Document: Web Scraping and Sentiment Analysis of iPhone 12 Reviews

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Overview

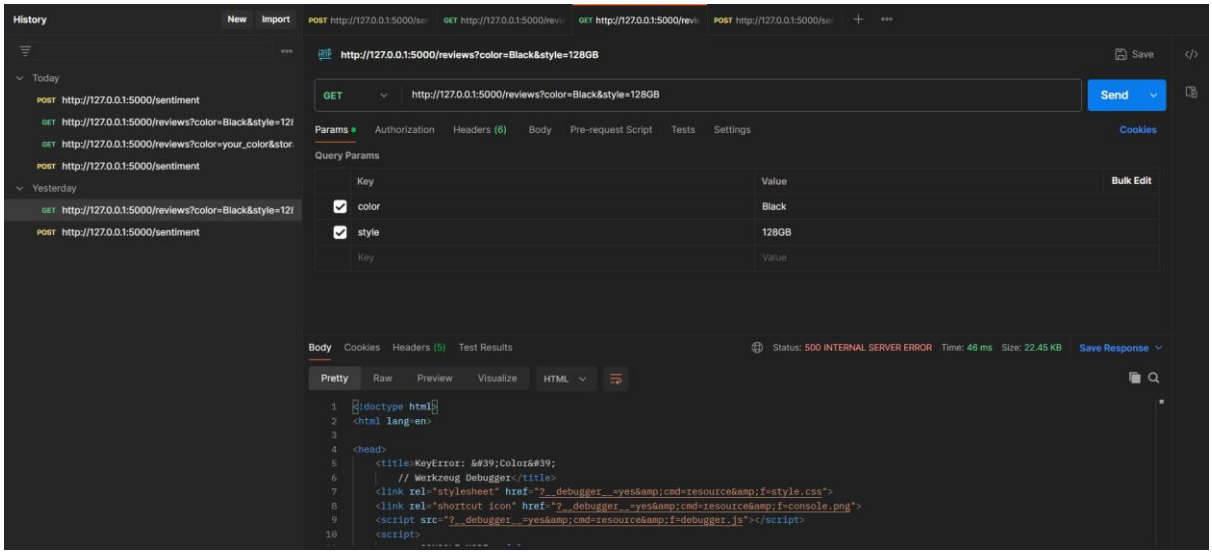
This document outlines the process of scraping reviews for the iPhone 12 from Amazon, storing the data in a SQLite database, and implementing sentiment analysis. The final product includes a Flask application with two endpoints for retrieving reviews and analysing sentiments.

Steps Taken

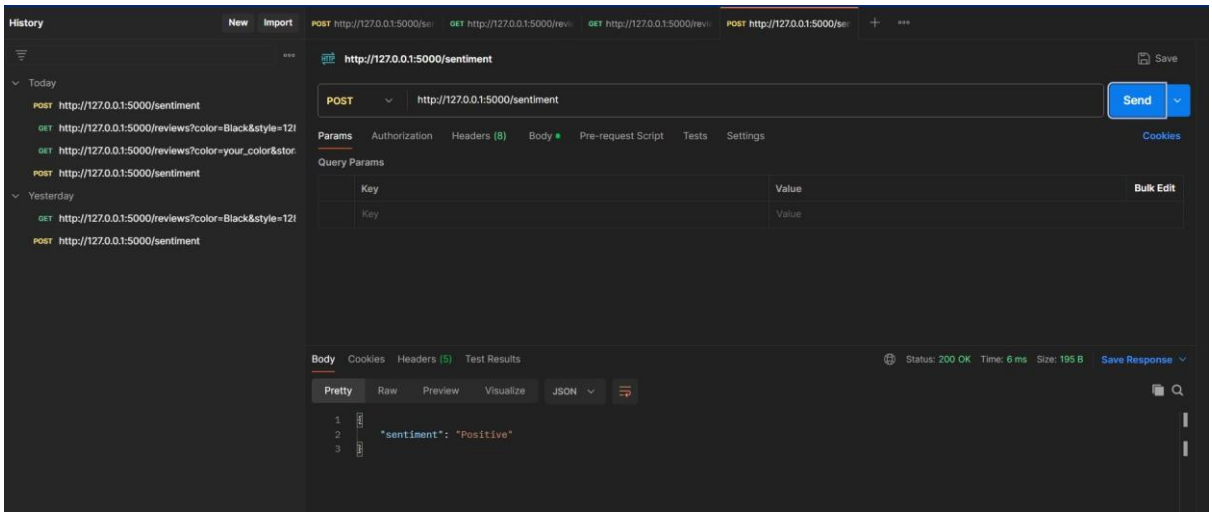
1. **Setting up the Environment**
    - **Flask Framework**: Flask was chosen for its simplicity and ease of use in creating web applications. It allows the creation of RESTful APIs to handle requests and responses effectively.
    - **Database:** SQLite was selected as the database to store the scraped reviews due to its lightweight nature and ease of integration with Python applications.
2. **Web Scraping**
    - **Web Scraping Tools**: The BeautifulSoup library was utilized to parse the HTML content from the Amazon product page. This library is effective for extracting data from web pages.
    - **Data Extraction**: Specific elements of the reviews were targeted, including the review title, review text, style, color, and verification status. This structured approach ensured comprehensive data collection.
3. **Data Storage**
    - **CSV Format:** The scraped data was initially saved in a CSV file for easy readability and manipulation.
    - **Database Integration**: The data was then imported into a SQLite database. This allowed for efficient querying and filtering of reviews based on user-defined parameters.
4. **Implementing the Flask API**
   Endpoints Creation: Two endpoints were created
    - **GET `/reviews`**: This endpoint retrieves reviews from the database, allowing users to filter the results based on color and style.
    - **POST `/sentiment`**: This endpoint accepts a review text and returns a sentiment analysis result. Although the sentiment analysis logic is assumed to be implemented, it provides a framework for further enhancement.
5. Testing the Application
    - **API Testing:** Postman was used to test the API endpoints. The GET request for `/reviews` successfully retrieved reviews based on query parameters, and the POST request for `/sentiment` provided a sentiment classification for given review text.

Output Verification: Screenshots:

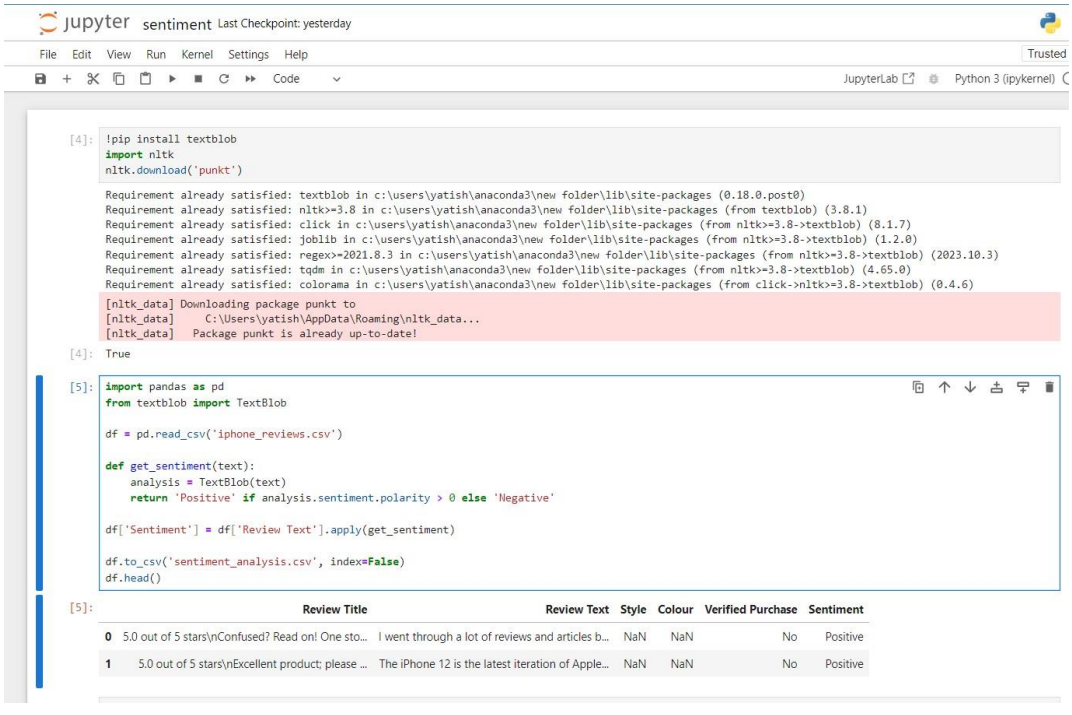
GET: http://127.0.0.1:5000/reviews?color=Black&style=128GB



POST: http://127.0.0.1:5000/sentiment



Sentiment Analysis



OUTPUT

[{"Review Title":"5.0 out of 5 stars\nConfused? Read on! One stop review for your flagship purchase.","Review Text":"I went through a lot of reviews and articles before I decided on the iPhone 12. I\u2019ve been an Android user all my life and frankly thought Apple phones were really overpriced(at least here in India). But in the present day, the flagship Android options are no less expensive. If you spend a lot of time on your mobile, using it as your primary camera, social media device, business emails\/collaboration and also to stream videos then you definitely need to spend a little more and go with a flagship option for the best experience.Coming to the flagships today (Aug2021), apart from the iPhone we have Samsung Galaxy S21\/+\/ultra, Oneplus 9 pro, Vivo x60 pro+, mi 11ultra. If you read a few reviews you\u2019ll understand that 888Snapdragon has a lot of heating issues and 9pro cameras didn\u2019t live up to the hype(also overheating when the camera is in use). Samsung in India ships the phone with exynos2100 which is way less powerful than 888. The prices of all these phones are in the same range (except the ultra). Imp note: iOS updates are across iPhone devices unlike the android updates.Apple has really done a lot of things right on the iPhone12:1. They changed its display from lcd to led (huge value jump)2. A14 Bionic chip is a really fast and smooth without any lag3. Huge improvement on the primary cameras. Still the best video recording phone in the market and the photos are top quality4. The change is the body design is really comfortable in the hand5. The haptics are spot onWhat\u2019s Missing: (Minor misses though)1. The Notch. Really wish they get rid of the notch but looks like it wont be out until 2023. Anyway you\u2019ll get used to it.2. USB type C charging. The iPad Pro 2020 model onwards already comes with the TypeC usb charging. I guess the iPhone 13 would get this change3. Fingerprint Sensor: Yes. Apple had done away with it couple of years back but with the pandemic still on, you sometimes wish there was a fingerprint sensorWait for the iPhone 13 or go with the 12:It took a while for 12\u2019s prices to fall. If you\u2019re willing to wait till Feb-March 2022 for a good deal then wait for the 13. If you want to change it now, go with the 12.64GB or 128GB:The difference is around \u20b96000. 64GB if you don\u2019t play too many games and keep dumping the media files every once in while to your pc\/storage . Else, the 128\ud83d\ude0aBattery:I was indeed very surprised with the battery life. Charging time is a little slower compared to it\u2019s competition but the back up is impressive. It easily lasts a day.Android Flagship Option:The truth is, right now is not a good time to purchase an android flagship. If you really want to buy an android flagship, do wait for a while. 895 snapdragon phones are expected to be out by end of the year or early 2022.Hope this review helped :)Update:13 gets a better cam sensor, a15 bionic, 10% bigger battery and a slightly smaller notch. That\u2019s it. No more differences. Everything else remains the same.iPhone 13 launched at 80k which is lesser than 12\u2019s launch price(86k). If you want to save on some cash , 12 will still do the job (12 is currently around 55k-62k). However if you can spend that extra 20k, then 13 should be your pick.Planning on taking an Android? Definitely wait until early 2022.\nRead more","Style":"N\/A","Colour":"N\/A","Verified Purchase":"No"},{"Review Title":"5.0 out of 5 stars\nExcellent product; please purchase if your data is crucial.","Review Text":"The iPhone 12 is the latest iteration of Apple's iconic smartphone series, and it continues to impress with its sleek design, powerful performance, and impressive camera capabilities. As a proud owner of the iPhone 12, I'd like to share my experiences and thoughts in this review.Design and Build Quality (5\/5):Apple's design philosophy shines through in the iPhone 12. The flat-edged, aerospace-grade aluminum frame feels premium and comfortable to hold. The Ceramic Shield front cover offers extra durability, making me feel more confident in everyday use. The device is available in a variety of stunning colors, and the Super Retina XDR OLED display is simply brilliant, providing vibrant colors and deep blacks.Performance (5\/5):Equipped with Apple's A14 Bionic chip, the iPhone 12 delivers top-notch performance. It handles multitasking, gaming, and demanding apps with ease. The device feels incredibly responsive, and I've never experienced any lag or slowdown, even with resource-intensive tasks.Camera (4.5\/5):The iPhone 12 features a dual-camera system with a 12 MP wide and ultra-wide lens. The Night mode and Deep Fusion technology excel in low-light conditions, and the Smart HDR 3 makes every shot look stunning. However, compared to its more expensive sibling, the iPhone 12 Pro, it lacks a telephoto lens. Nonetheless, for the average user, the camera quality is more than satisfactory.iOS 15 (5\/5):The iPhone 12 runs on iOS 15, which is Apple's latest and most feature-rich operating system. It's intuitive, secure, and keeps your device up-to-date. The App Library and widgets have been great additions, enhancing the user experience. Privacy features like App Tracking Transparency are commendable.Battery Life (4\/5):While the iPhone 12's battery life is decent, it may not be the best among its competitors. It comfortably gets me through a full day of moderate use, but power users might need a top-up in the evening. However, the MagSafe wireless charging and support for fast charging (adapter sold separately) make it convenient to juice up quickly.5G Connectivity (4.5\/5):With 5G support, the iPhone 12 is future-proofed for faster data speeds and improved connectivity. While 5G coverage may vary by region, it's an added bonus for those planning to keep their device for a few years.Conclusion:The iPhone 12 strikes an excellent balance between style and substance. It's a device that caters to the needs of a broad user base, offering impressive performance, a stunning display, and a camera that captures beautiful moments. iOS 15 brings a plethora of features to the table, and the device's design is nothing short of elegant. While battery life and the absence of a telephoto lens might deter some, for most users, the iPhone 12 is a fantastic choice, providing a premium Apple experience without the premium price tag.\nRead more","Style":"N\/A","Colour":"N\/A","Verified Purchase":"No"}]

Conclusion

This project effectively demonstrates the process of web scraping, data storage, and sentiment analysis using Python technologies. The Flask application provides a user-friendly interface for accessing and analyzing iPhone 12 reviews, paving the way for further enhancements, such as improving the sentiment analysis model and expanding the data set with additional reviews.