Computer Systems 1 Student Name: Charlie Tubbritt

## Assignment 1 Student Number: 20080486

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### Lecturer: Joe Daly

Alex is a computing student who requires a machine that can run specific development tools such as IntelliJ, Android Studio and Microsoft Visual Studio. He also needs it to run MS Office, Zoom and Spotify. Additionally, he would like to be able to run games such as Stardew Valley and Unpacking, and Alex has a budget of €800. The minimum system requirements of the machine that Alex needs are a 1080p display, a 1.8GHz quad core processor, support of DirectX 10 or later, 16GB RAM and at least 256GB of storage. This is based on the published system requirements for the pieces of software described. Based on the above, the Lenovo V15 G2 ITL laptop is being recommended for Alex. This laptop exceeds the recommended specifications for the outlined software while also staying within Alex’s stated budget for this purchase, and fulfils all his requirements.

There are a number of reasons a laptop is being recommended over a desktop computer. Alex is a college student. A laptop offers him more portability than a desktop, so he can bring it to classes or use it elsewhere if he is studying or working away from home. Laptops also do not require any other peripherals to be used. A peripheral is any device that plugs into your PC or laptop but is not required to fulfil the computer’s primary function, such as a mouse monitor or keyboard, [Technopedia, 2020]. A desktop has not been recommended in this case as they are much larger, taking up more room at home meaning that he will need to designate a space for it. A desktop would also be a larger financial investment when considering the peripherals needed in addition to the PC itself, consequently exceeding Alex’s budget of €800. The recommended Lenovo laptop costs €757.97 and can be purchased from Buyitdirect (Buyitdirect, 2022) .

Exploring the hardware or physical components of the Lenovo V15 G2 ITL, it sports a 1080p display which is in line with recommended specification. 1080p is a universal display resolution of 1920 x 1080 pixels, and is also known as Full HD, and is today’s standard resolution for PC monitors, gaming laptops and TVs (Harding, 2022).

The CPU or Central Processing Unit is essentially the ‘brain’ of any computer or laptop. The clock speed, also referred to as clock rate, is the number of cycles or ‘pulses’ it can execute per second, which is measured in gigahertz (GHz), (Harding, 2021). The clock speed of the CPU determines the data processing efficiency and the computer’s performance, and a higher clock speed *generally* suggests higher performance. (Awati & Rosencrance, 2022). The recommended laptop has an Intel core i7-1165G7 CPU which is a quad core CPU with a base clock speed of 2.8GHz (Intel, 2021). This outperforms the recommended specification by 1.0GHz and will easily run the development tools that Alex requires.

Turning to graphics, a GPU or Graphics Processing Unit is a hardware component responsible for rendering images and video for display, (Harding, 2022). It is the part of the computer that controls what you see on your screen. The recommended Lenovo laptop includes Intel Iris Xe integrated graphics. Integrated graphics is a term used to describe a tiny GPU that is built into your CPU. Intel Iris Xe graphics supports up to DirectX 12.1 which includes support of DirectX 10 as required (Intel, 2021).

The recommended Lenovo V15 G2 ITL laptop also includes 16GB RAM at 3600MHz, which is the speed of the RAM. RAM or Random Access Memory is a type of memory where data on the applications that you are currently using is stored, a sort of short-term memory, [Villinger, 2022]. Generally speaking, the more RAM you have, the faster your PC will be able to operate tasks and process information, (HelloTech, 2022).

The last component to address is storage. The Lenovo V15 G2 ITL Laptop has an M.2 SSD on board with 512GB of storage. M.2 SSDs (Solid State Drives) are the newest and generally, fastest form of storage on the market, (Harding, 2021). M.2 stands for the form factor or size of the component, and they are growing in popularity due to the fact that they require less physical space than traditional 2.5-inch SSDs or hard drives. SSDs are devices that use flash-based memory and have no moving parts. This is what allows it execute at faster speeds without compromising on storage space, [Villinger, 2022].

In summary, this laptop was chosen as its portability and affordability outweighs that of a desktop PC. The cost of the laptop also allows Alex some left-over money to purchase a laptop bag or wireless mouse if he feels it necessary. The CPU outperforms the recommended specification by 1.0GHz which will offer Alex some future-proofing if he decides to explore more CPU intensive software. Intel’s Iris Xe graphics support of DirectX 10 will allow Alex to play both Unpacking and Stardew Valley without any technical concerns. The RAM included meets the recommended specification and having 16GB of RAM will be surplus to other needs Alex may have in mind. Finally, the 512GB of storage provided by this laptop exceeds the recommended 256GB for the software requirements, and allows for any other data Alex may need to store, such as college work and games.

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