

SymCheck - Sprint 5 Presentation

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Agenda



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and New
Technologies



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4. Demo of New Features



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6. Timeline



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Project Overview

What is SymCheck?



- SymCheck is an image-based self-diagnosis application
- A patient's input image is fed into an original algorithm developed, tested, and run using TensorFlow's Keras library
- [Currently] generates positive or negative diagnoses for 2 illnesses – chickenpox (varicella) and pink eye (conjunctivitis)
- Does not require account creation or login, nor answering a long series of monotonous questions (image-based)

Persona 1:

Cindy the Single, Working Mother

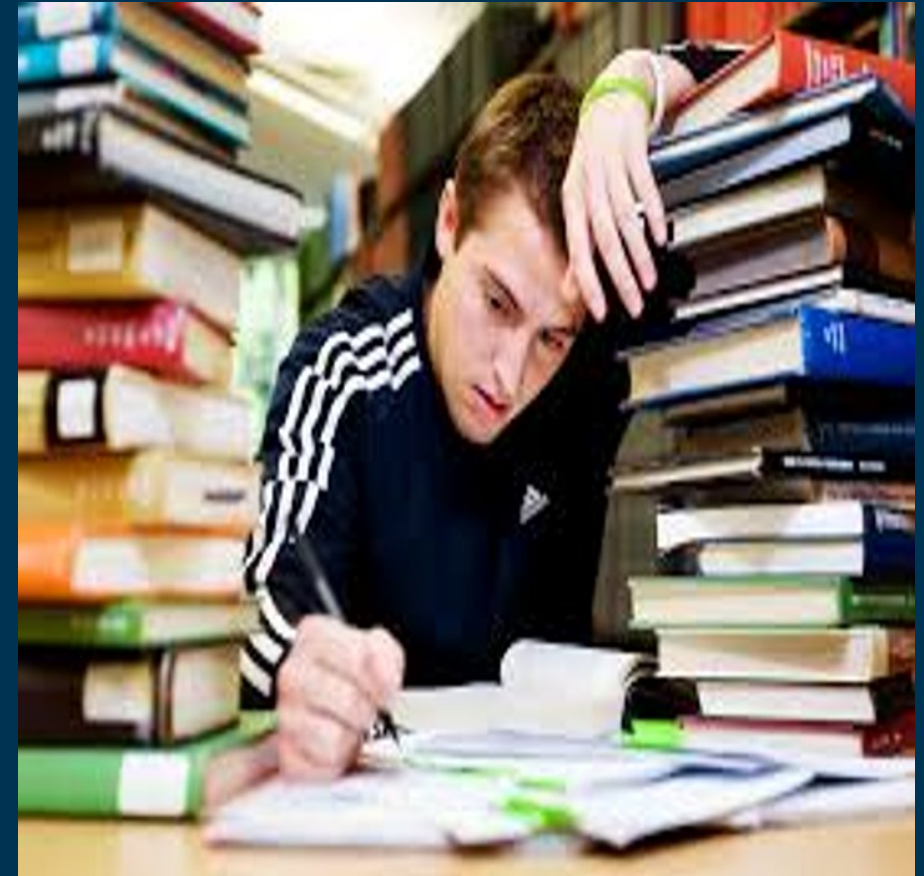


- **Background Profile:**
 - Cindy is a 32-year old single mother with 2 boys: Adrian (4 years old) and Simon (6 years old). She also has a full-time job as a business analyst, working around 80 hours a week.
 - Simon has recently developed a rash on his chest. Cindy called the family's pediatrician to seek a quick diagnosis, but they are reluctant to diagnose him without a physical visit.
- **How can SymCheck help?**
 - Cindy could very much use an application to get a cursory diagnosis of her son's symptoms from the comfort of her own home or work-desk. This would allow her to potentially save an unnecessary visit and follow recommendations listed on the SymCheck site, or even shorten a visit to the doctor by simply having him verify the result in confidence.

Persona 2:

Ryan the overwhelmed college student

- Background Profile:
 - Ryan is a junior at Pace University. Not only is he swarmed with assignments, but he has also just started to notice strange skin lesions on his arm. Although he wants to get his skin checked, he just doesn't have time to waste in his schedule to check in to a doctor's office or urgent care facility if it is not necessary.
- How can SymCheck help?
 - Ryan needs a cursory method of diagnosis for his skin abnormality, *without* having to pay a physical visit to some medical facility.
 - Our SymCheck application can solve this dilemma, and if the application identifies his lesions as to being serious or even life-threatening, it can recommend that he definitively needs to prioritize a visit to the doctor or nearest hospital.



Persona 3:

Lisa the Caring Nurse



- **Background Profile:**

- Lisa has 15 years of experience as a Nurse at various urgent care facilities. Now, during global COVID-19 pandemic, many of her patients complain to her about the waiting period to see a doctor.

- **How can SymCheck help?**

- In order to help minimize the number of patients in the office, Lisa seeks an application to help her patients determine whether or not their illness symptoms require immediate medical attention.
- Given that Lisa wishes to refer her patients to a reliable, and convenient source of diagnosis, the SymCheck application could potentially offer guidance in determining what a patient's symptoms may indicate and thus provide recommendations for at-home remedies.
- The use of SymCheck could thus also help in mediating the spread of COVID-19 by reducing the traffic in Urgent Care facilities.

Looking forward into this semester...

- This year our team plans to undertake an extensive focus on adding various additional features to our application to make it even more convenient and user/patient friendly:
 - Image upload preview
 - Interactive chatbot
 - Convenient site navigation bar
 - Mobile-friendly website
- Our team is also looking into adding more data to increase the accuracy of our existing prediction rates, as well as considering the addition of another non-threatening illness/condition
 - Current machine-learning algorithm accuracy: 78%
 - Addition of classification label for ringworm (*tinea* or *dermatophytosis*)



Image drawn from Shutterstock

Sprint 4 vs. Sprint 5

Comparison

Sprint 4

- We completed our machine learning algorithm to diagnose Chickenpox and Pinkeye.
 - The accuracy percentage is 78
- We provided information about these illnesses such as when to see a doctor and typical symptoms.
 - This information is from the CDC
- We added “Find nearest Emergency room” feature to our Image page and Results page.
 - Patients can find the nearest hospital or urgent care from their location

Sprint 5

- We added a new capability that allows you to see the image uploaded for confirmation purposes.
- We added a chatbot to each page that acts as a virtual assistant for SymCheck.
 - It can direct users to various resources such as our GitHub, the CDC website, or reach us via email
- We hosted our application to the cloud for easier accessibility.
 - Users can access SymCheck on any laptop or desktop
 - There is no need to install and run SymCheck on your device

Sprint 5 New Technologies



Dialogflow

- Natural language understanding platform
- Dialogflow can analyze multiple types of input (text or audio inputs)
- Advanced AI : BERT-based natural language understanding (NLU) model











repl.it

- Interactive, console-based, programming environment
- Multi languages support
- manage the environment for building and running code











Sprint 5

Sprint 5 Committed Tasks and Stories

T	Key	Summary	Story Points	P ↓
	HID-58	As a patient, I want to interact with the SymCheck Chat Bot so that I could have my questions answered quickly	5	↑
	HID-56	Find more images of Chickenpox, PinkEye, Normal skin and Normal eye for the ML algorithm		↑
	HID-65	Create questions for textual diagnosis and weight priority		↑
	HID-63	Enhance the SymCheck application by cleaning up code		↑
	HID-57	As a patient, I want to see the image I uploaded so that I know I chose the intended file	1	↑
	HID-61	Redo all stories, test cases, and acceptance criteria's to reflect proper type of user and verbiage		↓
	HID-60	Link all user stories, test cases, and acceptance criteria together		↓
	HID-66	Create a presentation for Sprint 5		↓

Sprint 5 Completed Tasks and Stories

- Items boxed in green were added mid-sprint
 - This was possible because repl.it is a collaborative coding environment and provided hosting capabilities.

T	Key	Summary	Story Points	P ↓
		HID-58 As a patient, I want to interact with the SymCheck Chat Bot so that I could have my questions answered quickly	5	↑
		HID-62 As a patient, I want to access the SymCheck application on the web so that I don't have to download and run an instance myself	8	↑ ...
		HID-56 Find more images of Chickenpox, PinkEye, Normal skin and Normal eye for the ML algorithm		↑
		HID-74 Find a coding collaboration tool for easier integration and editing of SymCheck		↑
		HID-65 Create questions for textual diagnosis and weight priority		↑
		HID-63 Enhance the SymCheck application by cleaning up code		↑
		HID-57 As a patient, I want to see the image I uploaded so that I know I chose the intended file	1	↑
		HID-61 Redo all stories, test cases, and acceptance criteria's to reflect proper type of user and verbiage		↓
		HID-60 Link all user stories, test cases, and acceptance criteria together		↓
		HID-66 Create a presentation for Sprint 5		↓

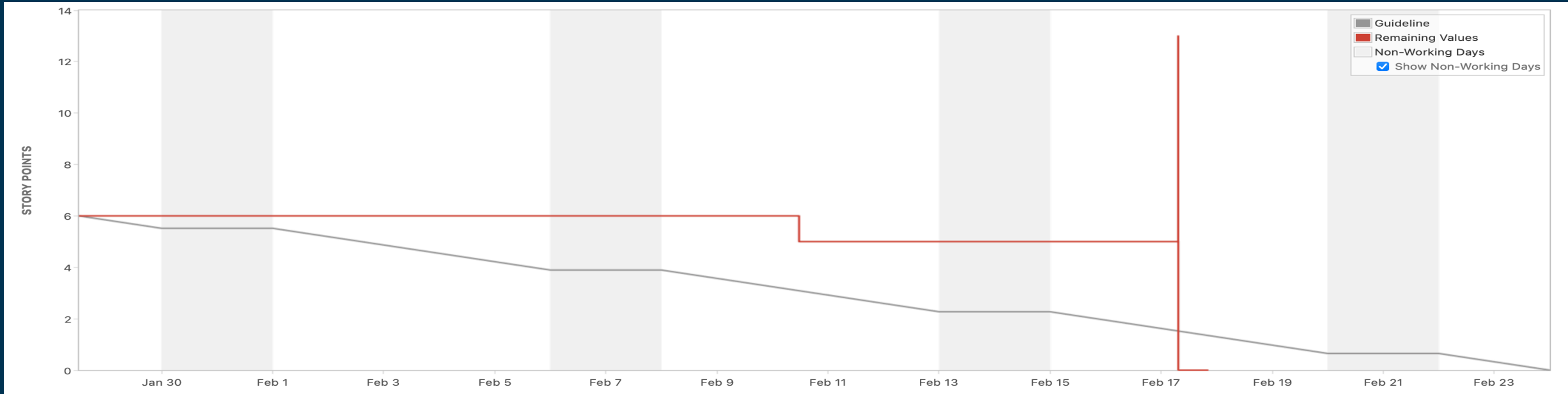
Acceptance Criteria

Key	Summary	Label
HID-57	<ol style="list-style-type: none">1. Given that the patient is on the ImageUploadPage, when the patient uploads their image, then the user should see their uploaded image within the application.	Image Upload Page
HID-58	<ol style="list-style-type: none">1. Given that the patient is on any page of the SymCheck application, when the patient clicks on the chatbot's greeting, then a dialogue window will pop up in the bottom right corner.2. Given that the patient has a dialogue box opened with the chatbot, when the patient enters "pinkeye" or "chickenpox", then the chatbot will respond by telling the patient they should go to the CDC website.	All Pages
HID-62	<ol style="list-style-type: none">1. Given that the patient has a browser open, when the patient types in SymCheck's URL, then the SymCheck application should be accessible without any errors.	Cloud Access

Test Cases

Test Case For	Key	Test Cases	Test Data	Expected Results	Actual Results	Pass/ Fail
Homepage	HID-58	Chatbot	Hi, chicken pox, pink eye	Patient can interact with SymBot and receive a response	SymBot responds on all patient inputs such as hello, what is chickenpox, how can I speak to creators of symcheck, etc.	P
Image Upload Page	HID-57	Image reflection	pinkeye image file	Patient can see their uploaded image	After you select an image to upload, the page shows you the uploaded image	P
Image Upload Page	HID-58	Chatbot	How do I upload an image?	Patient can interact with SymBot and receive a response	SymBot responds on all patient inputs such as hello, what is chickenpox, how can I speak to creators of symcheck, etc.	P
Results	HID-58	Chatbot	How can I get in touch with developers?	Patient can interact with SymBot and receive a response	SymBot responds on all patient inputs such as hello, what is chickenpox, how can I speak to creators of symcheck, etc.	P
Cloud Access	HID-62	Access via URL	https://symcheck.jazzy-maya.repl.co/	Patients can use SymCheck without any issues	Patients can use SymCheck without any issues	P

Sprint 5 Burndown Chart



- ❖ This chart shows our story point burndown.
- ❖ We have a velocity of 13 points.

- ❖ We added an 8-point story mid sprint, that is why there is a spike on the 17th.

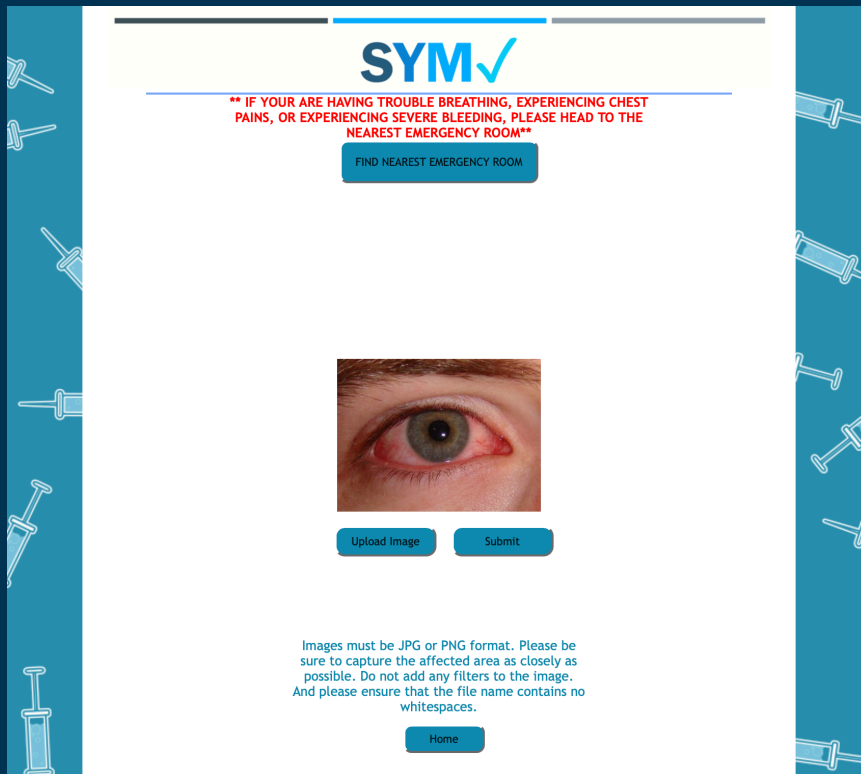
- ❖ We finished the sprint early, that is why the red line stops on the 18th.

Project Demo

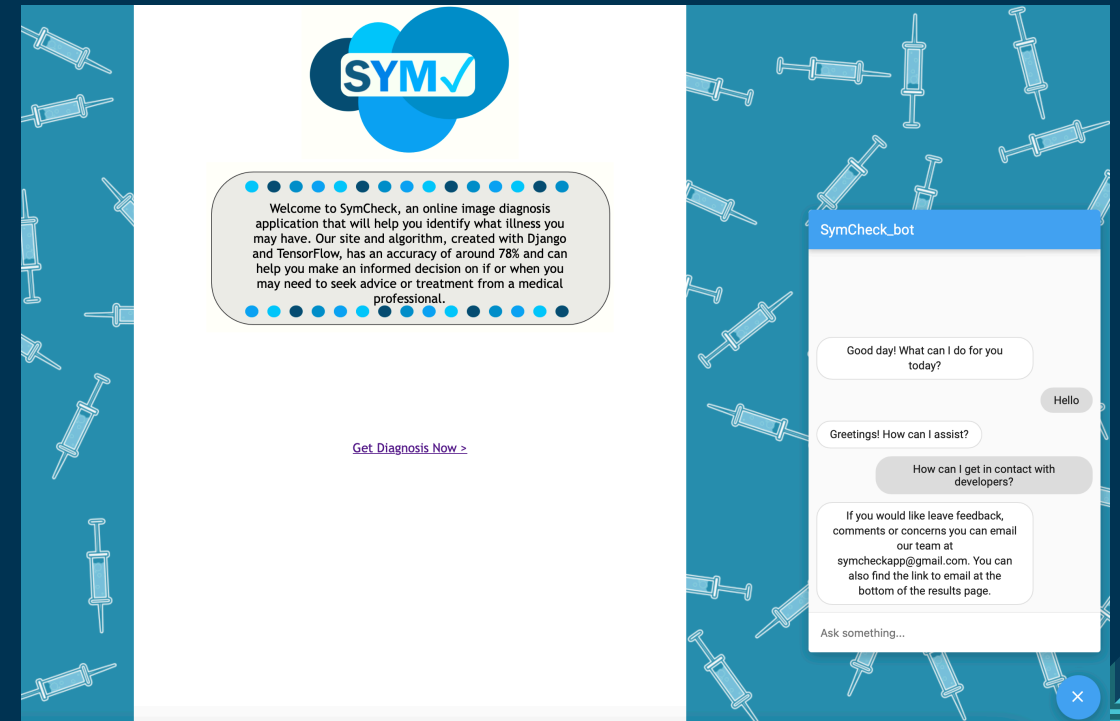
*Demo was performed live and can be found at
<https://github.com/jazzymaya/HiddenAgility/wiki>

Demo of New Capabilities

New Image Page Capability



Chatbot Capability





Product Backlog

Product Backlog

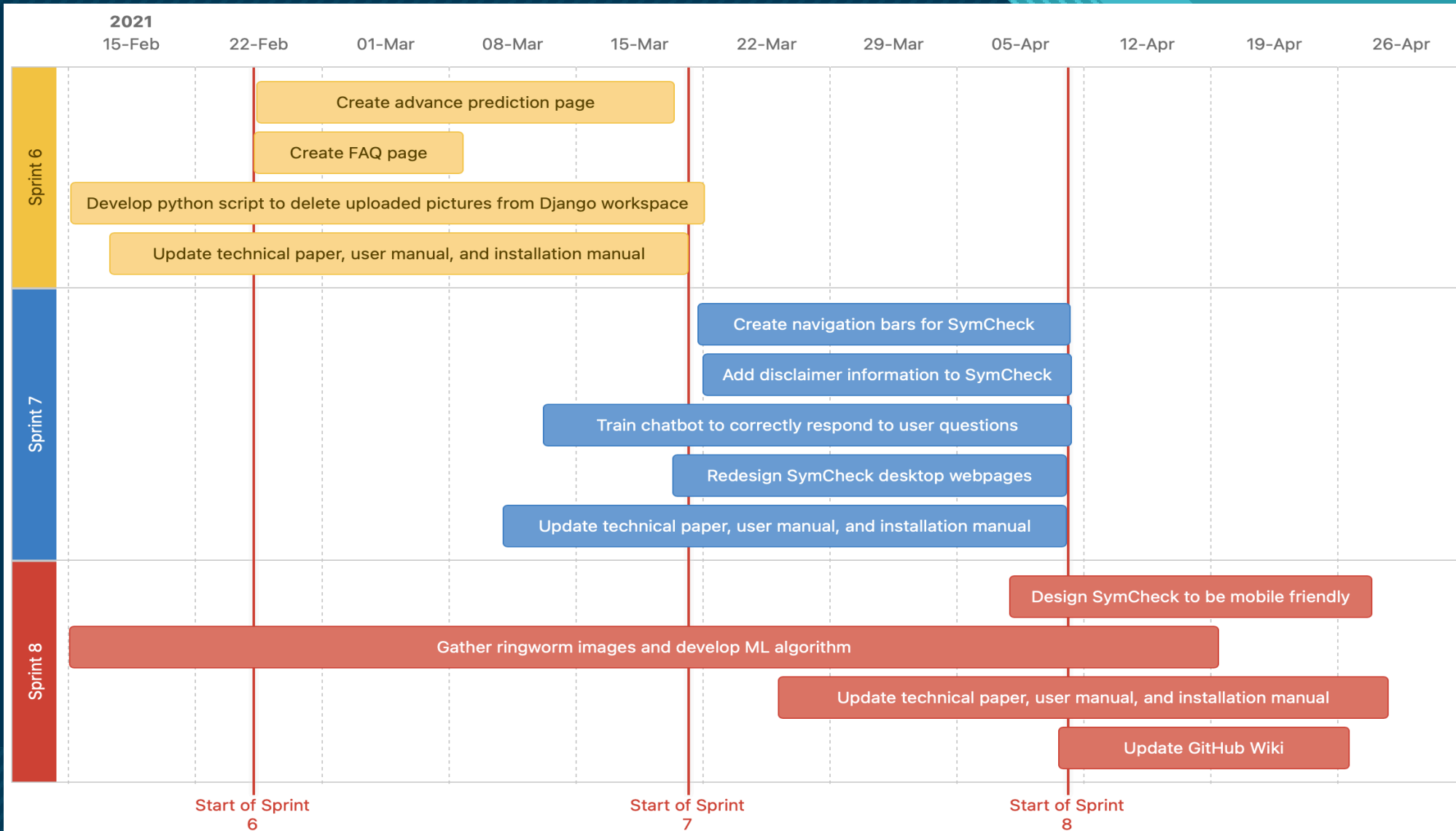
Backlog 15 issues

<input type="checkbox"/> As a patient, I want to include other symptoms along with my image upload so that I can receive a better diagnosis	SymCheck	SK	HID-59	↑	8
<input type="checkbox"/> As a patient, I want to access SymCheck on my mobile device for convenience	SymCheck	AS	HID-64	↑	8
<input type="checkbox"/> As a patient, I want to know which illnesses SymCheck can diagnose so that I know what I can upload.	SymCheck		HID-79	↑	1
<input type="checkbox"/> As a patient, I want to access a FAQ page so that I can see answers to common questions that I may have	SymCheck		HID-81	↑	1
<input type="checkbox"/> As a patient, I want to access other pages on the site with a navigation bar so that I can easily move from page to page	SymCheck		HID-82	↑	3
<input checked="" type="checkbox"/> Add ringworm as another illness that can be predicted			HID-78	↑	
<input checked="" type="checkbox"/> Create a presentation for Sprint 6			HID-70	↓	
<input checked="" type="checkbox"/> Create a presentation for Sprint 7			HID-71	↑	
<input checked="" type="checkbox"/> Create a presentation for Sprint 8			HID-72	↑	
<input checked="" type="checkbox"/> Develop a python script to clear media folder OR implement a database for uploaded pictures			HID-73	↑	
<input checked="" type="checkbox"/> Update installation guide and user manual			HID-75	↑	
<input checked="" type="checkbox"/> Update Technical Paper			HID-76	↑	
<input checked="" type="checkbox"/> Update GitHub wiki			HID-77	↑	
<input checked="" type="checkbox"/> Add a disclaimer at the bottom of each page			HID-80	↑	
<input checked="" type="checkbox"/> Redo SymCheck's application design			HID-83	↑	



Timeline

Timeline of Future Sprints



Retrospectives

Retrospectives



What went well

Using repl.it as our code collaboration tool and cloud hosting provider

Tri-weekly meetings to make sure roadblocks are avoided



What needs improvement

Sprint planned items needs to be enforced to avoid mid sprint scope changes

We need to work on stories and tasks in a timely manner



Next Steps

Read repl.it documentation for better understanding



Conclusion

Link to GitHub

<https://github.com/jazzymaya/HiddenAgility/wiki>

Link to SymCheck Website

<https://symcheck.jazzymaya.repl.co/>