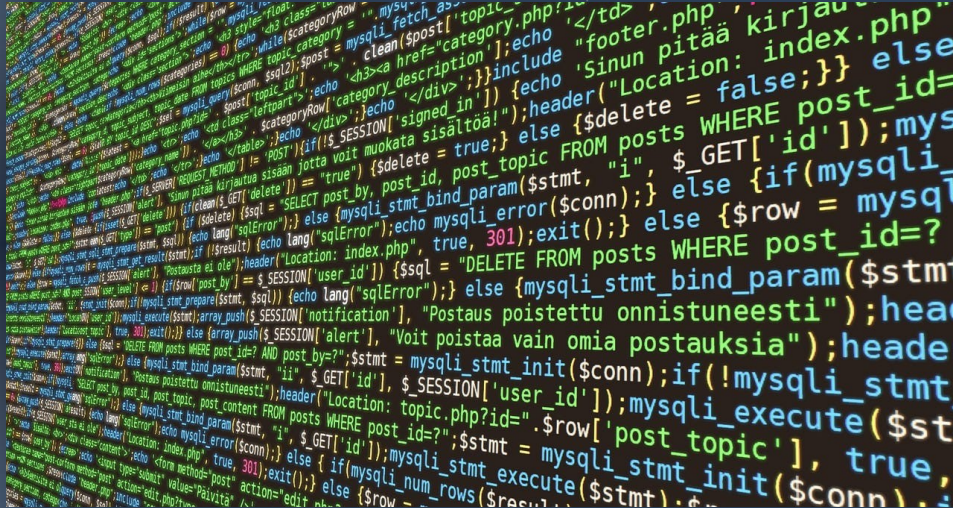
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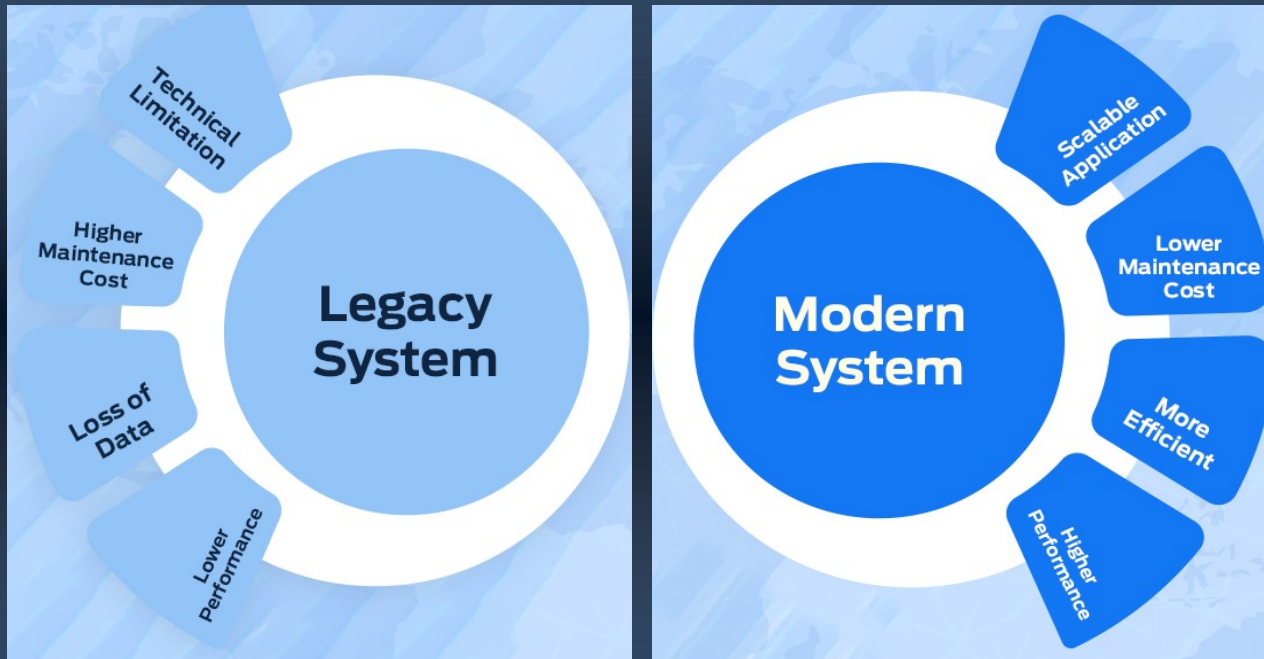
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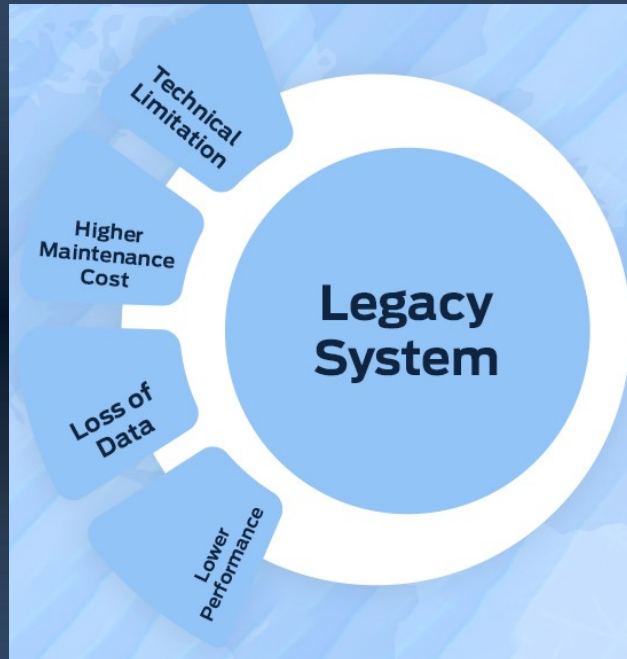
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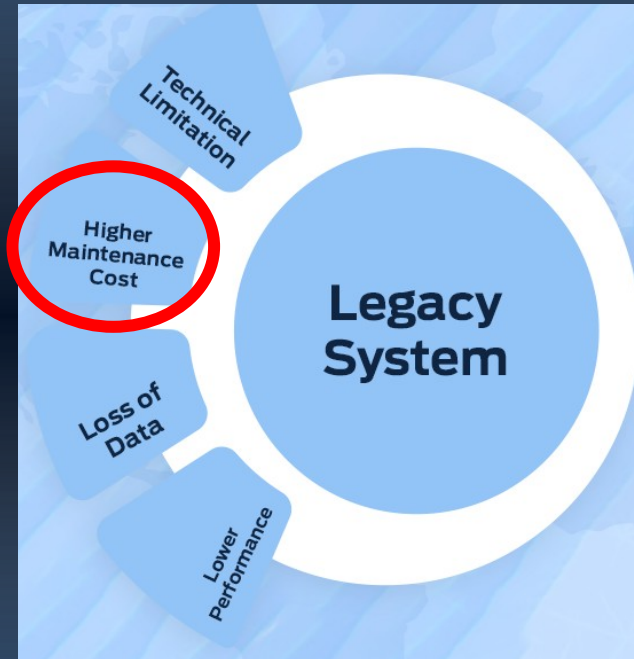
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60-80%

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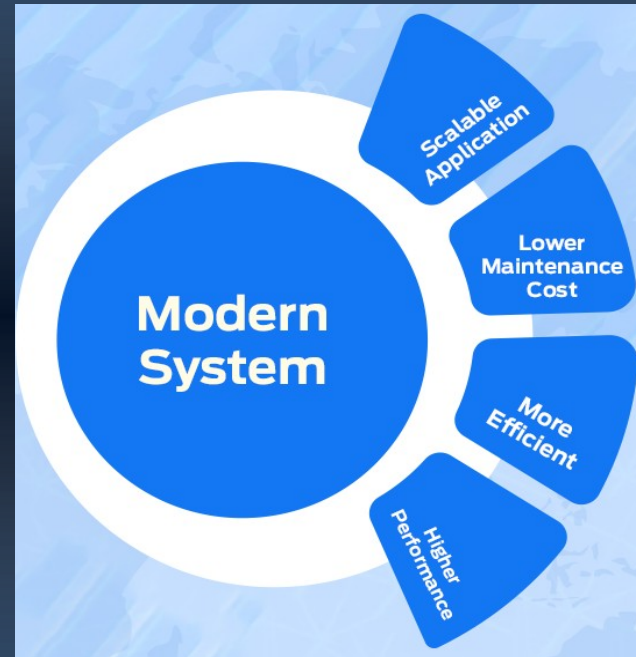
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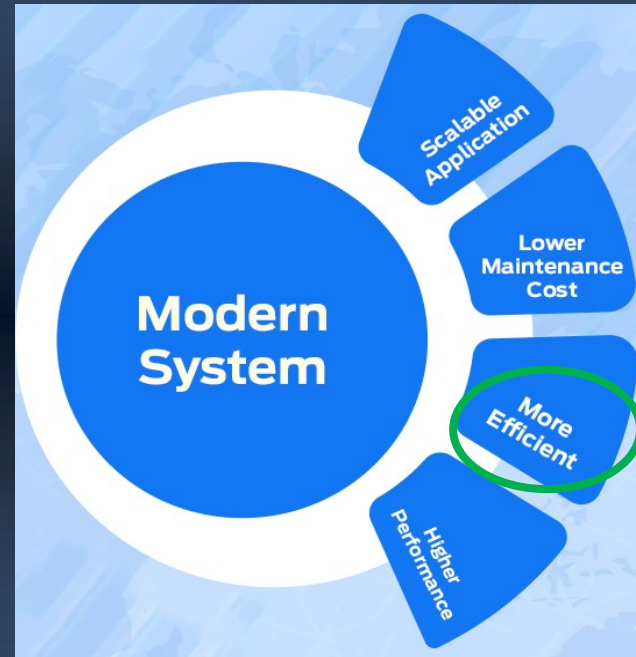
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EFFICIENCY



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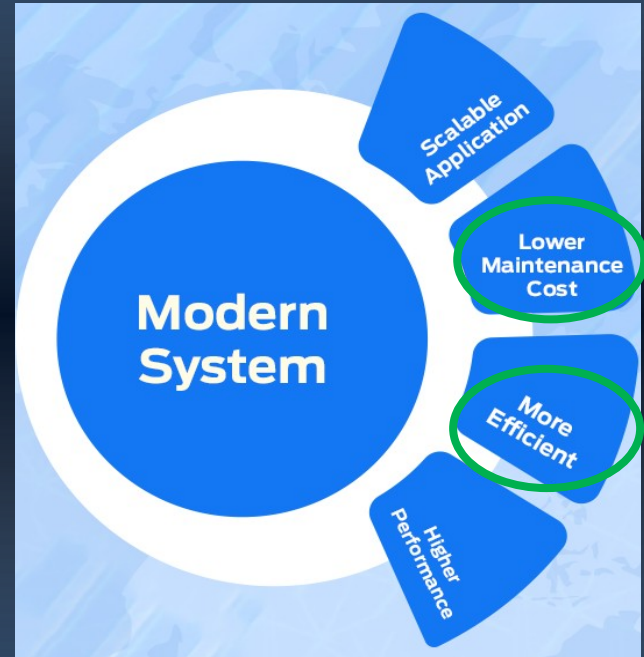
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What do we know?



**Inconsistent
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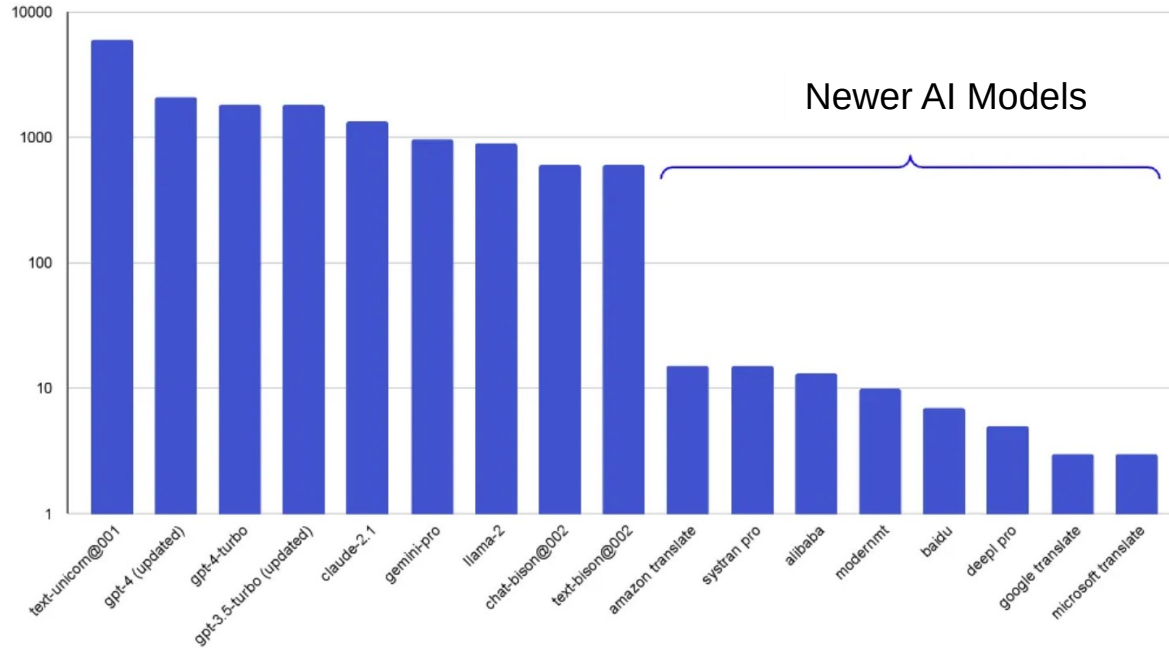
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Inconsistent Translation Results

Translation speed (seconds to translate for 480 segments)



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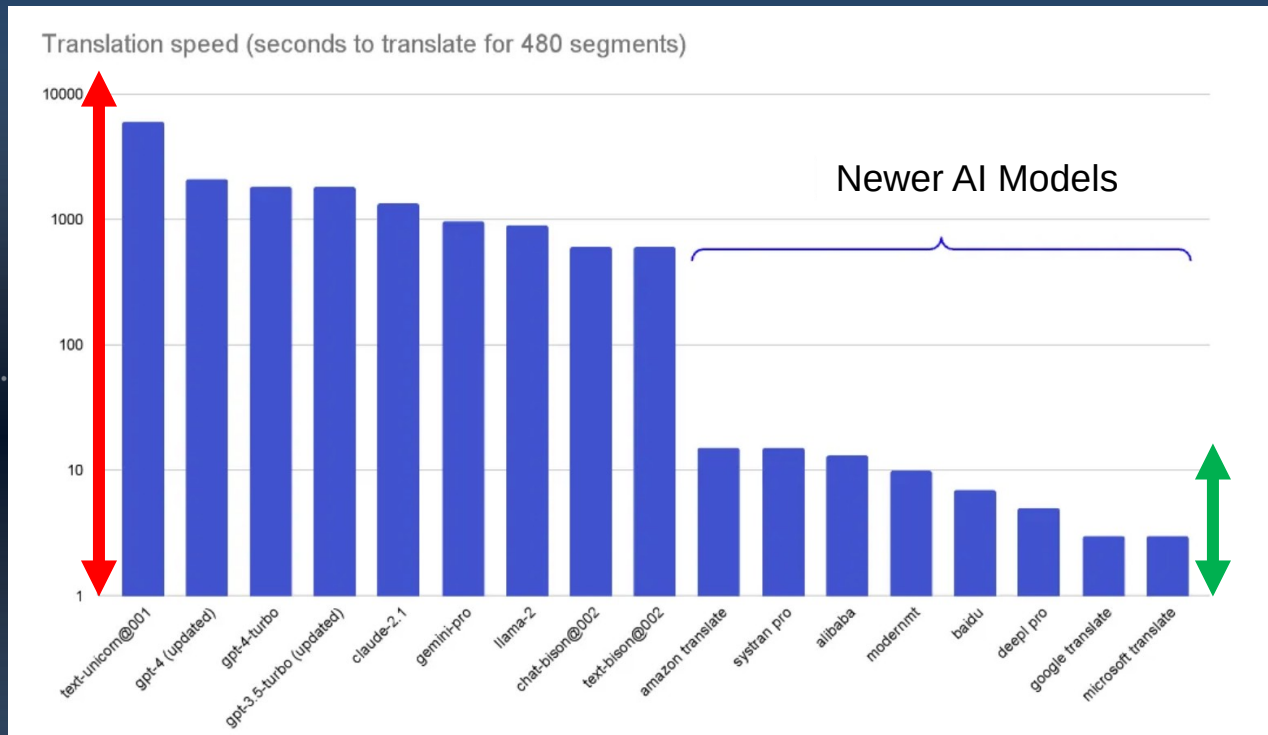
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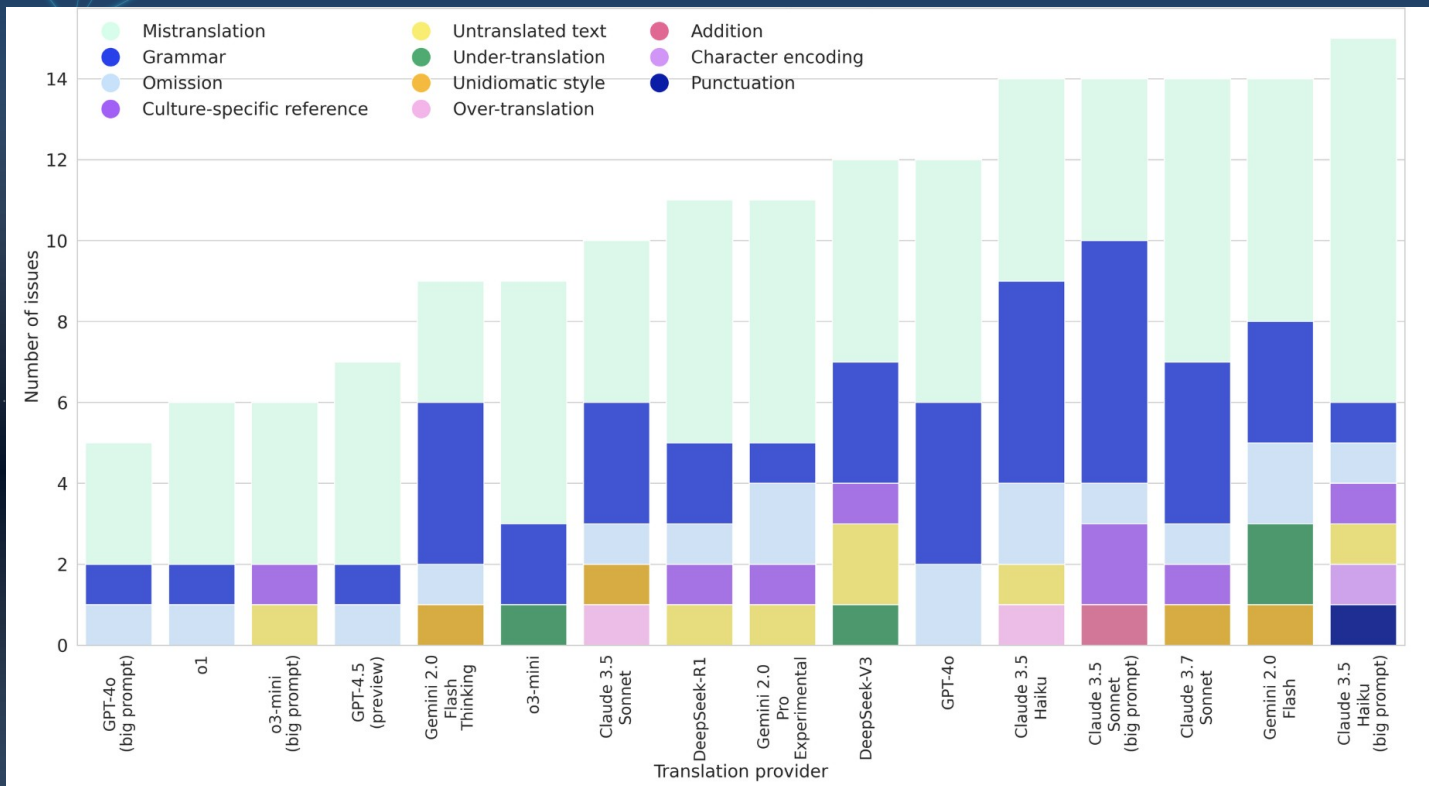
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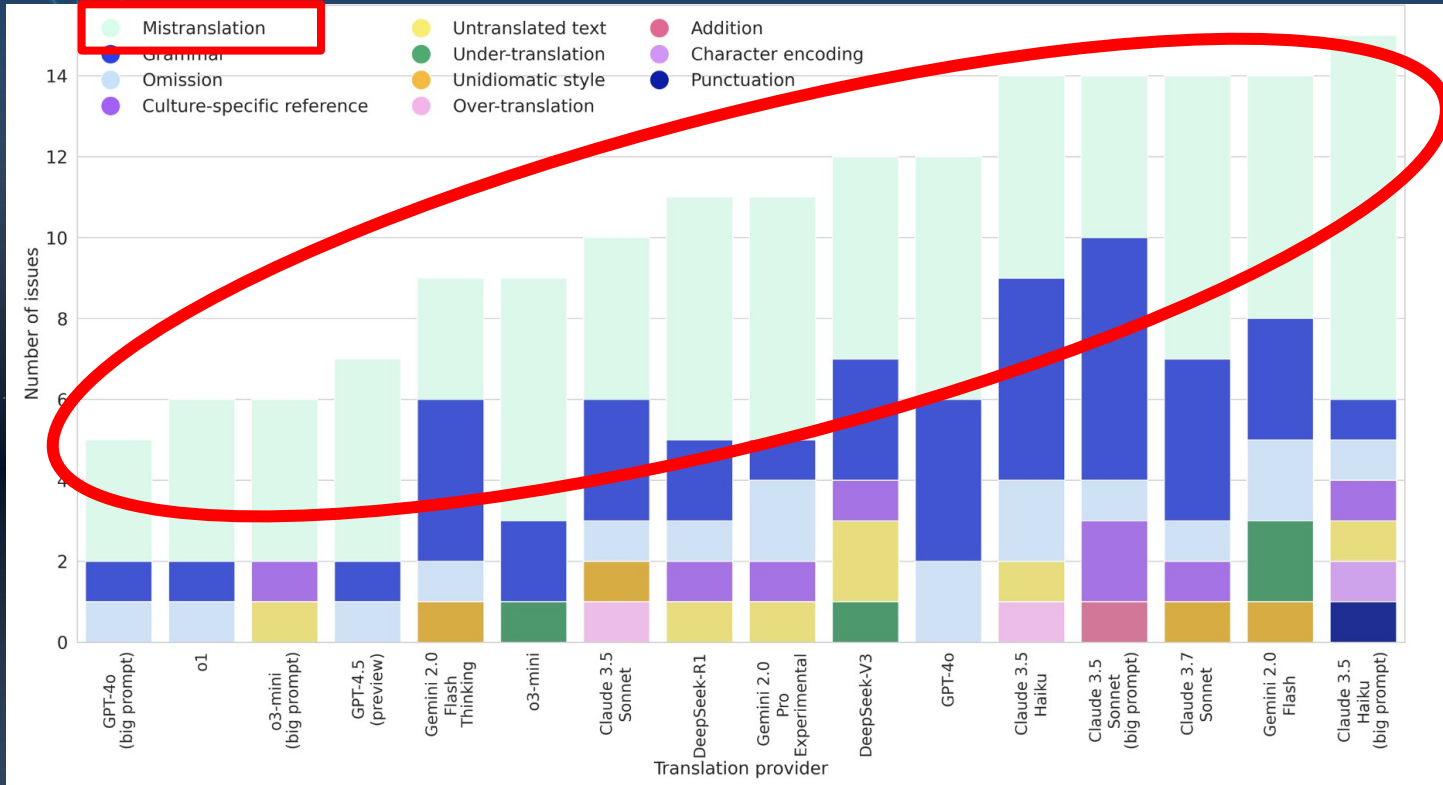
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**Code quality is
measurable**

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Code quality is
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Code quality is
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Code quality is
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Translations
require
multiple tests

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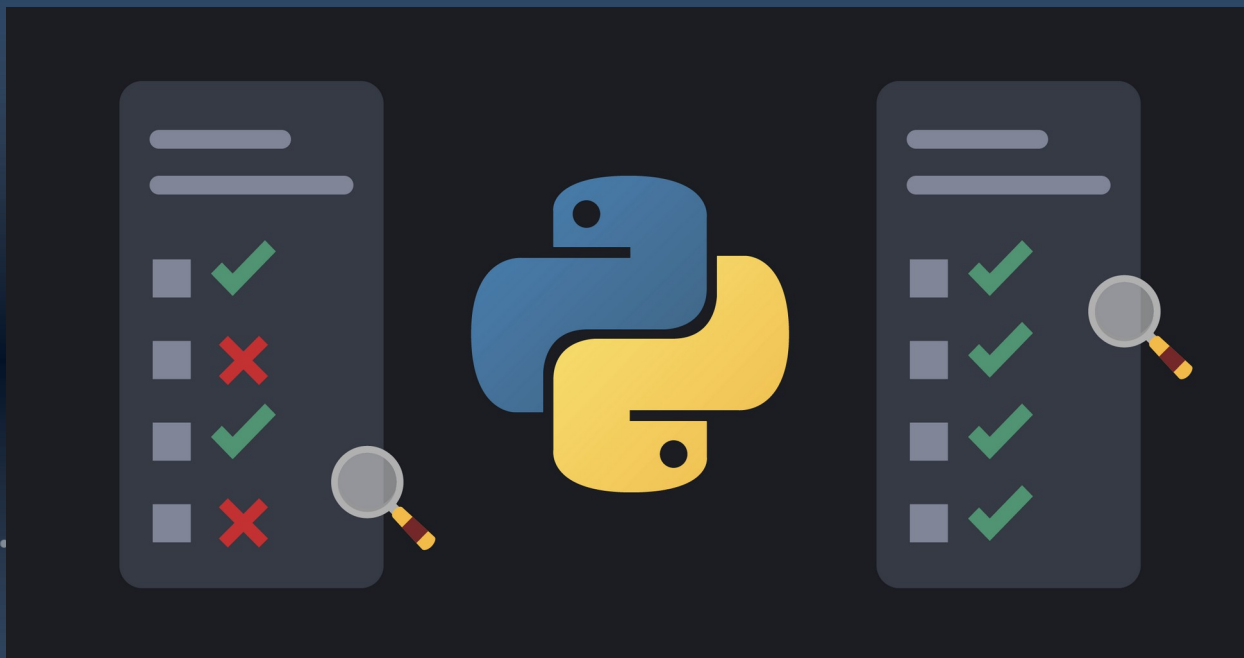
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Translations
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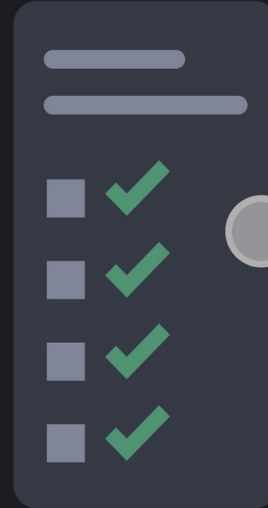
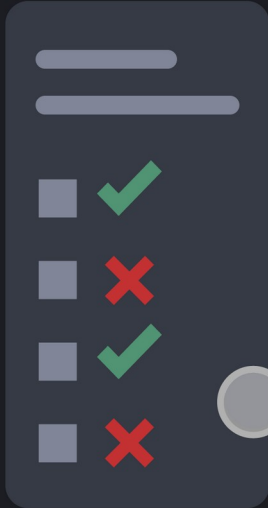
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Code quality is
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Unit Testing



Translations
require
multiple tests

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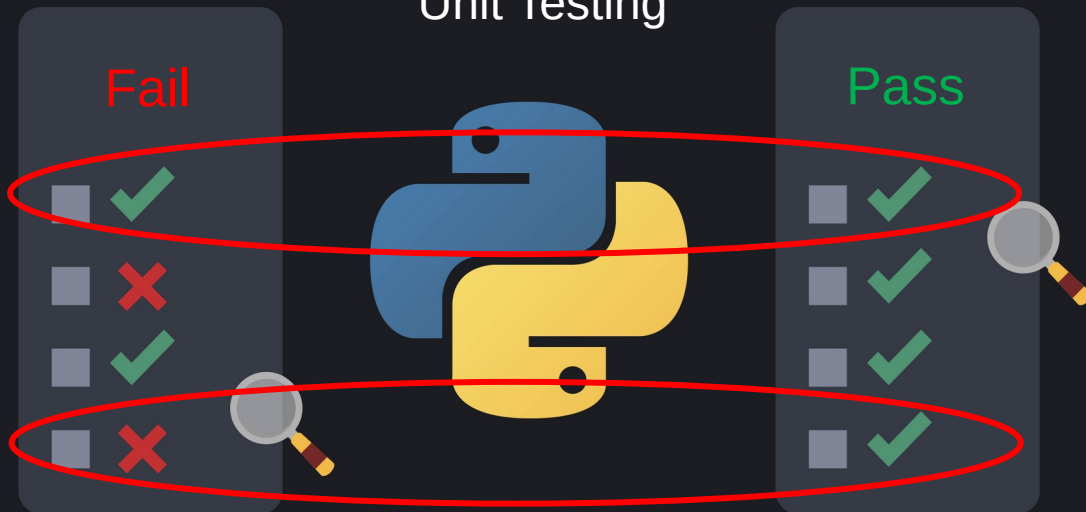
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Code quality is
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Fail

Pass



Translations
require
multiple tests

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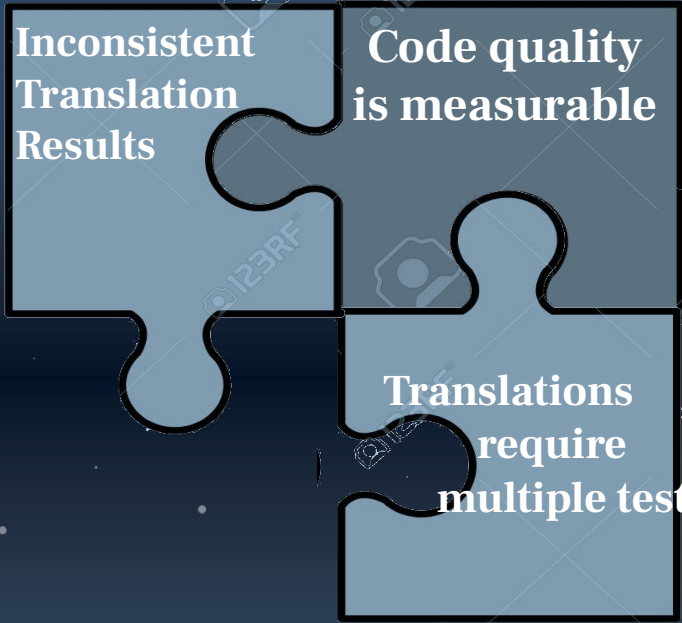
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**Inconsistent
Translation
Results**

**Code quality
is measurable**

**Translations
require
multiple tests**



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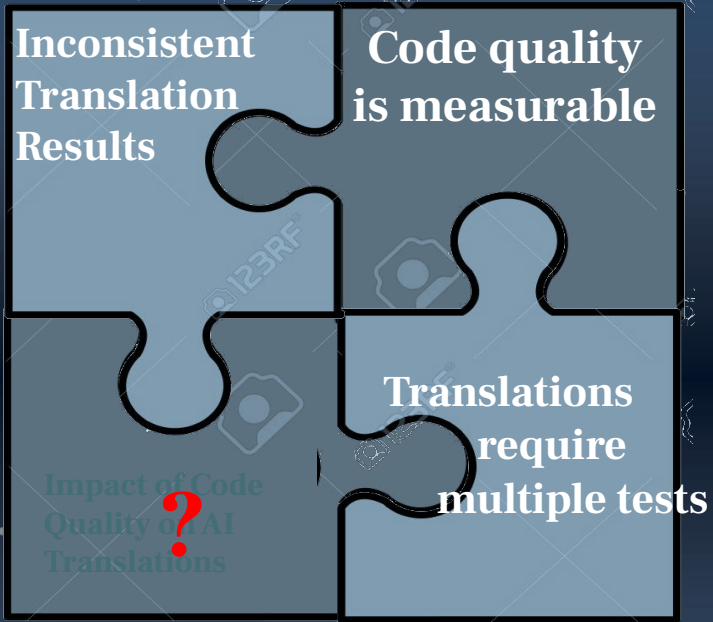
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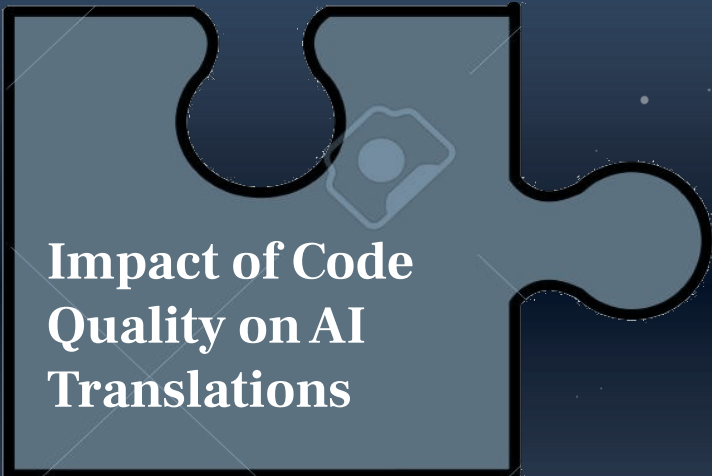
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Impact of Code Quality on AI Translations

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Research Question

To what extent does the structural quality of code affect the accuracy of AI code translation from Python to Java?

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Structural Quality

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15 Python programs
15 Clean 15 Messy

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15 Clean + 15 Messy = 30 Python Programs

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15 Clean



15 Messy



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15 Clean

15 Messy

✗ Clear Variable Names



✗ Proper Indentation



✗ Comments



✗ Simple Logic



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15 Clean

- ✖ Clear Variable Names
- ✖ Proper Indentation
- ✖ Comments
- ✖ Simple Logic

15 Messy

- ✖ Unclear Variable Names
- ✖ Poor Formatting
- ✖ No Comments
- ✖ Confusing Logic

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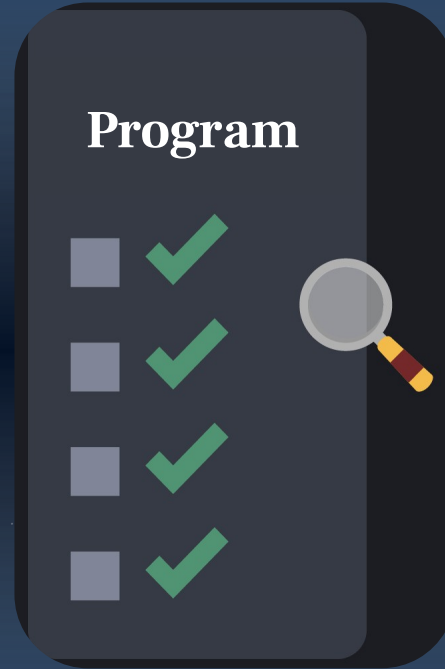
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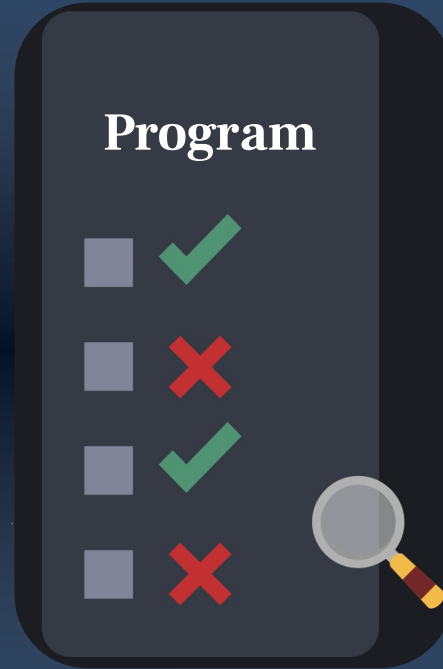
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Unsuccessful



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☀ Good afternoon, Riddhi

Translate this Python program into Java. Put everything in a single file. Use public class MyProgram as the top-level class name, and include a standard public static void main(String[] args) method as the entry point. Do not create any other public classes.

💡 Hi R21

Where should we start?

Translate this Python program into Java. Put everything in a single file. Use public class MyProgram as the top-level class name, and include a standard public static void main(String[] args) method as the entry point. Do not create any other public classes.



Translate this Python program into Java. Put everything in a single file. Use public class MyProgram as the top-level class name, and include a standard public static void main(String[] args) method as the entry point. Do not create any other public classes.

Ask

All repositories

Claude Haiku 4.5

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90 Java Translations

Programs (90)					All Program Types		Search For A Title
Name	Type	Created	Updated				
✓ ClaudeClean2	Java (main)	12/9/25 3:59 PM	12/9/25 4:03 PM	...			
✓ ClaudeMessy5	Java (main)	12/9/25 4:17 PM	1/12/26 6:39 AM	...			
✓ ClaudeClean8	Java (main)	12/9/25 5:30 PM	12/9/25 5:33 PM	...			
✓ ClaudeMessy11	Java (main)	12/9/25 5:33 PM	1/12/26 6:39 AM	...			
✓ ClaudeClean14	Java (main)	12/9/25 5:55 PM	12/9/25 6:25 PM	...			
✓ ClaudeMessy17	Java (main)	12/9/25 6:25 PM	1/12/26 6:40 AM	...			
✓ GitHubClean4	Java (main)	1/12/26 6:30 AM	1/28/26 7:10 AM	...			
✓ GitHubMessy7	Java (main)	1/12/26 6:35 AM	1/28/26 7:11 AM	...			
✓ GitHubClean10	Java (main)	1/28/26 7:11 AM	1/28/26 7:18 AM	...			
✓ GitHubMessy13	Java (main)	1/28/26 7:19 AM	1/28/26 7:24 AM	...			
✓ GitHubClean16	Java (main)	1/28/26 7:27 AM	1/28/26 7:31 AM	...			
✓ GitHubMessy19	Java (main)	1/28/26 7:51 AM	1/28/26 7:53 AM	...			
✓ GitHubClean22	Java (main)	1/28/26 8:00 AM	1/28/26 8:15 AM	...			
✓ GitHubMessy25	Java (main)	1/28/26 8:16 AM	1/28/26 8:20 AM	...			
✓ GitHubClean28	Java (main)	1/28/26 8:20 AM	1/28/26 8:37 AM	...			
✓ GitHubMessy31	Java (main)	1/30/26 5:12 AM	1/30/26 5:15 AM	...			
✓ GitHubClean34	Java (main)	1/30/26 5:16 AM	1/30/26 5:20 AM	...			
✓ GitHubMessy37	Java (main)	1/30/26 5:22 AM	1/30/26 5:25 AM	...			
✓ GitHubClean40	Java (main)	1/30/26 5:32 AM	1/30/26 5:37 AM	...			
✓ GitHubMessy43	Java (main)	1/30/26 5:40 AM	1/30/26 5:47 AM	...			
✓ GitHubClean46	Java (main)	1/30/26 5:50 AM	1/30/26 5:54 AM	...			
✓ GitHubMessy49	Java (main)	1/31/26 7:39 AM	1/31/26 8:11 AM	...			

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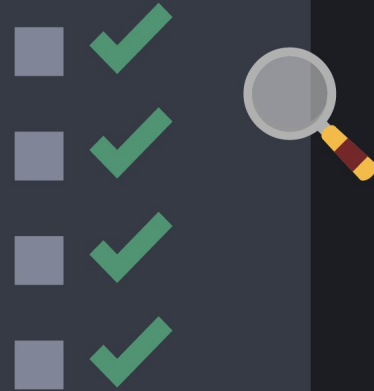
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Programs (90)				
All Program Types				
Search For A Title				
Name	Type	Created	Updated	
✓ ClaudeClean2	Java (main)	12/9/25 3:59 PM	12/9/25 4:03 PM	...
✓ ClaudeMessy5	Java (main)	12/9/25 4:17 PM	1/12/26 6:39 AM	...
✓ ClaudeClean8	Java (main)	12/9/25 5:30 PM	12/9/25 5:33 PM	...
✓ ClaudeMessy11	Java (main)	12/9/25 5:33 PM	1/12/26 6:39 AM	...
✓ ClaudeClean14	Java (main)	12/9/25 5:55 PM	12/9/25 6:25 PM	...
✓ ClaudeMessy17	Java (main)	12/9/25 6:25 PM	1/12/26 6:40 AM	...
✓ GitHubClean4	Java (main)	1/12/26 6:30 AM	1/28/26 7:10 AM	...
✓ GitHubMessy7	Java (main)	1/12/26 6:35 AM	1/28/26 7:11 AM	...
✓ GitHubClean10	Java (main)	1/28/26 7:11 AM	1/28/26 7:18 AM	...
✓ GitHubMessy13	Java (main)	1/28/26 7:19 AM	1/28/26 7:24 AM	...
✓ GitHubClean16	Java (main)	1/28/26 7:27 AM	1/28/26 7:31 AM	...
✓ GitHubMessy19	Java (main)	1/28/26 7:51 AM	1/28/26 7:53 AM	...
✓ GitHubClean22	Java (main)	1/28/26 8:00 AM	1/28/26 8:15 AM	...
✓ GitHubMessy25	Java (main)	1/28/26 8:16 AM	1/28/26 8:20 AM	...
✓ GitHubClean28	Java (main)	1/28/26 8:20 AM	1/28/26 8:37 AM	...
✓ GitHubMessy31	Java (main)	1/30/26 5:12 AM	1/30/26 5:15 AM	...
✓ GitHubClean34	Java (main)	1/30/26 5:16 AM	1/30/26 5:20 AM	...
✓ GitHubMessy37	Java (main)	1/30/26 5:22 AM	1/30/26 5:25 AM	...
✓ GitHubClean40	Java (main)	1/30/26 5:32 AM	1/30/26 5:37 AM	...
✓ GitHubMessy43	Java (main)	1/30/26 5:40 AM	1/30/26 5:47 AM	...
✓ GitHubClean46	Java (main)	1/30/26 5:50 AM	1/30/26 5:54 AM	...
✓ GitHubMessy49	Java (main)	1/31/26 7:39 AM	1/31/26 8:11 AM	...

Unit Tests



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Successful Translations

Clean: 15/15

Task	Tier (Clean or Messy)	Claude Translator	Compile (Y or N)	Test Passed out of 5 (n/5)	Works or Not Works
Student Grade Calculator C	Clean	Claude	Y	5/5	Works
Student Grade Calculator M	Messy	Claude	Y	5/5	Works
Shopping Cart Total Calculator C	Clean	Claude	Y	5/5	Works
ShoppingCartTotalCalc(M)	Messy	Claude	Y	5/5	Works
Password Strength Checker C	Clean	Claude	Y	5/5	Works
Password Strength Checker M	Messy	Claude	Y	5/5	Works
Word Statistics Analyzer C	Clean	Claude	Y	5/5	Works
Word Statistics Analyzer M	Messy	Claude	Y	5/5	Works
Temperature Data Analyzer C	Clean	Claude	Y	5/5	Works
Temperature Data Analyzer M	Messy	Claude	Y	5/5	Works
Bank Transaction Simulator C	Clean	Claude	Y	5/5	Works
Bank Transaction Simulator M	Messy	Claude	Y	5/5	Works
Matrix Row Sum Analyzer C	Clean	Claude	Y	5/5	Works
Matrix Row Sum Analyzer M	Messy	Claude	Y	5/5	Works
Tic Tac Toe C	Clean	Claude	Y	5/5	Works
Tic Tac Toe M	Messy	Claude	Y	5/5	Works
Grid Treasure Hunt C	Clean	Claude	Y	5/5	Works
Grid Treasure Hunt M	Messy	Claude	Y	5/5	Works
Word Guessing Game C	Clean	Claude	Y	5/5	Works
Word Guessing Game M	Messy	Claude	Y	5/5	Works
Road Trip Route C	Clean	Claude	Y	5/5	Works
Road Trip Route M	Messy	Claude	Y	5/5	Works
Scholarship Eligibility C	Clean	Claude	Y	5/5	Works
Scholarship Eligibility M	Messy	Claude	Y	5/5	Works
Travel Budget C	Clean	Claude	Y	5/5	Works
Travel Budget M	Messy	Claude	Y	5/5	Works
Medical Appointment C	Clean	Claude	Y	5/5	Works
Medical Appointment M	Messy	Claude	N	0/5	Not Works
Monthly Bill C	Clean	Claude	Y	5/5	Works
Monthly Bill M	Messy	Claude	Y	5/5	Works

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Successful Translations

Clean: 15/15

Messy: 14/15

Task	Tier (Clean or Messy)	Claude Translator	Compile (Y or N)	Test Passed out of 5 (n/5)	Works or Not Works
Student Grade Calculator C	Clean	Claude	Y	5/5	Works
Student Grade Calculator M	Messy	Claude	Y	5/5	Works
Shopping Cart Total Calculator C	Clean	Claude	Y	5/5	Works
ShoppingCartTotalCalc(M)	Messy	Claude	Y	5/5	Works
Password Strength Checker C	Clean	Claude	Y	5/5	Works
Password Strength Checker M	Messy	Claude	Y	5/5	Works
Word Statistics Analyzer C	Clean	Claude	Y	5/5	Works
Word Statistics Analyzer M	Messy	Claude	Y	5/5	Works
Temperature Data Analyzer C	Clean	Claude	Y	5/5	Works
Temperature Data Analyzer M	Messy	Claude	Y	5/5	Works
Bank Transaction Simulator C	Clean	Claude	Y	5/5	Works
Bank Transaction Simulator M	Messy	Claude	Y	5/5	Works
Matrix Row Sum Analyzer C	Clean	Claude	Y	5/5	Works
Matrix Row Sum Analyzer M	Messy	Claude	Y	5/5	Works
Tic Tac Toe C	Clean	Claude	Y	5/5	Works
Tic Tac Toe M	Messy	Claude	Y	5/5	Works
Grid Treasure Hunt C	Clean	Claude	Y	5/5	Works
Grid Treasure Hunt M	Messy	Claude	Y	5/5	Works
Word Guessing Game C	Clean	Claude	Y	5/5	Works
Word Guessing Game M	Messy	Claude	Y	5/5	Works
Road Trip Route C	Clean	Claude	Y	5/5	Works
Road Trip Route M	Messy	Claude	Y	5/5	Works
Scholarship Eligibility C	Clean	Claude	Y	5/5	Works
Scholarship Eligibility M	Messy	Claude	Y	5/5	Works
Travel Budget C	Clean	Claude	Y	5/5	Works
Travel Budget M	Messy	Claude	Y	5/5	Works
Medical Appointment C	Clean	Claude	Y	5/5	Works
Medical Appointment M	Messy	Claude	N	0/5	Not Works
Monthly Bill C	Clean	Claude	Y	5/5	Works
Monthly Bill M	Messy	Claude	Y	5/5	Works

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Successful Translations

Clean: 15/15

Task	Tier (Clean or Messy)	Gemini Translator	Compile (Y or N)	Test Passed out of 5 (n/5)	Works or Not Works
Student Grade Calculator C	Clean	Gemini	Y	5/5	Works
Student Grade Calculator M	Messy	Gemini	Y	5/5	Works
Shopping Cart Total Calculator C	Clean	Gemini	Y	5/5	Works
ShoppingCartTotalCalc(M)	Messy	Gemini	N	0/5	Not Works
Password Strength Checker C	Clean	Gemini	Y	5/5	Works
Password Strength Checker M	Messy	Gemini	Y	5/5	Works
Word Statistics Analyzer C	Clean	Gemini	Y	5/5	Works
Word Statistics Analyzer M	Messy	Gemini	Y	5/5	Works
Temperature Data Analyzer C	Clean	Gemini	Y	5/5	Works
Temperature Data Analyzer M	Messy	Gemini	Y	5/5	Works
Bank Transaction Simulator C	Clean	Gemini	Y	5/5	Works
Bank Transaction Simulator M	Messy	Gemini	Y	5/5	Works
Matrix Row Sum Analyzer C	Clean	Gemini	Y	5/5	Works
Matrix Row Sum Analyzer M	Messy	Gemini	Y	5/5	Works
Tic Tac Toe C	Clean	Gemini	Y	5/5	Works
Tic Tac Toe M	Messy	Gemini	N	0/5	Not Works
Grid Treasure Hunt C	Clean	Gemini	Y	5/5	Works
Grid Treasure Hunt M	Messy	Gemini	Y	3/5	Not Works
Word Guessing Game C	Clean	Gemini	Y	5/5	Works
Word Guessing Game M	Messy	Gemini	Y	5/5	Works
Road Trip Route C	Clean	Gemini	Y	5/5	Works
Road Trip Route M	Messy	Gemini	Y	5/5	Works
Scholarship Eligibility C	Clean	Gemini	Y	5/5	Works
Scholarship Eligibility M	Messy	Gemini	Y	0/5	Not Works
Travel Budget C	Clean	Gemini	Y	5/5	Works
Travel Budget M	Messy	Gemini	N	0/5	Not Works
Medical Appointment C	Clean	Gemini	Y	5/5	Works
Medical Appointment M	Messy	Gemini	Y	5/5	Works
Monthly Bill C	Clean	Gemini	Y	5/5	Works
Monthly Bill M	Messy	Gemini	Y	5/5	Works

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Successful Translations

Clean: 15/15

Messy: 10/15

Task	Tier (Clean or Messy)	Gemini Translator	Compile (Y or N)	Test Passed out of 5 (n/5)	Works or Not Works
Student Grade Calculator C	Clean	Gemini	Y	5/5	Works
Student Grade Calculator M	Messy	Gemini	Y	5/5	Works
Shopping Cart Total Calculator C	Clean	Gemini	Y	5/5	Works
ShoppingCartTotalCalc(M)	Messy	Gemini	N	0/5	Not Works
Password Strength Checker C	Clean	Gemini	Y	5/5	Works
Password Strength Checker M	Messy	Gemini	Y	5/5	Works
Word Statistics Analyzer C	Clean	Gemini	Y	5/5	Works
Word Statistics Analyzer M	Messy	Gemini	Y	5/5	Works
Temperature Data Analyzer C	Clean	Gemini	Y	5/5	Works
Temperature Data Analyzer M	Messy	Gemini	Y	5/5	Works
Bank Transaction Simulator C	Clean	Gemini	Y	5/5	Works
Bank Transaction Simulator M	Messy	Gemini	Y	5/5	Works
Matrix Row Sum Analyzer C	Clean	Gemini	Y	5/5	Works
Matrix Row Sum Analyzer M	Messy	Gemini	Y	5/5	Works
Tic Tac Toe C	Clean	Gemini	Y	5/5	Works
Tic Tac Toe M	Messy	Gemini	N	0/5	Not Works
Grid Treasure Hunt C	Clean	Gemini	Y	5/5	Works
Grid Treasure Hunt M	Messy	Gemini	Y	3/5	Not Works
Word Guessing Game C	Clean	Gemini	Y	5/5	Works
Word Guessing Game M	Messy	Gemini	Y	5/5	Works
Road Trip Route C	Clean	Gemini	Y	5/5	Works
Road Trip Route M	Messy	Gemini	Y	5/5	Works
Scholarship Eligibility C	Clean	Gemini	Y	5/5	Works
Scholarship Eligibility M	Messy	Gemini	Y	0/5	Not Works
Travel Budget C	Clean	Gemini	Y	5/5	Works
Travel Budget M	Messy	Gemini	N	0/5	Not Works
Medical Appointment C	Clean	Gemini	Y	5/5	Works
Medical Appointment M	Messy	Gemini	Y	5/5	Works
Monthly Bill C	Clean	Gemini	Y	5/5	Works
Monthly Bill M	Messy	Gemini	Y	5/5	Works

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Successful Translations

Clean: 15/15

Task	Tier (Clean or Messy)	Github Copilot Translator	Compile (Y or N)	Test Passed out of 5 (n/5)	Works or Not Works
Student Grade Calculator C	Clean	GitHub Copilot	Y	5/5	Works
Student Grade Calculator M	Messy	GitHub Copilot	Y	5/5	Works
Shopping Cart Total Calculator C	Clean	GitHub Copilot	Y	5/5	Works
ShoppingCartTotalCalc(M)	Messy	GitHub Copilot	Y	5/5	Works
Password Strength Checker C	Clean	GitHub Copilot	Y	5/5	Works
Password Strength Checker M	Messy	GitHub Copilot	Y	5/5	Works
Word Statistics Analyzer C	Clean	GitHub Copilot	Y	5/5	Works
Word Statistics Analyzer M	Messy	GitHub Copilot	Y	5/5	Works
Temperature Data Analyzer C	Clean	GitHub Copilot	Y	5/5	Works
Temperature Data Analyzer M	Messy	GitHub Copilot	Y	5/5	Works
Bank Transaction Simulator C	Clean	GitHub Copilot	Y	5/5	Works
Bank Transaction Simulator M	Messy	GitHub Copilot	Y	5/5	Works
Matrix Row Sum Analyzer C	Clean	GitHub Copilot	Y	5/5	Works
Matrix Row Sum Analyzer M	Messy	GitHub Copilot	Y	5/5	Works
Tic Tac Toe C	Clean	GitHub Copilot	Y	5/5	Works
Tic Tac Toe M	Messy	GitHub Copilot	Y	5/5	Works
Grid Treasure Hunt C	Clean	GitHub Copilot	Y	5/5	Works
Grid Treasure Hunt M	Messy	GitHub Copilot	Y	5/5	Works
Word Guessing Game C	Clean	GitHub Copilot	Y	5/5	Works
Word Guessing Game M	Messy	GitHub Copilot	Y	5/5	Works
Road Trip Route C	Clean	GitHub Copilot	Y	5/5	Works
Road Trip Route M	Messy	GitHub Copilot	Y	5/5	Works
Scholarship Eligibility C	Clean	GitHub Copilot	Y	5/5	Works
Scholarship Eligibility M	Messy	GitHub Copilot	Y	5/5	Works
Travel Budget C	Clean	GitHub Copilot	Y	5/5	Works
Travel Budget M	Messy	GitHub Copilot	Y	5/5	Works
Medical Appointment C	Clean	GitHub Copilot	Y	5/5	Works
Medical Appointment M	Messy	GitHub Copilot	Y	5/5	Works
Monthly Bill C	Clean	GitHub Copilot	Y	5/5	Works
Monthly Bill M	Messy	GitHub Copilot	Y	5/5	Works

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Successful Translations

Clean: 15/15

Messy: 15/15

Task	Tier (Clean or Messy)	Github Copilot Translator	Compile (Y or N)	Test Passed out of 5 (n/5)	Works or Not Works
Student Grade Calculator C	Clean	GitHub Copilot	Y	5/5	Works
Student Grade Calculator M	Messy	GitHub Copilot	Y	5/5	Works
Shopping Cart Total Calculator C	Clean	GitHub Copilot	Y	5/5	Works
ShoppingCartTotalCalc(M)	Messy	GitHub Copilot	Y	5/5	Works
Password Strength Checker C	Clean	GitHub Copilot	Y	5/5	Works
Password Strength Checker M	Messy	GitHub Copilot	Y	5/5	Works
Word Statistics Analyzer C	Clean	GitHub Copilot	Y	5/5	Works
Word Statistics Analyzer M	Messy	GitHub Copilot	Y	5/5	Works
Temperature Data Analyzer C	Clean	GitHub Copilot	Y	5/5	Works
Temperature Data Analyzer M	Messy	GitHub Copilot	Y	5/5	Works
Bank Transaction Simulator C	Clean	GitHub Copilot	Y	5/5	Works
Bank Transaction Simulator M	Messy	GitHub Copilot	Y	5/5	Works
Matrix Row Sum Analyzer C	Clean	GitHub Copilot	Y	5/5	Works
Matrix Row Sum Analyzer M	Messy	GitHub Copilot	Y	5/5	Works
Tic Tac Toe C	Clean	GitHub Copilot	Y	5/5	Works
Tic Tac Toe M	Messy	GitHub Copilot	Y	5/5	Works
Grid Treasure Hunt C	Clean	GitHub Copilot	Y	5/5	Works
Grid Treasure Hunt M	Messy	GitHub Copilot	Y	5/5	Works
Word Guessing Game C	Clean	GitHub Copilot	Y	5/5	Works
Word Guessing Game M	Messy	GitHub Copilot	Y	5/5	Works
Road Trip Route C	Clean	GitHub Copilot	Y	5/5	Works
Road Trip Route M	Messy	GitHub Copilot	Y	5/5	Works
Scholarship Eligibility C	Clean	GitHub Copilot	Y	5/5	Works
Scholarship Eligibility M	Messy	GitHub Copilot	Y	5/5	Works
Travel Budget C	Clean	GitHub Copilot	Y	5/5	Works
Travel Budget M	Messy	GitHub Copilot	Y	5/5	Works
Medical Appointment C	Clean	GitHub Copilot	Y	5/5	Works
Medical Appointment M	Messy	GitHub Copilot	Y	5/5	Works
Monthly Bill C	Clean	GitHub Copilot	Y	5/5	Works
Monthly Bill M	Messy	GitHub Copilot	Y	5/5	Works

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Research Question

To what extent does the structural quality of code affect the accuracy of AI code translation from Python to Java?

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Research Question

To what extent does the structural quality of code affect the accuracy of AI code translation from Python to Java?

Thesis

Structural code quality affects AI translation accuracy to a moderate extent, but this effect is not universal across all AI translators

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Thesis

Structural code quality affects AI translation accuracy to a moderate extent, but this effect is not universal across all AI translators

1. Clean code consistently led to successful translations

Statistical significance was observed for only one translator

2.

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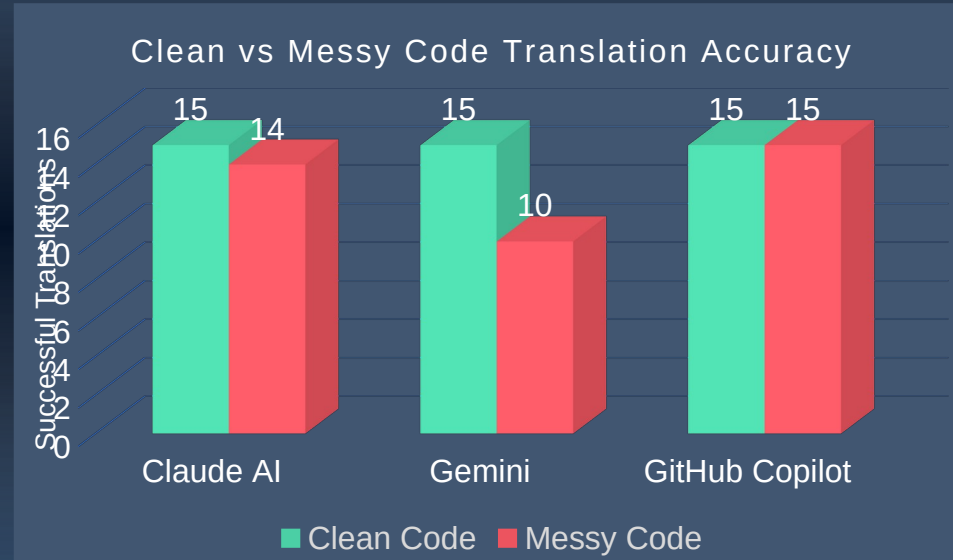
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1 Clean code consistently
led to successful
translations

Statistical significance
was observed for only
one translator 2.



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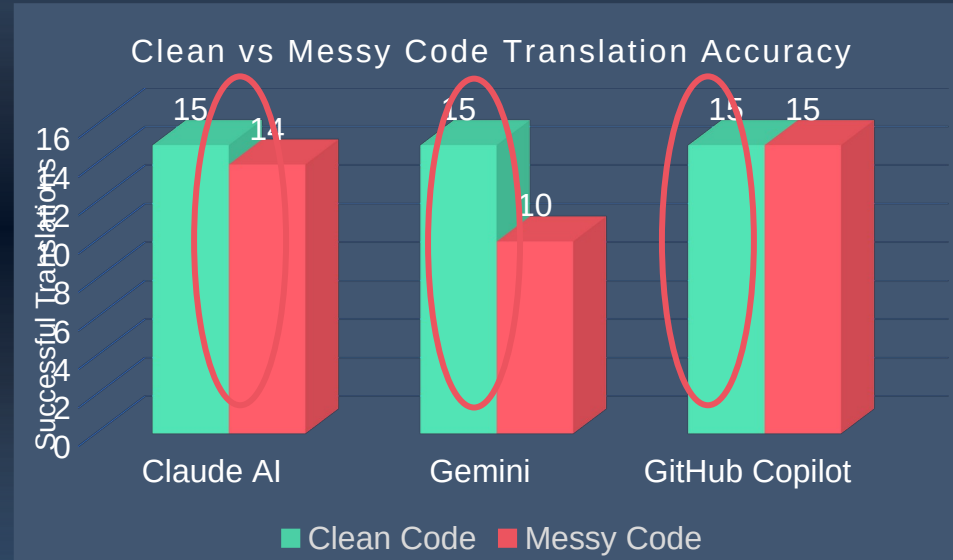
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1 Clean code consistently
led to successful
translations

Statistical significance
was observed for only
one translator 2.



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¹Clean code consistently
led to successful
translations

Statistical significance
was observed for only one
translator ^{2.}

Chi-Square Test

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¹Clean code consistently
led to successful
translations

Statistical significance
was observed for only one
translator ^{2.}

Chi-Square Test

Code Quality

Translation Success

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¹Clean code consistently
led to successful
translations

Statistical significance
was observed for only one
translator ^{2.}

$$\chi^2 = \sum \frac{(\text{Observed value} - \text{Expected value})^2}{\text{Expected value}}$$

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¹Clean code consistently
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Statistical significance
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$$\chi^2 = \sum \frac{(\text{Observed value} - \text{Expected value})^2}{\text{Expected value}}$$

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¹Clean code consistently
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Statistical significance
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χ^2



p-value

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¹Clean code consistently
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translations

Statistical significance
was observed for only one
translator ^{2.}

X^2 → p-value

Critical values of the Chi-square distribution
with d degrees of freedom

Probability of exceeding the critical value							
d	0.05	0.01	0.001	d	0.05	0.01	0.001
1	3.841	6.635	10.828	11	19.675	24.725	31.264
2	5.991	9.210	13.816	12	21.026	26.217	32.910
3	7.815	11.345	16.266	13	22.362	27.688	34.528

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¹Clean code consistently
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Statistical significance
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p-value 0.05

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¹Clean code consistently
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Statistical significance
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p-value < 0.05



p-value > 0.05



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¹Clean code consistently
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Statistical significance
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Chi Square Value	p - value
1.03	0.31



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¹Clean code consistently
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Statistical significance
was observed for only one
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$0.31 > 0.05$

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¹Clean code consistently
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Statistical significance
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$$0.31 > 0.05$$

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¹Clean code consistently
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Statistical significance
was observed for only one
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Chi Square Value

p - value

6.00



0.014

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¹Clean code consistently
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Statistical significance
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$$0.014 < 0.05$$

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¹Clean code consistently
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Statistical significance
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$$0.014 < 0.05$$



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¹Clean code consistently
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Statistical significance
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¹Clean code consistently
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Statistical significance
was observed for only one
translator ^{2.}



Successful Translations

Clean: 15/15

Messy: 15/15

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¹Clean code consistently
led to successful
translations

Statistical significance
was observed for only one
translator ^{2.}



Successful Translations

Clean: 15/15

Messy: 15/15

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¹Clean code consistently
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translations

Statistical significance
was observed for only one
translator ^{2.}



Claude



GitHub Copilot



Gemini

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¹Clean code consistently
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Statistical significance
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Claude



GitHub Copilot



Gemini

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Implications



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Implications

+ Improved Translation Accuracy



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Implications

+ Improved Translation Accuracy

+ Modernize Structure First

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Implications

- + Improved Translation Accuracy**
- + Modernize Structure First**
- + Choose Translators Carefully**

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Limitations



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Limitations

✖ Limited Task Scope

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Limitations

✗ Limited Task Scope

✗ Single Language Pair



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Limitations

- ✗ **Limited Task Scope**
- ✗ **Single Language Pair**
- ✗ **Future Tool Evolution**

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Future Research

✖ **Expand Task Complexity**

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Future Research

✕ **Expand Task Complexity**

✕ **Diversify Language Pairs**

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Future Research

- ✖ **Expand Task Complexity**
- ✖ **Diversify Language Pairs**
- ✖ **Test More Translators**

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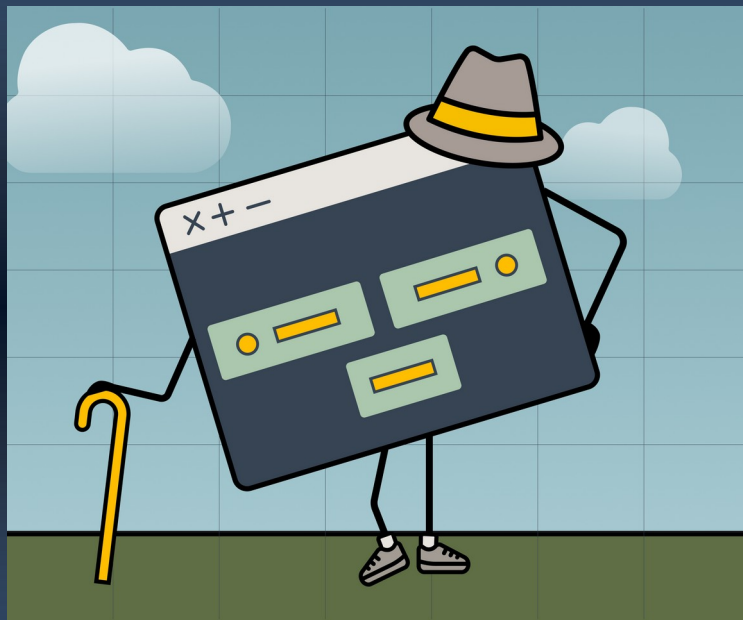
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Oral Defense

Research Question

To what extent does the structural quality of code affect the accuracy of AI code translation from Python to Java?

Thesis

Structural code quality affects AI translation accuracy to a greater extent, but this effect is not universal across all AI translators