SBoM

The Fad, The Future, and In-Between

Anant Shrivastava

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- Chief researcher @ Cyfinoid Research
- 15+ yrs of industry exposure
- **Speaker / Trainer:** BlackHat, c0c0n, nullcon, RootConf, RuxCon
- **Project Lead:**
  - Code Vigilant (Code Review Project)
  - Hacking Archives of India,
  - TamerPlatform (Android Security)

- (@anantshri on social platforms) https://anantshri.info

Software Bill of Material

- Itemized list of all the ***<u>ingredients</u>*** in the software
- Ingredients means mostly third-party components
  - Software name
  - Version
  - Checksum
  - License information
  - Dependencies list if possible

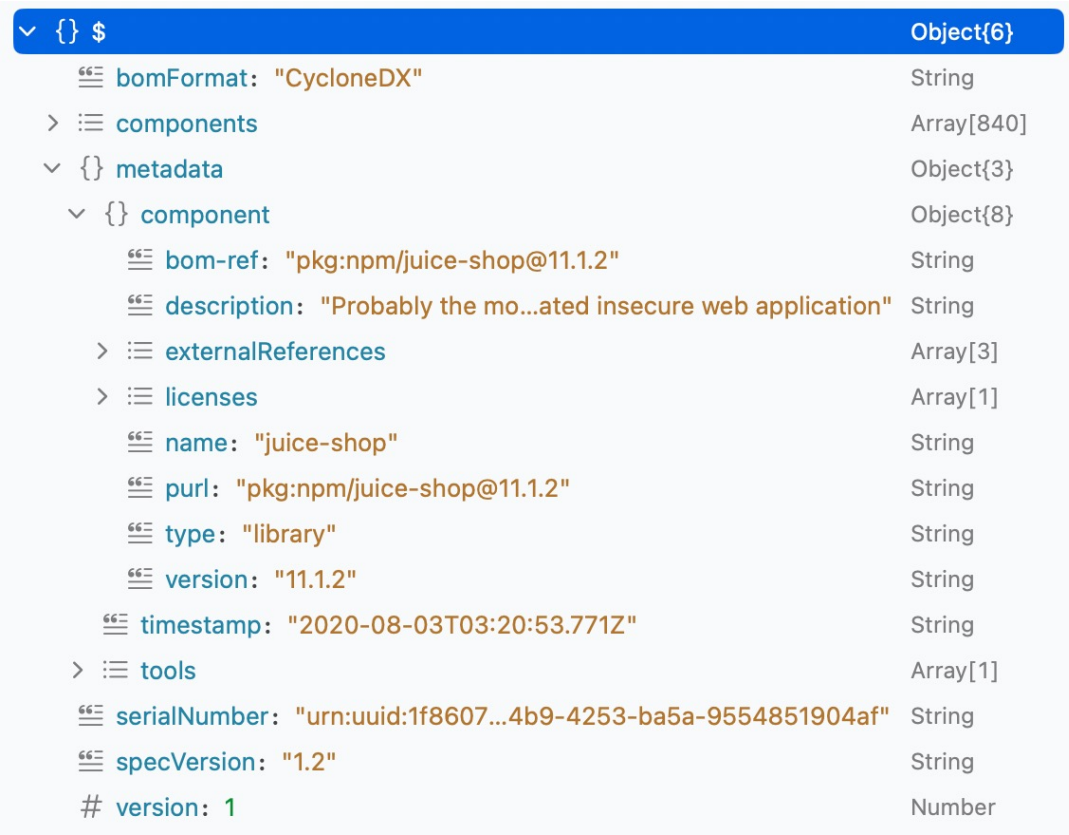
- SBoM's are mostly for one level depth only with other levels plugged in each other.

Every standard starts with competition

- SPDX
  - ISO Standard
  - Github provides default export in this format
- CycloneDX
  - OWASP Supported
- SWID
  - Alternative ISO specification

https://www.ntia.gov/files/ntia/publications/sbom_formats_survey-version-2021.pdf

Example CycloneDX SBoM




```
{
  "bomFormat": "CycloneDX",
  "components": [
    {
      "bom-ref": "pkg:npm/body-parser@1.19.0",
      "description": "Node.js body parsing middleware",
      "externalReferences": [
        {
          "type": "website",
          "url": "https://github.com/expressjs/body-parser#readme"
        },
        {
          "type": "issue-tracker",
          "url": "https://github.com/expressjs/body-parser/issues"
        },
        {
          "type": "vcs",
          "url": "git+https://github.com/expressjs/body-parser.git"
        }
      ],
      "hashes": [
        {
          "alg": "SHA-1",
          "content": "96b2709e57c9c4e09a6fd66a8fd979844f69f08a"
```

Example SPDX SBoM

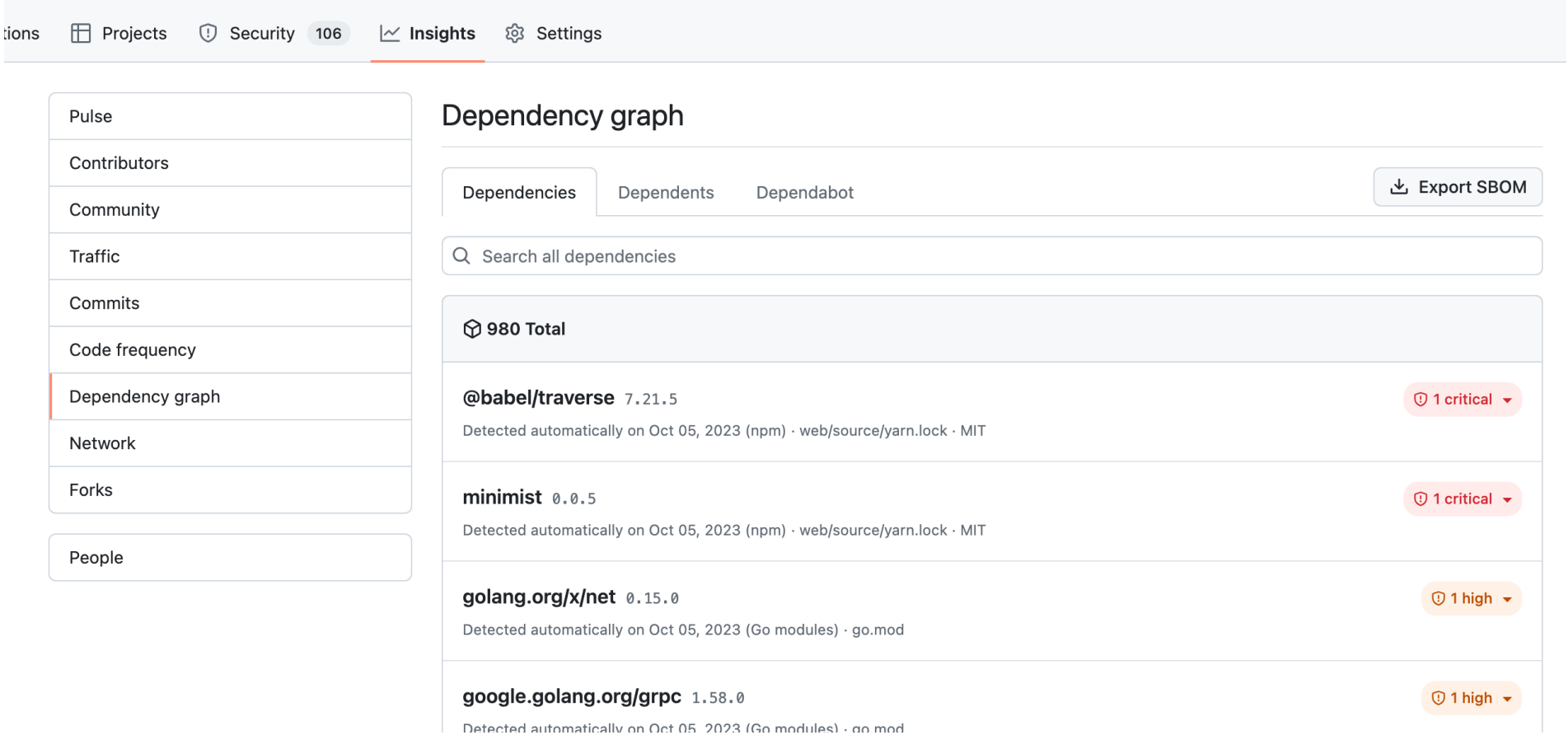
{} $	Object{9}
SPDXID: "SPDXRef-DOCUMENT"	String
{} creationInfo	Object{2}
dataLicense: "CC0-1.0"	String
documentDescribes	Array[1]
documentNamespace: "https://...graph/sbom-ed16ac5641d41487"	String
name: "com.github.antcfd-supplychain/gotosocial"	String
packages	Array[935]
relationships	Array[934]
spdxVersion: "SPDX-2.3"	String


```
1  {
2    "SPDXID": "SPDXRef-DOCUMENT",
3    "creationInfo": {
4      "created": "2024-06-27T23:17:32Z",
5      "creators": [
6        "Tool: GitHub.com-Dependency-Graph"
7      ]
8    },
9    "dataLicense": "CC0-1.0",
10   "documentDescribes": [
11     "SPDXRef-com.github.antcfd-supplychain-gotosocial"
12   ],
13   "documentNamespace": "https://github.com/antcfd-supplychain/gotosocial
14   "name": "com.github.antcfd-supplychain/gotosocial",
15   "packages": [
```

How to create SBoM

- Github provides dependency Graph in “Insights”
- SBoM generation tools
  - Cdxgen
    - https://github.com/CycloneDX/cdxgen
  - SPDX Generator
    - https://github.com/spdx/tools
- /dev/hand if all else fails (Its XML)

GitHub Export SBOM Option




DEMO GODS
PLEASE LET THIS DEMO WORK

Is SBoM really useful

- SBoM rose to prominence coz of exec order by US President.
- Requirement is to create SBoM
- No directions around usage, consumption etc

- **SBoM Tells you software composition nothing else**

- Industry representatives have started asking Questions?
  - Should we focus on building SBOM or fix issues in that time?

Thoughts from Industry around SBoM

- Why should I disclose my composition to the world
- I will only share the SBoM to NDA covered entities
- I don’t need SBoM coz I don’t sell to USA
- Better to spend time in fixing bugs then making SBoM

Food for thought

software industry

is mostly

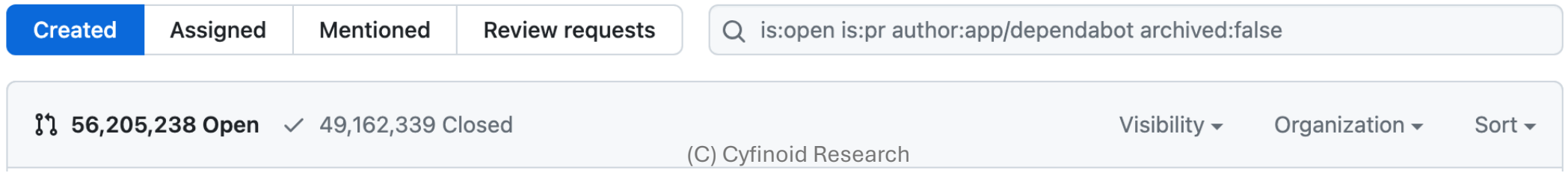
fixing problems

created by

software industry

What problems have we created

- Software build automation == quicker release cycle
- Automated release cycle == less wait for features
- Faster feature release == less inclination to upgrade dependencies
- Too much focus on OSS Codebase without helping the maintainers
- Impossible segregation of features and bug fixes
- Automated notification of vulnerability (hedonic hamster wheel)

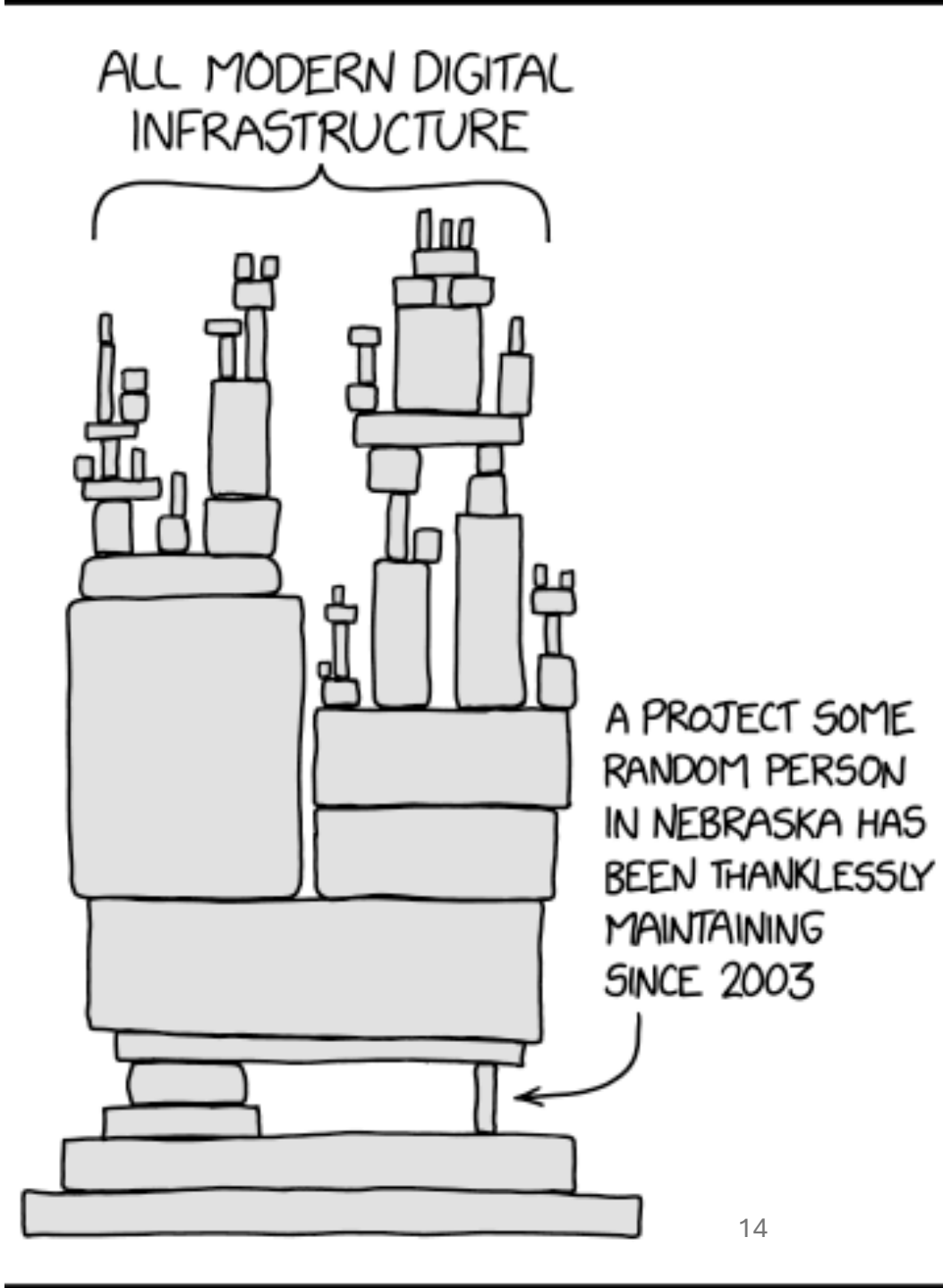


SBoM can help

- Identifying incorrect use of software
- Identify what to fix in scenarios like log4shell
- Identify impact in sec bug release in a core component

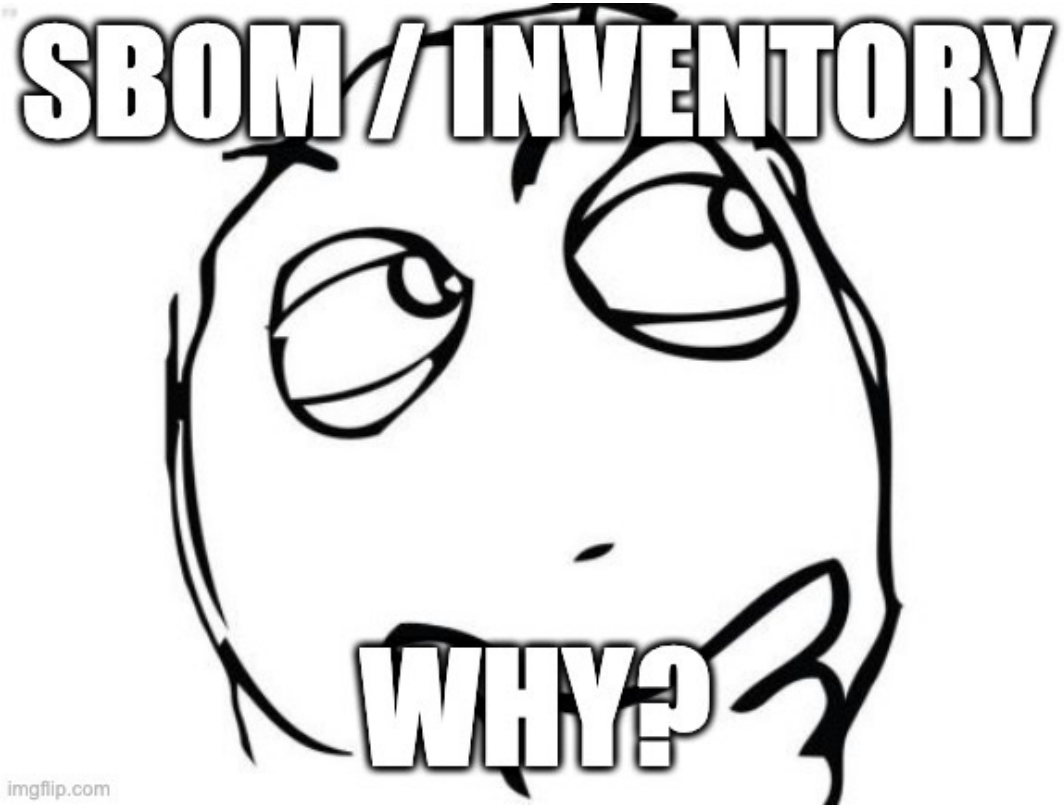
- Basically, Inventory problems

Ref: XKCD.com/2347



Another thought

- Infosec has never had the luxury of well-maintained inventory
- SBoM can help with it
- we never had inventory; we don’t even know what to do with it when its created



Consequences for Infosec

For Practitioners both infosec and Devops

- We have been asking for better visibility, this is it

For Industry entities

- This is like “opening the kimono” moment

If security practitioners want to preserve this facility they need to act now


STOP THE DRAMA
ALREADY!!!
imgflip.com

Existing tooling

- OWASP Cyclone DX : https://cyclonedx.org/
- Google SLSA dev : https://slsa.dev/
- SPDX : https://spdx.dev/
- SafeDep : https://safedep.io/
- Dependency Tracker: https://dependencytrack.org/
- SYFT : https://github.com/anchore/syft

Security efforts already in progress

- VDR : Vulnerability Disclosure Report
- VEX : Vulnerability Exploitability eXchange
- xBoM's
  - Software-as-a-Service Bill of Materials (SaaSBOM)
  - Hardware Bill of Materials (HBOM)
  - Machine Learning Bill of Materials (ML-BOM)
  - Cryptography Bill of Materials (CBOM)
  - Manufacturing Bill of Materials (MBOM)
  - Operations Bill of Materials (OBOM)
- Attestations

What can we do

- Security is largely considered a cost center and any incentive that is solely useful for security is a cost.
- Inventory allows organization to make data driven decisions
- Make SBoM's usefulness visible for other departments
- If more people especially profit centers and business requirements (HR, Finance) need it, its hard to kill

SBoM Usage beyond security teams

Use each SBoM as part of inventory,

Consolidate then and then draw inferences from it

- Development
- Acquisitions and mergers
- Compliance (adjunct security)
- Risk Management

SBoM usage for Developers

- Manage technical Debt
- Reduce dependency scatter
- Consolidate efforts for usage
- Simplified package selection in case of newer project

SBoM usage for Acquisitions & Mergers

Use SBoM as an indicator for future cost and decision

- Too many outdated / EOL / unmaintained software in use leads to high cost of ownership after acquisitions
- If the toolset / techstack is vastly different than existing, then extra talent cost
- If too many techstacks in picture, shows non cohesive teams

SBoM usage for Compliance

- Licensing policy spread not just at product but at input component level
- Possible cost of rework due to non-compliance with company policy
- Possible repercussions if my code touches this code (GPL restrictions to name as one)

SBoM usage for Risk Management

Interesting questions that can be answered

- Do I want to include X amount of risk by purchasing this vendor's software?
- If risk is low but product will be highly visible, can I still afford it.
- Even with high risk, in a self-contained environment is it okey
- Do I really want my SSO auth token going into this software

What is needed

- Better tooling (tech and UX)
  - Current tools are not easy to use even for practitioners
- Collaboration and seeking feedback from other parties
  - Don’t make tooling for yourself make it for others
- Focus on usage not on glamorizing tech
  - We technologists focus too much of technical side.

To Conclude

- I believe SBoM is a Boon for overall IT Industry to move in better directions.
- Newton’s first law of motion stands : Inertia can only be countered by greater force
- There is a bright future ahead if we can muster the courage for it

Thanks for listening & open to Questions?

NAME

WEBSITE

anant@cyfinoid.com

EMAIL

References

- What if we spent all the time it took to make SBOMs fixing bugs instead? #appsec #sbom : https://www.youtube.com/watch?v=jdNtUK8kpJE
- SBoM Guidance by Kymberlee Price: https://www.youtube.com/watch?v=_yWRQ6XM6pQ