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| Code Challenge 2022 |
| Pc-Recommender |
| By Harry Tsang |

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# The basis of my proportions for the budget

While I first thought that the proportion of budget was equal for every part of the PC, I realised that was not true at well.

Let’s take for example:

A low end build:

GPU: ASUS GeForce Dual RTX 3050 - £321

CPU: AM4 Ryzen 5 5500 - £144

Motherboard: MSI B450 TOMAHAWK MAX II AMD ATX Motherboard - £58

RAM: Kingston Fury Beast 16GB Kit 2 x 8GB, DDR4, 3200MHz - £65

Storage: WD Blue SN550 NVME SSD (250 GB) - £28

Case: Corsair White 4000D Mid-Tower Windowed PC Case White - £60

PSU: CORSAIR RMX SERIES RM550X 80 PLUS GOLD FULLY MODULAR ATX PSU - £51

Total Price: £727

The percentage of budget for the GPU: (321/727)\*100 = 44%

CPU: 19%

Motherboard: 8%

A high end build:

GPU: MSI GeForce RTX 3080 Ti Ventus 3X 12GB OC GPU- £1129

CPU: AMD Ryzen 7 5800X Processor - £300

Motherboard: ASUS TUF Gaming X570-Plus (WI-FI) AMD Motherboard- £210

RAM: Corsair Vengeance LPX 32GB (2X16GB) DDR4 3200Mhz- £115

Storage: Crucial P2 1TB 3D NAND NVMe PCIe M.2 SSD - £80

Case: Corsair 4000D Airflow Tempered Glass Mid-Tower ATX Case - £88

PSU: Corsair RM850 850 Watt 80+ Gold Fully Modular - £85

Total Price: £2007

The percentage of budget for the GPU: 56%

CPU: 15%

Motherboard: 10%

While these percentages are close, it still differs, especially when people start wanting a more CPU/GPU intensive build. Currently, the prototype uses a hard budget cap on each part, but it shouldn’t be a linear, so lower budget builds should have more towards the entire, and higher end builds should have more towards the GPU. This could also change drastically, since prices of GPUs are still quite high compared to some MSRP, especially for medium end cards, such as the GeForce RTX 3050s, 3060s, and 3070s. When the price changes so much due to unknown reasons, such as COVID, it may mean the budget we give to each part changes. There is a certain flexibility when you ask someone about a PC build, and in the future, if I complete this project, I would add a more complicated way to find the budget for each part, and more flexibility, e.g: by having different builds that are possible with the budget, like increasing CPU power while saving on a PC case, or storage. The current prototype is still too rigid, but it shows the functionality and potential of a website to recommend PC builds.

# Design for UI

Navigation Bar – Points you to different websites.

Pc recommender –

An introduction to the website: telling you what its about…

User Inputs:

Budget: Textbox input

Gpu/Cpu Balance (Balanced/Gaming/Video editing): Dropdown choice

GPU choice (Nvidia GeForce/ AMD Radeon): Dropdown choice

CPU choice (AMD Ryzen/ Intel): Dropdown choice

Overclocking (No preference, No overclocking, light oc, heavy oc):Dropdown choice.

Pc recommender | Pc Builder | Peripheral Recommender |

Only allow submit button to be pressed when the necessary inputs are filled.

# The Web Scrapers

The web scraper I currently have developed are very simple, to bypass the request limits of amazon. It loads the page listing of a PC part and takes the information from there instead of clicking into each listing, which would generate too many requests. This means you can only get minimal information for each part, its price, and name. To check for more in-depth compatibility, more information is need from the web scraper, which would require clicking into each listing. This would require many proxies, and much more configuration to get the information needed. I am not skilled enough to do so and so I settled for a basic web scraper to show the functionality of the website.

The basic web scraper does this:

Timeline

Description automatically generated with medium confidence

It takes the information straight from this website, but if I had to develop it, and create a better web scraper, I would have to click into each one of these listings. However, each click would make a request, which is limited by amazon, so the basic web scraper is the best option I have for now.

Graphical user interface, website

Description automatically generated

Since each of these pages have a lot more information, shown here:

Graphical user interface, table

Description automatically generated with medium confidence

Once these web scrapers are possible, more data can be stored about each part, which can be used to find a better PC build. E.g: I could add an user input for colour scheme, I could check compatibility between the motherboard and CPU, and I could compare RAM speeds of sticks if they are different. Currently, my prototype only has 3 main parts which are produced, the GPU, the CPU and the motherboard, due to lack of time. In order for RAM to be added to this list, I would need more data on the motherboard to check said compatibility.

Table

Description automatically generated

Another problem I faced is the many different selectors for the price.

Since the web scraper loads the page, then finds each selector tag, some different formatting stops the web scraper from functioning. For example the 2 prices are the standard in the picture below.

Text

Description automatically generated

However, formats like this stop the web scraper from functioning, which I need to correct in the near future. I plan to do this by using if statements, by checking through every possible selector tag, and if one returns null, then check the other format. In doing so should fix this problem.

Graphical user interface, text

Description automatically generated

# How to use the web scrapers

Find the webscraper.js file.

A screenshot of a computer

Description automatically generated

Open the file however you want. The JSON files already have test data in them, so the write file code that appends any other listings found is commented out.

Shown below:

Text

Description automatically generated

Each one of the web scrapers have this commented out. If you want to test the functionality of the web scrapers, feel free to remove all the test data, and remove the comments on that line.

Text

Description automatically generated

You will find this block of commented out code in the server.js file. Remove the commenting on any web scraper you want to run. When done, use ‘npm start’ in the command prompt to start the website and the web scraper. The info for the web scraper will appear in the command prompt, while the website will be at the link: ‘localhost:3000’ .

Due to the formatting problems of amazon, explained above, the web scrapers have a tendency to stop. This can be fixed manually, since there is no way to fix it automatically yet.

Text

Description automatically generated

By manually increasing ‘i’, you can skip the differently formatted prices, to see the web scraper does work.

# Improvements I would make

Overall, I believe the prototype shows great functionality, while not yet being the perfect solution. There are many developments I would like to include, and I will list them below.

A better web scraper, for reasons explained above. It would allow the website to be more functional and correct, since currently each though there are hard-coded compatibility checks (since the Ryzen motherboard function is only called when a Ryzen CPU, and the same for Intel), I cannot check if they are actually compatible, since they may be in different generations. It would also allow more parts to be included in the results.

This improved web scraper would also lead to the development of the PC builder secondary site. The secondary site would let you input a build that you already thought about, and if the parts have data on them, they can check for the compatibility issues, or potential upgrades or bottlenecks. E.g: If the RAM is mismatched, and if the GPU/CPU is a lot more powerful than the other, I would want to the system to pick up on it. An additional feature I would want to add would be the website returning possible upgrades, for example if you had a weaker GPU, it could recommend to upgrade it, etc.

I would also improve the current algorithm for calculating the budget in each part, explained earlier. Another addition to this could be a lower and a maximum price for each part, so more PC builds can be recommended, so it is more flexible, just like when a person answers the same question.

Another option I would like to give the user is integrated graphics. There are CPUs which have integrated graphics, which mean that technically a GPU is not needed. This is great for low budget builds, or someone who wants a system while they save up for a graphics card. This of course would require the improved web scraper, as most CPUs state if they have the integrate graphics in the extra information.

The other feature to be added would be overclocking user inputs. There are some CPUs which have overclocking capabilities, and other that don’t, so an option should ask if they want to be able to overclock the system.

More user inputs would be colour scheme, max dimensions, and if they want RGB. Colour scheme and RGB would be important for those who care about aesthetics. The max dimensions could be for those who need a system to fit in a particular space. Overall, I should also add an option to say they have no preference in each input in case they just want the PC build to be the most efficient possible.

There could also be small features which can be added. E.g: Wi-Fi motherboard so that you don’t have to have a wired ethernet cable.

Adding the RAM and the storage for the system is hard. This is due to the preferences of the user. Current standards would be 16gb, but if they multitask a lot, it is recommended to have 32gb, which can double the price for the RAM. Storage is also preference, since the user could install any number of games. This can be solved by adding preferences for each in the user input. Adding to this, there could be an option to change the RAM and storage sizes, to see if the change in price is worth it.

A necessity I should add to the PC parts is at least an SSD boot drive. This means that the OS is installed in the SSD, meaning much quicker power on times, than a HDD. While HDD are much cheaper, it is worth it to buy a 128GB SSD for powering the system on, then a HDD for the rest of the applications.

# Summary

Overall, my prototype still has a long way to go, but I am happy with the progress I have made. I believe with more development time, this could be the best possible solution for reducing the PC build recommend posts, and allow the community to answer harder questions.

Thank you for your time.