

Task 1:

The output is to make a graph show the relation between vector size and the Flops/s.

- 1- the C++ code consists of 7 files as follows:
 - a- Header file(**Benchmark.h**): that file contain the two member functions (run and getFlopsPerSecond), and private member variables.
 - b- Class file (**Benchmark.cpp**): that file constructor definition, initializing member variables and vectors with the specified (vectorSize) and start and end the member function (run) to record the (elapsedTime) variable the start the member function (getFlopsPerSecond).
 - c- Main file(**main.cpp**): this is the main source code file which These lines declare an array of vector sizes and the number of sizes in the array then specify the output csv file.
 - d- Executable file(**benchmark**): this file generated after compilation and it is the file which write the data to the screen and the csv output file.
 - e- 2 object files[**main.o & benchmark.o**] (also . o) contains compiled object code (that is, machine code produced by C++ compiler), together with the names of the functions and other objects the file contains.
 - f- the last file is (**Makefile**)
- 2- One (**benchmark_results.csv**) file that has the output (compiled data)
- 3- One (**HW2_Task1.ipynb**) python notebook file that will develop the relation between the vector size and the Flops/s.
- 4- My system caches levels are as follows (L1 = 128KB, L2=512 KB, L3= 30 MB)
- 5- It is obviously that the relation is somehow abnormal in the high range of vector size which is not related to my system data. and in the low vector size region it appears that there is an effect to use the virtual machine on the results.

