Automated Testing and Integration of IFTTT Support to Wikidata

Introduction

This is part 1 of 3 of my blog post about my experience as a GSoC student with the Wikimedia Foundation. This section will answer 3 fundamental questions as a GSoC participant in the Wikimedia Foundation such as; What is Google Summer of Code, Why did I apply for GSoC and Why the Wikimedia Foundation?

What is Google Summer of Code?

Google Summer of Code (GSoC) is an annual international program where Google awards stipends of US$5,500 to students who successfully complete their requested work on a free and open-source projects during the summer. The summer of code in this light is a period of 3 months that spans from May to August (which is the actual coding period) where students work with mentors on accepted free and open-source projects.

Google Summer of Code started in 2005 and from that time, the program has been running for 11 years and so far, 103 countries, 515 open-source organisations and 11,000 students were involved and over 50 million lines of code have been written by participants. Wikimedia Foundation has been always participating for the GSoC since it 2009 (from the GSoC archive now on the Google Melange website) making 8 years of participation. This program is a very exciting one and builds the career path of students who participate since they get the opportunity to work on real world projects and see how people around the world use their code to solve real life problems.

For more information about Google Summer of Code here are some pointers to help you get started;

- website [2]
- student manual [3]
- More information can be gotten also on GSoC's social media pages like Facebook, Twitter, Google+ and more ...

Why did I apply for the GSoC?

First of all, this is my 3rd year applying in the GSoC program, and the first year I was selected. The program begins with a competitive application process, and my proposal was to build ***Automated Testing and Integration of IFTTT support to Wikidata***" project.

I applied for the GSoC program because:

- My passion for contributing to open source communities and projects has always been a continuous burning flame and my dream is to one day work for an open source community as maybe their software engineer (since I am studying software engineering in school - B.Eng) or working under the IT department in the community. So, I figured that GSoC is a good place to starts with, carrying out this internship with them and proving myself of being able to work on their projects.
- I hope to be able to measure my programming skills with that of an active programming community working on real world projects. I felt like my skills are not used as expected in my university and wanted to work on projects that are even stronger, than the mini projects I do in school.
- I wanted to work on software that many other programmers are working on at the same time. Create contacts with other great programmers and get to know deeply how open source communities work so I can build an open source community in my local community and bring in more open source contributors into the program.
- Finally, the US$5,500 that Google gives as award to all students who complete the program is a great motivation for who ever wants to venture into a study-work program as a student. I found out that doing this can really help cater for some issues faced as a student and also help finance my education in a better way which will in effect boost my educational and career path. Thanks to Google.

Why the Wikimedia Foundation?

After the non-acceptance into GSoC for my first 2 years of application, probably because I wanted to work on very difficult projects which I was not skilled enough for, I sat back and decided to think about the next step to take. I found out that even in school, I was always tutoring many lower level students in programming and making knowledge available to them (for free). I loved the feeling of helping people and make them succeed without asking anything back from them so I decided to follow that path and looked for an organization that does something almost similar to what I do in school.

I found the Wikimedia Foundation, an organisation that focuses on encouraging the growth, development and distribution of free, multilingual, educational content, and to providing the full content of these wiki-based projects to the public free of charge, is an organisation worth working with to make my continent (Africa) - and especially Cameroon - aware of such organisations. These are projects which enrich knowledge to the society for free. This will go a long way to improve my community and Africa including the world as a whole in terms of education and academics "for free".

In as much as I am interested making knowledge free to people and other students, my main point of focus in Wikimedia is not just making knowledge free but “how to make knowledge free”. I wanted to see how the community uses programming and software technologies to power free knowledge to the whole world. In addition, I was already very proficient in the technologies and programming languages and technologies used in Wikimedia such as PHP, CSS and JavaScript, jQuery, JSON, Python, SQL, HTML5, Github, Git/Gerrit. Since I was already good with these technologies, I was very positive that if I apply for a project with the Wikimedia Foundation, I might be selected for a project during the summer.

Finally, in addition to the above mentioned points, I had also done a lot of contributions to many extensions in the MediaWiki software and also mentored in the Google Code-In 2015 program for the Wikimedia Foundation so this was my main motivations for applying for this community for GSoC 2016.

Conclusion

In the next blog post, I will write about how my project (Automated testing and Integration of IFTTT support to Wikidata) was carried out, how the project looked like, what I did during the Summer of Code and how the Wikimedia community members can help me enhance the project.

Introduction

This is part 2 of 3 of my blog post about my experience as a GSoC student with the Wikimedia Foundation. This section will address the following issues; About the project and what I have done so far, how has the development of my project looked like and how the members of Wikimedia will help me on the project.

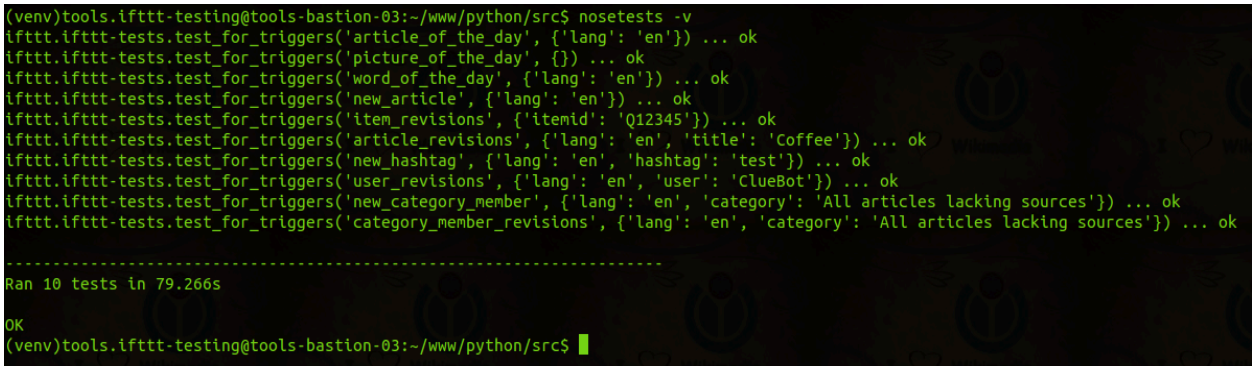
About the project and what I have done so far

This section focuses on what I have done so far as the project is concerned. Thanks to the org admins and the organization for recommending all students to document their work on the project. For more information about what I have done during GSoC in detail, checkout the following links:

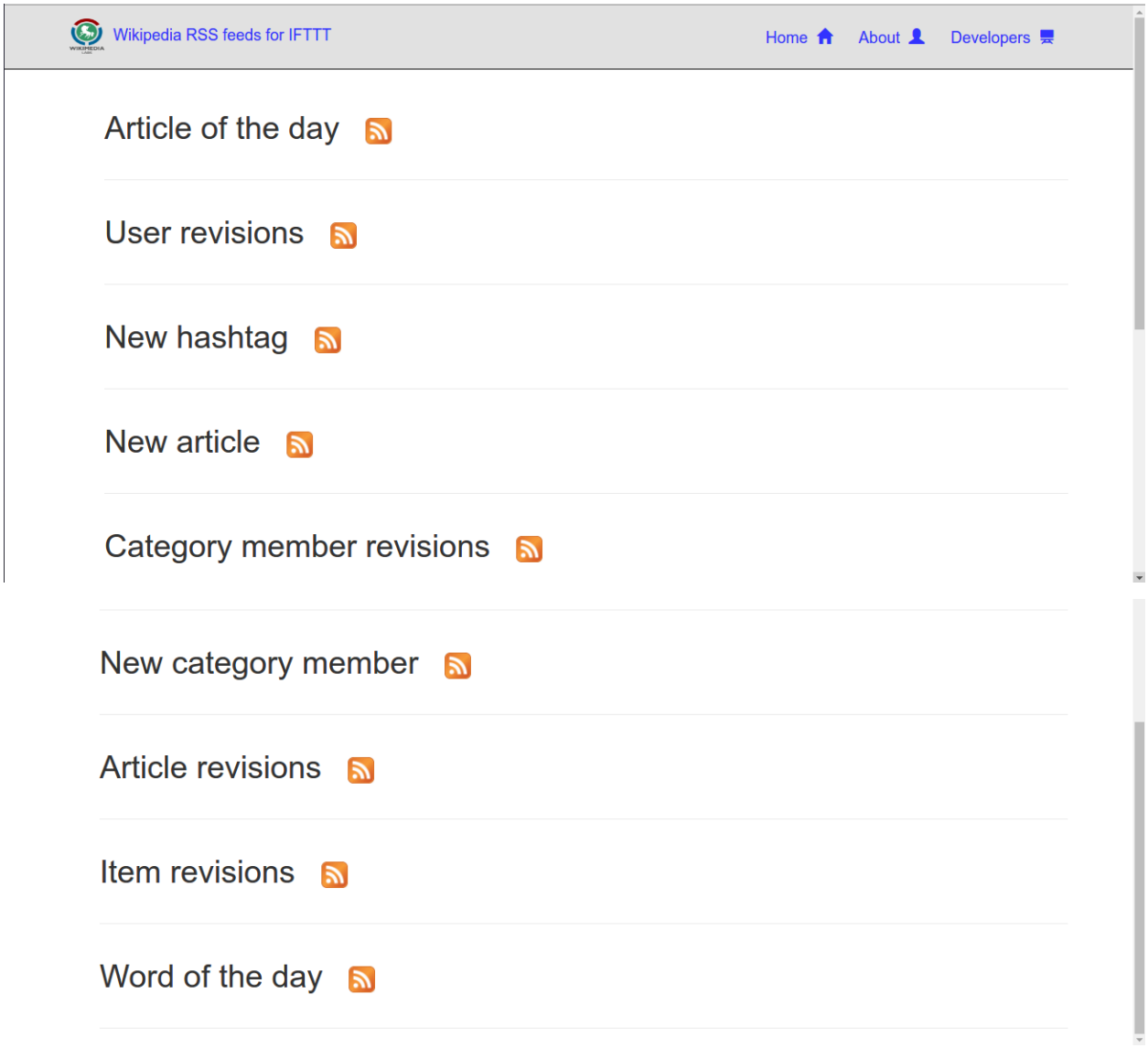
- GSoC community bonding period: https://phabricator.wikimedia.org/T134724
- GSoC coding period: https://phabricator.wikimedia.org/T134723
- MediaWiki page for the project: https://www.mediawiki.org/wiki/User:Alangi_derick/IFTTT_GSoC_Report_2016
- Blog posts about the project on blogger: http://gsoc2016withwikimedia.blogspot.com/

I will approach this section by giving the project accomplishments in sections that I have completed beginning by;

1. **Testing**: I integrated the Travis-CI testing bot to the project's Github repository which will continuously build the project each time I push code online to make sure the project passes its build and I am sure it's fine. Also, I wrote unit tests for all the existing Wikipedia triggers and new Wikidata triggers making 10 in total and all the tests are passing after deployment on Wikimedia Tool Labs.



2. **RSS feeds**: I built RSS feed views of each of the triggers of the application so that users who don't want use the IFTTT website can use RSS to still have information concerning the various triggers. This is a great feature that my primary mentor (Stephen LaPorte) decided that should be added to the application which was part of my GSoC project. This was done successfully and I got all triggers returning RSS feeds successfully. These RSS feeds were tested on an Ubuntu 14.04 LTS (my localhost) feed reader called Liferea Feed Reader and it worked like a charm. Here are the triggers in the browser;



Below is an RSS view for the article of the day trigger

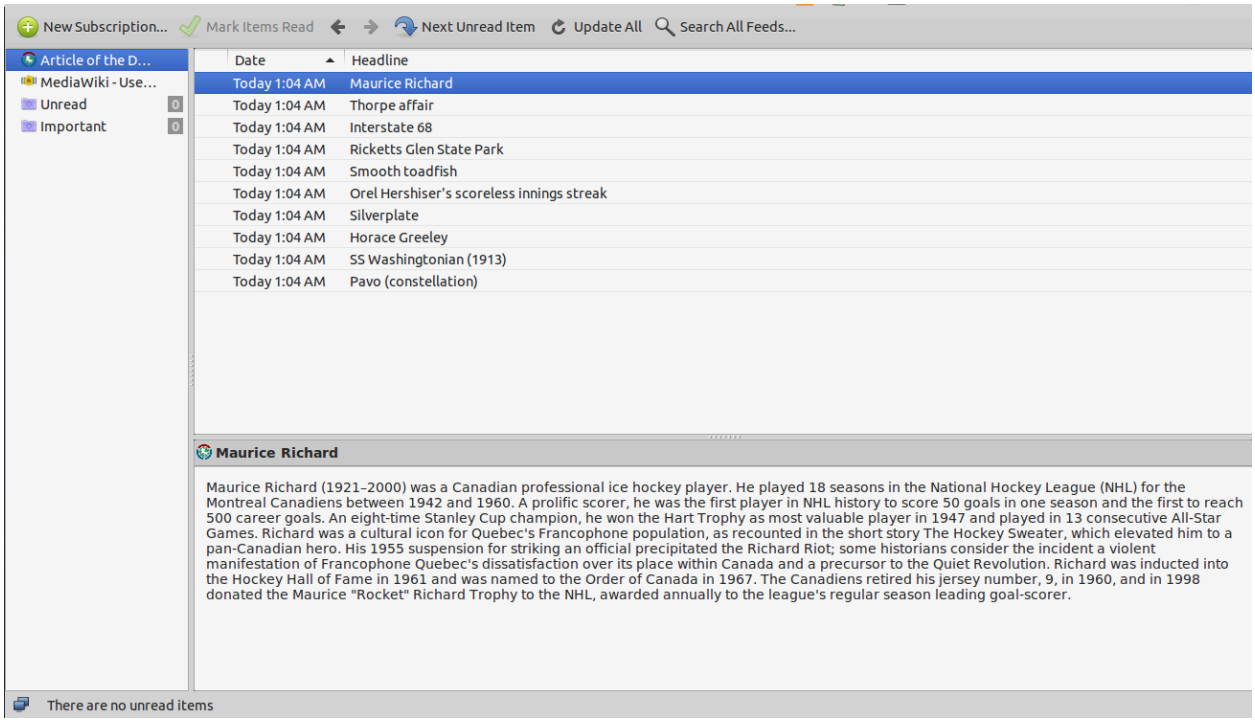
<?xml version="1.0" encoding="UTF-8"?>
<rss version="2.0">
    <channel>
        <title>Article of the Day feeds</title>
        <description>List of articles of the day for Wikipedia.</description>

        <language>en-us</language>

            <item>
                <pubDate>2016-08-04</pubDate>
                <guid>7ee4e874-fc6d-5049-bd3c-4328b9b2f782</guid>
                <image>
                    <url>https://upload.wikimedia.org/wikipedia/commons/thumb/c/c7/Maurice_richard_profile.jpg/370px-Maurice_richard_profile.jpg</url>
                </image>
                <description>Maurice Richard (1921–2000) was a Canadian professional ice hockey player. He played 18 seasons in the National Hockey League (NHL) for the Montreal Canadiens between 1942 and 1960. A prolific scorer, he was the first player in NHL history to score 50 goals in one season and the first to reach 500 career goals. An eight-time Stanley Cup champion, he won the Hart Trophy as most valuable player in 1947 and played in 13 consecutive All-Star Games. Richard was a cultural icon for Quebec's Francophone population, as recounted in the short story The Hockey Sweater, which elevated him to a pan-Canadian hero. His 1955 suspension for striking an official precipitated the Richard Riot; some historians consider the incident a violent manifestation of Francophone Quebec's dissatisfaction over its place within Canada and a precursor to the Quiet Revolution. Richard was inducted into the Hockey Hall of Fame in 1961 and was named to the Order of Canada in 1967. The Canadiens retired his jersey number, 9, in 1960, and in 1998 donated the Maurice "Rocket" Richard Trophy to the NHL, awarded annually to the league's regular season leading goal-scorer.
</description>
                <title>Maurice Richard</title>
                <link>https://en.wikipedia.org/wiki/Maurice_Richard</link>
            </item>

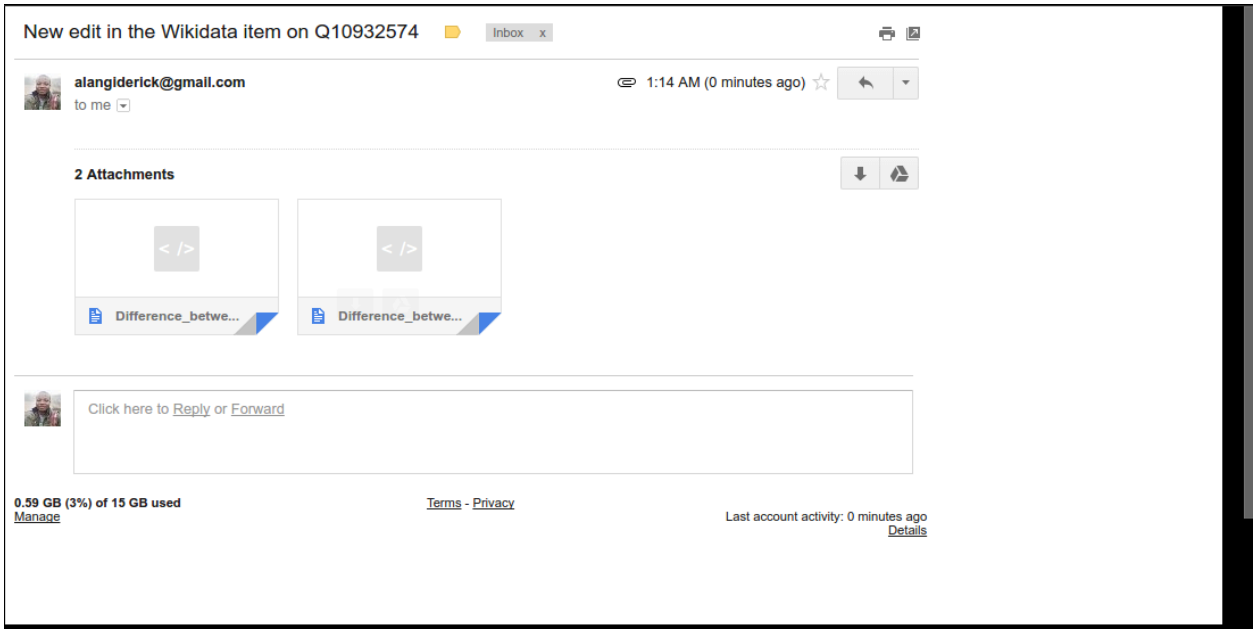
            <item>
                <pubDate>2016-08-03</pubDate>
                <guid>87a7d175-6941-5dea-b5ec-10bb1ebd0d72</guid>
                <image>
                    <url>https://upload.wikimedia.org/wikipedia/commons/thumb/0/08/Barnstaple_Long_Bridge_and_surrounding_buildings_-_geograph.org.uk_-_1754403.jpg/500px-Barnstaple_Long_Bridge_and_surrounding_buildings_-_geograph.org.uk_-_1754403.jpg</url>
                </image>
                <description>The Thorpe affair of the 1970s was a British political and sex scandal that ended the career of Jeremy Thorpe, the leader of the Liberal Party and Member of Parliament for North Devon. The scandal arose from allegations by Norman Scott of a homosexual affair, at a time when such relationships were illegal in the United Kingdom. Thorpe denied any such liaison and largely managed to avoid public and press scrutiny, but Scott's allegations were a persistent threat for years, endangering the Liberal Party's mid-1970s revival. Unsuccessful attempts to buy Scott's silence and frighten him culminated in 1975 with the shooting of his dog by a hired gunman. The police investigation and publicity forced Thorpe's resignation. He and three others were charged with conspiracy to murder Scott, but the main prosecution witnesses were undermined by, among other factors, their financial arrangements with newspapers. All four defendants were acquitted, although there were later claims that important prosecution evidence had been suppressed by the police. Thorpe's reputation was damaged irreparably by evidence that was uncontested, and he did not return to public life.
</description>

and when I subscribe to the feed with my feed reader it looks like this:



If you look at the last two snapshots, you will see that the two information in both matches since they were taken on the same day. This proves that the information gotten by the feed reader is the same as the information returned by the trigger on the browser. The same concept applies for all the other remaining triggers. All results match and this part was successful.

3. **<u>Building new triggers</u>**: This part of the project was for me to build new triggers that will support events on Wikidata. Since the application at the time had only Wikipedia triggers, part of my tasks for GSoC was to build Wikidata triggers. At this point, I have built the "Item Revision Trigger" that gets fired when a particular Wikidata item gets edited (as configured in your recipe created on IFTTT). For all these triggers I am supposed to create for Wikidata, I am supposed to write their unit tests, RSS views and do their integration tests (endpoint tests) on IFTTT. If you look at the test results above, you will find out that the item_revisions trigger is among them and the unit test was passing and integration test as well. Using the trigger in real life, I created a recipe that tested this trigger and here is the gmail action after I edit a Wikidata item;



Also, below is the RSS for the item_revisions trigger;

```
<?xml version="1.0" encoding="UTF-8"?>
<rss version="2.0">
    <channel>
        <title>Wikidata Item revisions feed</title>
        <description>List of a Wikidata item revisions.</description>

        <language>en-us</language>

            <item>
                <comment>/* wbsetaliases-remove:1|en */ Counting</comment>
                <pubDate>2016-06-17T00:34:15Z</pubDate>
                <date>2016-06-17T00:34:15Z</date>
                <image>
                    <url></url>
                </image>
                <description>Size: 10890</description>
                <url>https://www.wikidata.org/w/index.php?diff=348354283&amp;oldid=348354264</url>
                <title>Q12345</title>
                <guid>Alangi derick</guid>
            </item>

            <item>
                <comment>/* wbsetaliases-add:1|en */ Counting</comment>
                <pubDate>2016-06-17T00:34:06Z</pubDate>
                <date>2016-06-17T00:34:06Z</date>
                <image>
                    <url></url>
                </image>
                <description>Size: 10951</description>
                <url>https://www.wikidata.org/w/index.php?diff=348354264&amp;oldid=313459149</url>
                <title>Q12345</title>
                <guid>Alangi derick</guid>
            </item>

            <item>
                <comment>/* wbsetlabel-add:1|bn */ কাউন্ট ডন কাউন্ট</comment>
                <pubDate>2016-03-18T15:03:28Z</pubDate>
                <date>2016-03-18T15:03:28Z</date>
                <image>
                    <url></url>
                </image>
                <description>Size: 10890</description>
                <url>https://www.wikidata.org/w/index.php?diff=313459149&amp;oldid=312286755</url>
```

and so on and so forth. You can also subscribe to the Wikidata item revisions trigger on your feed reader and start getting updates when a particular Wikidata item is edited.

4. **Deployment on Tool Labs**: Deployment is also a key part of the project since that's the only way of putting my work online for others to test and give me feedback on what I have done. Before I was able to deploy my work on tool labs, I was first of all given access to tool labs by requesting a tool labs account from the tool labs admins and my request was granted. Then I was able to create as many tools as possible, I created a tool named "ifttt-testing" which I deployed my work on. Since my project is Python based running on the Flask micro-framework and tool labs used the UWSGI web service to run the application, I was suppose to learn how to configure UWSGI to run the application and then use the Python venv (virtual environment) to start the service and run the application. All these was successful until the application is now running live on tool labs and can be accessed throught the link: **http://tools.wmflabs.org/ifttt-testing/ifttt/v1/rss-feeds.** Below is a snapshot of the application on tool labs;

```
(venv)tools.ifttt-testing@tools-bastion-03:~/www/python/src$ ls
app.py  channel_config.yaml  fabfile.py  ifttt.cfg  LICENSE  README.md         run
cache   default.cfg          ifttt       ifttt.log  README   requirements.txt  setup
(venv)tools.ifttt-testing@tools-bastion-03:~/www/python/src$
```

5. **Integrate new trigger to IFTTT**: After building each trigger, I am supposed to make sure it passes its integration / endpoint test on IFTTT and also it should not break other tests and functionalities of other triggers that already exist. This was a hard part since I needed to make sure that I don't break existing code and keep everything clean. Nevertheless, I still succeeded in making this happen and the triggers I built passed the

endpoint tests and didn't break any existing code. In addition, I am suppose to configure this trigger on IFTTT following its specifications.

So, in conclusion, this is the cycle I was going through in GSoC, all the work I am doing resides around these points listed above. Then documentation and writing codes to perform the various tasks. Check the links above at the beginning of this section to see the work done in detail.

How has the developement of my project looked like?

The development of the project has been great overall. This project has really brought out the best in me and also in my software engineering skills. I have been able to work with my mentors from different continents, handling different time-zones and also able to understand different accents of English language. The project is really fun and also very exciting, seeing your code being used by others and solving programming task which are up to standard and used in the real world is very encouraging.

The initial timeline that was developed during the application period of GSoC was slightly modified by my mentors after I was selected. After this modifications, I have been following this timeline strictly to make sure I accomplish all my goals for the project before the end of the summer. During the development of the project, there were also a few changes to how I will solve some tasks but this was only programmatic (implementation approach) which I did not anticipate will happen, but this made the project more and more fun and also very interesting.

Finally, so far, I have gone very far into the project and almost exhausted by task list, I am very happy in the level at which I am in the project right now and with the passion I have for this project. It's not only about GSoC, it's about maintaining this project and adding more features and working for the Wikimedia community.

Request for help from community members on my project

I would love help from the Wikimedia community and those familiar with RSS technologies with the following;

- Test the RSS views on Wikipedia RSS IFTTT website by clicking on the RSS icons (for each of the links) and see if it returns the RSS feed. Then copy the link to the RSS feed and try to subscribe to it in as many feed readers as possible (MAC OS X, Linux OS, Windows) and see if it works.
- Users of RSS feeds should report any problem they find related to this project. You can create an issue on the official github repo here and I shall look into it and fix ASAP.

- It would also like the community members of Wikidata to create IFTTT accounts and test out the new triggers I have built for Wikidata and the Wikipedia triggers that were initially built by Stephen LaPorte. Test them and see if there are any issues and file a bug in the official Wikimedia IFTTT repository (the link is above).
- In addition to the above mentioned, I will be maintaining and upgrading the project after GSoC and if there is space for more triggers to be added, I would like Wikidata community members to share their trigger ideas with us so that we can add more of them.

Conclusion

In the next blog post, I will write about what I did not anticipate that will happen during GSoC, experience gained through my GSoC project, how my experience affected my daily life, my recommendations for anyone who wants to participate in future GSoC programs in Wikimedia and Why, finally, appreciations to my mentors and mentoring organisations.

Introduction

This is part 3 of 3(the last part) of my blog post about my experience as a GSoC student with the Wikimedia Foundation. This section will address the following issues; What I did not anticipate happening during the GSoC period, the experience I gained on doing this project during GSoC, how the experience I gained has affected my lifestyle and daily activities, the recommendations I have to those interested in GSoC and Wikimedia Foundation (FOSS as a whole) and finally a big thanks to my mentors and the Wikimedia Foundation (mentoring organisation) who help me realize this project successfully.

What I did not anticipate that will happen during GSoC?

During GSoC, there are a few things I did not anticipate that will happen. They are mostly programming related issues and a few on my proposal:

- When I was selected, my original timeline for the project was modified (which I think is necessary) but I did not anticipate it will happen. But mentors really know what they are doing when they tell you to do something. My timeline was modified for the better and after this I clearly saw how the project took its real shape.
- I did not anticipate that I will write this blog post you are reading right now. But I think it's really necessary since I will need to tell the world what I did in the project overall. After my midterm evaluations, my mentors explained to me in detail what I was required

to do during the second half of the GSoC coding period. Writing is fun and very interesting, so try as much as possible to write about what you do because it's very important.

- Creating tickets for each task on Phabricator, that I didn't anticipate. It was a requirement for all GSoCers in Wikimedia but I didn't see it coming. From the beginning, I was facing difficulties to manage this many tickets but as time went on, I realized that it was instead the best approach since it clearly defines and differentiates the various tasks/tickets and makes problem solving better. The tickets are many, yes, but believe me it is the most efficient method that was used during the GSoC period to track student progress, evaluations and reporting. Thanks to Tony Thomas and Sumit Asthana who were the managers of this session of GSoC in the Wikimedia Foundation.

Experience gained through this project during GSoC

This is my first time of doing GSoC after trying for the last 2 years. I have gained a lot of experience throughout this program which range from personal experience to social experience. GSoC is really interesting and fun. I had the experience of working over 40 hours a week which was something I was not doing before GSoC and I also realized that my time management skills improved, I was focusing on things that will really help me complete the job awarded to me by Google and also trying to make sure I pass my exams very well in school. I was able to do GSoC and handle my school at the same time with little or no worries.

Also, I learnt how to work with people of different language accents and timezones. My level of programming increased a lot and I was able to improve on my software engineering skills through the project. Communication is also a very important part of GSoC and a fundamental concept of life. I learnt how to be in constant communication with my mentors and updating them on everything I do in the project so that at any given point in time, they know where I am in the project. I also gained the skill of writing and documentation since in the Wikimedia Foundation, it's a requirement for all GSoCers to document their work as they progress weekly. As of now, I am very astonished about the amount of text I have written down so far. At the beginning, I was not sure I could do this.

Finally, I also learnt a lot of tools and software related principles such as:

- Wikimedia Tool Labs (where I deployed my project)
- Software Testing and Maintenance (Unit Testing, Integration Testing and Regression Testing)
- Debugging of large software and understanding of other people's source code.
- Travis CI testing bot for continuous integration testing.
- UWSGI configurations on WMF Tool Labs and working with virtual environments.

Just to list a few, all these experiences have made me a better software engineer and a better open source contributor to the Wikimedia Foundation.

How my experience has affected my Day-to-Day life

The experience I have had through GSoC has greatly affected my day to day life in a positive way.

- My way of interaction with people has completely changed since I pay keen attention to things that are very important and that will help both me and the community when interacting with people. I have a focus when interacting with the society, meaning I don't just interact for the sake of interaction.
- I am very careful with my time since GSoC started since first of all, I am suppose to put in at least 40 hours a week during GSoC and so I make sure that whatever I am doing should not interfere with my GSoC time. So, GSoC has taught me how to manage my time very well.
- Now, I am quieter than before and when I am in my silent state, I am thinking of how to solve a task in my GSoC project. This state of mind makes me think very well and this has made me to become more quiet in life now than before.
- GSoC has strengthen my skills on how to carry out individual research and be able to use these finding to create something new, or improve on the existing solutions. With this skill that has been improved, I can now pick up a project of any kind and be able to do a lot of research and solve the problem (the project).
- I can multitask due to the experience gained in GSoC. I was able to handle my school and GSoC at the same time and still have a very good result in school while performing very well in the GSoC evaluations. This experience gained has made me to be able to handle multiple tasks at the same time without any worries. This has greatly affected my life style since I can now do many important things at the same time without anyone following me up.

My recommendations for anyone to participate in GSoC/Wikimedia and Why?

I joined the Wikimedia Foundation on the **Sep 13 2015, 7:40 AM** to be very precise and since that moment onwards, my life and way of doing things changed completely. I have been a better programmer and it is gradually polishing up my software engineering skills, the more I work with the Foundation, the better I become. My recommendations to others who are interested in contributing to free and open-source software communities especially Wikimedia Foundation are:

- The members of the community are very friendly in the way they do things, they are very welcoming and very active in communication so feel free to join the community ask your questions and hope to have others point you to the right path in solving your problems. Beginners are very much welcomed in the community and they are treated indeed as beginners and this is a point I also came across and I must say that the community is very welcoming and they help beginners very much to make them advanced contributors in the future.
- Wikimedia Foundation also is equipped with very smart people within the community so joining this community will really make they way you do things very smart and also not waste time on things that are irrelevant which in turn, teaches you how to manage time very well. Before joining the community, I was not as smart as I am now, so join the community and believe me you will see how much smarter you will become in the future.
- The Foundation is really big and has many different extensions that do different things which you can work on. Don't feel as if there is nothing that can interest you on their project. On the contrary, there must be something that will interest you. I urge you to join this community and look for a project/extension that interest you (or why not create yours) so we keep looking for a better way of making knowledge free.

For GSoC, you will have a great experience when you do the program. In addition of being able to make money while still a student, there are also more important things that you will acquire;

- In case you perform very well in GSoC program for your organisation, there is a very high possibility of you having a job in the organisation you contributed to if you really want it.
- At the end of the program, you must have learnt new technologies, created contacts with other members of the program and the mentoring organisation which will also open your way of having better opportunities of building new products and maintaining others.
- When you do a project during GSoC, you find yourself in a different level in the programming ladder and the way you do things becomes very organise and straight to the point.

So, I really urge students to participate in this GSoC program as this will make them very productive and very passionate about free and open-source software.

Appreciation and Thanks to my mentors and Wikimedia Foundation

I will like to use this opportunity to thank my mentors for their hard work in their various domains and guiding me throughout this project. A special thanks to my primary mentor **Stephen LaPorte (a genius)** who made me think like him in this project since I was mostly

building on this code and extending it to support Wikidata. He guided me through the implementation of the project and also provided resources that help me on the project. Also I would like to thank **Lydia Pintscher (my only female mentor)** who really was very active anytime I need help in documentation and review of evaluations and this blog and other document related work, she really mentored me and from her I leant how to be very friendly because she always smiles and it made me feel relieved when I was worried, thanks **Lydia**.

Also, to my very able and intelligent mentor **Marius Hoch** from Wikidata DE who help me very much on learning the WDQS (Wikidata Query Service) and Wikidata API which where key requirement to the accomplishment of part of the project. He also provided resources which pointed me to what to learn which directly impacted the project and made me succeed. To conclude my thanks and gratitude to all the mentors, I also want to thank **Benedikt Seidl** who also helped me on the Wikidata end with very good resources before even the project started. Before I had to work on the project, I was suppose to know what Wikidata is and all it's terminologies. **Benedikt** took his time and compiled resources and sent them by email to me and that is what I have been using to learn about Wikidata so well and so far, I have not encountered much trouble about Wikidata. Thank you all my mentors and if it was not for my mentors, I don't think the project would have been a success or I don't think I would have come this far on the projects. Thank you all once more…

Conclusion

This is the last post and my GSoC project came to a successful end. I wish to thank Google for this opportunity they gave us students to work on open source projects under their supervision in various organisations. It was a great summer of code and it went well. The End!!!