

Things* I wish I knew* before starting an industry job

TODO:explain *

Trevor Sullivan

February 23, 2018

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Starting any new job comes with a learning phase that lasts weeks or months, but knowing* about some things* ahead of time will help you make the transition more easily

On things and knowing

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 - *knowing knowing*

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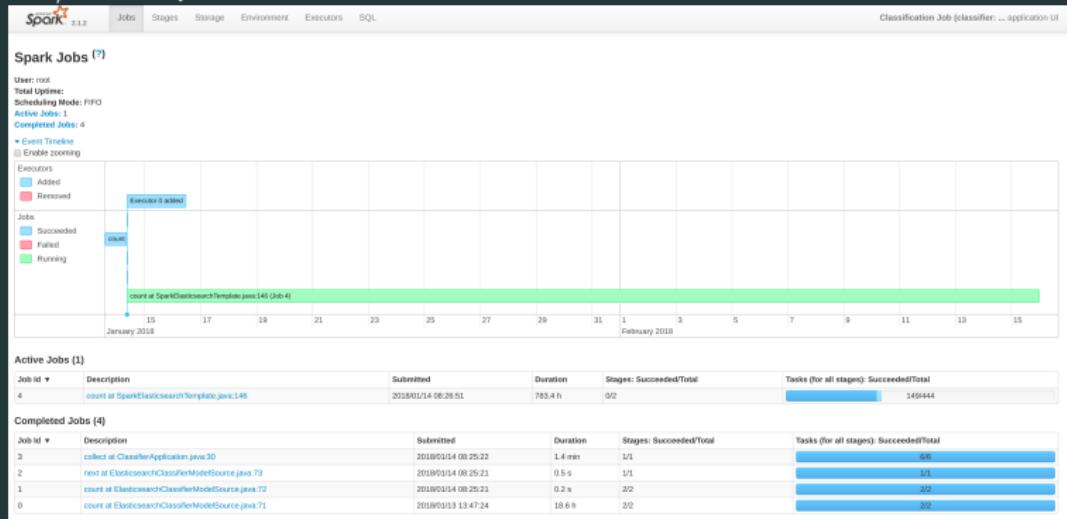
Cluster computing | Functional programming

Be aware of: Cluster computing

Spark/Hadoop

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Spark/Hadoop



A way to distribute data and computation to make your stuff scalable.

Abstracts away parallelism and data structure so you can focus on functionality

Do it now: Functional programming

Cluster computing relies on functional programming, so you should definitely be familiar with it.

These two code samples do the same thing.

```
1 for i, row in big_everything.iterrows():
2     if row.type == "Listings_City":
3         big_everything[i, 'jsonstuff'] = re.sub("displayValue\":(.*\")", lambda m:
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4 minutes

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It requires you to think a different way from the typical OOP paradigm, but there is great benefit and a good mental exercise besides.

Most important things to learn:

- lambda
- foreach
- apply
- map
- filter
- reduce

Continuous Integration | Testing

Be aware of: Continuous Integration

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In commercial applications, you will probably use Jenkins

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The screenshot shows the Jenkins dashboard. On the left, there's a sidebar with links like 'New Item', 'Build History', 'Project Relationship', 'Check File Fingerprint', 'Manage Jenkins', 'My Views', 'Open Blue Ocean', 'Credentials', and 'New View'. Below that is a 'Build Queue' section stating 'No builds in the queue.' Under 'Build Executor Status', it shows two entries: 'master' (with 1 idle, 2 available, 3 offline) and 'devinst' (with 1 idle, 1 available, 1 offline). The main area displays a table of builds:

S	W	Name	Last Success	Last Failure	Last Duration	Fav
1	Cloud	Azure Platform	N/A	N/A	N/A	☆
2	Cloud	docker-prune	20 hr - #114	N/A	23 sec	☆
3	Cloud	legacy-searchchild	N/A	N/A	N/A	☆
4	Cloud	L1Locate	2 days 8 hr - #50	N/A	4 min 54 sec	☆
5	Cloud	searchplugins	8 min 14 sec - log	N/A	1 sec	☆
6	Cloud	searchplugins.old	1 yr 0 min - #8	N/A	57 sec	☆
7	Cloud	Ultrikit Backend	10 hr - #82	N/A	1 min 26 sec	☆
8	Cloud	Ultrikit Frontend	9 hr 10 min - #81	2 days 8 hr - #50	4 min 47 sec	☆

At the bottom right, there's a legend for RSS feeds: RSS for all jobs, RSS for failures, and RSS for just latest builds. The footer includes links for 'Page generated: Fri 16, 2018 12:43:25 AM CEST', 'REST API', and 'Jenkins ver. 2.88.3'.

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---	---	search-plugins	8 min 14 sec - log	N/A	1 sec	☆
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CI builds your code in a consistent environment and tests it to make sure it works.

About Us Blog Status Help Trevor Sullivan 

Search all repositories 

My Repositories +

✓ Trevordts/lingbot  build pending

Duration: 9min 45 sec  Finished: a day ago

✗ artois/phonological-imaging  # 44 Duration: 21 min 3 sec  Finished: 2 years ago

Trevordts / lingbot  build pending

Current Branches Build History Pull Requests More options 

Default Branch

Branch	Builds	Passed	Time	Commit	Author	Build Status				
✓ master	27 builds	# 47 passed	■ a day ago	→ ffa416f ↵	Ubuntu	✓	✓	✓	✓	✓

Active Branches

Branch	Builds	Passed	Time	Commit	Author	Build Status				
✓ hotfix/catchall	1 build	# 42 passed	■ 3 months ago	→ 6d9fc1d ↵	trevordts	✓				
✓ develop	6 builds	# 40 passed	■ 4 months ago	→ be320a1 ↵	trevordts	✓	✓	✗	✓	✓
✓ feature/better-schedule	3 builds	# 38 passed	■ 4 months ago	→ c4bf5a1 ↵	trevordts	✓	✗	✓		

Inactive Branches

Branch	Builds	Passed	Time	Commit	Author	Build Status				
✓ feature/yaml	8 builds	# 27 passed	■ 4 months ago	→ 123ef4f ↵	trevordts	✓	✗	✗	✗	✗

Do it now: Testing

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For medium-to-large size projects

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There are testing systems out there for every language.

Python pytest

Java junit

scala scalatest

And you can set up your environment to run tests on every commit.

How to write tests

There are three kinds of tests.

Unit tests Test a method or function

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Regression tests Duplicate known bugs

Integration tests Test interactions between modules

Unit test example

```
00     return reminder
67
68 ▼def test_check_morning(patch_datetime_morning):
69     assert datetime.datetime.now() == FAKE_TIME_MORNING
70     assert FAKE_TIME_MORNING.date() == patch_datetime_morning.next_nlprg.date.date()
71     assert FAKE_TIME_MORNING.weekday() == 4
72     assert FAKE_TIME_MORNING == FAKE_TIME_MORNING.replace(hour=10, minute=0, second=0)
73 ▼    assert patch_datetime_morning.check() == (("\n" + "Rebecca" + "\n" +
74         "presenting on\n" + "Deep Learning for NLP Best Practices\nLink: "
75         "http://ruder.io/deep-learning-nlp-best-practices/?utm_campaign=Arti"
76         "ficial%2BIntelligence%2BWeekly&utm_medium=email&utm_source=Arti"
77         "ficial Intelligence Weekly_66\n" +
78         "\n\nJoin us in Gould-Simpson 906 at 1400\n\n" +
79         "(food and coffee provided)\nSee full schedule here: " +
         "https://github.com/clulab/nlp-reading-group/wiki/FALL" +
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75         "http://ruder.io/deep-learning-nlp-best-practices/?utm_campaign=Arti
76         ficial%2BIntelligence%2BWeekly&utm_medium=email&utm_source=Arti
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Each unit test should look at one method and exemplify one edge case.

Forces you to think about how things could go wrong, and reveals them before they do.

Docker, containerization, packaging | Git/Git-flow

Be aware of: Docker, containerization, packaging

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Docker is a system for dedicated containers, mini VMs, that run just one application accessed over the network.

Docker lets you manage

- environment variables

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- data locations
- including what to store and what to keep ephemeral
- custom binaries to inject
- memory and cpu limits
- system integration
- all kinds of cool stuff

Using Docker

Settings go into a docker-compose.yml

```
x 1 version: '2.1'
x 2 services:
x 3   api:
x 4     image: quay.io/ayfile/platform:v1.9.0
x 5     mem_limit: ${AYFILE MEM LIMIT:-40G}
x 6     memswap_limit: ${AYFILE MEM_LIMIT:-40G}
x 7     restart: unless-stopped
x 8     stop_grace_period: 2m
x 9     environment:
x10       SPARK_WORKER_MEMORY=${PROCESSING_MEM_LIMIT:-24G}
x11       SPARK_EXECUTOR_MEMORY=${PROCESSING_MEM_LIMIT:-24G}
x12     links:
x13       - extraction:extraction
x14       - suggest:suggest
x15       - elasticsearch:elasticsearch
x16     volumes:
x17       - ${DATA_VOLUME:-data}:/data
x18       - /application-custom.yml:/home/dev/restapp/application-custom.yml
x19   elasticsearch:
x20     image: quay.io/ayfile/elasticsearch:v5.6.3.1
x21     mem_limit: ${ELASTICSEARCH MEM LIMIT:-16G}
x22     memswap_limit: ${ELASTICSEARCH_MEM_LIMIT:-16G}
x23     ulimits:
x24       - nproc: 1024
x25       - soft:-1
x26       - hard:-1
x27     environment:
x28       - soft: 65536
x29       - hard: 65536
x30     volumes:
x31       - ${DATA_VOLUME:-data}:/data
x32   messaging:
x33     image: rabbitmq:3.6.14-management-alpine
x34     hostname: queue
x35     environment:
x36       - RABBITMQ_DEFAULT_USER=ayfile
x37       - RABBITMQ_DEFAULT_PASS=platform
x38     alerting:
x39       image: quay.io/ayfile/alerting:v1.9.0
x40     links:
x41       - messaging:messaging
x42       - elasticsearch:elasticsearch
x43       - api:api
x44     extraction:
```

And starting the system as a background service is as easy as docker-compose up

Maybe consider: yaml for configuration

Way easier than putting stuff at the top of each file, and more understandable than environment variables

```
1 # This is the default config. If you want to change something for a
2 # particular instance, make a config-custom.yml in the same folder.
3 version: 1.0
4
5 ▼features:
6 ▼▼ passive:
7 ▼▼▼ hackyHourReminder:
8   active: True
9   location: Pasco
10  time: 10
11 ▼▼ nlpgrReminder:
12   active: True
13   url: "https://raw.githubusercontent.com/wiki/clulab/nlp.reading-group/
14     Fall-2017-Reading-Schedule.md"
15   time: 10
16 ▼▼ genericReminder:
17   active: True
18   hoursBefore: 6
19   filename: "generic_schedule.csv"
20 ▼▼ active:
21   meetingInfo:
22     active: True
23     command: "next"
24     filename: "generic_schedule.csv"
25 ▼▼ addEvent:
26   active: True
27   command: "add event"
28   filename: "generic_schedule.csv"
29
30 # TODO Figure out how to get default behavior, esp for channels.
31 # make a default yaml that is common to all versions, and an unversioned
32 # yaml that overrides the defaults
33 ▼channels:
34 ▼▼ restricted: True
35 ▼▼▼ allowed:
36   - \#bottest
37   - C25Nw0Wn7
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```
30
31 ▼try:
32   ...with open("config.yml", "r") as yamlfile:
33     ...cfg = yaml.load(yamlfile)
34   ▼except FileNotFoundError:
35     ...with open("default-config.yml", "r") as yamlfile:
36       ...cfg = yaml.load(yamlfile)
37
```

Do it now: Git everything!

- We are all introduced to git for collaboration

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- Version Control

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- Github, Gitlab, Bitbucket are nice for publishing and sharing, but you should be using git even if you don't want to share.

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THAT'S NOT WHAT IT'S FOR
- Version Control
- Even if you don't have a repository
- Github, Gitlab, Bitbucket are nice for publishing and sharing, but you should be using git even if you don't want to share.
- `cd thing_im_working_on ; git init`

Do it now: Git Flow

For semester projects, theses, things you expect to be working on more than a week

Do it now: Git Flow

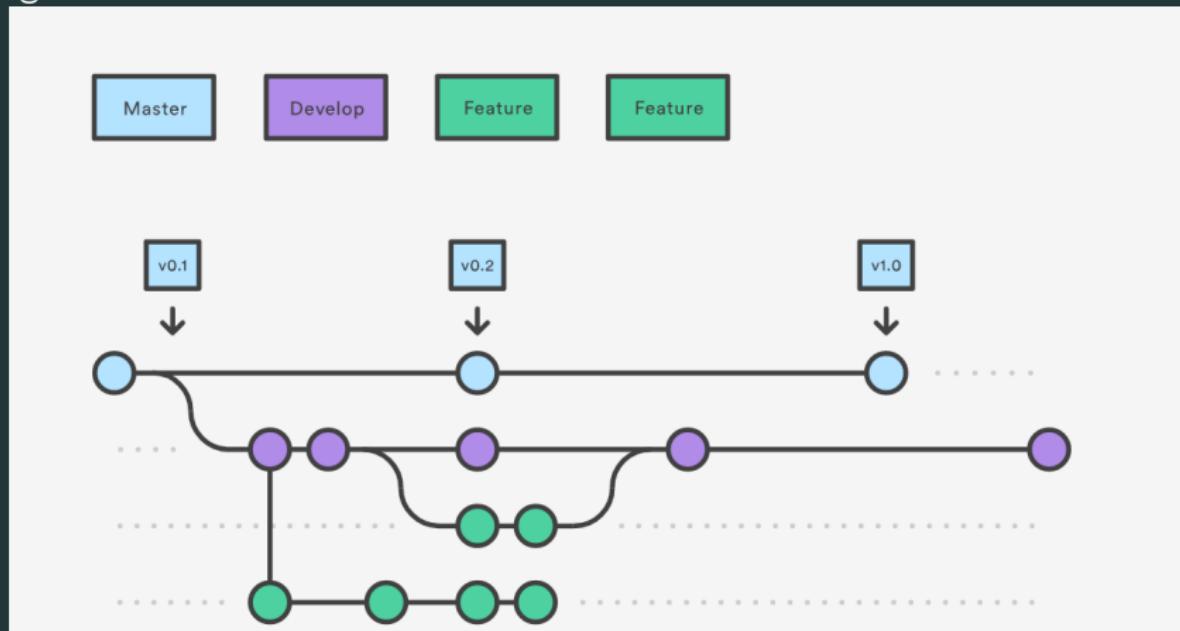
For semester projects, theses, things you expect to be working on more than a week

```
git flow init
```

Do it now: Git Flow

For semester projects, theses, things you expect to be working on more than a week

git flow init



Check time!

Team workflows | Personal task management

Be aware of: Scrum and Team Workflows

- Every company does this a different way

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- scrum master

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- board

Boards

Professional Services

Kanban board

Release  

TO DO 2 of 23 BLOCKED 5 of 12 IN PROGRESS 2 of 9 DONE 4 of 6

Bahr POC 5 issues

Enable deeplink functionality
                                 <img alt="grey info icon" data-bbox="

Boards

CRUNCH

AP Sprint 65

Stabilize for iConnect

3 days remaining | Complete sprint | ...

Quick Filters | Assignee |

TO DO	IN PROGRESS	DONE
✓ AP-3034 DONE 2 sub-tasks Basic Spark Telemetry		<p>Use metrics library 3 hours, 30 minutes AP-3140</p> <p>Fix metric type bug None AP-3159</p>
✗ AP-2693 TO DO 2 sub-tasks Find out why some emails are missing thread meta.		
<p>Fix it None AP-3130</p> <p>Changelog None AP-3137</p>		
✗ AP-3123 DONE 2 sub-tasks Branch points for forwarded emails in group 1144595606 on paul.		<p>Fix it in ultrakit-frontend None AP-3131</p> <p>Investigate None AP-3163</p>

Do it now: Task Management

- People tend to overestimate their own ability to remember things

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- People tend to overestimate their own ability to remember things
- There is a limited amount of space in your working memory, and to commit something to long term memory, you need to call it back to working memory several times
- This is a waste of brain power. Everything you have to remember distracts you.
- Strive therefore to get things out of your head as soon as possible

Apps: Asana

The screenshot shows the Asana application interface. On the left, there's a sidebar titled "My Favorites" containing various projects and tasks. The main area has two tabs: "Inbox" and "List". The "List" tab is active, displaying a "My Personal Tasks" section. This section includes a search bar, a "Today" section with tasks like "setup up application.yml that does email threading and duplication and measure performance" and "Look at Dene yenisan evidence", and an "Upcoming" section with tasks such as "setup two amazon instances" and "make gusc's changes". Each task has a checkbox, a due date, and a color-coded status indicator. To the right of the main list, there's a detailed view of a specific task titled "Look at Dene yenisan evidence". This view includes sections for "Add to Project", "Description" (which is currently empty), and a "Comments" section where Trevor Sullivan has written "Trevor Sullivan created task. May 28, 2017". There are also "Followers" and "Following" buttons at the bottom.

My Tasks Inbox +

Search

My Personal Tasks

Today

1. setup up application.yml that does email threading and duplication and measure performance

2. set up same app on a server and minimize resource requirements

3. Look at [Dene yenisan](#) evidence

4. pay off credit card

5. pay cox

6. pay lep

7. contacts:

Upcoming

8. setup two amazon instances

9. ingest and process emnun dataset, measure time

10. do several runs to stabilize numbers

11. find maximum amount to data ingestible using apache email dataset

12. setup a demo based on [wikipedia](#) content

13. fill out check writing thing for cash management account

14. Look into active learning for [Eymachine](#)

15. Xkcd smiley parenthetical

16. Make new survey data into .ped format

17. make gusc's changes

18. data normalization: why it's important to have input values in a known range

19. respond to this

20. make twitch streaming [settings](#) in obs

21. make twitch

22. [hackyhour](#) share photo

23. Understanding LSTM Networks -- colah's blog

24. [np-read] Pvd: Augur: Mining Human Behaviors from Fiction to Power Interactive Systems

25. Skinner box games

26. The generation fraction for the simple world

Add to Project

Look at Dene yenisan evidence

Description

Trevor Sullivan created task. May 28, 2017

Trevor Sullivan assigned to you. May 28, 2017

Trevor Sullivan marked today. May 28, 2017

Write a comment...

Followers

Following

Apps: Todoist

The screenshot shows the Todoist application interface. On the left is a sidebar with navigation links: Inbox (5), Today (2), Next 7 days (2). Below these are sections for Projects, Labels, and Filters. The Projects section lists several projects with their names and counts: packing list (1), Personal (1), ayfile (1), Elymachine (1), Shopping Errands (1), blog (1), Lingbot (1), move (1), Errands (1), Movies to watch (1), Incubation (1), and The Greats To Date (1). There are also buttons for Add Project and Archived projects.

The main area is titled "Today" and shows two tasks:

- Overdue: set up nlp on tulka (Due 29 2017, Inbox)
- call bobs (Due 29 2017, Inbox)

Below this, there is a "Today" summary (Thu Feb 15) and a "Add Task" button.

Apps: HabitRPG

The screenshot shows the Habitica app interface, which is a productivity app designed to feel like a RPG game.

Habits (Left Column):

- Str - Stretching, lifting, cardio, sports
- Dex - language, art, music, trying new things
- Cos - eat twice a day, no junk food, sleep well
- Int - studying paperwork reading writing
- Wis - chores, ask a question, letting go, meditating
- Cha - small talk, ask people about themselves, stand up for beliefs, help people
- Study or Work/Procrastinate

Dailies (Second Column):

- Floss
- time commute
 - start timer
 - save in note
- Get up to date on slack
- coffee
- wake up before 7
- catch up on youtube

To-Dos (Third Column):

- bag of holding
- gloves of dex
- bracelet of health
 - roll twice on con
 - roll twice on con
 - roll twice on con
- Persept of wisdom
- headband of int

Rewards (Right Column):

- Add a Reward
- pick off all dailies (2 days, 200 gold)
- video game night (.5 days, 15 gold)
- soda (4 days, 10 gold)
- pizza (7 days, 20 gold)
- Hire Mercenary (Hire a mercenary to do a daily for you! Check off one unfinished daily. Every additional use of this reward per day requires an additional 25 gold.)
- Mana Potion (Gain 15 Mana. [To use this feature, click the settings toolbar; click site, then click "Fix character values".])
- Bank (2000 Deposit or withdraw from your bank. Edit the banks extra info in the settings. Withdrawing money costs an additional 10 gold. [To use this feature, click on settings, then site, then "Fix character values".])

Skills (Bottom Bar):

- Burst of Flames (Gold: 10)
- Ethereal Surge (Gold: 20)
- Earthquake (Gold: 25)
- Chilling Frost (Gold: 40)

Character Status (Top Left):

- Trevor the Apprentice (Level 76 Mage)
- Health: 27 / 90
- Dexterity: 1776 / 2340
- Wisdom: 264 / 284

Top Navigation:

- Tasks, Inventory, Shops, Party, Guilds, Group, Challenges, Help
- Notification icons: 11 notifications, 679.64 coins, a clock icon, a message icon, and a user profile icon.

Apps: Trello

Hannibal/Scipio2 ☆ | The Greats to Date Free | Team Visible

Hannibal/Scipio II

- Put both files on same machine
- Line up and do meticulous primary edits
- listen and make notes for secondary edits
- listen at super speed and make notes for tertiary edits
- Upload to media host
- Update Blog
- publish to RSS
- Add a card...

in progress

- Add a card...

done

- Read relevant book
⌚ Jul 11, 2016
- Make notes for show
⌚ Jul 12, 2016 ⚖ 1
- Do show
⌚ Jul 21, 2016
- Do show
- Add a card...

Add a list...

Apps: todo.txt

```
todo.todo x

1
2
3 ▼Stuff to do now:
4   o do CV test with syllables
5   o add language names to stopwords list
6   o add code to submission
7   o add readme to submission (python notebook)
8
9   o run through naive bayes
10  o run through k-nearest neighbors
11  o add some neural network stuff to this list o run through naive bayes
12  o run through k-nearest neighbors
13  o add some neural network stuff to this list o run through naive bayes
14  o run through k-nearest neighbors
15  o add some neural network stuff to this list
16
17
18 ▼features:
19  ✓ bag of words @done (16-11-21 13:25)
20  ✓ characters present @done (16-11-23 12:30)
21  o syllables
22  o bigrams (over characters and/or syllables)
23  ✓ attested year (or none) @done (16-11-28 16:49)
24  o normalize over centuries, or continuous value
25  o
26
27 ▼Machine learning categorization:
28  ✓ vectorize definitions (features below) @done (16-11-23 12:30)
29  ✓ SVM @today done (16-11-28 14:49)
30  ✓ test different kernels @done (16-11-28 19:44)
31  ✓ Make a confusion matrix visualization @done (16-11-29 08:46)
32
33  o run through naive bayes
34  o run through k-nearest neighbors
35  o add some neural network stuff to this list
36
37
38 ▼After project is done:
```

Apps: Bulletjournal

15th

- ▲ pick up library book on hold
- Amy for lunch @ 11:30 am
- ☛ make summer bucket list
- started watching Vikings finally

16th

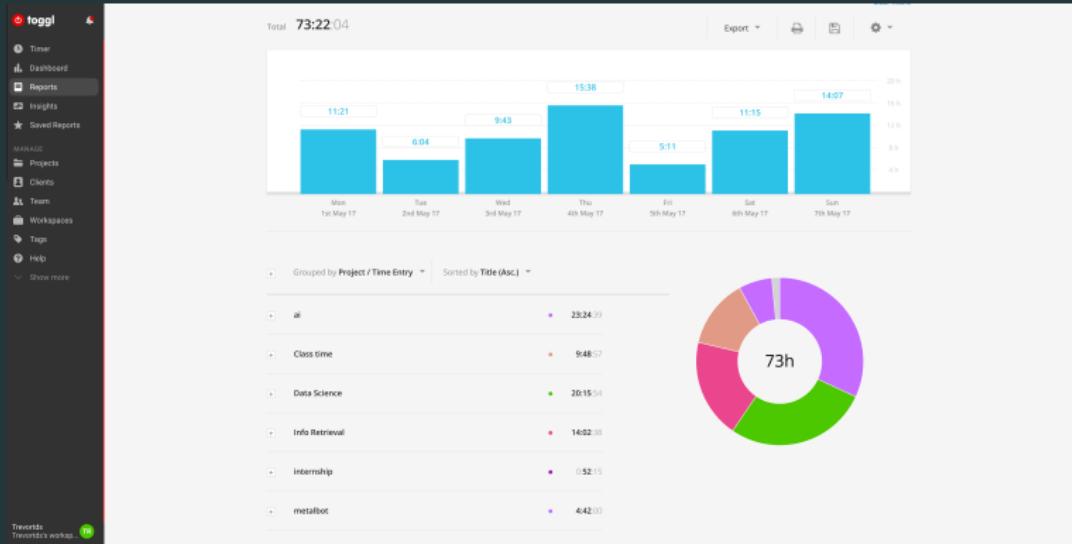
- look for UNC tickets

17th

- ▲ OT @ 3pm
- ▲ dinner at Mellow w/ Carter's @ 5:30PM
- finish Friday's blog post
- Sam said, "Mom, I can't be quiet! I'm a talker!"

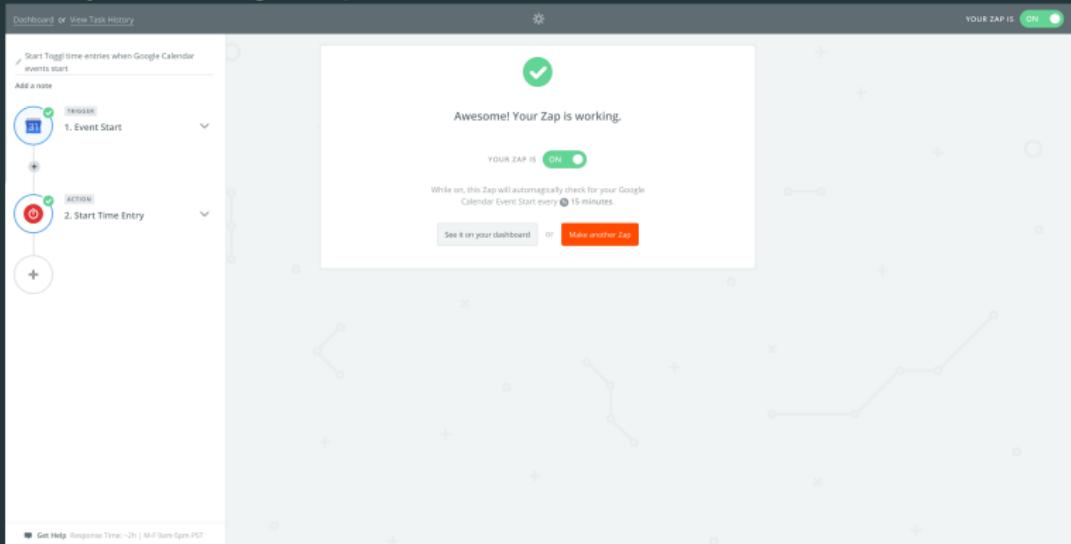
Advanced: Time tracking

Not essential, but if you already have a good system for keeping track of your tasks.



Super-Advanced: Automation

Many of the aforementioned apps have APIs that can be manipulated manually, or through Zapier



System Administration | The Command Line

Be aware of: Finer points of sysadmin

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When you're working on a server. you will need to learn some particular skills and methods to manage things

Managing volumes df -h, fdisk, mkfs

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Managing volumes df -h, fdisk, mkfs

ssh tunnels and UDP ssh -L 18080:127.0.0.1:18085 -R
18086:127.0.0.1:18086 user@server

Be aware of: Finer points of sysadmin

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Managing volumes df -h, fdisk, mkfs

ssh tunnels and UDP ssh -L 18080:127.0.0.1:18085 -R
18086:127.0.0.1:18086 user@server

web access control nginx

Do it now: The Command Line

- Navigating a *nix filesystem

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- text editor (vim, emacs, nano)

Do it now: The Command Line

- Navigating a *nix filesystem
- text editor (vim, emacs, nano)
- tmux or screen

They may seem dumb at first, but you will soon find you can't live without it

Like browsing without tabs

tmux

File Edit View Search Terminal Help

```
"clustersPerLevel": 20,
"documentsPerCluster": 1000,
"gramianSingularVectors": 50,
"gramianThreshold": 0.14,
"maxDfFraction": 0.25,
"maxRecursionDepth": 2,
"minDf": 3
    }
},
"type": "CLUSTERING"
},
"details": {
    "applicationId": "app-20180215165851-0005",
    "description": "Execution completed successfully",
    "timestamp": "2018-02-15T17:05:54.0368Z"
},
"id": "1727374435",
"state": "SUCCEEDED"
}
]
},
"_links": {
    "self": {
        "href": "http://localhost:93/ayfie/v1/jobs"
    }
}
```

dev@docker2:/home/docker-demos/compositions/ayfie/new-wiki**ipedia\$**
[trevor] 0:ssh 1:bahr-monitor 2:bash* 3:bash-

"docker2" 23:19 15-Feb-18

That's all!