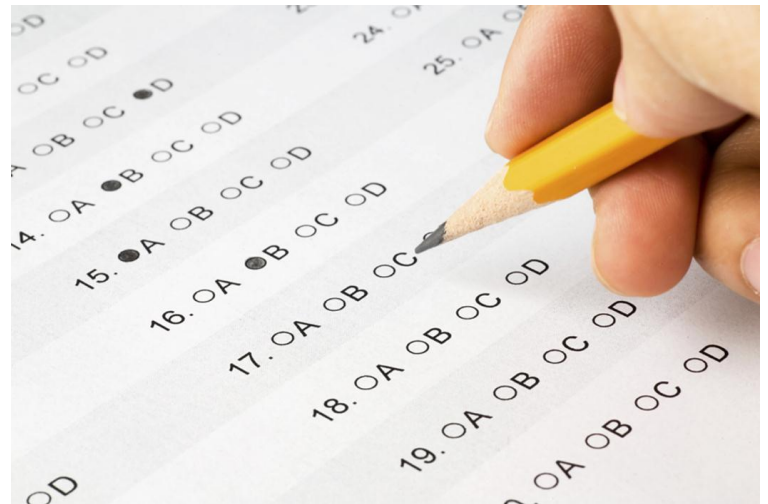


Spaced Repetition Systems for Predicting Foreign Language Vocabulary Test Scores

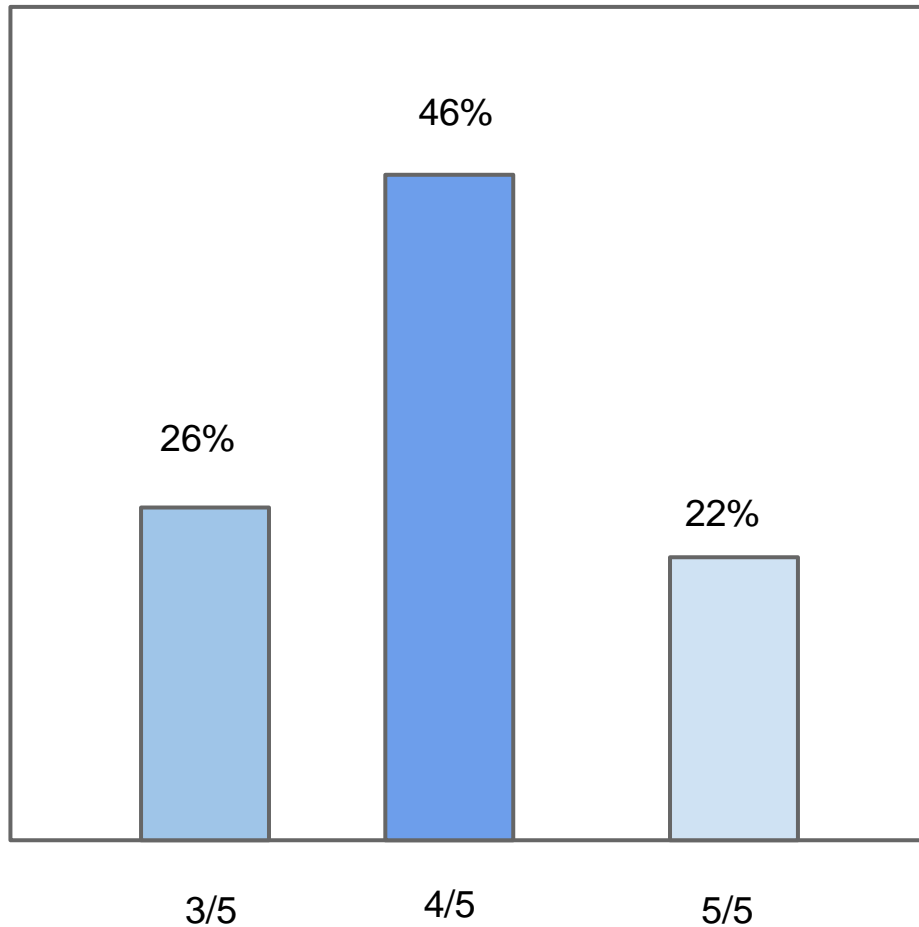
Jordan
West

Why Predict Test Scores?

- Find gaps in student knowledge
- Detect struggling students early
- Advise students
- Adjust course materials



Predicting Test Scores



p

0.86

0.95

0.64

0.97

0.44



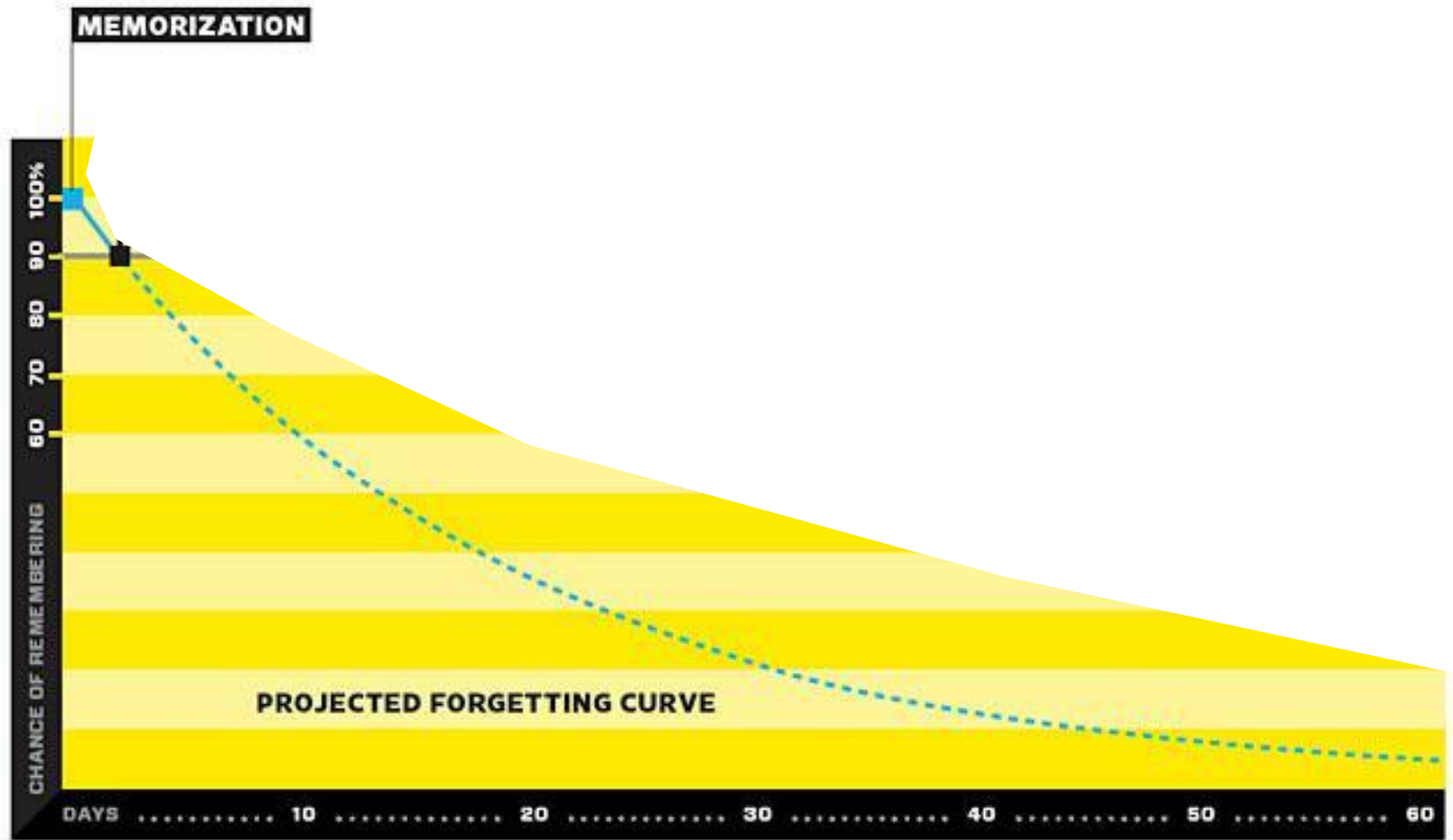
?

3/5 with 26% chance

4/5 with 46% chance

5/5 with 22% chance

Spaced Repetition



http://www.wired.com/medtech/health/magazine/16-05/ff_wozniak?currentPage=all

Spaced Repetition Platform

What is the meaning of this word?

天気予報

Show

Spaced Repetition Platform

天気予報

Weather Forecast

How well did you recall the meaning?

Forgot

Difficult

Easy

Spaced Repetition

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	0	1		2		
		5				
			8	1		
3						
			10			

Data Model

1. Word Frequency
2. Interval (Days)
3. Time since last answered (Days)
4. Time of day
5. # of previous failures

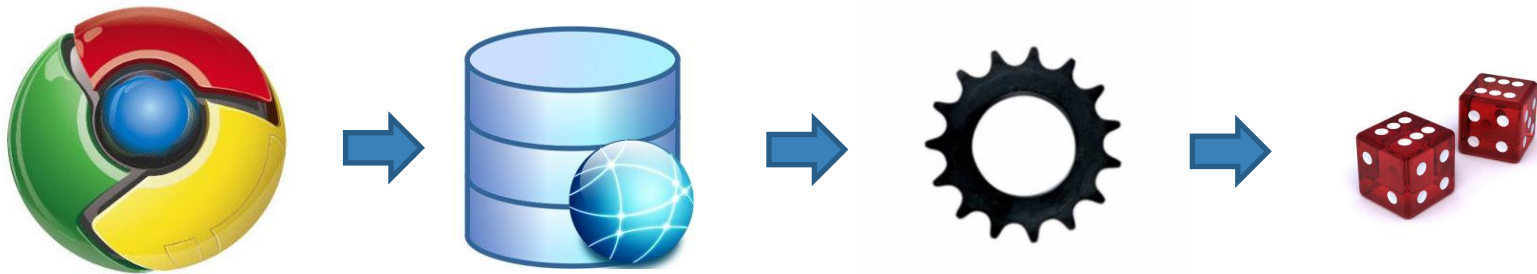


- 1. Answered Correctly**
- 2. Response Time**

Word ID#	User ID#	Inputs	Word Frequency	Interval (days)	Time since last answered (days)	Time of day	# of previous failures	Outputs	Answered Correctly?	Response Time (sec)
1	1		53	1		1	9	0	1	1.2
1	2		428	4		5	18	1	0	5
2	1		430	5		6	18	1	1	0.8
2	2		430	6		7	19	2	1	0.5
3	1		842	5		6	17	0	0	0.8
3	2		842	4		5	17	1	0	1.2
4	1		814	1		2	18	0	0	5
5	2		605	1		2	16	2	0	8
6	1		522	1		1	18	3	1	0.5
6	2		522	1		1	18	4	1	1.2
6	2		522	7	10		19	0	1	1.5
7	1		369	3		4	20	1	0	4.3
8	2		312	4		5	22	2	1	1.3
8	1		312	3		5	18	1	0	6.5
8	2		312	5		6	21	2	0	4.5
9	1		804	7		8	21	1	1	1.5
10	2		136	14		15	17	0	1	0.8

Solution

- Web based platform to collect data and perform testing
- Built-in vocabulary list for a university Japanese class (~200 words)

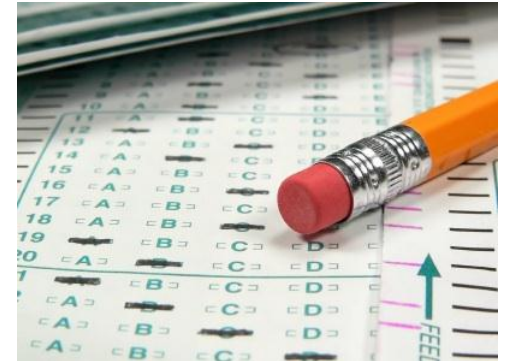


Method

1. Run spaced repetition platform over several weeks to gather student data
2. Generate probability model of student's memory using machine learning techniques
3. Test student and compare test results to probability model

Potential Uses

- **Estimate test scores**
- Improve spaced repetition algorithms
- Gain more understanding of human memory
- Profile facts on difficulty to memorise



Work completed

- Research/Topic development
- Class confirmed
- Spaced Repetition System UI Prototypes

Remaining Work

- Ethics Committee Approval
- Build Spaced Repetition Platform (by Week 1, Semester 2)
- Collect Data
- Apply Machine Learning Algorithm
- Test Students (within online platform)
- Compare Results

Existing Projects

The screenshot displays the Memrise web interface for a Japanese lesson. On the left, a sidebar for a 'New User' shows session statistics: 3 words seen, 0% percent correct, and 0 points. The main area features a 'Japanese - Meaning Multiple Choice' question. The word 'dust' is shown with its Japanese reading 'n' and a green speech bubble icon containing a question mark. Below the question, four options are listed: 1. まいご, 2. おおや, 3. あわ, and 4. ほこり. A timer at the bottom indicates 4 minutes remaining. The interface includes a 'Sign up' button and a 'Save your progress' link.

New User
Save your progress

session stats

3
words seen

0%
percent correct

0
points

Sign up

Japanese - Meaning Multiple Choice

?
n
dust

1. まいご

2. おおや

3. あわ

4. ほこり

Click on the correct answer above

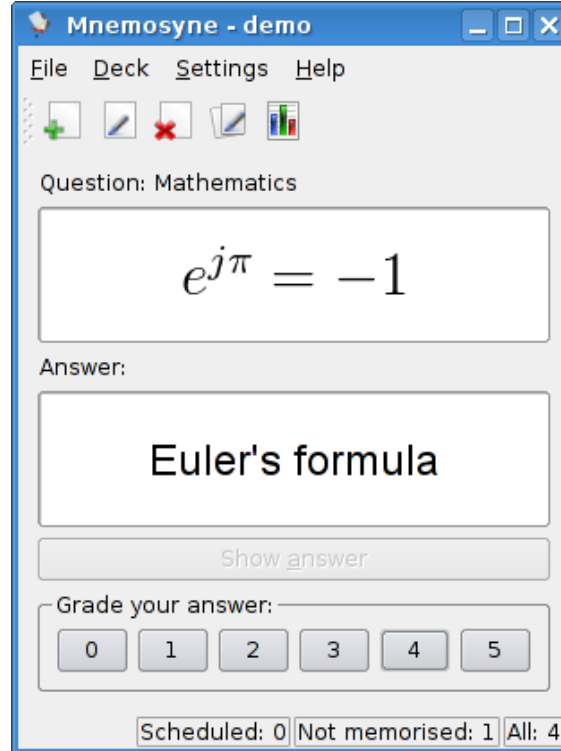
⌚ 4

Memrise

Web-based Spaced
Repetition Platform

www.memrise.com

Existing Projects



Mnemosyne

Personal spaced-
repetition software

www.mnemosyne.com

Acknowledgements

- Prof. Phillip Long
- Dr. Yuriko Nagata
- Dr. Michael Harrington
- The CEIT Team
- Dr. Mark Schulz

AND OVER THERE WE HAVE THE LABYRINTH GUARDS.
ONE ALWAYS LIES, ONE ALWAYS TELLS THE TRUTH, AND
ONE STABS PEOPLE WHO ASK TRICKY QUESTIONS.

