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Modifications resulting in a faster, quieter and cooler PC

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The speed of the microprocessor (CPU) and the amount of Random Access Memory are the main factors affecting the processing speed of information of personal computers (PC). Because new higher speed processors are very expensive, some users tend to buy cheaper lower speed processors, and then increase their speed using a process called "over-clocking". However this is not popular in Sri Lanka due to the unavailability of parts and the dearth of relevant expertise.

The "over-clocking" results in an increase in the temperature of the CPU, which causes an instability in operation and leads to a reduction in the lifetime of the processor. The temperature increase does not play a big role when used in air-conditioned environment. However, in developing countries like Sri Lanka, this solution is expensive. Although the adding more internal fans is a cheaper alternative, it results in undesirable noise. In this project, this problem is addressed by devising a solution which includes building a water cooling system to obviate the rise in temperature, "over-clocking" to increase the speed of CPU and a benchmarking in order to check the performance of the computer.

Two well polished copper plates with the same size of CPU are used to prepare copper box with inlet an outlet tubes and fixed it to the CPU tightly with a CPU clip. A submersible water pump is placed under a 10 L water reservoir and rubber tubes are used to make water circulation through the copper box. Then the heat, which dissipates from the CPU is absorbed by water through the copper interface and subsequently the temperature of the CPU drops.

The CPU, AMD Athlon™ XP 2600+ (1.9 GHz) and the motherboard, Gigabyte nForece2 Ultra are used for this project. The multiplier 11.5 is reduced to 11 by changing the dipswitches and the speed of the motherboard is increased from 333 MHz to 400 MHz by changing settings of BIOS (Basic Input Output Setup). According to these changes, the BIOS shows the new resulting CPU speed is 2.2 GHz. Finally PerfromanceTester® 5.0 benchmarking software is used to ensure the speed increment and the results of benchmarking before and after the over-clocking clearly show the over-clocked CPU beats the conventional by 12%. Also the temperature of the CPU was 60 ^{0}C, which is absolutely great, because the rated maximum temperature of that kind of CPU is 85 ^{0}C.

Therefore the developed PC is more economical, noiseless and dust free with 12% increase in speed performance and operate at a reasonable temperature.

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