**Activity 1:**

**Free and Open Source Software (FOSS)**

This activity introduces the concepts of FOSS. It then investigates some elements, structures, roles and principles shared by many (but not all) FOSS.

## **Content Learning Objectives**

*After completing this activity, students should be able to:*

* Describe reasons that individuals support & participate in FOSS projects, including but not limited to financial incentives.
* Describe roles in a typical FOSS project, and how people transition between roles.

## **Process Skill Goals**

*During the activity, students should make progress toward:*

* Teamwork
* Information processing

## **Team Roles**

*Record role assignments here.*

|  |  |
| --- | --- |
| Manager |  |
| Presenter |  |
| Recorder |  |
| Reflector |  |

# **Model 1: FOSS Introduction**

## **Information**

An open source software community is a group of people united by the shared purpose of developing, maintaining, extending, and promoting a specific body of open source software. These communities are often globally distributed—their members occupy different geographic regions and work across numerous industries. What unites them is their common vision for the open source software project—as well as the spirit of camaraderie and collective identity that participating in the community affords them.

## **Instructions and Questions (15 min)**

1. Watch (**Students can watch the video as homework before class starts**) the “Open Source Basics” video by Sarah Moyle for Intel Software. The video uses “family cookies recipe” as a metaphor for the processes that FOSS communities use to collaborate.

<https://www.youtube.com/watch?v=Tyd0FO0tko8>

As a team, discuss these terms from the video and agree on a brief description for each of them (your descriptions can be changed or enhanced in the next POGIL activities):

* 1. Roles:
  2. Rules -> License:
  3. Contributor:
  4. Maintainer:
  5. Upstreaming:
  6. Branch / Patch:
  7. Main branch:
  8. Fork:

1. What does “Upstream early and often” mean? and why we need to do it?
2. Who makes up the community in the Cookie example?
3. What are some challenges that an open source community will face?

* **Coordination and Collaboration**
* **globally distributed**
* **different regions / languages / time zones**
* **different industries**

1. What advantages/opportunities does an open source community afford?

* **larger community**
* **more diverse community**
* **varied perspectives**
* **distinct skill sets and expertise**

# **Model 2: FOSS Motivations and Principles**

## 

## **Information**

**Motivations**

In 2001, Karim Lakhani and Robert Wolf surveyed 684 developers in 287 FOSS projects to understand why they contributed to FOSS. The table below summarizes their survey results.

|  |  |  |  |
| --- | --- | --- | --- |
| **Motivation** | **% all** | **% paid** | **% volunteers** |
| This code is intellectually **stimulating** to write. | 45% | 43% | 46% |
| They liked working with the development **team**. | 20% | 18% | 21% |
| Improve programming **skills**. | 41% | 33% | 46% |
| Code is needed for **work**. | 34% | 56% | 19% |
| Code is needed for **non-work**. | 30% | 19% | 37% |
| Enhance professional **status**. | 17% | 23% | 14% |
| They believe that source code should be **open**. | 33% | 31% | 35% |
| They feel an **obligation** to contribute because of the use of FOSS. | 29% | 27% | 30% |
| **Dislike** proprietary software. | 11% | 11% | 11% |
| Improve one's **reputation** in the FOSS community. | 11% | 9% | 12% |

## **Instructions and Questions (15 min)**

1. Based on the above table, answer the following questions (answer using the bold words from the table such as; **stimulating, team ... etc.**):

|  |  |  |
| --- | --- | --- |
| **a.** | Column 2 shows responses from **all** participants.  What are their two most common motivations? | **stimulating, skills** |
| **b.** | What are their next four most common motivations? | **work, open, non-work, obligation** |
| **c.** | Column 3 shows responses from **paid** contributors. What are their two most common motivations? | **stimulating, work** |
| **d.** | What are their next three most common motivations? | **skills, open, status** |
| **e.** | Column 4 shows responses from unpaid **volunteers**. What are their two most common motivations? | **stimulating, skills** |
| **f.** | What are their next three most common motivations? | **non-work, open, motivation** |
| **g.** | Some motivations are similar for paid and volunteer work developers.  What are the two biggest differences in motivation? | **work, non-work** |
| **h.** | What are the next two biggest differences? | **skills, status** |

1. Motivations can be classified into two categories: motivations based on *personal enjoyment or fulfillmen*t and motivations based on *community obligations*. List the motivations (obligation, stimulating, team, reputation, skills, work, non-work, status, open, dislike, non-work) in each category:

|  |  |  |
| --- | --- | --- |
| **a.** | personal enjoyment or fulfillment | **stimulating, team, skills, work, non-work, status** |
| **b.** | obligations or community | **open, obligation, dislike, reputation** |

# 

## **Information**

**Principles of FOSS Communities:**

* Transparency.
* Collaboration.
* Release early and often.
* Inclusive meritocracy.
* Community.

Read more about the principles in: <https://opensource.com/open-source-way>

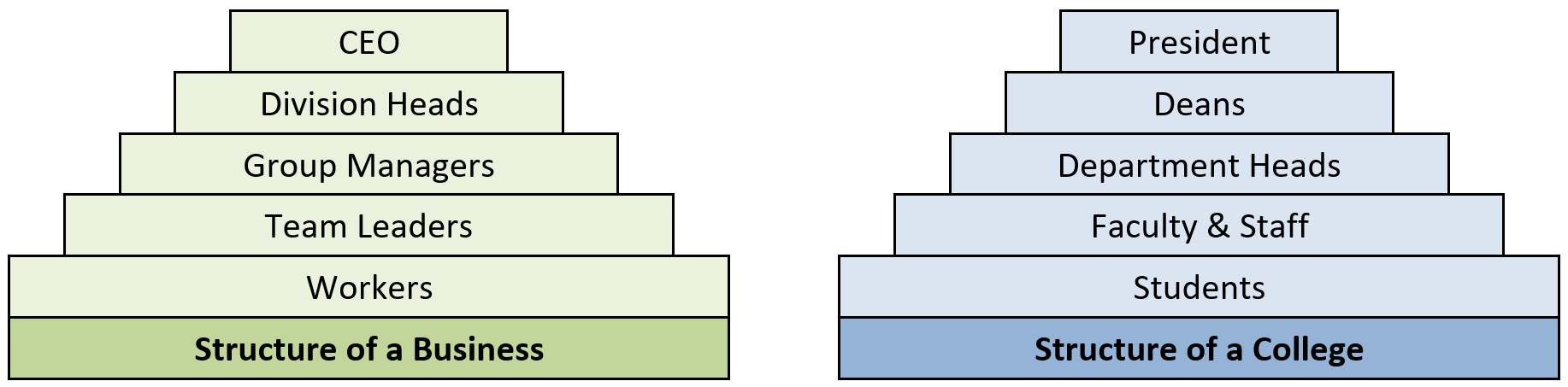
1. Discuss the meaning of these words (Principles) and what do you think they mean in the context of a FOSS community?
2. Why are these principles good things?
3. Consider each of the following statements about the operation of a FOSS community and label it with the principle (or principles if multiple apply) with which it most closely aligns.

|  |  |
| --- | --- |
| **Statement** | **FOSS Community Principle(s)** |
| By building on each other’s work the community can solve problems that no one could solve alone. |  |
| Decisions and the rationale for them are available to the community. |  |
| The mission and goals of the community are more important than individual agendas. |  |
| The best ideas should win, regardless of where they come from. |  |
| Incorporating new changes and features quickly generates feedback and leads to rapid improvement. |  |
| Community members enhance and extend what others contribute in unanticipated ways. |  |
| Decision makers continually seek diverse perspectives. |  |
| All community members have access to the information necessary to do their best work. |  |

# **Model 3: FOSS Community Structures**

## **Information**

Below, two examples of pyramidal-structured organizations (*non-FOSS*).



## **Instructions and Questions (15 min)**

1. As shown above, in many organizations, people are in a **pyramidal structure**.

|  |  |  |
| --- | --- | --- |
| **a.** | What is the largest group of people in a college and in a business? | **Students** |
| **b.** | What is the level above workers in a business? | **Team Leaders** |

1. As we move down the pyramid (from top to bottom):

|  |  |  |
| --- | --- | --- |
| **a.** | Do responsibility and authority go up or down? | **down** |
| **b.** | Does the number of people go up or down? | **up** |

1. Most large FOSS projects also have a pyramidal structure, but with different roles.
2. **Contributors** who add patches and test cases.
3. **Core team** of developers who work on the code, test suites, and documentation.
4. **Leaders** who make key decisions and consider long-term project goals.
5. **Requesters** who report defects and ask for new features.
6. **Users** who download and use the software.

Put these roles (a-e) above in the correct order in the pyramid below:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **c. Leader(s)** |  |  |  |  |
|  |  |  | **b. Core Team** | | |  |  |  |
|  |  | **a. Contributors** | | | | |  |  |
|  | **d. Requesters** | | | | | | |  |
| **e. Users** | | | | | | | | |
| **Structure of a FOSS Project** | | | | | | | | |

1. In a typical FOSS project:

|  |  |  |
| --- | --- | --- |
| **a.** | Which role has the largest number of people? | **User** |
| **b.** | Which role has the smallest number of people? | **Leader** |
| **c.** | What is the most likely role for the people who started the project? | **Leader** |
| **d.** | Which role could a typical user easily transition to if they wanted to contribute more to the project? | **Requester** |
| **e.** | Which role is most likely to provide new leaders for the project? | **Core** |
| **f.** | Which role is most likely to provide new contributors? | **Requester** |

1. Consider each of the actions described below. For each action, label it with the role of the individual (or individuals if multiple apply) that is *most likely* to be responsible for the action.

|  |  |
| --- | --- |
| **Action** | **Role** |
| Choosing the license under which the project will be released. |  |
| Using the software in a new, unanticipated or creative way. |  |
| Asking that a useful new feature be added to the software. |  |
| Discovering a bug in the software. |  |
| Providing a code patch that fixes a bug in the software. |  |
| Submitting an improved set of installation instructions. |  |
| Documenting a bug in the issue tracker so others can fix it. |  |
| Defining the goals for the next year of work on the project. |  |
| Incorporating a contributed bug fix into the main branch. |  |
| Redesigning a critical software module in the system. |  |

## **Model 4: FOSS Anatomy**

## **Information**

Open-source projects have a distinct culture and set of tools that support project development. The form of the culture and the specific tools vary somewhat across projects, but there is significant commonality such that many open source developers migrate easily among open source projects. This model focuses on Sugar Labs, a well-established humanitarian open source (FOSS) project.

## **Instructions and Questions (15 min)**

* + - 1. Listed below are several important starting points for the *Sugar Labs* project. Take a quick look at each and then answer the questions below.
* <http://sugarlabs.org/>
* <https://wiki.sugarlabs.org/go/Welcome_to_the_Sugar_Labs_wiki>
* <https://github.com/sugarlabs>
* <https://github.com/sugarlabs/sugar-docs>

Answer the following questions:

1. Which of the links above would be the best starting point for someone interested in using Sugar?
2. Which of the links above would be the best starting point for someone interested in contributing to Sugar?
   * + 1. Check the [Getting Involved](https://wiki.sugarlabs.org/go/Sugar_Labs/Getting_Involved) page which describes the roles of various contributors to Sugar Labs. Note that there are a variety of different types of contributions that may be made by people in different roles.

Answer the following questions:

1. What roles do you think would be most applicable for a new participant?
2. What are the commonalities across roles? What are the differences?

**Team’s Reflection (5 min)**

* *Reflector:* lead the discussion to review the team’s performance during the activity. The team must discuss two positive points and two areas for improvement for the next activities.
* *Recorder:* type the discussion’s summary.
* *Reflector:* be ready to present the points when asked.

## **References & Resources**

* <https://gitlab.com/hfossedu/kits/GitKit>
* <http://foss2serve.org/index.php/Intro_to_FOSS_Project_Anatomy_(Activity)>
* K Crowston, J Howison (2005) [The social structure of FOSS development](https://firstmonday.org/article/view/1207/1127). *First Monday* 10(2).
* C Jensen, W Scacchi (2007) [Role migration and advancement processes in OSSD projects: A comparative case study](http://ieeexplore.ieee.org/document/4222598/). In *Proc. of the 29th Int’l Conf. on Software Engineering (ICSE’07)* (pp. 364–374). IEEE Computer Society.
* KR Lakhani, RG Wolf (2003) [Why hackers do what they do: Understanding motivation & effort in FOSS projects](http://papers.ssrn.com/sol3/Papers.cfm?abstract_id=443040). *MIT Sloan Working Paper* 4425-03.
* CG Wu, JH Gerlach, & CE Young (2007) [An empirical analysis of OSS motivations & intentions](https://www.sciencedirect.com/science/article/abs/pii/S0378720607000067). *Information & Management* 44(3):253-262.
* Y Ye, K Kishida (2003) [Toward an understanding of the motivation of open source software developers](https://dl.acm.org/citation.cfm?id=776867). *Int’l Conf. on Software Engineering*, 419-429.
* The Open Source Way 2.0[*https://www.theopensourceway.org/the\_open\_source\_way-guidebook2.0.html*](https://www.theopensourceway.org/the_open_source_way-guidebook2.0.html)

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