basic facts

- [ ] you are using github to host your project (fork my project)
- [ ] before break add the github repo. link to our shared google doc.
- [ ] minimally your repo. needs to contain the forked files.
- [ ] this is a required deliverable
- [ ] more on git and github next class.

Minimal Requirements

- [ ] Log in working. only people logged in can chat
- [ ] Messages stored in database. (need to design a database)
- [ ] When a user logs in they will see some list of previous messages.
- [ ] Search. I can search for a particular term and see the results.

I don’t want one person to learn how to do this and the rest of you practicing your human compiler skills of just implementing that person’s ideas.

This is a partner task.

Piazza and in person guidelines

- ☐ Feel free to discuss how the provided code works.
- ☐ You can even project the unmodified code and talk with the entire class about each and every line.
- ☐ Looking at unmodified code and discussing what changes need to be made is not permissible.

Piazza continued

- ☐ You are not to show to any part of your code --even elided versions of your code-- to anyone.
- ☐ If you are looking for help you cannot show your code
- ☐ If you are providing help to someone you cannot show your code.

Piazza continued

- [ ] Feel free to share online resources (other than those that are a direct cut-and-paste solution to his task).If you are looking for help you cannot show your code

- [ ] Feel free to answer questions that are not code based. For ex., I think you created a new workspace and forgot to install flask -> sudo easy_install flask

- [ ] Any question/answer exchanges that are entirely in English and without props are fine (i.e., not sharing code snippets).

figuring out new things is hard

part of being a software developer

```scala
case class ALSAlgorithmParams(
  rank: Int,
  numIterations: Int,
  lambda: Double,
  seed: Option[Long]) extends Params

class ALSAlgorithm(val ap: ALSAlgorithmParams)
  extends PAlgorithm[PreparedData, ALSModel, Query, PredictedResult] {

  @transient lazy val logger = Logger[this.type]

  def train(data: PreparedData): ALSModel = {
    // MLLib ALS cannot handle empty training data.
    require(!data.ratings.take(1).isEmpty,
      s"RDD[Rating] in PreparedData cannot be empty." +
      " Please check if DataSource generates TrainingData" +
      " and Preprator generates PreparedData correctly.")
    // Convert user and item String IDs to Int index for MLlib
    val userStringIntMap = BiMap.stringInt(data.ratings.map(_.user))
    val itemStringIntMap = BiMap.stringInt(data.ratings.map(_.item))
    val mllibRatings = data.ratings.map( r =>
      // MLlibRating requires integer index for user and item
      MLlibRating(userStringIntMap(r.user), itemStringIntMap(r.item), r.rating)
    )
```

fine line

challenging

suffering

candidate packets for the department job search

I mentored four students who went on to Computer Science Ph.D. programs: All were accepted into “Top 10” programs, all went to their top choice program,

Many, many applications mention something like this.

that’s great

some cs students go on to grad school

majority of students get jobs as software developers

how many applicants mention cool jobs students get?

majority of students get jobs as software developers

how many applicants mention cool jobs students get?

Zero

“It is amazing how easy it is to sail through a Computer Science degree from a top university without ever learning the basic tools of software developers, without ever working on a team, and without ever taking a course for which you don’t get an automatic F for collaborating”

Joel Spolsky October 2009

“Many CS departments are trapped in the 1980s, teaching the same old curriculum that has by now become completely divorced from the reality of modern software development. ...

Many universities have managed to convince themselves that the more irrelevant the curriculum is to the real world, the more elite they are. It’s the liberal arts way.”

Joel Spolsky

Quotes by CS professors

“We must prepare the best students for graduate studies”

“...this is important not only for students going to graduate school but for those who are just going to be working”

This Class

- ☐ hands on
- ☐ team-based
- ☐ focused on using dbs for web apps
- ☐ uses an agile software development process
- ☐ uses the git versioning system
- ☐ looks at cutting-edge dbs (Cassandra)

Software Development

Centre for Speech Technology Research
IBM (OS/2 Warp) - 7 Million SLOC
Computing Research Center

Software Development

Centre for Speech Technology Research
IBM (OS/2 Warp)
Computing Research Center

The right tool for the job

space shuttle software

- ☐ 120 ton shuttle
- ☐ 4 million pounds of explosives
- ☐ 4 on-board computers running identical software
- ☐ pulling info from thousands of sensors
- ☐ making hundreds of millisecond decisions by voting.
- ☐ a 5th computer with different software on standby.
- ☐ controls each of the 3 engines (gimbal)
- ☐ computers give orders to blow the explosive bolts.

an error in the code ...

“If the software isn’t perfect, some of the people we go to meetings with might die.”

Chris Hadfield
@Cmdr_Hadfield

Follow

Good Morning, Earth! Today we transition the Space Station's main computers to a new software load. Nothing could possibly go wrong.

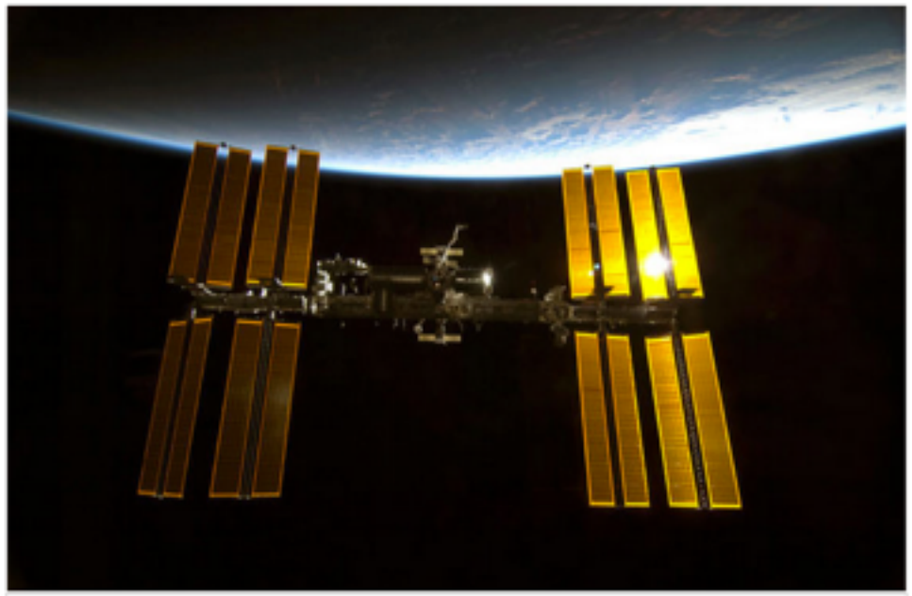
1:43 AM - 19 Feb 2013

1,090 RETWEETS **403** FAVORITES

an aside

Space Station Loses Contact with NASA Mission Control

by Miriam Kramer, Space.com Staff Writer | February 19, 2013 11:52am ET



the most perfect software humans can write

- ☐ the last 3 versions ea. 420k lines long had just one error each.
- ☐ the last 11 versions had a total of 17 errors.
- ☐ equivalent commercial programs would have 5,000 errors.
- ☐ industry average is 15-50 errors per 1,000 lines of code.
- ☐ it doesn’t crash -- doesn’t need to be rebooted.

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How?

How?

- ☐ work 9-5 -- late-nighters are not the norm.
- ☐ detailed plans --
  - ☐ the spec for a change that required 6k lines of code ran 2,500 pages.
- ☐ two teams -- coders and verifiers
- ☐ every line annotated

Most Software Development

Rapid
Don’t follow paths that lead to dead-ends

Agile Software Development with Scrum

Scrum

Software Development Process


TEAMWORK
Together We Achieve That Which No One Can Achieve Alone

Scrum

An iterative, incremental method of software development (or any complex project).

Differs from traditional software development methodologies.

Wegner's Lemma

Impossible to fully specify or test an interactive system.

Agile Software Development with Scrum

Ken Schwaber and Mike Beedle

The Scrum Framework in a few slides

- [ ] what is scrum (spec)
- [ ] how we will use it in class (class)

A product owner creates a prioritized wish list called a product backlog.

During sprint planning, the team pulls a small chunk from the top of that wish list, a sprint backlog, and decides how to implement those pieces

The team has a certain amount of time — a sprint (usually two to four weeks) — to complete its work, but it meets each day to assess its progress (daily Scrum)

Along the way, the ScrumMaster keeps the team focused on its goal.

At the end of the sprint, the work should be potentially shippable: ready to hand to a customer, put on a store shelf, or show to a stakeholder.

The sprint ends with a sprint review and retrospective.

As the next sprint begins, the team chooses another chunk of the product backlog and begins working again.

ScrumAlliance®

SCRUM PROCESS

Scrum Team

- [ ] spec: 5-8 members in a Scrum team.
- [ ] previous semesters' class: 3-5 members.
- [ ] partners

The Scrum Master

- manages team and is responsible for the success of Scrum.
- more details later
  - spec: often project manager or consultant
  - class: team will elect.

Product Backlog

- ☐ prioritized queue of technical functionality that needs to be developed into the system.
- ☐ list of features, functions, and bug fixes
- ☐ only one person is responsible for maintaining product backlog

irc project

Backlog

- Fork irc project on github.
- get basic system working
- Login working (only people logged in can chat)
- Design Database
- When a user logs in the see the list of previous messages.
- Search working

Add a card...

Product owner

- ☐ product owner controls product backlog.
- ☐ ‘customer representative’
- ☐ no one can make end-runs around the product owner.
- ☐ spec: product owner cannot be member of Scrum team.
- ☐ class: combo of me and you.

Sprint

- ☐ team works for a fixed period of time called a sprint.
- ☐ one development cycle
  - ☐ spec: 15-30 days
  - ☐ class: 2 weeks
- ☐ at the end of the sprint there is a release.
  - ☐ (may or may not be public)

The Process

- [ ] Scrum team meets to review product backlog.
- [ ] selects set of backlog items into a working product
- [ ] The team commits to achieving this sprint goal.
- [ ] The team divides the work among members.

Scrum status meetings

- ☐ spec: daily scrum meetings
- ☐ class: every class meeting
- ☐ Scrum master enforces rules and runs meeting.
- ☐ Meeting is a few min. long.

Format of meeting

- [ ] Scrum master starts on their left.
- [ ] each team member answers three questions:
  - [ ] What have you done since last Scrum?
  - [ ] What will you do between now and the next Scrum?
  - [ ] What got in your way of doing work?

Format of mtg. cont'd

- ☐ Scrum master writes impediments on white board.
  - ☐ ex, can't install software
  - ☐ unsure how to proceed.
  - ☐ doing something else
- ☐ job of Scrum master to fix impediments.

Format of Scrum mtg.

- [ ] Scrum status meeting is just about status.
- [ ] If there needs to be a design/brainstorming meeting do it after or some other time.

Scrum Meetings

Transparency

Trust

Scrum Sprint Demo

class: every 2 weeks

That’s it for Scrum!

git

Audience Participation: What is git?

Git Process

- [ ] one team member sets up a repository for the project
- [ ] each team member
  - [ ] tbd
- [ ] to evaluate your project I will be pulling from your repository.

more on git next class

<resume>

---

skills:

experience with agile software development using Scrum

experience with the Git versioning system

Project XP

not only what you do
but how you do it

Scrum/git

Requirements

- [ ] Scrum
- [ ] Git
- [ ] Trello

Boards

Trello

FredEvent ★ Private

Backlog

- add search box and results page
- add page showing venues
- add login feature (only people who are logged in can add info)
- page to add events
- add pages to support art shows and galleries
- add comments feature - users can comment on events and shows
- add band pages

Add a card…

Sprint Backlog

- get git repository set up.
- basic form page for creating events
- Home page showing one event from db. RP
- basic events list page RP
- design and create sql database

Add a card…

Done

- Find template and flaskify

Add a card…

Each Project will have a Trello Page

- ☐ made public (so I can see it)
- ☐ must accurately reflect current sprint backlog
- ☐ tasks must be assigned to a single identifiable individual (blame/reward)
- ☐ Up-to-date (updated every TTh)

Requirements of This Sprint

Sprint Demo Thursday 27 February

Requirements

- [ ] working website in flask by demo date
- [ ] each member of the team writes code that uses mySQL to access a single table. There can be (and probably will be) multiple tables in the db.
- [ ] follow Scrum and use GIT correctly

Homework for next class

come up with cool ideas for web apps
(esp. mobile web apps)

movie review website

rate pick up lines

Fredericksburg Food

cub scout popcorn sales

local intramural sports

cat video db

Doodle in class (take a pic of your doodle and post it)

Drinking 101 (mixed drinks)

Pick something that interests you & is fun

key to success

Next Class

- [ ] Brainstorm ideas - write on board and 1 minute “elevator pitch”
- [ ] self-organize into teams
- [ ] first Scrum meeting to come up with backlog and Sprint Backlog.

The more people on the team

The more I expect in the demo

That’s it

Prioritized Product Backlog (using a single table)

- [ ] a site that allows users to add band information and see information about a band
    - [ ] Phoenix, alternative rock, 1999-present, Versailles, France
- [ ] a site that allows for information about venues
    - [ ] Antone's, 213 W. 5th St., Austin, TX. 512-320-8424, Blues
- [ ] ...

Scrum Meeting

What have you done since last Scrum Meeting?

What will you do between now and the next meeting?

What got in your way of doing your work?