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CS 12 computer science 12

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Exercise Sheet 9

Discussion starts from Monday, July 6, 2020

9.1 Introduction

Answer the following questions by looking at according sources:

- What is the Sniper-Simulator?

- Which simulation modes are provided by the Sniper-Simulator?

- What kind of programming language is python and which ending is usual for python scripts?

- How do you execute a python script?

9.2 Sniper - Analysetools

Work through the following steps to familiarize yourself with the Sniper-Simulator.

(a) Simulation

- Connect to the test system and update the SVN. In your home folder, you will find the folder "sniper".

- Change to the folder "sniper/test/fft".

- Enter "make run" to start the simulation. Check the file "sim.out" to see the simulation result (Number of cores, Instructions, Branch-prediction statistics, Cache summary, etc.).

(b) Anaylsis

- Execute following commands from within the folder "sniper/test/fft" and interpret the results. What do the analysis scripts do?:
    - "sniper/tools/cpistack.py" – "cpi-stack.png"
    - "sniper/tools/gen_topology.py" – "topo.svg"
    - "sniper/tools/mcpat.py" – "power.png" / "power.txt"

9.3 Power and Energy Evaluation

- In the "Makefile" of "fft", you can find the parameters -n and -p (http://snipersim.org/documents/sniper-manual.pdf Page 20). By changing these parameters, you can set the number of processors for the simulation. Execute the simulation for "fft" again with different number of cores (1, 2, 4, 8, 16 and 32 cores). Use a tool like *Libreoffice Calc* or *Excel*, to illustrate the relation between the number of cores and following parameters:

    a. Time ("sim.out")

    b. Runtime Dynamic Power ("power.txt")

    c. Total Leakage Power ("power.txt")

    d. b+c

- What is the optimal number of cores regarding power and total energy consumption?