

8th Central and Eastern European Software Engineering Conference in Russia - CEE-SECR 2012

November 1 - 2, Moscow



Learning to Code in an Online World

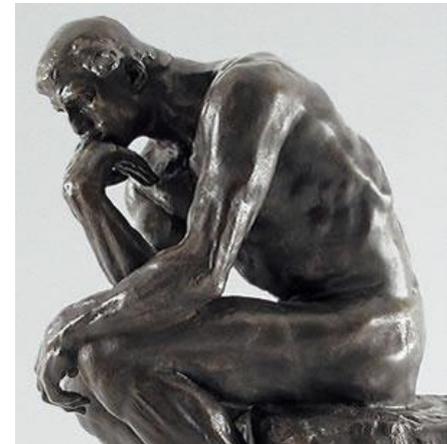
Ben Bederson

University of Maryland
Computer Science Dept.

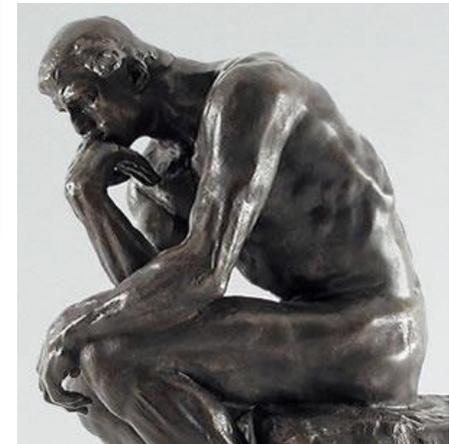
Human-Computer Interaction Lab



What is Learning?



What Does Technology Offer?



Technology & Education

Long History



MOOC Popularization



INTRODUCTION TO Artificial Intelligence

In partnership with



Sebastian Thrun



Peter Norvig

MOOCs Trending



Open Learning Initiative

Transforming higher education through the science of learning.

Anatomy of a MOOC



INTRODUCTION TO
Artificial Intelligence

In partnership with
STANFORD ENGINEERING

Course Discussion Progress Information Profile

Watch

Available units:

- ▶ Final(closed)
- ▶ 22. Natural Language Processing II
- ▶ Optional NLP Programming
- ▶ 21. Natural Language Processing
- ▶ Homework 8(closed)
- ▶ 20. Robotics II
- ▶ 19. Robotics I
- ▶ Homework 7(closed)
- ▶ 18. Computer Vision III
- ▶ 17. Computer Vision II
- ▶ 16. Computer Vision I
- ▶ Homework 6(closed)
- ▶ 15. Advanced Planning
- ▶ 14. Game Theory
- ▶ 13. Games
- ▶ Midterm(closed)
- ▶ 12. MDP

Upcoming due dates in the next 7 days:

None

Announcements

Please check out our new site and classes!

AI Class Team - 8 month ago

We're pleased to announce the launch of two new classes: CS101 Building a Search Engine and CS373 Programming a Robotic Car through our new website at <http://www.udacity.com!>

Thank you to the Community

Irvin - 10 month ago

One of the major things that has made this class so special is the community so we'd like to give a huge thanks to the following members who have really contributed to the discussion!

Community Creators, way to take the initiative that has helped so many of your fellow students!

Xochipilli - reddit

Terminator - aigus

Ivan Yurchenko - AI-class - "Introduction to Artificial Intelligence" online course facebook group

Jacqueline Spiegel - ai-class systems now compscisters

Aigus members who helped moderate during the exams, you guys put in a heroic effort and we truly appreciate your help (please let us know if we've left anyone out)!

L_McLean

robrambusch

sea otter

franciso

aca

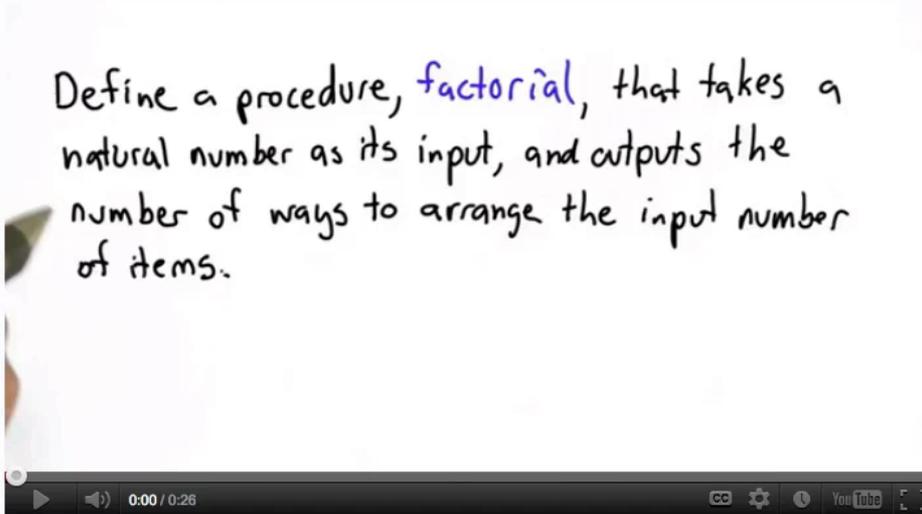
Mike H

Udacity

 An error has occurred on this page. You may be able to continue using it or you may need to refresh the page.

Enroll

Recursive Factorial



 Like { 0 }  Tweet { 0 }  +1 { 0 }

- 2. Long words - Question - Answer
- 3. Counter
- 4. Counter Quiz - Question - Answer
- 5. Expanding Our Grammar - Question - Answer
- 6. Recursive Definitions
- 7. Ancestors - Question - Answer
- 8. Recursive Procedures
- ✓ 9. Recursive Factorial - Question - Answer**
- 10. Palindromes - Question - Answer
- 11. Recursive Vs Iterative
- 12. Bunnies - Question - Answer
- 13. Divide And Be Conquered
- 14. Counting Calls - Question - Answer
- 15. Faster Fibonacci - Question - Answer
- 16. Ranking Web Pages
- 17. Popularity
- 18. Good Definitions - Question -

< Previous

Next >

Auto-Next: ON

Instructor Comments

Supplementary Material

Why the Excitement?

- Cheaper
- Better learning
- Broader access

Why the Success?

- Free
- Short videos
- Focus on content, not talking head
- Built-in activities
- Community of students
- Name-brand suppliers

Content

Udacity (14 courses)

- Intro to CS
- Intro to Physics
- Intro to Statistics
- Algorithms
- Differential Equations
- Web Development
- Software Testing
- Software Debugging
- Programming Languages
- Intro to Theoretical CS
- How to Build a Startup
- Design of Computer Programs
- Artificial Intelligence
- Applied Cryptography

Coursera (198 courses)

- Networked life (U Penn)
- Social Network Analysis (U Mich)
- Probabilistic Graphical Models (Stanford)
- Neural Networks (Toronto)
- Computational Investing (Georgia Tech)
- Computer Vision (Stanford)
- Comp. Photography (Georgia Tech)
- AI Planning (Edinburgh)
- Control Mobile Robot (Georgia Tech)
- Natural Language Proc. (Columbia)
- Computational Neuroscience (U. Wash)
- Linear Algebra (Brown)
- Computer Vision (Berkeley)
- ...

Or, Roll Your Own –

<https://code.google.com/p/course-builder/>



course-builder

Course Builder

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[Summary](#) [People](#)

Project Information

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[Project feeds](#)

Code license
[Apache License 2.0](#)

Labels
Academic, AppEngine,
Education, Python

Members
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[kpar...@google.com](#),
[magg...@google.com](#),
[ma...@google.com](#),
[pgbov...@google.com](#),
[pnor...@google.com](#),
[psimakov@google.com](#),
[s...@google.com](#),
[v...@google.com](#)
8 committers

Featured

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[ImplementCourseMaterial](#)
[ManageCommunity](#)
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Welcome to Course Builder!

Course Builder is our experimental first step in the world of online education. It packages the software and technology we used to build our [Power Searching with Google](#) online course. We hope you will use it to create your own online courses, whether they're for 10 students or 100,000 students. You might want to create anything from an entire high school or university offering to a short how-to course on your favorite topic.

Course Builder contains software and instructions for presenting your [course material](#), which can include lessons, student activities, and assessments. It also contains instructions for using other Google products to create a [course community](#) and to evaluate the [effectiveness](#) of your course. To use Course Builder, you should have some technical skills at the level of a web master. In particular, you should have some familiarity with HTML and JavaScript.

If you have technical issues or feature requests, please report them in our [Issues Tracker](#).

Course Builder Intro Video



[Get Started](#)

[Dive Deeper](#)

- [Advice for online course design](#)
- [Implement course material](#)
- [Develop community](#)
- [Evaluate course efficacy](#)

[Hangouts on Air](#)

Peter Norvig hosted two Hangouts on Air with special guests. They answered your questions about MOOC design and the technical aspects of using Course Builder.

- [19 Sept 10:00am - 10:45am PDT](#)
- [26 Sept 10:00am - 10:45am PDT](#)

[Details](#)

Google CourseBuilder

YOUR LOGO HERE | Search Education  +1  0

Course Forum test@example.com | Logout

Power Searching with Google

Google Search makes it amazingly easy to find information. Come learn about the powerful advanced tools we provide to help you find just the right information when the stakes are high.

Daniel Russell
Senior Research Scientist
Google, Inc.



Schedule

[Pre-course assessment](#)

[Unit 1 - Introduction](#)

[Unit 2 - Interpreting results](#)

[Unit 3 - Advanced techniques](#)

[Mid-course assessment](#)

[Unit 4 - Find facts faster](#)

[Unit 5 - Checking your facts](#)

Stanford Class2Go

<https://github.com/Stanford-Online/class2go>

An Introduction to Computer Networks

WEEK 3



WEEK 2



WEEK 1



-  Pre-Course Survey
-  00 - Welcome
-  01 - Introduction to the Class
-  02 - Why you should care about the Internet - Why this course?
 -  Why you should care about the Internet - Why this course? (Slide)
-  03 - What is the Internet - The 4 Layer Internet Model (Volume Increased)
 -  What is the Internet - The 4 Layer Internet Model (Slide)
-  04 - What is the Internet - The IP service model

Recent Announcements

Oct. 23, 2012, 11:14 p.m.

Update: 2 additional videos posted for week 3

We decided to include two additional videos in the course materials for week 3:

- 37 - Congestion Control - RTT Estimation and Self Clocking
- 38 - TCP Reno and New Reno

The corresponding problem sets and slides have also been posted. The concepts are not too complicated, so it should not represent much more workload. We hope you enjoy them!

Oct. 19, 2012, 1:25 a.m.

First Screenside Chat

We're both very excited at how many of you have learned about the Internet from the videos we've recorded as well as how many interesting questions there have been on the forums. We've recorded the **first of our Screenside Chat series** to talk about what you've learned so far and how the course is going. We of course don't want to add a lot more for you to view, so it's quite short. We hope you enjoy it!

- Phil & Nick



Video Not The Only Online Strategy

Probability & Statistics (Open + Free) | Syllabus | Outline | Help | More

Unit 1: Exploratory Data Analysis | This course is not led by an instructor

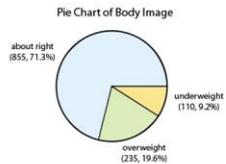
Examining Distributions | Examining Relationships | Search this course

Module 1 / One Categorical Variable (2 of 3) | 11

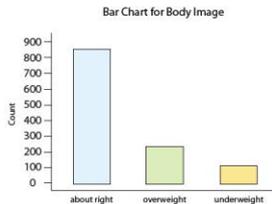
LEARNING OBJECTIVES: Summarize and describe the distribution of a categorical variable in context.

In order to visualize the numerical summaries we've obtained, we need a graphical display. There are two simple graphical displays for visualizing the distribution of categorical data:

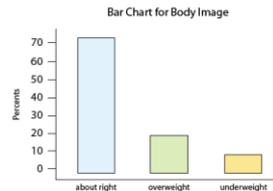
1. The Pie Chart



2. The Bar Chart



OR



learn by doing

What is the difference between the two bar charts?

- There is no difference.
- The two bar charts represent the distributions of two different variables.
- The first bar chart represents the count of respondents that chose each category, while the second bar chart represents the percentage of respondents that chose each category.
- The two bar charts represent the distribution of "Body Image" obtained from two different samples.

Hint: Look at the vertical axis for each bar chart.

Now that we have summarized the distribution of values in the Body Image variable, let's go back and interpret the results in the context of the questions that we posed:

learn by doing

The results suggest that the students [dropdown] equally divided across the three body image categories. The vast majority of students (71.3%) feel that they are [dropdown]. Among the remainder of the students, more students (19.6%) feel that they are [dropdown] and the body perception that occurred the least often was [dropdown] (9.2%).

Now that we've interpreted the results, there are some other interesting questions that arise:

- Can we reliably generalize our results to the entire population of interest and conclude that a similar distribution across body image categories exists among all U.S. college students? In particular, can we make such a generalization even though our sample consisted of only 1,000 students, which is a very

Features:

- Learn by doing
- Did I get this?
- Learning objectives
- Exams

Sufficient to Teach Programming Skills?



Live Coding – www.codecademy.com

Tracks

Tracks are series of courses grouped to help you master a topic or language. Choose one to start learning!

JavaScript Fundamentals

Learn to create simple applications and games with this introduction to the JavaScript language. By the end of this track, you'll make your own Blackjack game!

What you'll learn...

- Programming basics
- Make JavaScript apps
- Build a real game

Web Fundamentals

Learn the building blocks of web development with HTML and CSS. Build a basic webpage by the end of the first course, and a complete website by the end of the track!

What you'll learn...

- How to build websites
- HTML and CSS
- Style and design

Python

Python is the language of choice for beginners and experts alike. Learn how to create a variety of interactive applications with one of the most popular languages.

What you'll learn...

- Versatile language
- Beautiful syntax
- Useful libraries

Ruby

Ruby is an incredibly popular programming language that helps power websites all over the world. Learn how to create a number of useful applications quickly and easily.

What you'll learn...

- Ruby fundamentals
- Beautiful syntax
- Rapid prototyping

NEW

JavaScript
jQuery
HTML/CSS
Python
Ruby

Live Coding – www.khanacademy.org

201,866,618 lessons delivered

**KHANACADEMY**

1  bederson Donate

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[Computer Science](#) » [Tutorials](#) » [Intro to Animation](#)

Intro to Animation New Program

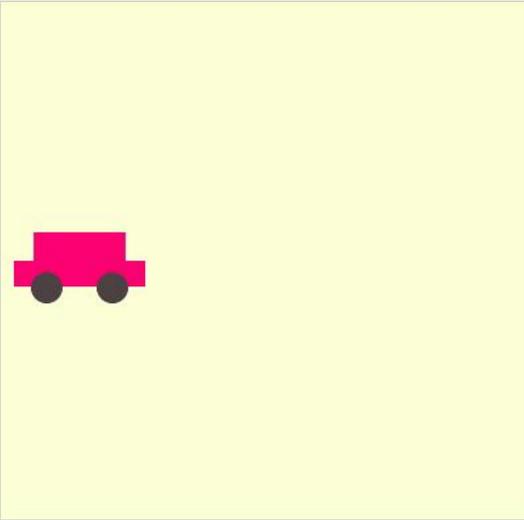
```
background(252, 255, 214);
noStroke();

// position of the car
var x = 10;

// draw the car body
fill(255, 0, 115);
rect(x, 200, 100, 20);
rect(x + 15, 178, 70, 40);

// draw the wheels
fill(77, 66, 66);
ellipse(x + 25, 221, 24, 24);
ellipse(x + 75, 221, 24, 24);

var draw = function() {
  // this is the draw loop! everything inside these
```



  -4:32 [Save As...](#) [Share...](#) [Restart](#)

Next Steps

[Previous Tutorial](#)
Drawing Bonus: Rotation!

[Next Tutorial](#)
Incrementing Shortcuts

[Explore!](#)


Live Diagramming – www.pythontutor.com



LEARN programming by visualizing code execution

Online Python Tutor is a free educational tool that helps students overcome a fundamental barrier to learning programming: understanding what happens as the computer executes each line of a program's source code. Using this tool, a teacher or student can write a [Python](#) program directly in the web browser and visualize what the computer is doing step-by-step as it executes the program.

For example, I wrote the following Python program to [recursively](#) find the sum of a linked list of numbers. Click the "Forward" button to see what happens as the computer executes one line of code at a time.

```
→ 1 def listSum(numbers):
   2     if not numbers:
   3         return 0
   4     else:
   5         (f, rest) = numbers
   6         return f + listSum(rest)
   7
   8 myList = (1, (2, (3, None)))
   9 total = listSum(myList)
```

Frames Objects

[Edit code](#)



< Back Step 1 of 18 Forward >

→ line that has just executed
→ next line to execute

So far, over 100,000 people have used Online Python Tutor to understand and debug their programs, often as a supplement to learning from textbooks, lecture notes, and online programming tutorials.

Submit Server – marmoset.cs.umd.edu



Marmoset Project **CS Project Submission Server**

demo-student2: ALL COURSES | UMD 101 | CODE REVIEWS **Logout**

UMD 101: Java exercises

Demo Student2 (demo-student2)

Projects

project	submissions	last submission test results		web submission	download starter files	Due	Title
		Public	Release				
3	view	0 / 25	-	submit	download	23 Mar, 11:59 PM	Multi-tap text entry
2				submit	download	21 Mar, 11:59 PM	FizzBuzz
1				submit	download	08 Mar, 11:59 PM	Java warmup
0	view	NEW		submit	download	07 Mar, 11:59 PM	Compute square of an int

25 Oct, 11:55 AM

1: Java warmup

Implement several simple functions in java

Deadline: Thu, 08 Mar at 11:59 PM

[Overview](#) | [Utilities](#) | [Baseline](#) | [History](#) | [Test details](#) | [Inconsistencies](#)

Jaime Spacco (jspacco), Submission # 2, 23 Feb, 11:31 AM

jaime.spacco@gmail.com | [Source](#) | [Continue Code Review](#) | [Download](#) | [Student view](#) | [Grant extension](#) | [all test runs](#) | [Retest](#) | [mark broken](#)

- 16/20 points for public test cases.
- 20/80 points for release test cases.

Test results

type	test #	outcome	source coverage	points	name	short result	
PUBLIC	1	passed	source	4	testIsOddFor0_2	PASSED	
PUBLIC	2	passed	source	4	testFirstDigitSimple	PASSED	
PUBLIC	3	passed	source	4	testFirstDigitTeens	PASSED	
PUBLIC	4	passed	source	4	testDistinctValues	PASSED	
PUBLIC	5	not_implemented	source	4	testBitCount	java.lang.UnsupportedOperationException: You must implement this at	

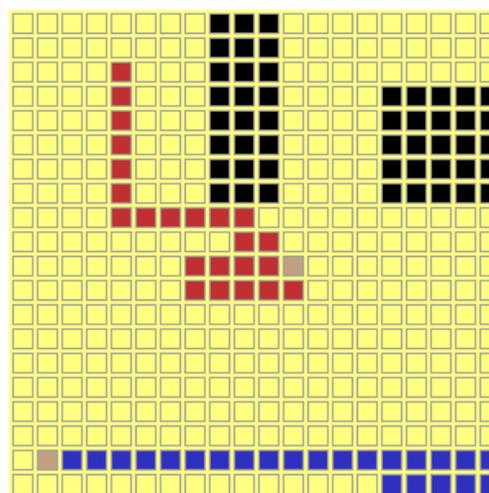
Inspiration by Competition

Tron leaderboard from tournament 2010-05-26 16:57:11 [[past tournaments](#)]

Show TAs

Pos	TA	Entrant	Wins	Ties	Losses	Points
1		FURRIES FTW	176	0	34	352
2		brockfanning	162	0	48	324
3		T3	148	0	62	296
4		JP	137	0	73	274
5		player(s)	136	0	74	272
6		KualityPlay	135	0	75	270
6		Undra	135	0	75	270
8		Jovial Joe	131	0	79	262
9		OaftheBear	128	0	82	256
10		tbid	127	0	83	254
11		cs131186	126	0	84	252

Tron played between [brockfanning](#) and [YOOHOO](#) in game #8194 on 2010-05-26 16:57:11



Round	Player	Game State
1		-1,-1,-1,-1,-1,-1
2	brockfanning	-1,-1,-1,-1,-1,-1
3	YOOHOO	-1,-1,-1,-1,-1,-1
4	brockfanning	-1,-1,-1,-1,-1,-1
5	YOOHOO	-1,-1,-1,-1,-1,-1
6	brockfanning	-1,-1,-1,-1,-1,-1
7	YOOHOO	-1,-1,-1,-1,-1,-1
8	brockfanning	-1,-1,-1,-1,-1,-1
9	YOOHOO	-1,-1,-1,-1,-1,-1
10	brockfanning	-1,-1,-1,-1,-1,-1
11	YOOHOO	-1,-1,-1,-1,-1,-1
12	brockfanning	-1,-1,-1,-1,-1,-1
13	YOOHOO	-1,-1,-1,-1,-1,-1

Online ONLY Not The Only Strategy

- Blended learning / “Flipped” classroom

Lectures → Homework

Homework → Class work

Peer Learning



Peer Learning

SearchParty - <http://search-party.appspot.com/>



Student View

>>> **SEARCH PARTY** Annathema [Logout](#)

Student logged in: Hello Annathema

Task

1. Crops ▼

Problem

Native Americans had a name for the moon associated with the most widely grown crop in America. During what month would you see that moon?

Response

August

Note

SAVE

Search History

Milk moon

Corn moon

Moon Names

[full moon names h...](#) ✓

[Corn Moon](#) ✕

Milk moon ✕

About 6,020,000 results (0.27 seconds)

 [What is a 'milk moon' anyway? - CSMonitor.com](#)
May 26, 2010 ... The full moon of May, also known as the "Milk moon," will occur at 7:07 p.m. EDT Thursday. What better time to discuss this brightest object in ...

 [Milkmoon](#)
Aug 22, 2012 ... I am working on some other significant changes here at Milkmoon, too. Something which just seems like the right thing to do. I have come to ...

 [Supermoon Saturday: Why it's the biggest, brightest of 2012 \(+video ...\)](#)
May 4, 2012 ... Supermoon Saturday: It's also called the 'Flower Moon,' and 'Milk Moon.' The 'supermoon' will be only 221802 miles from Earth, the closest to ...

 [Full moon - Wikipedia, the free encyclopedia](#)
This full moon was near its greatest northern ecliptic latitude, so the southern Mid Spring, May, **Milk Moon**, When women weed corn, Corn Planting Moon, ...

 [milkmoonkids — Welcome](#)
Home · Shop · Growth Charts · Wall Art · Screen Prints · About Us · FAQ · Contact Us · Featured Items · Dino Dance; \$26.00. Dino Smile; \$28.00. D-I-N-O Height!

 [Moon Milk Review](#)
Moon Milk Review is now The Doctor T. J. Eckleburg Review.

[Greg Brown - Lyrics for MILK OF THE MOON](#)
Lull It By; A Little Excited; Let Me Be Your Gigolo; Small of Coffee; Milk of the Moon; Mud; Ashamed of Our Love; Steady Love; The Moon Is Nearly Full; Telling ...

[milkmoonkids — Growth Charts](#)
D-I-N-O Height! (green); \$44.00. D-I-N-O Height! (purple); \$44.00. Flying High; \$44.00. Galactically Grown (lime); \$44.00. Galactically Grown (primary); \$44.00 ...

 [Milk Moon Kids Whimsical Children's Art by milkmoonkids on Etsy](#)
Milk Moon Kids. Columbus & Cincinnati, United States. Contact · Favorites · Circles: 13 ... milkmoonkids. Milk Moon Kids Whimsical Children's Art. Favorite ...

[hameaufarm.com » BELTANE/MAY DAY/MILK MOON](#)
May 2, 2010 ... BELTANE/MAY DAY/MILK MOON ... And last, but certainly not least, Milk Moon. ... The full moon that falls right near Beltane is the Milk Moon.

1 2 3 4 5 6 7 8 9 10

powered by  Custom Search

Student View

en.wikipedia.org/wiki/Crop

Native Americans had a name for the moon associated with the most widely grown crop in America. During what month would you see that moon?

>>> SEARCH PARTY

Response:

Note:

Save

05/23/12 13:47

Rate This Page: Helpful Unhelpful

Show: [Helpful](#) [Unhelpful](#) Unrated

Queries: [corn moon](#) [a name for the moon associated...](#) [corn moon native american](#) [corn planting moon](#) [Crop moon crops](#) [cropsey](#) [green corn moon](#) [Harvest moon](#) [harvest moon](#) [Maple sugar](#) [milk moon](#) [month named after corn native](#)

...

Create account Log in

Article **Talk** Read **Edit** View history Search

Wiki Loves Monuments: Historic sites, photos, and prizes!

Crop

From Wikipedia, the free encyclopedia

Main page
Contents
Featured content

Teacher View - Queries

>>> SEARCH PARTY
bederson [Dashboard](#) [Logout](#)

Task

1. Cloth weaving ▼

Problem

What style of cloth weaving is named for the world's oldest continuously-inhabited city?

STUDENTS (27)

QUERIES (45)

WORDS (48)

LINKS (21)

RESPONSES (4)

STOP ACTIVITY ||

DOWNLOAD DATA 📄

CLEAR DATA ✕

DELETE ACTIVITY 🗑️

Activity

EIST 2012
Activity code: 58647

Queries

Sort by: Frequency [ABC](#)

- ▶ **cloth weaving** (✓ 1, 2 unrated)
- ▶ **Cloth** (2 unrated)
- ▶ **cloth weaving** (✓ 1, 1 unrated)
- ▶ **cloth weaving city oldest** (2 unrated)
- ▶ **oldest continuously inhabited city** (✓ 1, 1 unrated)
- ▶ **cesar** (✗ 1)
- ▶ **city weaving** (1 unrated)
- ▶ **city weaving old** (1 unrated)

Teacher View - Words

>>> SEARCH PARTY

bederson [Dashboard](#) [Logout](#)

Task

1. Cloth weaving

Problem

What style of cloth weaving is named for the world's oldest continuously-inhabited city?

STUDENTS (28)

QUERIES (65)

WORDS (73)

LINKS (73)

RESPONSES (5)

COMPLETE HISTORY

EDIT ACTIVITY

STOP ACTIVITY

Activity

EIST 2012
Activity code: 58647

Words

Show: [Helpful](#) [Unhelpful](#) [Unrated](#)

cloth, Cloth weaving oldest, Oldest city style, styles inhabited named, names of continuously-inhabited for world's, world, worlds continuously What, what city? History, history <empty> clothe world,s

Sort by: [Frequency](#) [ABC](#)

- ▶ cloth, Cloth (✓7, ✗2, 11 unrated)
- ▶ weaving (✓7, ✗2, 10 unrated)
- ▶ oldest, Oldest (✓8, ✗1, 8 unrated)
- ▶ city (✓6, ✗2, 9 unrated)
- ▶ style, styles (✓2, 4 unrated)
- ▶ inhabited (✓3, 2 unrated)
- ▶ named, names (✓4, 1 unrated)
- ▶ of (✓3, 2 unrated)

Teacher View - Responses

bederson [Dashboard](#) [Logout](#)

Task

1. Cloth weaving 

Problem

What style of cloth weaving is named for the world's oldest continuously-inhabited city?

STUDENTS (28)

QUERIES (65)

WORDS (73)

LINKS (73)

RESPONSES (5)

COMPLETE HISTORY

Activity
EIST 2012
Activity code: 58647

Responses

Damask **Damascus** **Damask** <http://www.wired.com/geekdad/t...> **twill**

Sort by: **Frequency** [ABC](#)

- ▶ **Damask (4)**
- ▶ **Damascus (2)**
- ▶ **Damask (1)**
- ▶ <http://www.wired.com/geekdad/tag/a-google-a-day/> **Has this exact question :) (1)**
- ▶ **twill (1)**

EDIT ACTIVITY 

STOP ACTIVITY 

Teacher View - Students

COMPLETE HISTORY

EDIT ACTIVITY ✎

STOP ACTIVITY ||

CLONE ACTIVITY

DOWNLOAD DATA 📄

CLEAR DATA ✕

DELETE ACTIVITY 🗑️

students logged in: 0

▶ Andrew

▶ Ben

▶ Ben 2

▶ chad

▼ **Chris A**

Queries

- Damascus cloth weaving (1 unrated)
- world oldest continuously inhabited city (✓ 1)
- world oldest continuously inhabited city (1 unrated)

Words

- city (✓ 1)
- cloth (1 unrated)
- continuously (✓ 1)
- Damascus (1 unrated)
- inhabited (1 unrated)
- inhabited (✓ 1)
- oldest (✓ 1)
- weaving (1 unrated)
- world (✓ 1)

Links Followed

- [Damask - Wikipedia, the fre...](#) (1 unrated)
- [List of cities by time of c...](#) (✓ 1)

Responses

- Damask (1)

Does Online Learning Work?

- Three Studies

Does Online Learning Work?

- Three Studies

- 1) **I T H A K A**

Introductory Statistics classes

Blended Learning style

Compared across 6 public universities

⇒ Learning the same as in classroom

⇒ 25% reduction in time spent

Does Online Learning Work?

- Three Studies

2) **BRYN MAWR**

Small liberal arts college

10 courses (biology, chemistry, economics, math, French)

Blended Learning style

- ⇒ Disadvantaged students did just as well
- ⇒ Nearly 100% retention
- ⇒ Performed better than traditional classes in all but 1 course

Does Online Learning Work?

- Three Studies

3) Meta Study

no difference between online & face-to-face

But, wide variability – depends on the details

Exs – meta-studies of 232 distance education studies:

- <http://rer.sagepub.com/content/79/3/1243.short>
- <http://rer.sagepub.com/content/74/3/379.abstract>

Does Online Learning Work?

Other studies generally show:

→ ***no difference*** between online & face-to-face

But, wide variability – depends on the details

Exs – meta-studies of 100's of distance education studies:

- <http://rer.sagepub.com/content/79/3/1243.short>
- <http://rer.sagepub.com/content/74/3/379.abstract>

Are We Done?

- Retention
- Cheating
- Assessment
- Feedback
- Certification / Credentials
- Quality of course
- Effectiveness of approach

Suggestions

- Consider blended approaches
- Consider motivation – attrition a big problem
- Consider cheating – anonymity risky

Questions?

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