

ACA Semester Project 2016-17 Report -Tushar Gurjar

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1 Introduction

This aca project is basically a Mini project and is composed of several tasks.

Algorithms, Machine Learning, Python, Web scraping, Latex, Bash scripting, Web Development were all part of this Aca project.

This project gave insight of various topics from many fields.

2 Algorithms

In mathematics and computer science, an algorithm is a self-contained sequence of actions to be performed. Algorithms can perform calculation, data processing and automated reasoning tasks.

We started off with understanding the basic concepts that were necessary for applying Algorithm like structure (stacks, binary tree, graphs, etc).

We went through the slides of Data Structure and Algorithm (CS210) available on- <https://onedrive.live.com/?cid=e4a857c294623d8b&id=E4A857C294623D8B%212977&authkey=%21AKSyXsSR8QpUmes>

The task involved was to make an Arithmetic Expression Evaluator with operations $+$, $-$, $*$, $/$, along with parenthesis. This task was completed using the stack data structure and an algorithm to evaluate the expression.

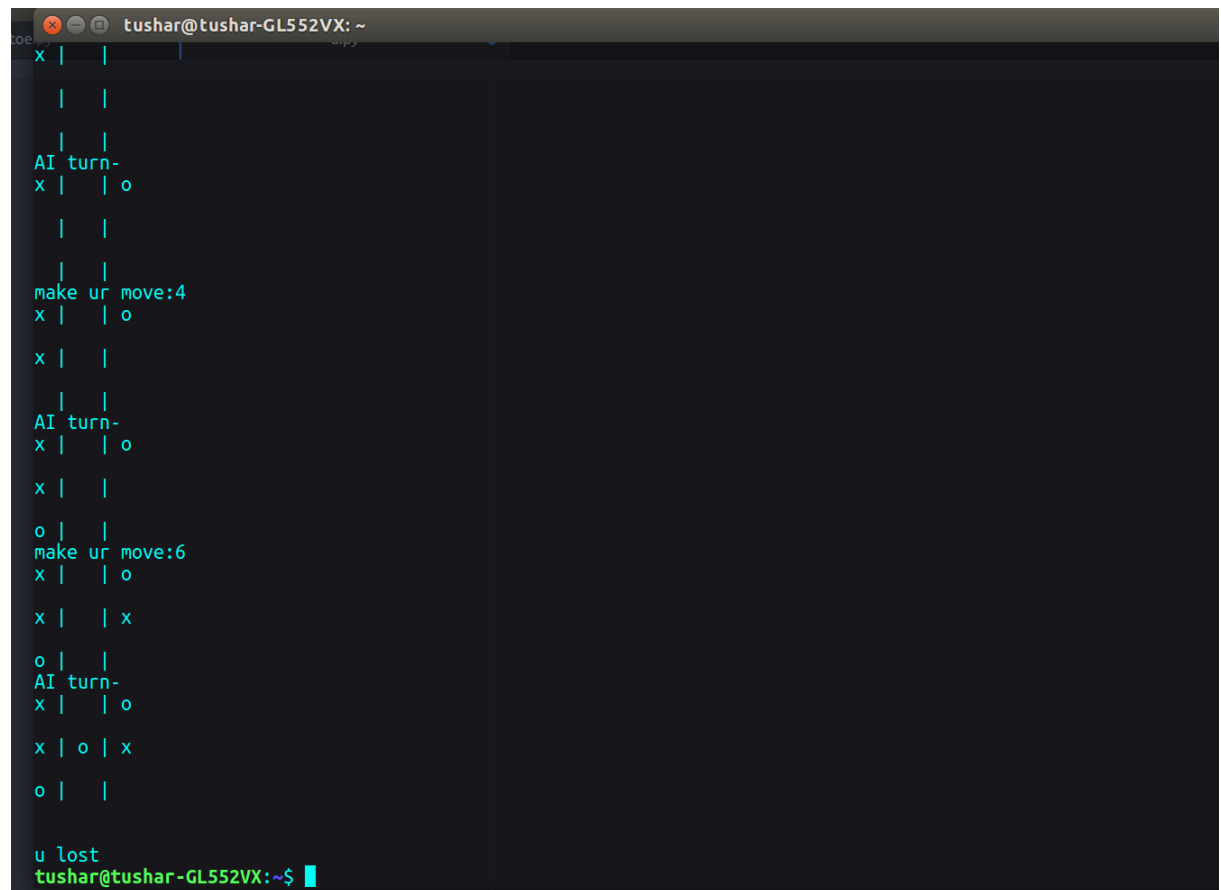
3 Learning Python

Python is a widely used high-level programming language for general-purpose programming. Python features a dynamic type system and automatic memory management and supports multiple programming paradigms, including object-oriented, imperative, functional programming, and procedural styles.

We started learning Python from online resources-

<https://www.tutorialspoint.com/python/>

We learnt expressions, operators, conditionals, control in python. The task that we did after learning python was to make a AI for TICTACTOE game. That was successfully done using an AI algorithm



```
tushar@tushar-GL552VX: ~  
x | |  
| |  
| |  
AI turn-  
x | | o  
| |  
| |  
make ur move:4  
x | | o  
| |  
x | |  
| |  
AI turn-  
x | | o  
x | |  
o | |  
make ur move:6  
x | | o  
x | | x  
o | |  
AI turn-  
x | | o  
x | o | x  
o | |  
u lost  
tushar@tushar-GL552VX:~$
```

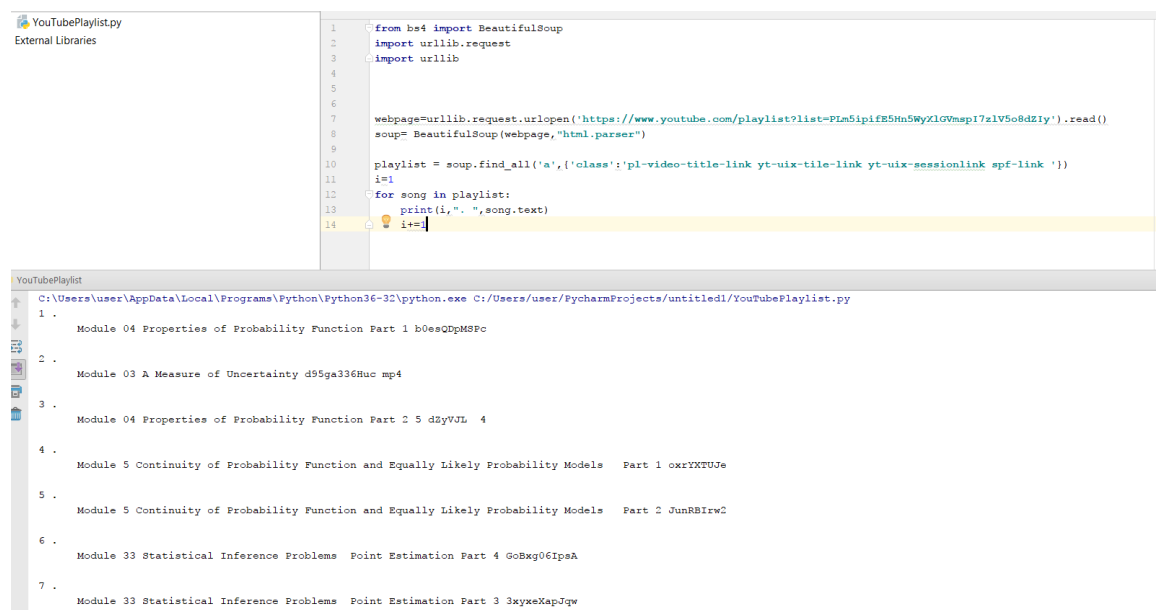
AI vs User game screenshot

4 Web Scraping

Web scraping (web harvesting or web data extraction) is data scraping used for extracting data from websites. Web scraping a web page involves fetching it and extracting from it. Web scraping is used for contact scraping, and as a component of applications used for web indexing, web mining and data mining, online price change monitoring and price comparison, product review scraping, etc.

The task assigned for web scraping was to scrap the data from you tube channel and create a playlist of the videos available under that channel. Web scraping in python can be done using different libraries like selenium, beautifulsoup. Our task was completed using BeautifulSoup library of python.

Learnt BeautifulSoup from online resources- <http://www.pythonforbeginners.com/beautifulsoup/beautifulsoup-4-python>



The screenshot displays a Python IDE with two main panels. The top panel shows a script named 'YouTubePlaylist.py' using BeautifulSoup to scrape a YouTube playlist. The script imports BeautifulSoup and urllib, fetches a webpage, and extracts video titles. The bottom panel shows the output of the script, which is a list of video titles extracted from a YouTube channel.

```
1 from bs4 import BeautifulSoup
2 import urllib.request
3 import urllib
4
5
6
7 webpage=urllib.request.urlopen('https://www.youtube.com/playlist?list=PLm5ipifE5Hn5WYxLGvmspi7z1V5o8d2Iy').read()
8 soup= BeautifulSoup(webpage,"html.parser")
9
10 playlist = soup.find_all('a',{'class':'pl-video-title-link yt-ui-tile-link yt-ui-sessionlink spf-link '})
11 i=1
12 for song in playlist:
13     print(i,". ",song.text)
14     i+=1
```

YouTubePlaylist

```
C:\Users\user\AppData\Local\Programs\Python\Python36-32\python.exe C:/Users/user/PycharmProjects/untitled1/YouTubePlaylist.py
1 .
Module 04 Properties of Probability Function Part 1 b0esQDpMSPc
2 .
Module 03 A Measure of Uncertainty d95ga336Huc mp4
3 .
Module 04 Properties of Probability Function Part 2 5 d2yVJL 4
4 .
Module 5 Continuity of Probability Function and Equally Likely Probability Models Part 1 oxrYXTUJe
5 .
Module 5 Continuity of Probability Function and Equally Likely Probability Models Part 2 JunR8Irw2
6 .
Module 33 Statistical Inference Problems Point Estimation Part 4 GoBwg06IpeA
7 .
Module 33 Statistical Inference Problems Point Estimation Part 3 3kyxeXapJqw
```

List of channel videos extracted using BeautifulSoup

5 Web Development

The task given for web developement was to learn HTML and CSS and create a webpage for an Earth Sciences Professor similar to Prof. Vinay P.Nambodiri webpage.

Learnt HTML and CSS from- <https://www.w3schools.com/html/default.asp>
<https://www.w3schools.com/css/default.asp>

The created website is availabe on [http://home.iitk.ac.in/ tushargr/](http://home.iitk.ac.in/tushargr/)

6 Bash Scripting

A Bash script is a plain text file which contains a series of commands. These commands are a mixture of commands we would normally type ourselves on the command line (such as `ls` or `cp` for example) and commands we could type on the command line. Learnt bash scripting from <http://ryanstutorials.net/bash-scripting-tutorial/> Along with bash scripting, Grep and Sed were also learnt to format and display the output after running bash script in a desirable format.

Code for all the tasks is available at- https://github.com/tushargr/ACA_tushar