CS5542: Big Data Analytics and Apps

LAB Assignment 11

Show and Tell

•a deep neural network that learns how to describe the content of images

•an example of anencoder-decoderneural network

•first "encoding" an image into a fixed-length vector representation

•"decoding" the representation into a natural language description

•We will use inception v3 for image encoding

•The decoder is a long short-term memory (LSTM) network.

•LSTM network is trained as a language model conditioned on the image encoding

•Words in the captions are represented with an embedding model. Each word in the vocabulary is associated with a fixed-length vector representation that is learned during training.

First Phase of Training •parameters of the Inception v3model are kept fixed

•it is simply a static image encoder function

•A single trainable layer is added on top of the Inception v3model to transform the image embedding into the word embedding vector space

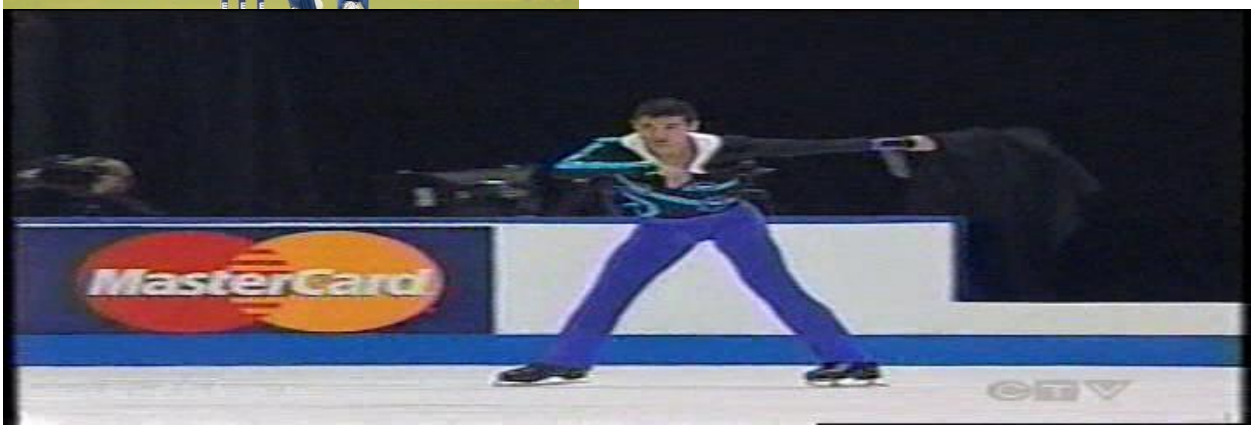
•The model is trained with respect to the parameters of the word embeddings, the parameters of the layer on top of Inception v3and the parameters of the LSTM

The program is executed using the models generated from the first phase training on the images.

Here are the screenshots:


Paytm


Star
INDIA


MasterCard


MEMPHS
31
MURPHY
1


Montreal

ShowAndTell - [~/Documents/ShowAndTell] - .../run_inference.py - PyCharm Community Edition 2016.3.2

File Edit View Navigate Code Refactor Run Tools VCS Window Help

ShowAndTell > run_inference.py

run_inference

Project

ShowAndTell ~/Documents/ShowAndTell

- data
- inference_utils
- ops
- pretrained_model
- 252600.jpg
- 258391.3.jpg
- 3164328039.jpg
- 3165123595.jpg
- build_data.py
- configuration.py
- evaluate.py
- img_5_00022038.jpg
- img_31.jpg
- img_000089.jpg
- img_699.jpg
- inference_wrapper.py
- nltk

build_data.py | train.py | show_and_tell_model.py | evaluate.py | run_inference.py | caption_generator.py

beam_search Match Case Regex Words One match

```
from __future__ import division
from __future__ import print_function

import math
import os


import tensorflow as tf

import configuration
import inference_wrapper
from inference_utils import caption_generator
from inference_utils import vocabulary

FLAGS = tf.flags.FLAGS

tf.flags.DEFINE_string("checkpoint_path", "pretrained_model/",
                       "Model checkpoint file or directory containing a "
                       "model checkpoint file.")
tf.flags.DEFINE_string("vocab_file", "pretrained_model/word_counts.txt", "Text file containing the vocabulary.")
tf.flags.DEFINE_string("input_files", "258391.3.jpg,img_000089.jpg,252600.jpg,img_5_00022038.jpg",
                       "File pattern or comma-separated list of file patterns "
                       "of image files.")
```

Run run_inference

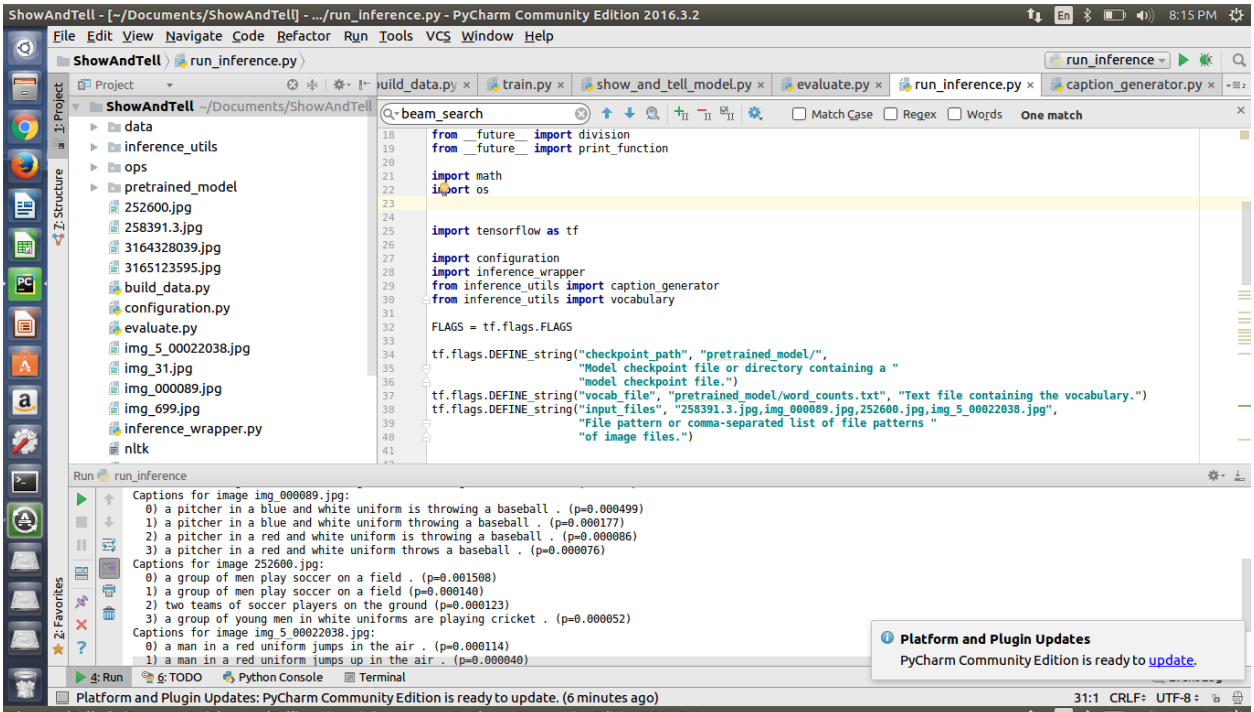
```
Captions for image img_000089.jpg:
  0) a pitcher in a blue and white uniform is throwing a baseball . (p=0.000499)
  1) a pitcher in a blue and white uniform throwing a baseball . (p=0.000177)
  2) a pitcher in a red and white uniform is throwing a baseball . (p=0.000086)
  3) a pitcher in a red and white uniform throws a baseball . (p=0.000076)
Captions for image 252600.jpg:
  0) a group of men play soccer on a field . (p=0.001508)
  1) a group of men play soccer on a field (p=0.000140)
  2) two teams of soccer players on the ground (p=0.000123)
  3) a group of young men in white uniforms are playing cricket . (p=0.000052)
Captions for image img_5_00022038.jpg:
  0) a man in a red uniform jumps in the air . (p=0.000114)
  1) a man in a red uniform jumps up in the air . (p=0.000040)
```

Platform and Plugin Updates
PyCharm Community Edition is ready to update.

4: Run 6: TODO Python Console Terminal

Platform and Plugin Updates: PyCharm Community Edition is ready to update. (6 minutes ago)

31:1 CRLF UTF-8


ShowAndTell - [~/Documents/ShowAndTell] - .../run_inference.py - PyCharm Community Edition 2016.3.2
File Edit View Navigate Code Refactor Run Tools VCS Window Help
ShowAndTell
run_inference.py
run_inference
build_data.py
train.py
show_and_tell_model.py
evaluate.py
run_inference.py
caption_generator.py
Project
ShowAndTell ~/Documents/ShowAndTell
data
inference_utils
ops
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inference_wrapper.py
nltk
beam_search
Match Case
Regex
Words
One match
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Run run_inference
Captions for image img_000089.jpg:
0) a pitcher in a blue and white uniform is throwing a baseball . (p=0.000499)
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2) a pitcher in a red and white uniform is throwing a baseball . (p=0.000086)
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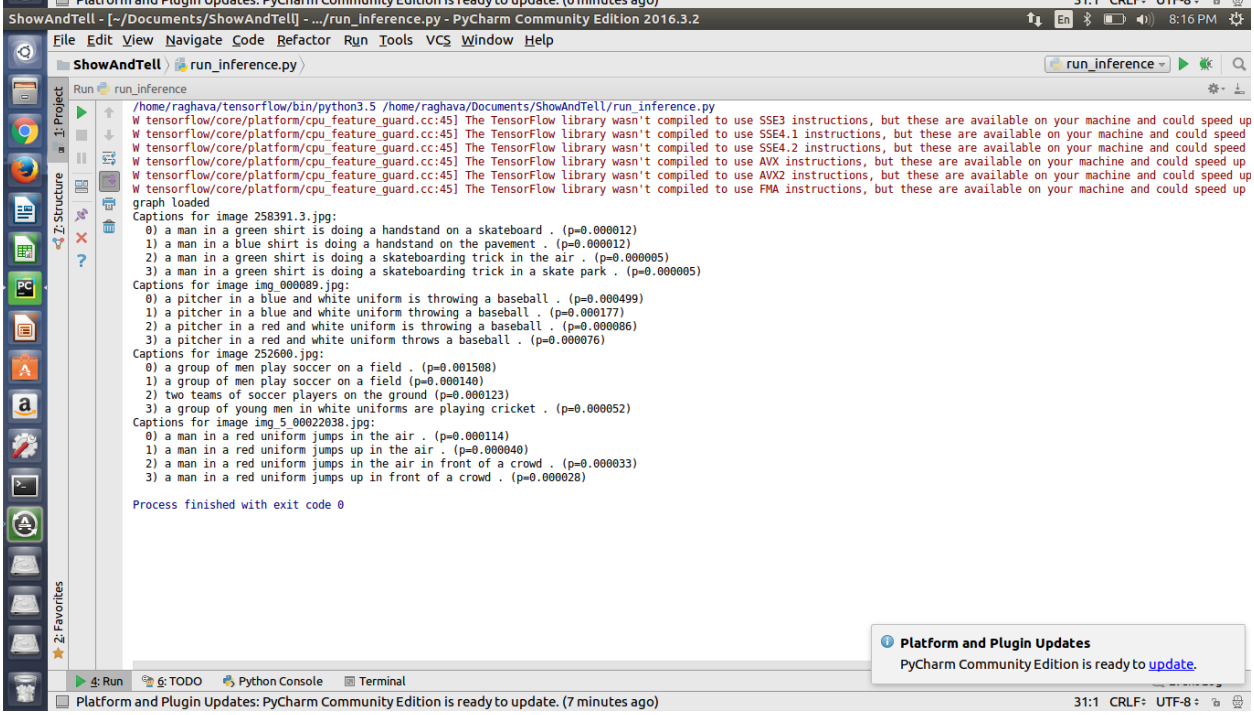
Captions for image 252600.jpg:
0) a group of men play soccer on a field . (p=0.001508)
1) a group of men play soccer on a field (p=0.000140)
2) two teams of soccer players on the ground (p=0.000123)
3) a group of young men in white uniforms are playing cricket . (p=0.000052)
Captions for image img_5_00022038.jpg:
0) a man in a red uniform jumps in the air . (p=0.000114)
1) a man in a red uniform jumps up in the air . (p=0.000040)
Platform and Plugin Updates
PyCharm Community Edition is ready to update.
4: Run
6: TODO
Python Console
Terminal
Platform and Plugin Updates: PyCharm Community Edition is ready to update. (6 minutes ago)
31:1 CRLF UTF-8
1: Project
7: Structure
2: Favorites


ShowAndTell - [~/Documents/ShowAndTell] - .../run_inference.py - PyCharm Community Edition 2016.3.2
File Edit View Navigate Code Refactor Run Tools VCS Window Help
ShowAndTell
run_inference.py
run_inference
Run run_inference
/home/raghava/tensorflow/bin/python3.5 /home/raghava/Documents/ShowAndTell/run_inference.py
W tensorflow/core/platform/cpu_feature_guard.cc:45] The TensorFlow library wasn't compiled to use SSE3 instructions, but these are available on your machine and could speed up
W tensorflow/core/platform/cpu_feature_guard.cc:45] The TensorFlow library wasn't compiled to use SSE4.1 instructions, but these are available on your machine and could speed
W tensorflow/core/platform/cpu_feature_guard.cc:45] The TensorFlow library wasn't compiled to use SSE4.2 instructions, but these are available on your machine and could speed
W tensorflow/core/platform/cpu_feature_guard.cc:45] The TensorFlow library wasn't compiled to use AVX instructions, but these are available on your machine and could speed up
W tensorflow/core/platform/cpu_feature_guard.cc:45] The TensorFlow library wasn't compiled to use AVX2 instructions, but these are available on your machine and could speed up
W tensorflow/core/platform/cpu_feature_guard.cc:45] The TensorFlow library wasn't compiled to use FMA instructions, but these are available on your machine and could speed up
graph loaded
Captions for image 258391.3.jpg:
0) a man in a green shirt is doing a handstand on a skateboard . (p=0.000012)
1) a man in a blue shirt is doing a handstand on the pavement . (p=0.000012)
2) a man in a green shirt is doing a skateboarding trick in the air . (p=0.000005)
3) a man in a green shirt is doing a skateboarding trick in a skate park . (p=0.000005)
Captions for image img_000089.jpg:
0) a pitcher in a blue and white uniform is throwing a baseball . (p=0.000499)
1) a pitcher in a blue and white uniform throwing a baseball . (p=0.000177)
2) a pitcher in a red and white uniform is throwing a baseball . (p=0.000086)
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Captions for image 252600.jpg:
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Captions for image img_5_00022038.jpg:
0) a man in a red uniform jumps in the air . (p=0.000114)
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2) a man in a red uniform jumps in the air in front of a crowd . (p=0.000033)
3) a man in a red uniform jumps up in front of a crowd . (p=0.000028)
Process finished with exit code 0
Platform and Plugin Updates
PyCharm Community Edition is ready to update.
4: Run
6: TODO
Python Console
Terminal
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31:1 CRLF UTF-8
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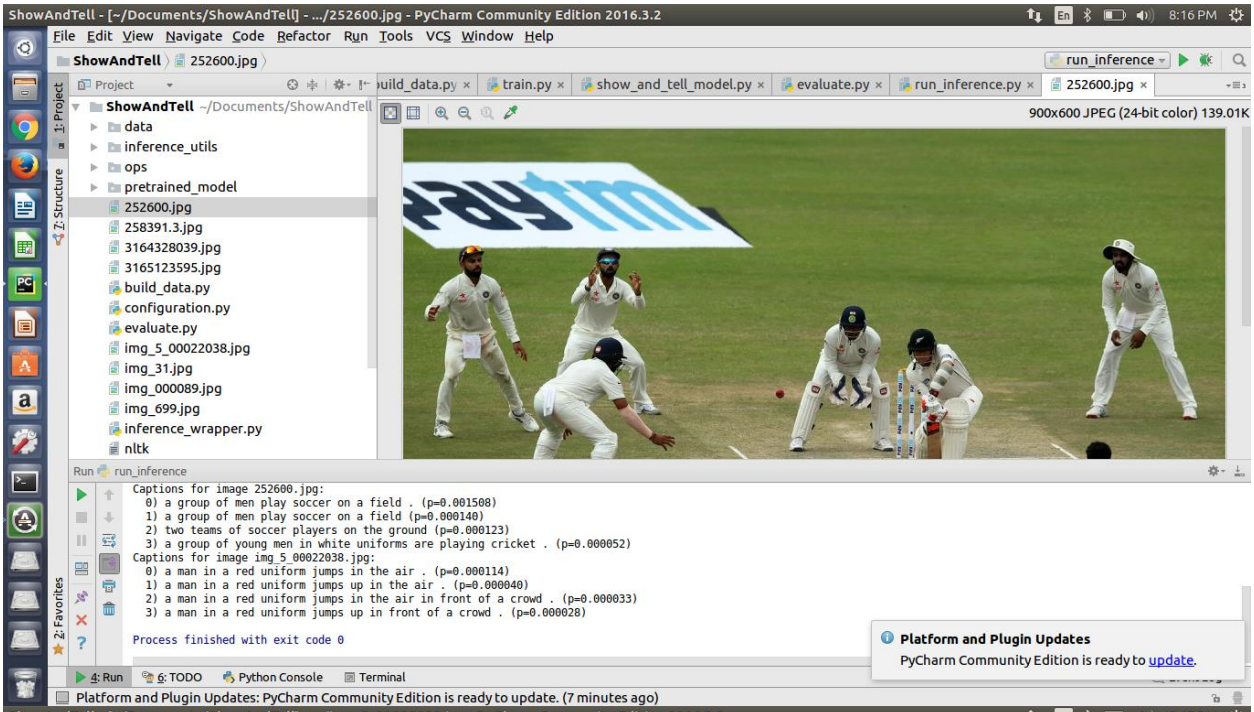
ShowAndTell - [~/Documents/ShowAndTell] - .../252600.jpg - PyCharm Community Edition 2016.3.2
File Edit View Navigate Code Refactor Run Tools VCS Window Help
ShowAndTell 252600.jpg
run_inference
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build_data.py
train.py
show_and_tell_model.py
evaluate.py
run_inference.py
252600.jpg
900x600 JPEG (24-bit color) 139.01K
ShowAndTell ~/Documents/ShowAndTell
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inference_utils
ops
pretrained_model
252600.jpg
258391.3.jpg
3164328039.jpg
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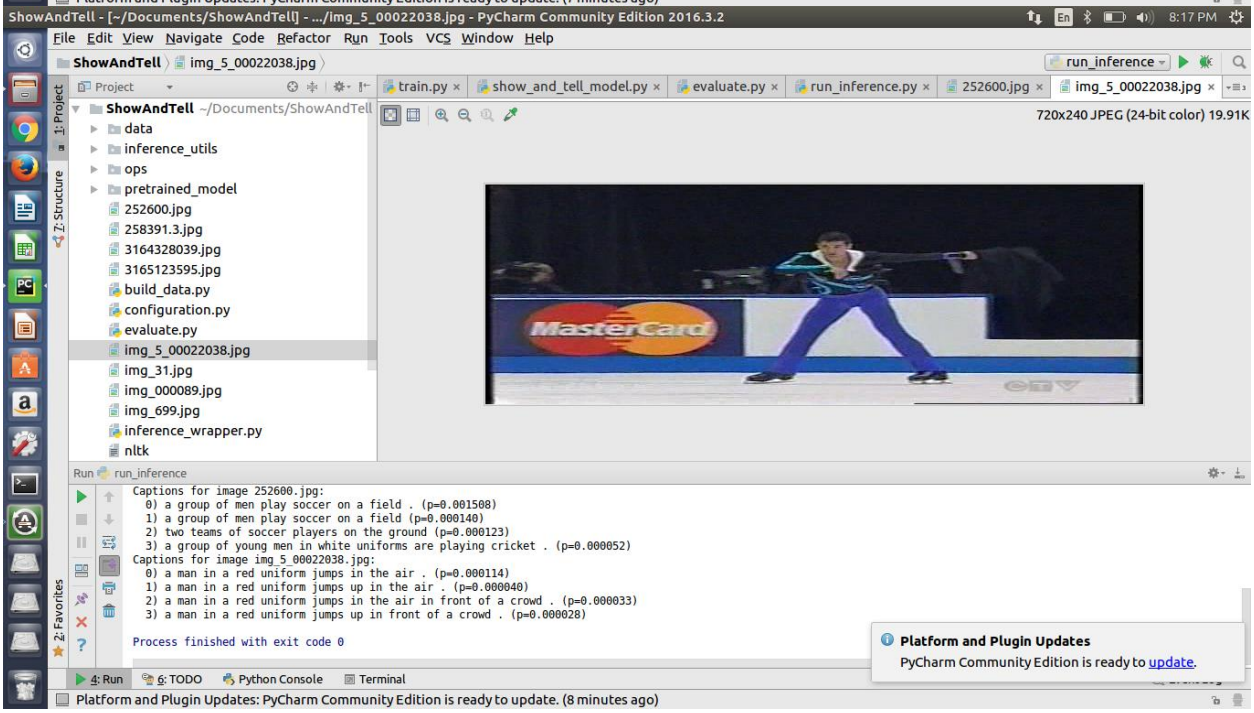
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ShowAndTell img_5_00022038.jpg
run_inference
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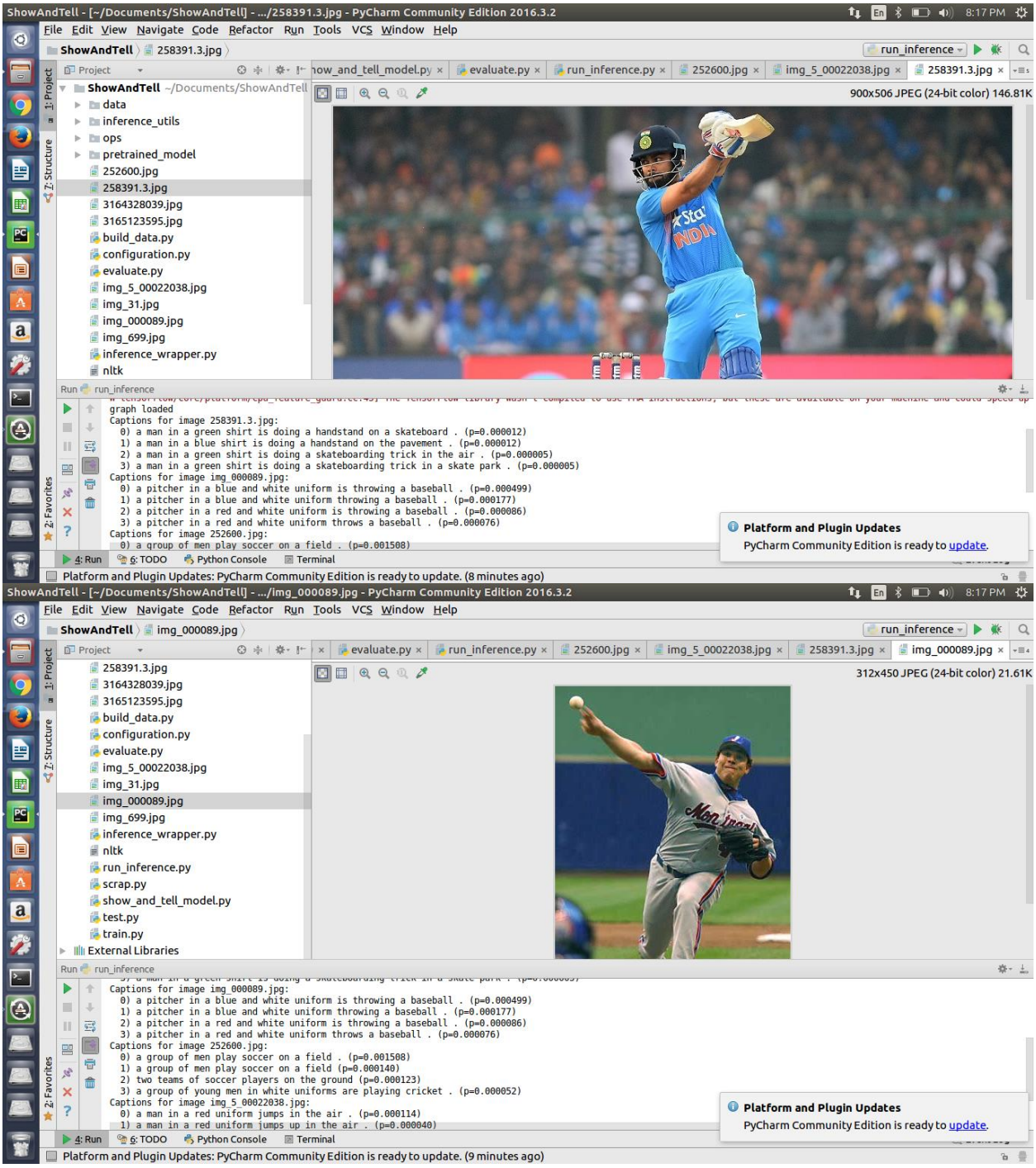
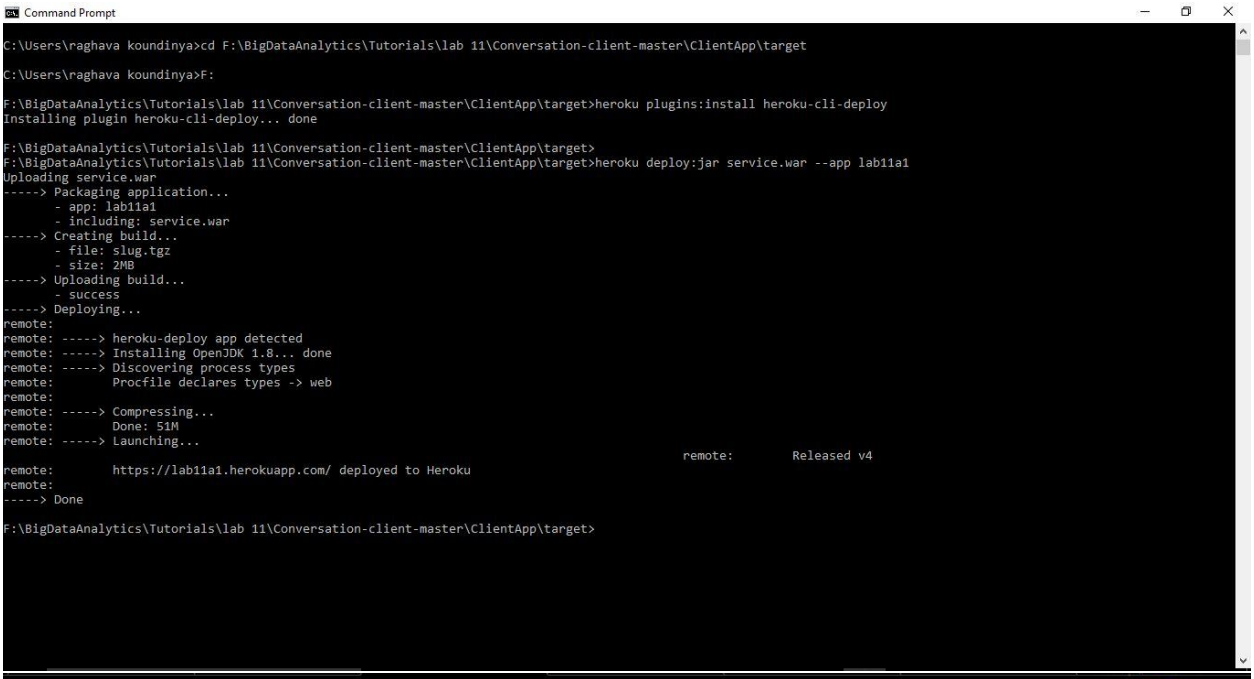


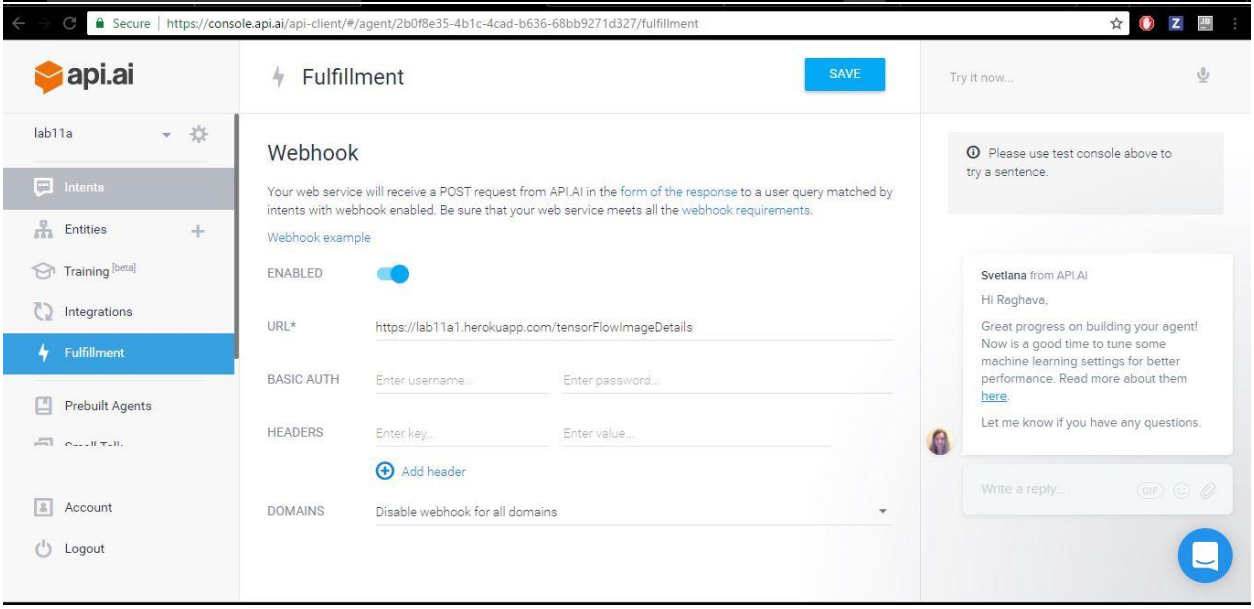
The accuracy turned out to be good enough, but not high enough because of the models are from only the first phase training. The above images generated fairly accurate captions.

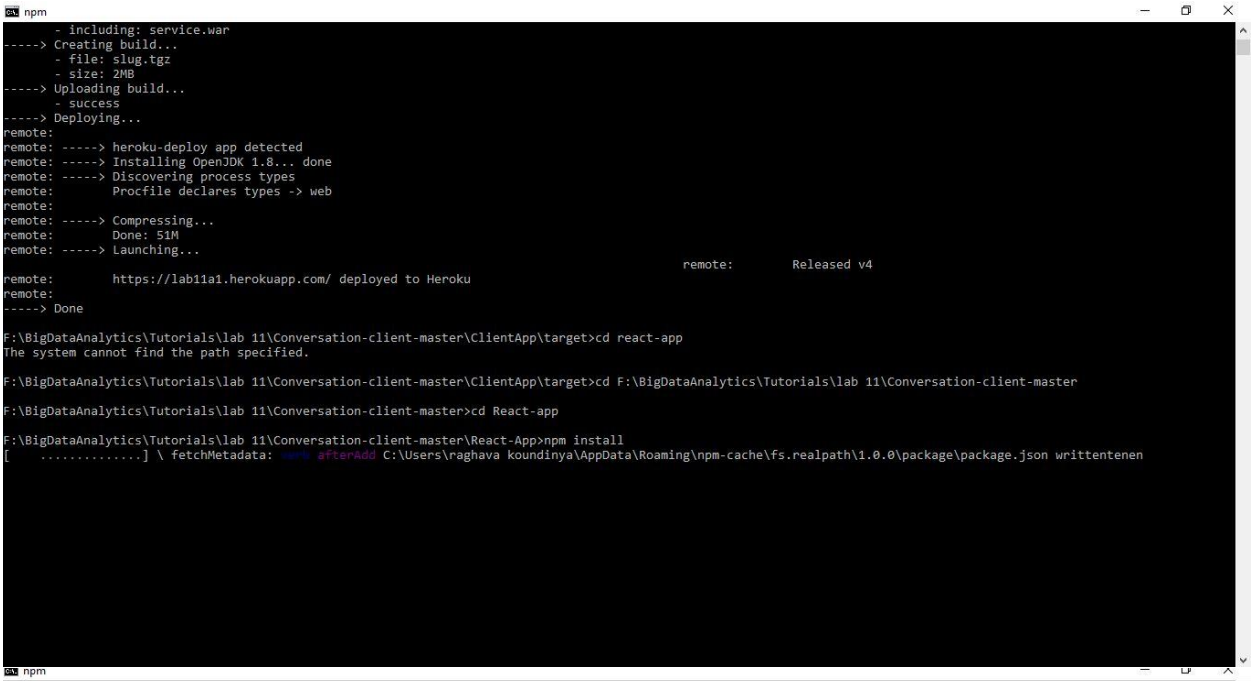
Heroku Web Conversation-Tensor Flow

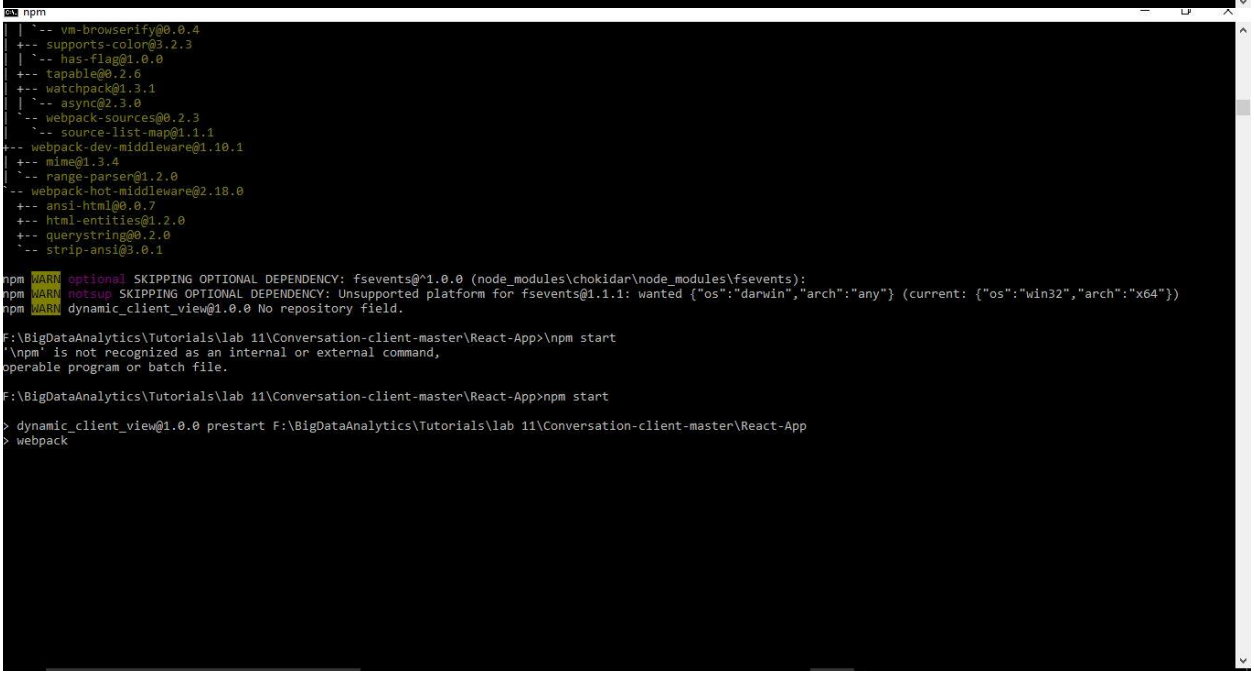
The second part of the program is Web Conversation using tensor flow, node js, api.ai and google conversation.

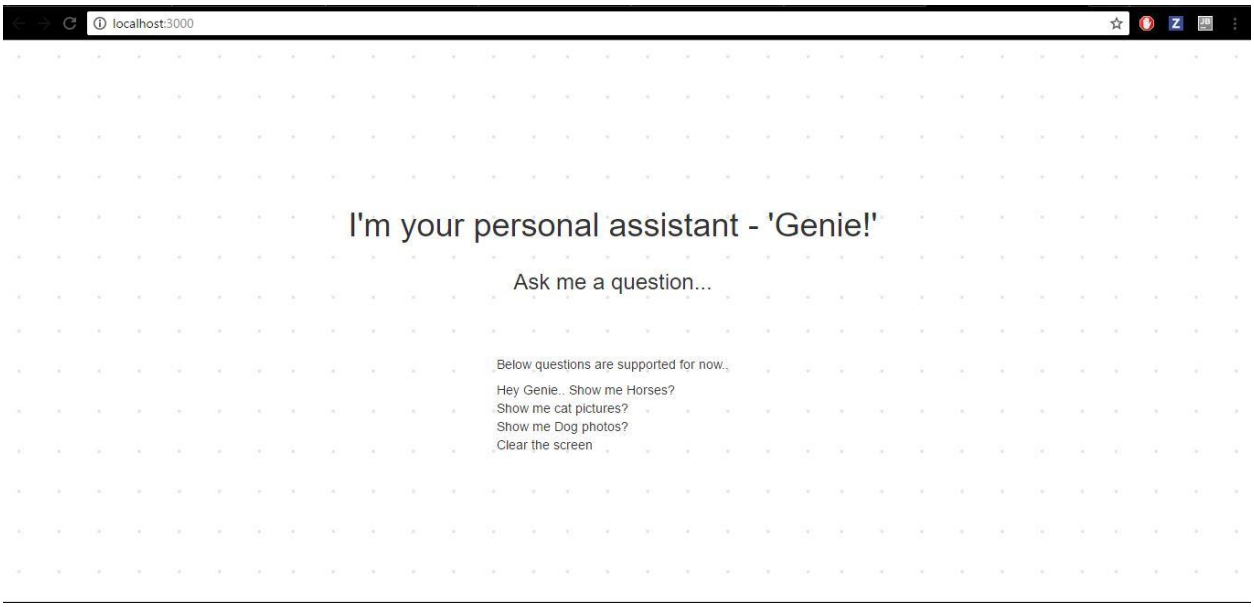
Here are the screenshots for the program:

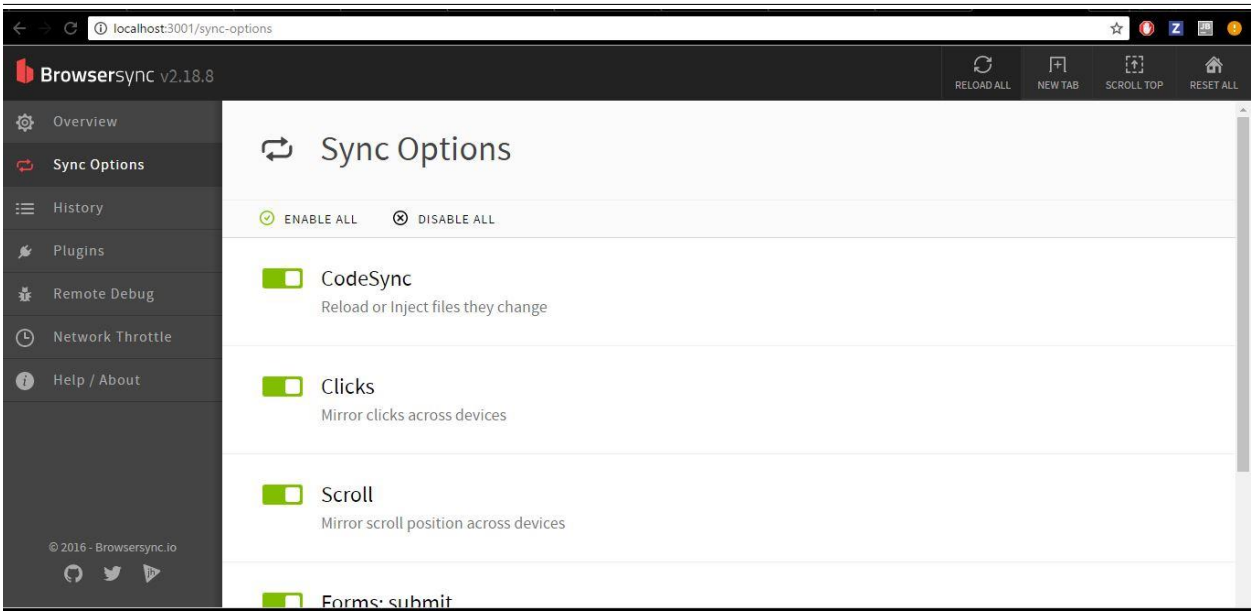


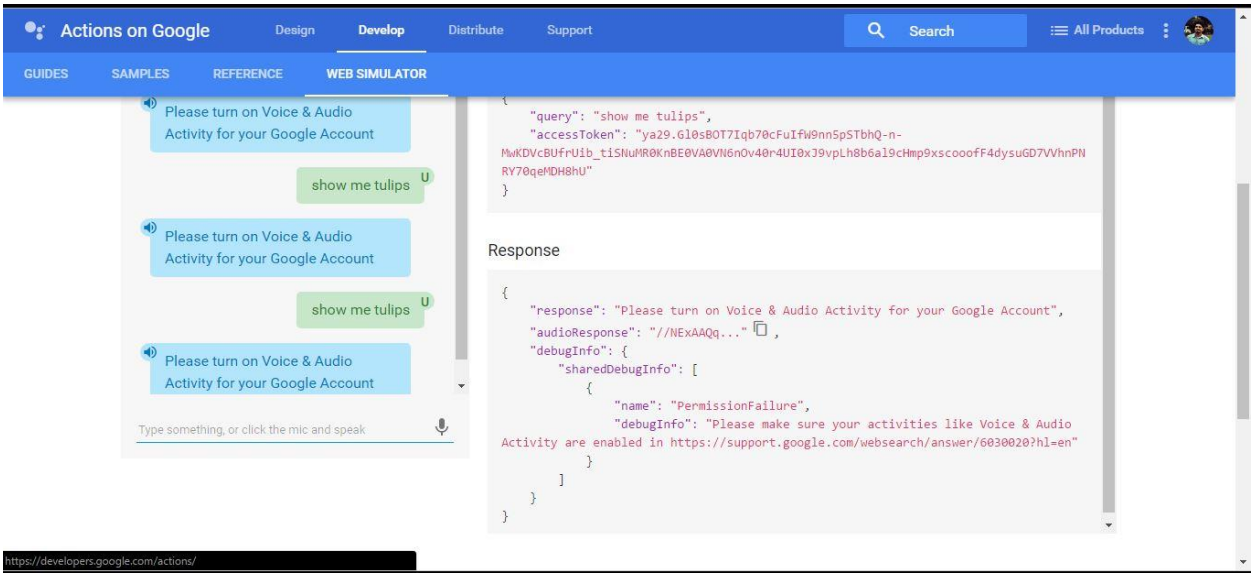



npm
- including: service.war
-----> Creating build...
- file: slug.tgz
- size: 2MB
-----> Uploading build...
- success
-----> Deploying...
remote:
remote: -----> heroku-deploy app detected
remote: -----> Installing OpenJDK 1.8... done
remote: -----> Discovering process types
remote: Procfile declares types -> web
remote:
remote: -----> Compressing...
remote: Done: 51M
remote: -----> Launching...
remote: Released v4
remote: https://lab11a1.herokuapp.com/ deployed to Heroku
remote:
-----> Done
F:\BigDataAnalytics\Tutorials\lab 11\Conversation-client-master\ClientApp\target>cd react-app
The system cannot find the path specified.
F:\BigDataAnalytics\Tutorials\lab 11\Conversation-client-master\ClientApp\target>cd F:\BigDataAnalytics\Tutorials\lab 11\Conversation-client-master
F:\BigDataAnalytics\Tutorials\lab 11\Conversation-client-master>cd React-app
F:\BigDataAnalytics\Tutorials\lab 11\Conversation-client-master\React-App>npm install
[.....] \ fetchMetadata: sill afterAdd C:\Users\raghava koundinya\AppData\Roaming\npm-cache\fs.realpath\1.0.0\package\package.json writtentenen


npm
| `-- vm-browserify@0.0.4
| +-- supports-color@3.2.3
| | `-- has-flag@1.0.0
| +-- tapable@0.2.6
| +-- watchpack@1.3.1
| | `-- async@2.3.0
| `-- webpack-sources@0.2.3
| `-- source-list-map@1.1.1
+-- webpack-dev-middleware@1.10.1
| +-- mime@1.3.4
| `-- range-parser@1.2.0
`-- webpack-hot-middleware@2.18.0
+-- ansi-html@0.0.7
+-- html-entities@1.2.0
+-- querystring@0.2.0
`-- strip-ansi@3.0.1
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@^1.0.0 (node_modules\chokidar\node_modules\fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@1.1.1: wanted {"os":"darwin","arch":"any"} (current: {"os":"win32","arch":"x64"})
npm WARN dynamic_client_view@1.0.0 No repository field.
F:\BigDataAnalytics\Tutorials\lab 11\Conversation-client-master\React-App>\npm start
'\npm' is not recognized as an internal or external command,
operable program or batch file.
F:\BigDataAnalytics\Tutorials\lab 11\Conversation-client-master\React-App>npm start
> dynamic_client_view@1.0.0 prestart F:\BigDataAnalytics\Tutorials\lab 11\Conversation-client-master\React-App
> webpack


localhost:3000
I'm your personal assistant - 'Genie!'
Ask me a question...
Below questions are supported for now..
Hey Genie.. Show me Horses?
Show me cat pictures?
Show me Dog photos?
Clear the screen


localhost:3001/sync-options
Browsersync v2.18.8
RELOAD ALL
NEW TAB
SCROLL TOP
RESET ALL
Overview
Sync Options
History
Plugins
Remote Debug
Network Throttle
Help / About
© 2016 - Browsersync.io
Sync Options
ENABLE ALL
DISABLE ALL
CodeSync
Reload or Inject files they change
Clicks
Mirror clicks across devices
Scroll
Mirror scroll position across devices
Forms: submit


Actions on Google
Design
Develop
Distribute
Support
Search
All Products
GUIDES
SAMPLES
REFERENCE
WEB SIMULATOR
Please turn on Voice & Audio Activity for your Google Account
show me tulips
Please turn on Voice & Audio Activity for your Google Account
show me tulips
Please turn on Voice & Audio Activity for your Google Account
Type something, or click the mic and speak
{
"query": "show me tulips",
"accessToken": "ya29.Gl0sBOT7Iqb70cFuIfW9nn5pSTbhQ-n-MwKDVcBUfrUib_tiSNuMR0KnBE0VA0VN6nOv40r4UI0xJ9vpLh8b6al9cHmp9xscooofF4dysuGD7VVhnPNRY70qeMDH8hU"
}
Response
{
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"audioResponse": "//NExAAQq..."
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"sharedDebugInfo": [
{
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"debugInfo": "Please make sure your activities like Voice & Audio Activity are enabled in https://support.google.com/websearch/answer/6030020?hl=en"
}
]
}
}
https://developers.google.com/actions/