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CSCI 202

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Specification of Computer:

o The brand of CPU (Intel or AMD): **AMD**

o The model of CPU (e.g. Intel i7-9700K Coffee Lake): **AMD Ryzen 5 5500U with Radeon Graphics**

o The number of cores on CPU: **6 cores**

o The clock rate of CPU in GHz: **2.10 GHz**

o The amount of memory in GB: **8.00 GB**

o The speed of memory: **DDR4 3200**

o The capacity of hard drive: **256 GB**

o The type of hard drive: magnetic or SSD: **SSD**

SSD

- Max sequential read speed: 2100 Mb/s
- Max sequential write speed: 1400 Mb/s
- Max random read speed: 250000 IOPS
- Max random write speed: 180000 IOPS

Screenshots of Benchmarks

```
C:\Users\sashe\OneDrive\Desktop\Academics\CSCI 202\project\BenchmarkingProject>.\a.exe
Time for integer operations: 14773330300 ns
```

Caption: Output of integer operations benchmark

```
C:\Users\sashe\OneDrive\Desktop\Academics\CSCI 202\project\BenchmarkingProject>.\a.exe
Time for floating point operations: 14978268300 ns
```

Caption: Output of floating-point operations benchmark

```
C:\Users\sashe\OneDrive\Desktop\Academics\CSCI 202\project\BenchmarkingProject>.\a.exe
Time for memory operations: 20064810300 ns
```

Caption: Output of memory operations benchmark

```
C:\Users\sashe\OneDrive\Desktop\Academics\CSCI 202\project\BenchmarkingProject>.\a.exe
Time for hard drive benchmark 1: 4271242200 ns
```

Caption: Output of Hard Drive benchmark 2

```
C:\Users\sashe\OneDrive\Desktop\Academics\CSCI 202\project\BenchmarkingProject>.\a.exe
Time for hard drive benchmark 2: 2748607200 ns
```

Caption: Output of Hard Drive benchmark 2

Table recording the results of all the benchmarks

Name	Description	Execution time (ns)	Execution time (s)	Reference time (s)	Ratio
Integer Operations	o 10_{10} additions (of integer constants) o $5 \times 10_9$ multiplication (of integer constants) o $2 \times 10_9$ division (of integer constants)	14773330300	14.773330300	100	6.7689544584
Floating Point Operations	o Same as integer, use *double precision* floating point numbers instead of integer.	14978268300	14.978268300	100	6.6763392133
Memory Operations	o Read from $5 \times 10_9$ different array elements, 4 bytes each time o Write to $5 \times 10_9$ different array elements, 4 bytes each time	20064810300	20.064810300	100	4.9838497600
Hard drive benchmark 1	o Read a whole file of 10_9 bytes, 100 bytes each time o Write 10_9 bytes to a file, 100 bytes each time	4271242200	4.271242200	250	58.530981923
Hard drive benchmark 2	o Read a whole file of 10_9 bytes, 10000 bytes each time	2748607200	2.748607200	10	3.6382062886

	o Write 10^9 bytes to a file, 10000 bytes each time				
Geometric mean					8.633355247

Summary of Results of Benchmarks using Geometric Mean

Summary of results using a single number (geometric mean): 8.633355247