

Worksheets

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logic.stanford.edu

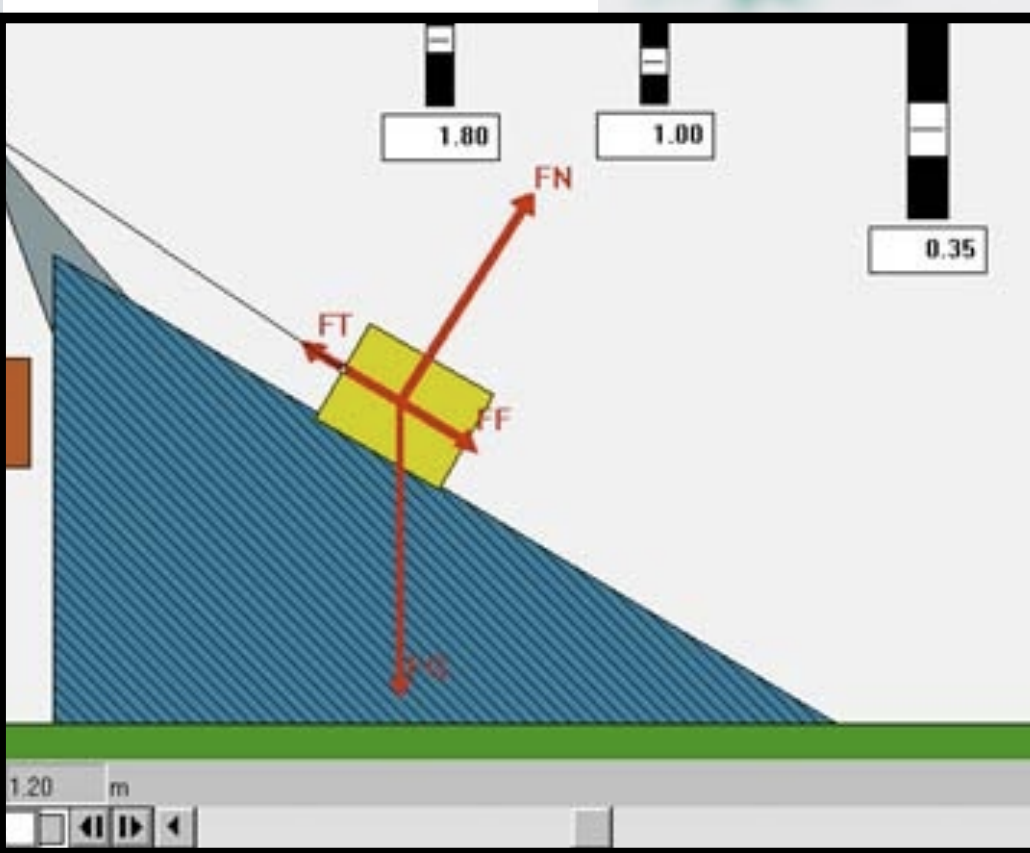
Worksheets

are **Dynamic, Interactive Webpages**

Educational Exercises

Simulations

Programsheets



Tax Forms

Expense Reports

Stanford University ♦ School of Engineering
Computer Science
Artificial Intelligence Track
2016-2017 Program Sheet

SUNET ID:
Email:
B.S. Expected: Jan 2016
Instructions: ([Hide](#))

- **Units and Grades:** For each course, make sure the units and the grade appear exactly as they appear on your transcript. Enter your grades using lowercase characters, e.g. a+, a, a-, b etc.
- **Petitions:** Leave this field blank unless you have petitioned either the CS Department (for Core, Depth, Track, or Electives) or SoE (for Math, Science, TIS, Engineering Fundamentals). If you have successfully petitioned for an exception, indicate the substitute course in the *Petitions* field. E.g. Suppose that you have successfully petitioned the selection of course C for requirement R. In this case, select any of the listed courses in R, and indicate C in the Petition's field for your selection.
- **AP Credit:** If you select AP Credit on your program sheet, the AP Credit must appear on your Stanford transcript.

Mathematics and Science Requirement

Mathematics

1. Satisfy 1a OR 1b OR 1c.

a. Take all of the following (5 units each).

☐ MATH 41 ☐ MATH 42

b. Take all of the following.

☐ MATH 19 ☐ MATH 20 ☐ MATH 21

c. AP Credit (approved by SoE).

☐ AP Calculus

2. Take all of the following (5 units each).

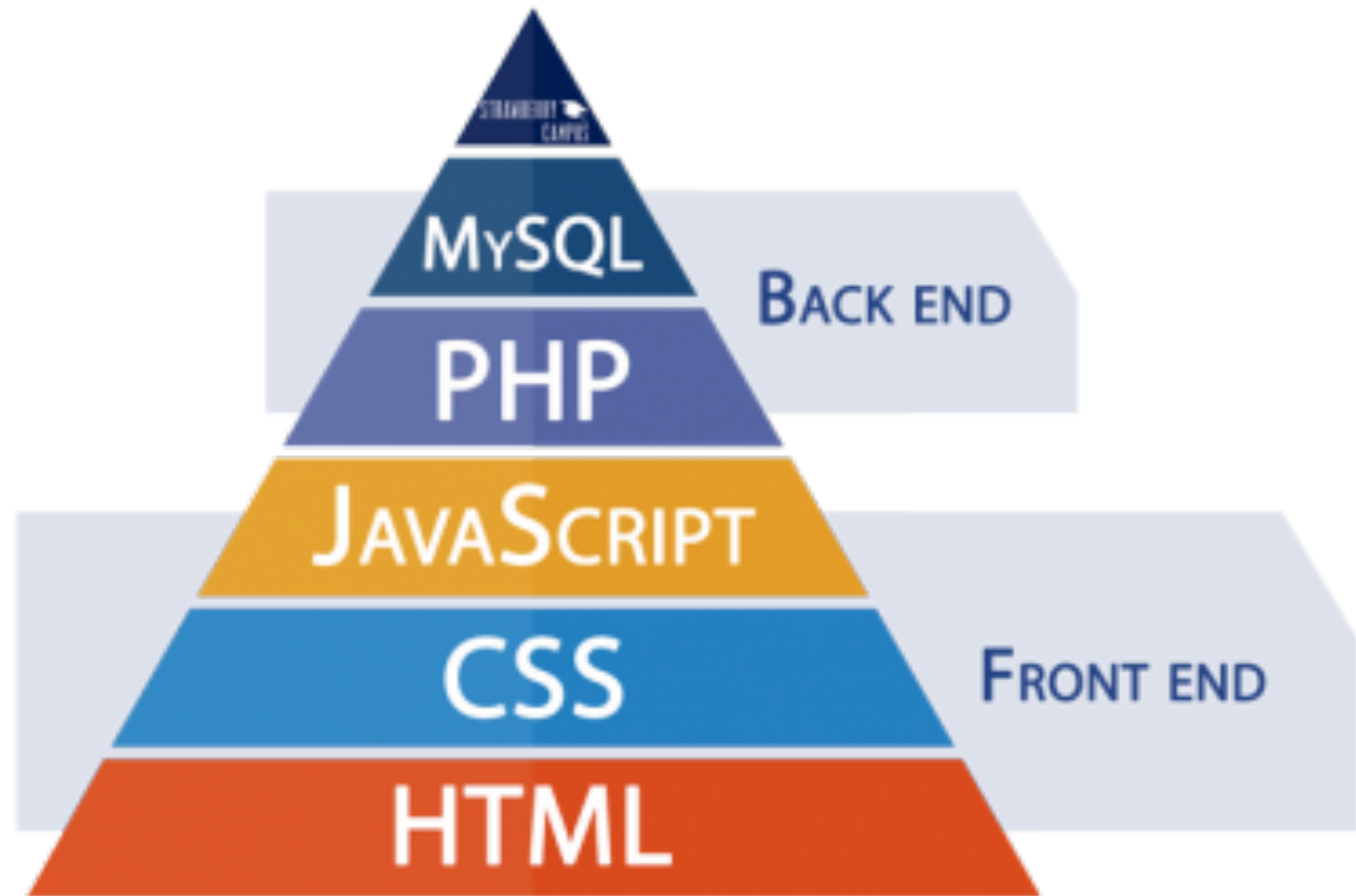
☐ CS 103 ☐ CS 109

Demo: Worksheet

Academic Programsheet

Checking compliance w.r.t academic program (UG / MS)
requirements in the CS Department at Stanford

Creating Worksheets



THE BIG 5

DO YOU MASTER THEM ALL?

Worksheets.Stanford.EDU

The **DIY** Approach

Set up Worksheets in *WYSIWYG* fashion using *Logical Rules*
No traditional programming required

Cloud Based

No need to install
hardware or
software

Easy to Manage

Through Dashboards
and drop down lists

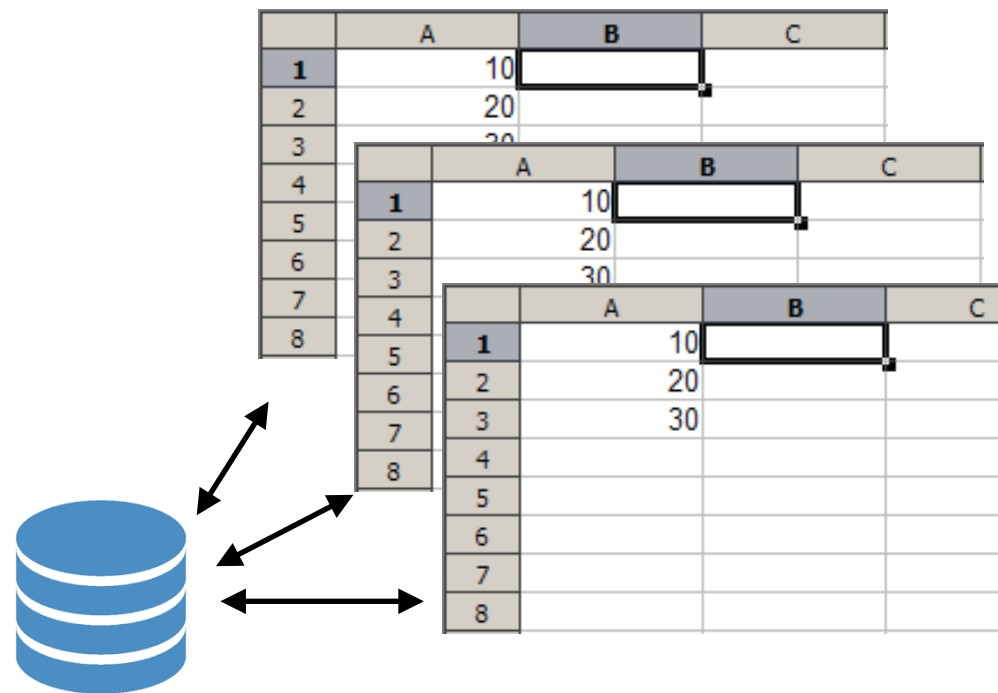
Worksheets Editor

WYSIWYG Editor for creating and editing worksheets

Demo: Worksheet Editor

Worksheets.Stanford.EDU

Personal and collaborative **worksheets**

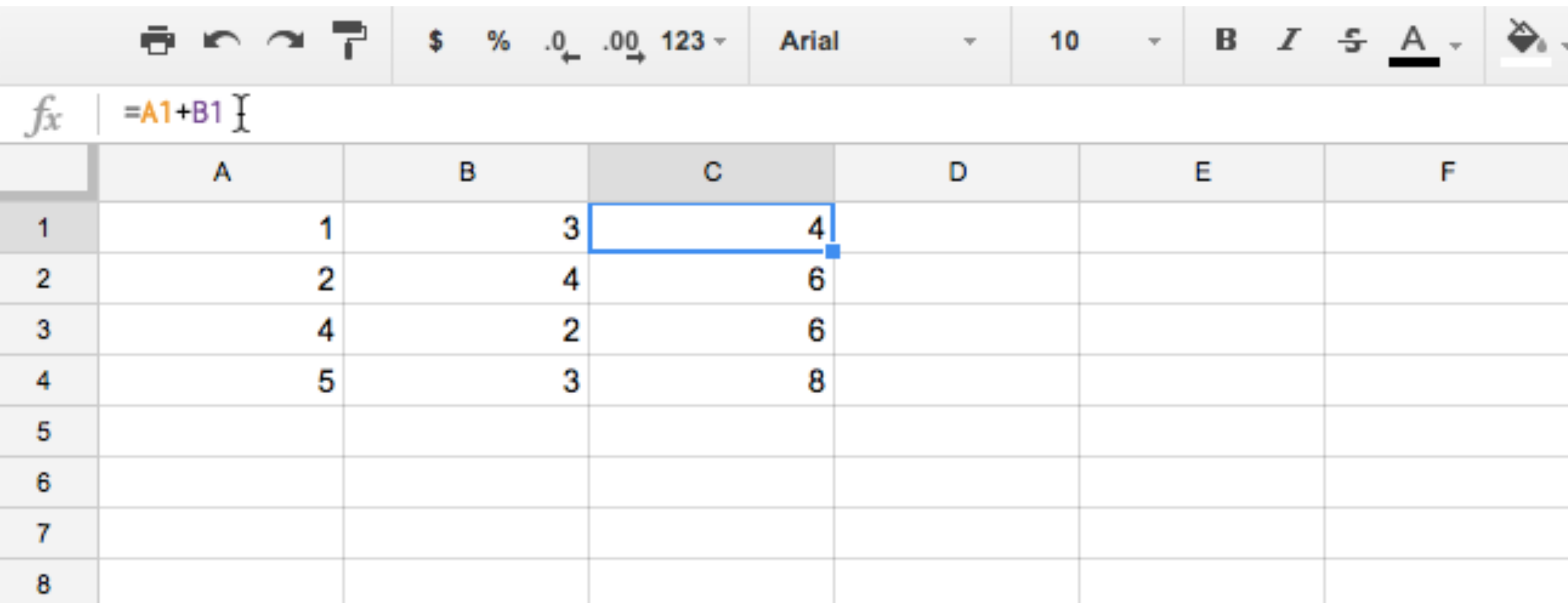


Workbook
of worksheet submissions



Workspaces
integrating heterogeneous
worksheets

Origins in Spreadsheets



The image shows a spreadsheet application interface. At the top is a toolbar with icons for printing, undo, redo, and a fill handle. Below the toolbar is a formula bar containing the text f_x and the formula `=A1+B1`. The spreadsheet grid has columns labeled A through F and rows numbered 1 through 8. Column C is highlighted in grey. The data in the grid is as follows:

	A	B	C	D	E	F
1	1	3	4			
2	2	4	6			
3	4	2	6			
4	5	3	8			
5						
6						
7						
8						

Huge success

- individual users
- companies
- conglomerates

Strengths

- automatic computation of values
- ease of specification using simple math formulas

Spreadsheets

Limitations

Functional formulas

$$C1 = A1 + B1$$

what if we had $C1 \geq A1 + B1$ instead ?

A1	B1	C1
1	3	4

insert

10

Unidirectional Updates

Constraint Violations

Take exactly one of CS 157 or PHIL 161

☐ CS 157 ☐ PHIL 161

Inconsistency!

What can be done?

1. Pinpoint the violation, and give some kind of visual feedback to the user

Take exactly one of CS 157 or PHIL 161

Logical Spreadsheets, Michael Kassoff (Thesis), 2011

Violation management for relational data, Eric Kao (Thesis), 2015

Constraint Violations

Take exactly one of CS 157 or PHIL 161



What can be done?

2. Repair the violation

In this case the repair is simple, i.e., to automatically **select PHIL 161** and **remove** the selection **CS 157**

Logical Spreadsheets, Michael Kassoff (Thesis), 2011

Violation management for relational data, Eric Kao (Thesis), 2015

Constraint Violations

Take at most 2 courses from:

☒ CS 157 ☒ PHIL 161 ☐ STATS 116

What should be the repair?

Delete CS 157? Delete PHIL 161?

Delete both? Disallow STATS 116?

*Let the worksheet creator decide using
Update Policies !*

Worksheet Foundations

Repairing Violations

Satisfy course prerequisites

Note: CS 157 is a prerequisite for CS 227

CS 161 is a prerequisite for CS 261

Suppose, cs157 is not checked

cs227 is checked by the user

we have a violation!

One update policy is to automatically check cs157 in response

$\text{value}(\text{cs227}, \text{true}) \Rightarrow \text{value}(\text{cs157}, \text{true})$

Summary

- Worksheets are dynamic, interactive webpages
- Traditional approaches to create worksheets require extensive expertise in different programming languages or access to good programmers
- DIY Approach to building Worksheets using Logical Rules
- Get started at Worksheets.Stanford.EDU
 - After signing in, WYSIWYG editor accessible
 - Tutorials, and References
- Deal with inconsistencies through visual feedback to users, and update policies specified by admins

World Data Web

“Correct-on-Capture”

- Majority of structured data on web generated as output of online forms.
- Shift our focus on validating data at entry point rather put significant effort to clean it later

Teaching Tool for Logic

Rules have tangible effects - reflected in a worksheet's UI