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Automation of WhatsApp using Python Selenium

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ABSTRACT

Chatbots, or conversational interfaces as they are also known, present a new way for individuals to interact with computer systems. Traditionally, to get a question answered by a software program involved using a search engine, or filling out a form. A chatbot allows a user to simply ask questions in the same manner that they would address a human. The most well known chatbots currently are voice chatbots: Alexa and Siri. However, chatbots are currently being adopted at a high rate on computer chat platforms. The technology at the core of the rise of the chatbot is natural language processing ("NLP"). Recent advances in machine learning have greatly improved the accuracy and effectiveness of natural language processing, making chatbots a viable option for many organizations. This improvement in NLP is firing a great deal of additional research which should lead to continued improvement in the effectiveness of chatbots in the years to come. A simple chatbot can be created by loading an FAQ (frequently asked questions) into chatbot software. The functionality of the chatbot can be improved by integrating it into the organization's enterprise software, allowing more personal questions to be answered, like "What is my balance?", or "What is the status of my order?". Most commercial chatbots are dependent on platforms created by the technology giants for their natural language processing. These include Amazon Lex, Microsoft Cognitive Services, Google Cloud Natural Language API, Facebook DeepText, and IBM Watson. Platforms where chatbots are deployed include Facebook Messenger, Skype, and Slack, among many others.

Keywords: WhatsApp, Selenium, Chatbot

1. INTRODUCTION

Chatbots have been designed to simplify the interaction between computers and humans and have hit the market. A chatbot is a software that uses artificial intelligence (AI) that can converse (or chat) with a user in natural language via virtual chat rooms,

websites, mobile apps and messaging applications or through the telephone.

Chatbots can be programmed for small talk, or can also serve as a medium of interaction with users, providing them with answers based on regular questions. This Ecommerce chatbot system project would help automate the online selling and negotiation based on price of the product.

2. WHAT BOTS CAN DO AND HUMANS CAN'T

- Automation
- Great number of dialogue scenarios according to specialization.
- Bot can save and store your enquiries log and return to each client personally in seconds when necessary.
- All information in a single screen.
- Bot works 24/7 with no days off.
- Chatbot makes it easier for the user to find information.
- Bots are great to handle routine and minimize the number of mistakes.

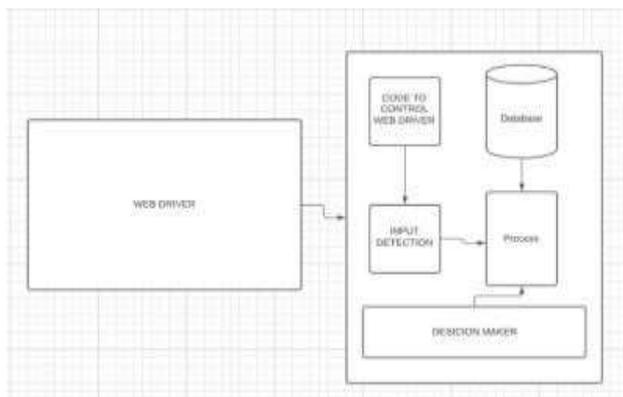
3. ADVANTAGES OF CHATBOT

- Chatbots help in providing faster customer service which is very important in developing a good customer relationship.
- Customer Satisfaction is taken care of completely by the chatbots.
- Chatbots help in reducing labour costs.
- Chatbots can be available for the customer 24/7.
- Chatbot eliminates or minimize the number of mistakes.
- Chatbots also make it easier for the users to find their data or information.
- It can be multipurpose

4. DISADVANTAGES OF CHATBOT

- Sometimes, chatbot can have a complex interface which can be difficult for the users to understand.

- Chatbots need to be maintained.
- Chatbots have limited functionalities.
- Bots don't understand natural language.
- Chatbots can be expensive.



5. CHAT TOOL

Text messaging is a very popular form of communication, and apps like Facebook Messenger, SnapChat, WeChat, or WhatsApp belong to the most installed apps worldwide. Text messaging is, in recent years, a hotbet for technical and user experience innovations: Small changes of rules and design lead to completely different usage patterns, usage scenarios and overall user experiences. As an example, Snapchat lets the messages disappear a short time after they are consumed/read. Just by doing so, messaging becomes a more ephemeral form of communication that does not leave traces or tangible artefacts behind and is providing a safer and trusted space to exchange more sensitive and private topics. WhatsApp lets users see the status of messages, i.e. whether they are transmitted successfully to the recipient or read, and it shows the online activity of others, which renders the interaction again more closely to face-to-face communication, compared to classical text messaging services such as SMS.

In recent years, major tech companies have also started to offer chatbot platforms that allow businesses to automate conversations with consumers and reach them where they spend a lot of their time (i.e. within popular messaging apps). On Facebook Messenger alone, more than 300,000 chatbots have been deployed by Mid 2018. Many industry observers claim that chatbots development will replace app development. At the current state of the technology, the text-based chat communication with computers is needed to be better understood, more actively designed and more frequently tested to make them more usable and valuable for users, let alone feel more natural. A common way to simulate conversations with chatbots in a cheap, versatile way without actually implementing them is to conduct so called Wizard of Oz studies (woz), in which a researcher pretends to be a computer during a conversation with a human test subject who is briefed to talk with a computer. Such studies are common in the field of CMC, Natural Language Processing (NLP) and Human-Computer-Interaction

A. Web Scraping and its applications:

Web Scraping is the practice of gathering information automatically from any website using an application that simulates human web-behavior. This is achieved by writing automated scripts that query the web server, request data, and transform the data in various structured formats like CSV, spreadsheets, and JSON. This technique is highly used to persist the data from various websites for which APIs are not available.

In practice, web scraping uses a wide variety of programming techniques and technologies, such as data analysis, information retrieval and security, Cyber Security, HTML parsing techniques. Web scraping has various applications across many domains. Some of them are

- For collecting data from a collection of sites that do not have a warranted API. With web scraping, even a small, finite amount of data can be viewed and accessed via a Python script and stored in a database for further processing.
- Analysis of product data from social media platforms like Twitter and e-commerce sites like Amazon i.e., big data and sentiment analysis.
- To use the raw extracted data like texts, images to refine machine learning models and to develop datasets. Equations
- Observing customer sentiment by scraping customer feedback and reviews of different businesses as visiting various websites can be cumbersome.

Scraping with Python and Selenium:

Web Scraping is all about dealing with huge amounts of data, Python is one of the most favorable options to handle it, as it has a relatively easy learning curve and has a vast set of libraries and frameworks like NumPy, CSV, Webdriver, etc. Using Python-based web scraping tools such as Selenium has its benefits. Selenium is an automation testing framework for websites that takes control of the browser and mimics actual human behavior using a web-driver package. With the majority of the websites being JavaScript-heavy, Selenium provides an easy way to extract data using Scrapy selectors to grab HTML code.

Web Scraping Tools and Techniques

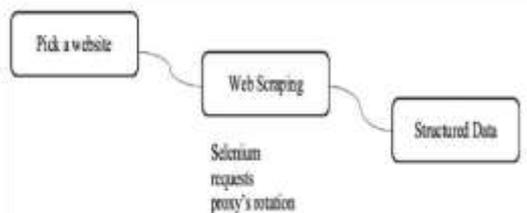
In this section various tools as well as techniques used for web scraping are presented. They have been found through searching the web or having heard about them due to their popularity.

- 1 Scrapy: Scrapy is an open-source Python framework initially outlined exclusively for web scraping and also supports web crawling and extricate data via APIs. Data extraction can be done using Xpath or CSS which is the built-in way as well as by using external libraries such as BeautifulSoup and xml. It allows for storing data within the cloud.
- 2 HtmlUnit: HtmlUnit is a typical headless Java browser used for testing web applications. It allows commonly used browser functionality such as following links, filling out forms, etc. Moreover, it is used for web scraping purposes. The objective is to mimic a "real" browser, and thus HtmlUnit incorporates support for JavaScript, AJAX and usage of cookies [13].
- 3 Text pattern matching: A basic yet effective approach to extract data from web pages can be based on the UNIX grep command or regular expression - coordinating facilities of programming languages (for example, Perl or Python).
- 4 HTTP programming: HTTP requests posted to the remote web server using socket programming are used to retrieve static and dynamic web pages
- 5 HTML parsing: Data of the same category are typically encoded into similar pages (generated from database) by a common script or template. In data mining, a wrapper is a program that extracts contents from such templates in a particular information source and translates it into a relational form. HTML pages can be parsed, and content can be retrieved using semi structured data query languages like Xquery and the HTQL.
- 6 DOM parsing: Browsers such as Mozilla browser or Internet

Explorer can parse web pages into a DOM tree using which parts of pages can be retrieved by programs. The resulting DOM tree is parsed using languages like XPath.

B. Proposed Methodology and Implementation

The proposed work focuses on analyzing a web page and extracting required visual blocks which can be lists or unstructured tables and store these datasets in various already available structured formats such as CSV, spreadsheets or SQL databases using respective Python libraries. Selenium web drivers are used to mimic human behavior and ease the extraction of large data sets and images, we have created one script to perform required scraping.



Main tools used

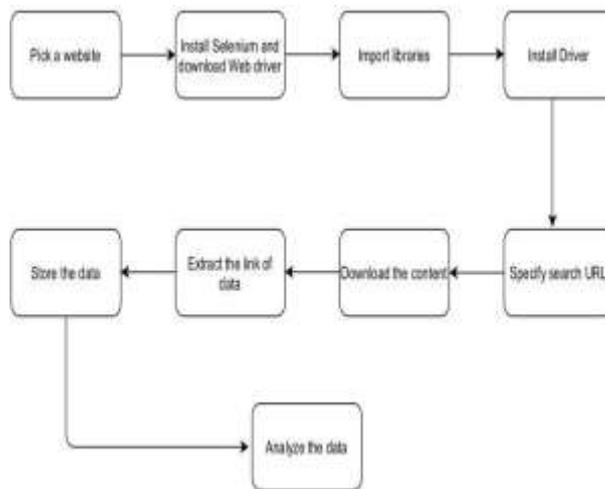
1. Python (3.5)
2. *Selenium library*: for handling text extraction from a web page's source code using element id, XPath expressions or CSS selectors.
3. *requests library*: for handling the interaction with the web page (Using HTTP requests).
4. *csv library*: for storing extracted data.
5. *Proxy header rotations*: generating random headers and getting free proxy IPs in order to avoid IP blocks.

6. DESCRIPTION OF WORK

The research work is developed in Python using HTML parsing running on Anaconda Platform. Script is supported by Selenium library [5]. The site used for scraping instances of unstructured data with and without pagination.

Simulation of experimented work:

- A. Installation of Python
- B. Importing selenium web drivers, requests and csv library
- C. Execution of script using Python
- D. Persisting the generated structured data in the database.



When the script is run, an instance of chrome web driver is initiated, and the required output CSV files are initialized. The scraper then parses the data from the aforementioned URL using element id or XPath and starts collecting the data, which then will be written in output files using writer headers. The script is designed to throw errors in case of time out or if the element id or XPath is missing.

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