## Project Title : Automation of Competitor Analysis of Products in E-Commerce Business

Analysis of products info across all competitor websites and automating the process to drive data driven decisions.

Data Analysis | Competitive Intelligence | Business Automation

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| Created By | Profile | Company |
| Ashutosh Kumar |  |  |

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| --- | --- | --- |
| Average Duration | Difficulty Level | Tools/ Skills |
| 20+ hours | Difficult | Python, Web Scraping, Data Extraction, Data Analysis, Email Automation, Data Handling, Problem Solving, Data-Driven Decision Making |

## **Landing Page Content:**

## Introduction

### "XYZ" Shoes India Pvt. Ltd is a company that specializes in retailing a diverse range of shoes, including both premium brands and locally styled options. Recently, the company has observed a decline in foot traffic at both its physical stores and online platforms. A preliminary analysis revealed that this decrease is due to customers finding better offers and lower prices for the same shoes on competitor websites.

### Problem Statement

### A decline in footfall, both online and offline, is a critical issue as it directly impacts sales and customer retention. Customers are increasingly purchasing products from online competitors due to better offers and lower prices. To address this problem, "XYZ" Shoes India Pvt. Ltd needs comprehensive data on products across various e-commerce platforms, including pricing, promotional offers, ratings, and other relevant information.

### Approach to the Problem

* Identify the specific data points necessary for effective competitor analysis, such as product price and availability across various e-commerce platforms.
* Create a Python script using web scraping tools to automate the extraction of data from competitor websites.
* Implement data processing techniques using libraries like Pandas to clean and structure the extracted data.
* Develop mechanisms to automatically generate reports and alert stakeholders through Email.

### Expected Deliverables

As a data automation specialist, you are expected to develop an automated Python script to fetch and analyze competitor product data, facilitating informed decision-making and strategic adjustments for "XYZ" Shoes India Pvt. Ltd.

## **Business Context Page**

### Understand the Business

Let's delve into why understanding competitor strategies and market trends is crucial for maintaining and enhancing the market position of "XYZ" Shoes India Pvt. Ltd.

**What is Competitor Analysis?**

Competitor analysis is the process of identifying, gathering, and evaluating information about competitors in order to understand their strengths, weaknesses, strategies, and market positioning relative to your own business. This strategic practice helps businesses gain insights into the competitive landscape and make informed decisions to improve their own market position.

**Why Competitor Analysis is Important?**

In today's competitive environment, the ability to analyze competitor strategies and market trends is critical for maintaining and enhancing our competitive edge. By closely examining how competitors price their products, the types of promotional offers they deploy, customer sentiment reflected in ratings and reviews, and other pertinent factors, we can gain actionable insights to inform strategic decision-making.

**What are the key aspects of Competitor Analysis and how to do it?**

**Identifying Competitors:**

* Identify direct competitors who offer similar products or services to your target market.
* Recognize indirect competitors who may serve the same customer needs through different means or substitute products.

**Gathering Information:**

* Collect data on competitor pricing strategies to understand their market positioning.
* Gather details on competitor product offerings, including features, variants, and any unique selling points (USPs) they emphasize.

**Analyzing Competitor Strategies:**

* Evaluate how competitors differentiate themselves through marketing tactics and brand positioning.
* Assess competitor strengths such as customer loyalty programs or service excellence that set them apart in the market.

**Benchmarking:**

* Compare your market share against competitors to gauge relative industry standing.
* Analyze customer reviews and feedback to understand perceptions of competitor product quality and customer service.

**Strategic Decision Making:**

* Utilize insights from competitor analysis to adjust pricing strategies and promotional offers.
* Incorporate competitor insights into product development decisions to address market gaps and customer preferences.

**What are the 4P’s of Competitor Analysis?**

The marketing mix, also known as the 4 P’s—product, price, promotion, and place—covers the must-have elements when bringing a product to market. As part of your analysis, ask yourself the following questions for each competitor you’ve selected.

**Product**

* What are they selling?
* What features are included in their product or service?
* What are some weak points of the product or service?

**Price**

* What kind of pricing model do they use? Is it a one-time purchase or a subscription?
* How much do they charge for their product or service? Do they offer sales or discounts?
* How does their pricing reflect the quality, or perceived quality, of their product or service?

**Promotion**

* What advertising channels (social media, email marketing, print advertisements, etc.) do they use?
* What elements of their product or service do they emphasize? What’s their unique selling proposition?
* What’s their company story? How do they talk about their brand?

**Place**

* Where do they sell their product? Do they sell online or in brick-and-mortar locations?
* Do they sell to customers directly, or do they partner with retailers or third-party marketplaces?

## **What are the types of Competitor Analysis?**

Various types help businesses understand competitors' strategies, strengths, weaknesses, and market positioning to inform strategic decisions effectively. Here are the various types of competitor analysis:

* **Direct Competitor Analysis**: Focuses on competitors offering similar products/services to the same target market.
* **Indirect Competitor Analysis**: Examines competitors offering substitute products/services that fulfill similar customer needs.
* **Primary Competitor Analysis**: Analyzes key competitors with significant market impact and detailed scrutiny.
* **Secondary Competitor Analysis**: Provides a broader overview of the competitive landscape, including emerging players and industry trends.
* **SWOT Analysis**: Assesses internal strengths and weaknesses and external opportunities and threats, including those posed by competitors.

We highly recommend reading the domain notes for further clarity about the basic concepts for this project→

>>[How](https://www.youtube.com/watch?v=xaIeoPtHnuY) to perform a Competitor [Analysis](https://www.youtube.com/watch?v=xaIeoPtHnuY) in 7 easy steps?

>>Domain Knowledge Guide

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## **Data Description Page**

For the competition analysis you will be working with the given dataset. Kindly download the dataset along with the domain guide from the previous section for better understanding:

**Dataset Link →**

**Table Name:** **Links**

This table contains URLs of various e-commerce websites that offer the product 'Nike Air Max.' These links facilitate data scraping for subsequent competitor analysis.

|  |  |  |
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| **Fields** | **Data Types** | **Description** |
| Website Name | string | Name of the website. |
| Link | string | Link or URL of the website. |



## 

## **Project Guide**

Hey there! Get ready to take on the challenge. You've already familiarized yourself with the dataset, tables, and fields. Now, let's look at the following inputs that will help you to automate the competitor analysis process by scraping data from various e-commerce websites, transforming the data for comparison, and notifying stakeholders if there is a significant price drop.

#### **Task 1: Data Scraping from Various E-commerce Websites**

#### The primary task is to prepare a DataFrame of target websites, scrape relevant data, and store it in a structured format.

1. **Identify Target Websites:** Compile a list of e-commerce websites that sell the product “Nike Air Max” and store them in a DataFrame.
2. **Set Up Web Scraping Environment**: Install necessary libraries like “Selenium” and set up a virtual environment for the project.
3. **Develop Web Scraping Scripts**: Write Python scripts to extract relevant data (e.g., product name, price, etc) from the identified websites and ensure the scripts handle various website structures and dynamic content.
4. **Store Scraped Data:** Save the scraped data into a structured format, such as a CSV file or a DataFrame.

#### **Task 2: Data Transformation**

#### The objective of this task is to Clean and standardize the scraped data, compare it with previous reports, and calculate price changes.

1. **Load Data for Transformation:** Load the scraped data from the storage format into a Pandas DataFrame.
2. **Data Cleaning and Formatting:** Standardize the format of the product prices, including converting different currencies to a common currency (e.g., INR) using python libraries like “Currency Converter”.
3. **Compare New Data with Previous Reports:** Load previous reports and compare the prices for any price drops. If there is drop of more than 5% then update the price in previous reports to the lowest price.

#### **Task 3: Automated Email Notification**

#### In this final task, you will have to identify significant price drops, set up email automation, and schedule regular execution of the process.

1. **Identify Significant Price Drops:** Filter the DataFrame to identify products with a price drop greater than 5%.
2. **Set Up Email Automation:** Install and configure the necessary libraries for sending emails (e.g., smtplib, email).
3. **Compose and Send Email:** Write a Python script to compose an email with details of the significant price drops. If there are no such products then there is no need to send the email.

#### **Summary**

## This project automates competitor analysis for "XYZ" Shoes India Pvt. Ltd. by scraping and comparing e-commerce data, and sending email alerts for significant price drops, ensuring timely, data-driven decisions.

## **Submission & Feedback**

We hope you had an amazing learning experience through this real-time data automation project on SkillCred. For the final submission you have to:

* Consolidate and store your Python notebooks, SQL scripts, and the PowerBI/Tableau dashboard link.
* Leadership presentations should be saved in a drive or GitHub repository. This will allow the SkillCred mentors and evaluators to assess your submissions without any hassles.

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## **Validation Questions**

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| **SN** | **Questions** | **Yes/ No** |
| 1 | Which Python library is commonly used for web scraping in this project?   1. TensorFlow 2. **Selenium** 3. PyTorch 4. NumPy |  |
| 2 | What is a primary challenge when standardizing currency formats from scraped data?   1. Handling dynamic content 2. Dealing with JavaScript rendering 3. **Converting multiple currencies to a common format** 4. Parsing HTML structures |  |
| 3 | Which Python module is suitable for sending automated emails in this project?   1. matplotlib 2. **smtplib** 3. sklearn 4. pandas |  |
| 4 | How would you optimize the performance of web scraping in a scalable competitor analysis system?   1. Increase the frequency of data scraping intervals 2. **Use parallel processing for simultaneous data extraction** 3. Decrease the number of competitor websites monitored 4. Utilize blockchain technology for data storage |  |
| 5 | Which port number is commonly associated with SMTP?   1. **587** 2. 543 3. 365 4. 487 |  |
| 6 | Which statement best describes the purpose and use of headless mode in Selenium?   1. **Headless mode allows Selenium to run tests without launching a visible browser window.** 2. Headless mode automatically resolves CSS selector specificity issues in Selenium scripts. 3. Headless mode is used to simulate network latency and test performance of web applications. 4. Headless mode enables Selenium to automatically handle dynamic elements on webpages. |  |
| 7 | Which syntax correctly demonstrates the use of a currency converter library in Python to convert a price variable `price\_usd` from USD to INR? (Here, c = CurrencyConverter()).   1. converted\_price = c.convert\_currency(price\_usd, 'USD', ‘INR’) 2. converted\_price = c.convert\_currency(price\_usd, ‘INR’, ‘USD’) 3. **converted\_price = c.convert(price\_usd, 'USD', ‘INR’)** 4. converted\_price = c.convert(price\_usd, ‘INR’, ‘USD’) |  |
| 8 | Which function is used to convert a “DataFrame” to “Table” to send through email?   1. Df.to\_table(index=False) 2. Df.to\_csv(index-False) 3. **Df.to\_html(index=False)** 4. Df.to\_excel(index=False) |  |
| 9 | What would be the behavior of Selenium's “find\_element(By.CLASS\_NAME, "example-class")” method if multiple elements on the webpage have the same class name "example-class"?   1. **It will return the first matching element found on the webpage.** 2. It will return a list of all matching elements with the class name. 3. It will throw a NoSuchElementException. 4. It will prioritize elements based on their CSS specificity. |  |
| 10 | Which of the following syntax is correct for launching a Firefox browser and navigate to <https://example.com>?   1. driver = webdriver.Firefox()   driver.open(<https://example.com>)   1. driver = webdriver.Firefox()   driver.launch(<https://example.com>)   1. driver = webdriver.Firefox()   driver.navigate(<https://example.com>)   1. **driver = webdriver.Firefox()**   **driver.get(**[**https://example.com**](https://example.com)**)** |  |
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