



**BSc (Hons) in Computer Engineering
Laboratory Practical**

Experiment #1 Investigation of Hardware and Software Factors that Effect Performance of the Computer Program

Name:	
Index No	
Intake	
Date	
Instructor Name and Signature:	
Comments	Grade

Objectives:

To identify hardware and software factors that should be effected for the performance of the computer program.

Outcomes:

After completing this experiment, students would be able to:

- a) Identify computer hardware and software components that are existed on different machines such as Processor, RAM, OS, and etc.
- b) Understand hardware and software factors that will effect the performance of the computer program.
- c) Explain the factors that will be critically effected for the computer program.

Equipment Required:

Computer Prgram, Tool to identify existing hardware (cpuz)

Ex 01: Identify Existing Hardware and Software Available on a Given Computer or Server

Use the software tool cpu-z (<https://www.cpubid.com/>) and identify existing hardware. If you have a Linux system please use relevant linux based software tools. Fill the following table

Machine #1

CPU Name	
Cores	
Threads	
Motherboard	
Chipset	
Memory type and size	
Graphics	
Size	
CUDA (cores)	
OS	
Other	(As required)

Ex 02: Measuring the Time Factor to Run a Sample Program

The following sample C++ program is used to identify time to run the program. Identify task of the each code of the program and explain key activity on this.

```
// C++ program to find out execution time|
#include <algorithm>
#include <chrono>
#include <iostream>
#include<vector>
using namespace std;
using namespace std::chrono;

int main()
{
    auto start = high_resolution_clock::now();
    vector<int> values(100000);
    auto f = []() -> int { return rand() % 100000; };
    generate(values.begin(), values.end(), f);
    sort(values.begin(), values.end());
    auto stop = high_resolution_clock::now();
    auto duration = duration_cast<microseconds>(stop - start);
    cout << "Time taken by function: "
         << duration.count() << " microseconds" << endl;
    return 0;
}
```

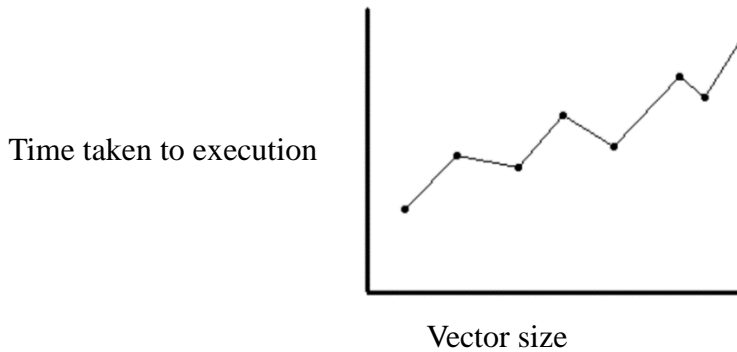
Ex 03: Calculate the Time Take to Run the Sample Program

Use the above sample program and compile and execute it then record the time taken to the program. Then change the vector size as given in the table below and measure the time taken to that.

Vector Size	1000	5000	10000	50000	100,000	500,000	1,000,000	5,000,000	10,000,000	50,000,000
Time										

Ex 04: Evaluate the performance (time vs a vector size)

Now draw a line chart and evaluate the performance describe the behavior of the graphs



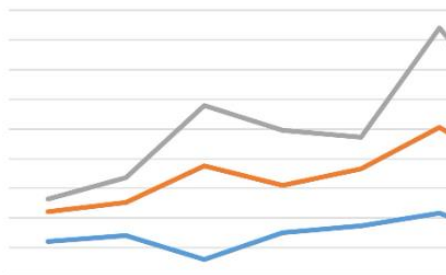
Ex 05: Calculate the Time Takes to Run the Sample Program on Different Machine

Repeat the activity on ex 03 on another different two machine and take the time as in the example 3

Vector Size	1000	5000	10000	50000	100,000	500,000	1,000,000	5,000,000	10,000,000	50,000,000
Time M#1										
M#2										
M#3										

Ex 06: Evaluate the Performance (time vs a vector size on different machine)

Now draw a line chart (all in one chart) and evaluate the performance describe the behavior of the graphs (Time taken to execute vs Vector size)



Ex 07: Discussion

Briefly explain your findings (Try to answer the questions **what kind of factor(s) directly effect run to computer program.**
