

Sprint 2

Product Backlog

Story	Priority	Effort (1-10)	Validation
As a user, I want to be able to find a song by giving our application lyrics verbally .	1	5	Assistant returns the correct song
As a user, I want to be able to find a song by giving our application lyrics through text .	1	5	Assistant returns the correct song
As a user, I want to be able to respond to the application and have it play a sample of the song.	2	6	Assistant plays the song that it finds
As a user, I want the application to return a way of finding the song (apple music, google music, spotify).	3	6	Assistant provides working links to different media
As a user, I want the application to be precise in that it can predict the song with the correct lyrics that I am looking for each time it is run.	2	7	Assistant provides the same song for the same search as long as the user confirms it is correct.
As a user, I want the application to respond smoothly throughout the duration of the user conversation.	2	6	Assistant interprets user requests correctly, can adjust conversation effectively based on user responses
As a user, I want the application to ask if the correct song was played and if not, I want the application to smoothly attempt to try again.	3	6	Assistant takes in additional information to narrow down false results, responds back to user

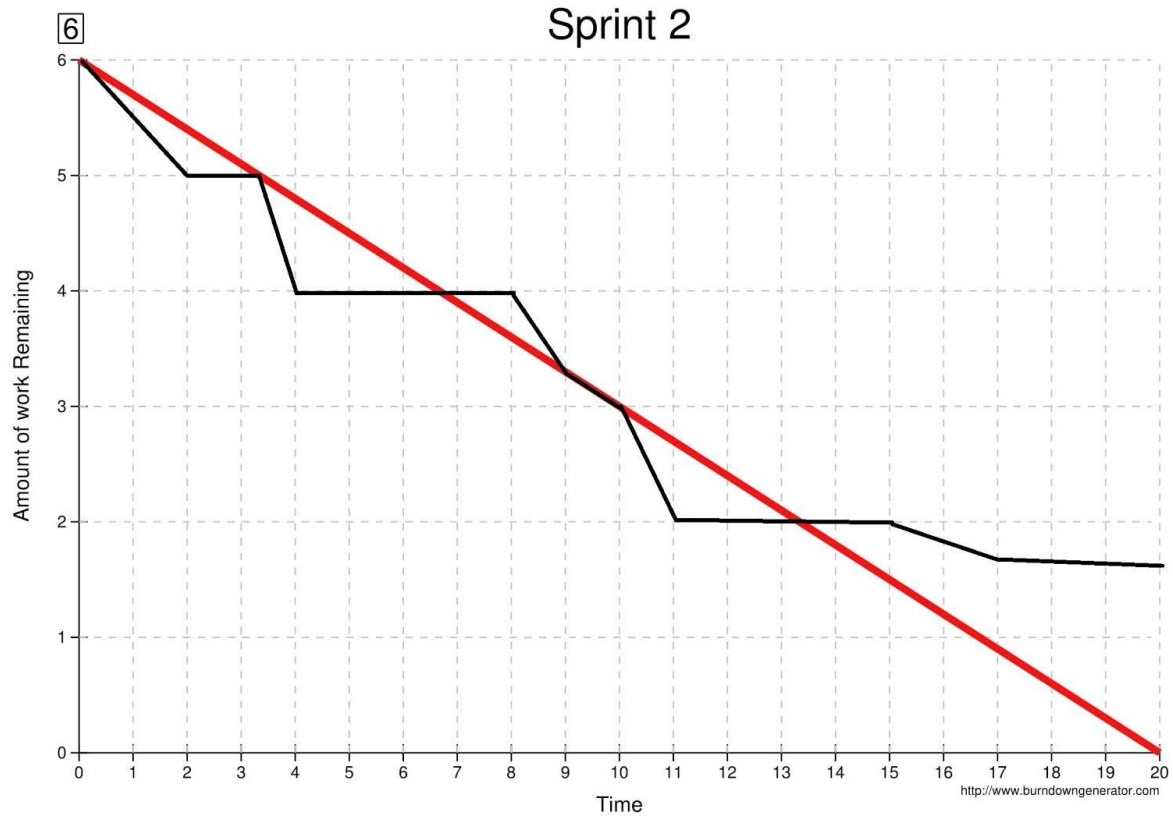
As a user, I want to be able to give input to the application and have it learn from mistakes and get rewarded for successful finds (ML).	3	9	Assistant is able to use ML to predict the best and most likely song from a list of songs.
As a user, I want to be able to use the application in multiple languages.	4	9	Assistant is able to understand and communicate in multiple languages.
As a user, I want to use the application (user interface).	1	3	User is able to interact with the assistant by talking and typing.
As a user, I want to be able to find a song using just the lyrics from a song (genius API).	1	3	Application is able to find the requested song using genius API.
As a user, share the song with social media.	4	7	Working links to post on social media appear.
Set up the firebase and google actions environment and get them to work with external API calls	1	7	Our code in the cloud can do external API calls [outside google]

Sprint 2 Backlog

<u>Story</u>	<u>Priority</u>	<u>Effort(1-10)</u>	<u>Validation</u>
As a user, I want to use a Neural Network (NN) to find the artist of a song based on the songs full lyrics.	1	5	NN returns artist
As a user, I want to correctly predict the artist of a song based on our NN training	1	6	NN returns the correct song
As a user, I want to use lyric sentiment values to narrow down the search for our lyrics.	2	5	Application finds song in a subset determined by sentiment values
As a user, I want our application to retrieve sentiment data of lyrics using Google's Natural Language (NL) API	2	5	Code can execute google NL API
As a user, I want the firebase and google actions environment to work with python code we written.	2	4	Our google actions code can return results found with python code
As a user, once the song is returned, I want the application to play a sample of the song.	3	6	Application is able to link the returned song to a link or mp3 and play it for the user.

Burndown Chart

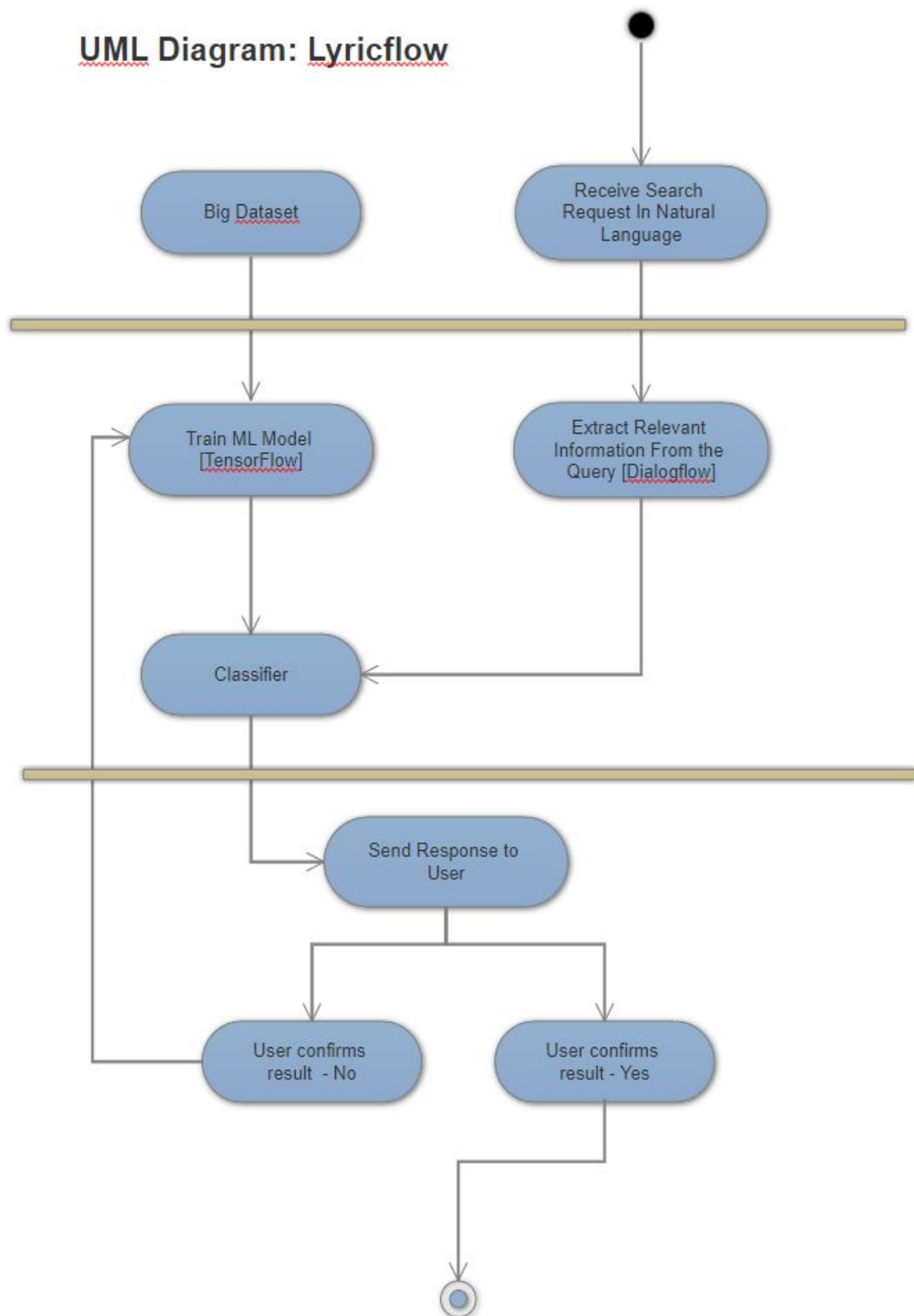
(Sprint 2)



Red line: Ideal

Black line: Actual

UML Diagram: Lyricflow



Sprint 2 tests/demos

Fig 1:
Training the model, 10 epochs

```
neural-network $ python3 song-classifier.py
Using TensorFlow backend.

-----
Layer (type)           Output Shape          Param #
-----
dense_1 (Dense)         (None, 512)           7680512
activation_1 (Activation) (None, 512)           0
dropout_1 (Dropout)     (None, 512)           0
dense_2 (Dense)         (None, 512)           262656
activation_2 (Activation) (None, 512)           0
dropout_2 (Dropout)     (None, 512)           0
dense_3 (Dense)         (None, 2473)          1268649
activation_3 (Activation) (None, 2473)          0
-----
Total params: 9,211,817
Trainable params: 9,211,817
Non-trainable params: 0
-----
Train on 4590 samples, validate on 510 samples
Epoch 1/10
4590/4590 [=====] - 7s 2ms/step - loss: 7.7075 - acc: 0.0076 - val_loss: 8.1334 - val_acc: 0.0000e+00
Epoch 2/10
4590/4590 [=====] - 6s 1ms/step - loss: 6.4998 - acc: 0.0630 - val_loss: 8.3265 - val_acc: 0.0059
Epoch 3/10
4590/4590 [=====] - 6s 1ms/step - loss: 4.7605 - acc: 0.2906 - val_loss: 9.2950 - val_acc: 0.0157
Epoch 4/10
4590/4590 [=====] - 6s 1ms/step - loss: 2.3841 - acc: 0.6407 - val_loss: 10.6815 - val_acc: 0.0196
Epoch 5/10
4590/4590 [=====] - 8s 2ms/step - loss: 0.8923 - acc: 0.8686 - val_loss: 12.1977 - val_acc: 0.0196
```

Fig 2:
Running a test with 100 random lyrics, with 92 correct predictions.

```
neural-network --bash -- 127x36
Predicted label: gary puckett the union gap
Actual label: the beatles
Predicted label: the beatles
Actual label: bob seger system
Predicted label: bob seger system
Actual label: the supremes the temptations
Predicted label: booker t the mgs
Actual label: marvin gaye
Predicted label: marvin gaye
Actual label: crazy elephant
Predicted label: crazy elephant
Actual label: booker t the mgs
Predicted label: booker t the mgs
Actual label: lou rawls
Predicted label: kenny g
Actual label: the originals
Predicted label: booker t the mgs
Actual label: edwin hawkins singers
Predicted label: edwin hawkins singers
Actual label: tom jones
Predicted label: tom jones
Actual label: paul revere the raiders
Predicted label: paul revere the raiders
Actual label: the guess who
Predicted label: the guess who
Actual label: david ruffin
Predicted label: david ruffin
Actual label: the box tops
Predicted label: the box tops
Actual label: bj thores
Predicted label: bj thomas
Actual label: the box tops
Predicted label: the box tops
Actual label: simon garfunkel
Predicted label: simon garfunkel
Score: 92/100
```