Feasibility Report Regarding Laptop Purchase, Involvement With CS Freshman

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1   Introduction

Starting off University after finding enrollment for a major pursuing Computer Science, Fahad Nasir has established a name for himself in the admission list for FAST NUCES, and will be starting off University in August as a freshman in a journey of 4 years towards better development, research, programming, writing, designing and for practicing Software Engineering ideas. This new introduction to University will be a life changing opportunity for Fahad to pursue into, but one of the main factors would be to say how it will help him either pursue further higher education, or find a place in a high paying job later down the road in his life.

Fahad wants to be as active and close to his work as much as possible, and would like to spend whatever time he has building newer ideas when he can, when he wants. Although getting into a CS engineering university is a big accomplishment, it opens up a broader horizon of problems and obstacles he must think about before he goes any further. One of these problems is about getting a new laptop that would help him overcome the challenges in his assignments and work, and also help him boost his work efforts to quickly build reputation in whatever fields he may want to specialize into. It is thus desire-able to take some time and consider the different form factors that will base his decision to buy a new machine for himself.

2 Discussion

2.1 Variables

After deciding to choose a laptop over a desktop machine, the resolution was made about gaining various opinions based on fundamental research done, regarding what factors to contemplate over the purchase of a brand new *"Laptop"*. Some of the main factors that were of concern are listed as the the the following,

1. ***CPU*** - What brand to consider for the CPU, whether it should be Intel or AMD, and which gives better performance and less heat issues. It is acknowledged that higher heat issues will result in more battery usage, and thus remove the benefit that higher battery life can give. Fahad expects that mostly, he will be programming, and most of that would be over typing and searching over the internet, so for him, the benchmark obviously is that he is able to comfortably do these tasks without the machine heating up, when for example, he is sitting down with his laptop in his lap
2. ***RAM*** - Due to potential extra usage and computationally related assignments and workload that can be assigned, the ideal candidate for a new laptop would be have affordable with at least 8 GBs of *RAM*
3. ***Storage*** - At least a 256 GB of SSD storage would help in better performance and smoother computing workloads. It can also help with dealing with larger files.
4. ***Price*** - Given a budget of a total of *1 lakh*, it would best to find the most optimal choice with the least cost
5. ***Battery Life*** - It is intended that this machine will be taken to University, or to other workplaces not at home, thus longevity in the battery life would mean higher levels of productivity and give the ability to move around and visit other places, show others the work on your machine, and thus would be great if the battery life lasted at least in good shape and condition, it should last on average 5 hours

2.2 Circumstances

In the given circumstance and evaluation of these metrics, it is fitting to prioritize the needs of the user accordingly to the given circumstances and inferences from the current situation,

1. The user wishes to use the laptop for the larger part, at home or at University.

This would mean there is a not much great of an emphasis on *battery life*, which would mean it is not the priority

2. The price range is reasonably enough to find well-fitting devices for the intended workload, comprises can be made if the differences are slightly in the range of the selected options in order to better secure a more reliable product. Laptops are one of a time purchase, so a slight difference here and there would not matter as much

3. *"CPU"*, *"RAM"*, and *"Storage"* are all very essential for a productive workload. If we have to prioritize, it would be (**a**) "RAM", (**b**) "Storage", and (**c**) "CPU", respectively.

2.3   Prioritization

As all is set, we can present a priority list for the aforementioned variables in the descending order,

1. RAM
2. Storage
3. CPU
4. Price
5. Battery

2.4   Data

On further investigation for products that fit the above criteria, the below options can be considered that fulfill the requirements specified.

Options	RAM	Storage	CPU	Price	Battery
Lenovo ThinkPad X1 Carbon	8GB DDR3	256GB SSD	Intel Core i5 5th Gen	PKR 74,299/-	5 hrs
HP 14 DQ1077wm	8GB DDR3	256GB SSD	Core i3 10th Gen	PKR 82,999/-	5 hrs
Dell Inspiron 15 3593	8GB DDR3	256GB SSD	Core i5 10th Gen	PKR 97,999/-	5 hrs
HP 15 DY1051	8GB DDR3	256GB SSD	Core i5 10th Gen	PKR 97,999/-	5 hrs
HP 14T DQ200	8GB DDR3	256GB SSD	Intel Core i5 1135G7	PKR 98,999/-	7 hrs
Dell 5591	8GB DDR3	256GB SSD	Core i5 8th Gen HQ 8400	PKR 88,000/-	6 hrs

Considering the current present data-set, the final decision cannot be made on the basis of *"RAM"*, and *"Storage"*, as all of the options have the same set of options, that is, *"8GB DDR3"*, and *"256GB SSD"* respectively. If now the decision is based on CPU, we can see that two competitors offer the same specifications, at the same price, with the same battery life. This is referring to *"Dell Inspiron 15 3593"*, and *"HP 15 DY1051"*.

3   Conclusion & Recommendations

Concluding the investigation over the best feasible set of machines that can be afforded under *1 lak* (PKR **1,00,000/-**), and judging on the basis of our previously set of variables in 2.1, and their priorities in 2.3, and recounting from our previous discussion about which products rank the highest from the data in 2.4.

3.1 Recommendation

If the sacrifice is made between *"Price"* and *"Battery"*, and if the CPU capacity is to be ranked higher, then again, we are left with only two options - *"Dell Inspiron 15 3593"*, and *"HP 15 DY1051"*. Anyone of these two can be selected as the product which offer the best value for the given range.