

Report for Lifestore

Proyecto 1 - Curso EMTECH

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INTRODUCTION

In this final project we were asked to write a program that generates a report for the managers of our hypothetical store “LifeStore”. We were given the information in the form of python lists. The elements of this lists contained the following:

- `lifestore_products [id_product, name, price, category, stock]`
- `lifestore_sales [id_sale, id_product, score (from 1 to 5), date, refund (1 for true or 0 to false)]`
- `lifestore_searches [id_search, id product]`

The management asked us to do the following:

1. Top selling products and lagging products based on the analysis of the categories with the lowest sales and categories with the lowest searches.
2. Products by review in the service from category analysis with higher sales and categories with higher searches.
3. Suggest a product strategy to be withdrawn from the market as well as suggestion of how to reduce inventory backlog by considering the monthly sales and income data.

To accomplish it we developed a program that generates three different analysis:

1. Best-selling products and lagging products:
 - a. Generate a list of the 50 products with the highest sales and one with the 100 most searched products.
 - b. By category, generate a list with the 50 products with less sales and one with the 100 products with the fewest searches.
2. Products per review in the service
 - a. Show two listings of 20 products each, one listing for products with the best reviews and another for the worst, considering products with return.
3. Total income and average monthly sales, annual total and months with more sales per year

The program is written as a python script that is runned directly on the terminal, as a challenge and as an exercise for the EMTECH scholarship it was written avoiding to use any external libraries and built-in functions.

CODE

The code was splitted into different files and functions to reuse code and to maintain order.

- `lifestore_file.py`
- `quick_sort.py`
- `operations.py`
- `main.py`

Almost all the code contains comments and docstrings, variables were named in a way that are easy to understand (there may be some exceptions).

`lifestore_file.py`

This file contains all the data provided by the management, as mentioned in the introduction. There are three lists, each of them contain lists with different information.

- `lifestore_products [id_product, name, price, category, stock]`
- `lifestore_sales [id_sale, id_product, score (from 1 to 5), date, refund (1 for true or 0 to false)]`
- `lifestore_searches [id_search, id product]`

`quick_sort.py`

To avoid the usage of the built-in method `sort()` associated to lists, we implemented a version of quick sort¹. This function takes a list as input and acts in place ordering the list in ascending order.

`operations.py`

This file contains all the business logic. Here we calculate all of the operations needed to show the results to the management.

`main.py`

Finally, this file contains the logic that interacts with the user, the login authentication, the selection of the analysis and the exit of the program.

¹ This implementation is a combination of the ones found in:

<https://stackabuse.com/quicksort-in-python/>
<https://www.geeksforgeeks.org/quick-sort/>

SOLUTION

To solve the problem management presented us, we used the results given by our program. The results can be found in the appendix.

Results

Analyzing the report, we can state the following:

- Even though motherboards and graphic cards are the third and fourth best selling categories respectively, only two products from their categories appear in top 10 sales and only one in top 10 searched products.
- There are 54 products with zero sales, and 22 with less than two sales.
- Screens and speakers categories only have 2 sales each, even though they have 12 and 13 products each.
- Disk drives had the most searches, 463 times, but they had the second place in sales.
- April had a significantly higher amount of sales.
- June, July and August had significantly lower sales.

Strategy

It is clear that the store has too many products that are not being sold or searched. The first measure is to stop selling the products with zero sales and zero searches, or offer them on demand instead of having them in stock.

It is a fact that the amount of sales in top 3 categories is not uniformly distributed among their products. The store needs to focus on the products that are being sold and reduce the amount of products in those categories.

It is suggested to verify the prices of speakers and screens with competitors, they are being searched but the customers are not buying them.

It is not clear what happened to sales from June onwards, it is recommended to check if the competitor's prices dropped.

As a final measure, it is needed to do a customer analysis, to know the kind of customers the store has. If it shows that the customers are IT technicians and specialized people, it would make sense to focus on computer parts rather than consumer electronics.

CONCLUSION

We were successful in writing a program that helps the management to make better and informed decisions. We also were able to find trends, hence we proposed a strategy to solve the inventory size and stock. Further analysis into the monthly sales and customer preferences may be needed.

APPENDIX

The final report generated by the program:

The top 10 selling products are:

- 1.- 50 sells for SSD Kingston A400, 120GB, SATA III, 2.5", 7mm
- 2.- 42 sells for Procesador AMD Ryzen 5 2600, S-AM4, 3.40GHz, Six-Core, 16MB L3 Cache, con Disipador Wraith Stealth
- 3.- 20 sells for Procesador Intel Core i3-9100F, S-1151, 3.60GHz, Quad-Core, 6MB Cache (9na. Generación - Coffee Lake)
- 4.- 18 sells for Tarjeta Madre ASRock Micro ATX B450M Steel Legend, S-AM4, AMD B450, HDMI, 64GB DDR4 para AMD
- 5.- 15 sells for SSD Adata Ultimate SU800, 256GB, SATA III, 2.5", 7mm
- 6.- 14 sells for Tarjeta Madre ASUS micro ATX TUF B450M-PLUS GAMING, S-AM4, AMD B450, HDMI, 64GB DDR4 para AMD
- 7.- 13 sells for Procesador AMD Ryzen 5 3600, S-AM4, 3.60GHz, 32MB L3 Cache, con Disipador Wraith Stealth
- 8.- 13 sells for Procesador AMD Ryzen 3 3200G con Gráficos Radeon Vega 8, S-AM4, 3.60GHz, Quad-Core, 4MB L3, con Disipador Wraith Spire
- 9.- 11 sells for SSD XPG SX8200 Pro, 256GB, PCI Express, M.2
- 10.- 9 sells for SSD Kingston A2000 NVMe, 1TB, PCI Express 3.0, M2

The top 10 searched products are:

- 1.- 263 searches for SSD Kingston A400, 120GB, SATA III, 2.5", 7mm
- 2.- 107 searches for SSD Adata Ultimate SU800, 256GB, SATA III, 2.5", 7mm
- 3.- 60 searches for Tarjeta Madre ASUS micro ATX TUF B450M-PLUS GAMING, S-AM4, AMD B450, HDMI, 64GB DDR4 para AMD
- 4.- 55 searches for Procesador AMD Ryzen 5 2600, S-AM4, 3.40GHz, Six-Core, 16MB L3 Cache, con Disipador Wraith Stealth
- 5.- 41 searches for Procesador AMD Ryzen 3 3200G con Gráficos Radeon Vega 8, S-AM4, 3.60GHz, Quad-Core, 4MB L3, con Disipador Wraith Spire
- 6.- 35 searches for Logitech Audífonos Gamer G635 7.1, Alámbrico, 1.5 Metros, 3.5mm, Negro/Azul
- 7.- 32 searches for TV Monitor LED 24TL520S-PU 24, HD, Widescreen, HDMI, Negro
- 8.- 31 searches for Procesador Intel Core i7-9700K, S-1151, 3.60GHz, 8-Core, 12MB Smart Cache (9na. Generación Coffee Lake)
- 9.- 30 searches for SSD XPG SX8200 Pro, 256GB, PCI Express, M.2
- 10.- 30 searches for Procesador Intel Core i3-9100F, S-1151, 3.60GHz, Quad-Core, 6MB Cache (9na. Generación - Coffee Lake)

Sales by category are:

- 1.- 104 for procesadores with 9 products
- 2.- 94 for discos duros with 13 products
- 3.- 49 for tarjetas madre with 18 products
- 4.- 26 for tarjetas de video with 19 products
- 5.- 5 for audífonos with 13 products
- 6.- 2 for pantallas with 12 products
- 7.- 2 for bocinas with 10 products
- 8.- 1 for memorias usb with 2 products

Searches per category are:

- 1.- 463 for discos duros with 13 products
- 2.- 222 for procesadores with 9 products
- 3.- 137 for tarjetas madre with 18 products
- 4.- 82 for tarjetas de video with 19 products
- 5.- 64 for audifonos with 13 products
- 6.- 56 for pantallas with 12 products
- 7.- 9 for bocinas with 10 products
- 8.- 0 for memorias usb with 2 products

The top 10 rated products are:

- 1.- 5.00/5 stars for Tarjeta de Video MSI AMD Mech Radeon RX 5500 XT MECH Gaming OC, 8GB 128-bit GDDR6, PCI Express 4.0
- 2.- 5.00/5 stars for Logitech Audífonos Gamer G635 7.1, Alámbrico, 1.5 Metros, 3.5mm, Negro/Azul
- 3.- 5.00/5 stars for Logitech Audífonos Gamer G332, Alámbrico, 2 Metros, 3.5mm, Negro/Rojo
- 4.- 5.00/5 stars for Tarjeta de Video ASUS AMD Radeon RX 570, 4GB 256-bit GDDR5, PCI Express 3.0
- 5.- 5.00/5 stars for TV Monitor LED 24TL520S-PU 24, HD, Widescreen, HDMI, Negro
- 6.- 5.00/5 stars for TCL Smart TV LED 55S425 54.6, 4K Ultra HD, Widescreen, Negro
- 7.- 5.00/5 stars for Kit Memoria RAM Corsair Dominator Platinum DDR4, 3200MHz, 16GB (2x 8GB), Non-ECC, CL16, XMP
- 8.- 5.00/5 stars for Tarjeta Madre Gigabyte XL-ATX TRX40 Designare, S-sTRX4, AMD TRX40, 256GB DDR4 para AMD
- 9.- 5.00/5 stars for Procesador AMD Ryzen 3 3300X S-AM4, 3.80GHz, Quad-Core, 16MB L2 Cache
- 10.- 5.00/5 stars for SSD Western Digital WD Blue 3D NAND, 2TB, M.2
- 11.- 5.00/5 stars for Procesador Intel Core i7-9700K, S-1151, 3.60GHz, 8-Core, 12MB Smart Cache (9na. Generación Coffee Lake)
- 12.- 5.00/5 stars for SSD Crucial MX500, 1TB, SATA III, M.2
- 13.- 5.00/5 stars for Kit SSD Kingston KC600, 1TB, SATA III, 2.5, 7mm
- 14.- 5.00/5 stars for Procesador Intel Core i5-9600K, S-1151, 3.70GHz, Six-Core, 9MB Smart Cache (9na. Generación - Coffee Lake)
- 15.- 5.00/5 stars for Tarjeta de Video Zotac NVIDIA GeForce GTX 1660 Ti, 6GB 192-bit GDDR6, PCI Express x16 3.0
- 16.- 5.00/5 stars for Tarjeta de Video Sapphire AMD Pulse Radeon RX 5500 XT Gaming, 8GB 128-bit GDDR6, PCI Express 4.0
- 17.- 5.00/5 stars for Tarjeta de Video MSI NVIDIA GeForce GTX 1050 Ti OC, 4GB 128-bit GDDR5, PCI Express x16 3.0
- 18.- 5.00/5 stars for Procesador Intel Core i9-9900K, S-1151, 3.60GHz, 8-Core, 16MB Smart Cache (9na. Generación Coffee Lake)
- 19.- 4.87/5 stars for SSD Adata Ultimate SU800, 256GB, SATA III, 2.5", 7mm
- 20.- 4.81/5 stars for Procesador AMD Ryzen 5 2600, S-AM4, 3.40GHz, Six-Core, 16MB L3 Cache, con Disipador Wraith Stealth

The worst 10 rated products are:

- 1.- 1.00/5 stars for Tarjeta Madre ASRock ATX H110 Pro BTC+, S-1151, Intel H110, 32GB DDR4, para Intel
- 2.- 1.00/5 stars for Tarjeta de Video Gigabyte AMD Radeon R7 370 OC, 2GB 256-bit GDDR5, PCI Express 3.0
- 3.- 1.83/5 stars for Tarjeta Madre AORUS micro ATX B450 AORUS M (rev. 1.0), S-AM4, AMD B450, HDMI, 64GB DDR4 para AMD
- 4.- 2.00/5 stars for Tarjeta Madre Gigabyte micro ATX GA-H110M-DS2, S-1151, Intel H110, 32GB DDR4 para Intel
- 5.- 3.00/5 stars for Cougar Audífonos Gamer Phontum Essential, Alámbrico, 1.9 Metros, 3.5mm, Negro.
- 6.- 4.00/5 stars for HyperX Audífonos Gamer Cloud Flight para PC/PS4/PS4 Pro, Inalámbrico, USB, 3.5mm, Negro

- 7.- 4.00/5 stars for Tarjeta de Video Asus NVIDIA GeForce GTX 1050 Ti Phoenix, 4GB 128-bit GDDR5, PCI Express 3.0
- 8.- 4.00/5 stars for MSI GeForce 210, 1GB GDDR3, DVI, VGA, HDCP, PCI Express 2.0
- 9.- 4.14/5 stars for Tarjeta Madre ASUS micro ATX TUF B450M-PLUS GAMING, S-AM4, AMD B450, HDMI, 64GB DDR4 para AMD
- 10.- 4.23/5 stars for Procesador AMD Ryzen 5 3600, S-AM4, 3.60GHz, 32MB L3 Cache, con Disipador Wraith Stealth

The total amount of income was: 737916
The average monthly income was: 61493.00
The total concreted sales of 2020 are: 274

The monthly sales are:

- 1.- 52 concreted sales in January
- 2.- 40 concreted sales in February
- 3.- 49 concreted sales in March
- 4.- 74 concreted sales in April
- 5.- 34 concreted sales in May
- 6.- 11 concreted sales in June
- 7.- 11 concreted sales in July
- 8.- 3 concreted sales in August
- 9.- 0 concreted sales in September
- 10.- 0 concreted sales in October
- 11.- 0 concreted sales in November
- 12.- 0 concreted sales in December