Microbenchmark Execution on Normal Machine:

```
vt-cs@OptiPlex-7020:~/raghavs/final_check_github/ophawk/piton/verif/diag/c/riscv/ariane$ gcc hawk_demo.c -o hawk_demo.o
vt-cs@OptiPlex-7020:~/raghavs/final_check_github/ophawk/piton/verif/diag/c/riscv/ariane$ /usr/bin/time -v ./hawk_demo.o
Performing HAWK Test ..
--------------------------
Start of Array1=0x601060
End of Array1=0x3fdf1060
--------------------------
Start of Array2=0x3fdf1060
End of Array2=0x69601060
--------------------------
Computing on Array1...!
Working on Page 1 to Page 50001..
Working on Page 50001 to Page 100001..
Working on Page 100001 to Page 150001..
Working on Page 150001 to Page 200001..
Working on Page 200001 to Page 250001..
Working on Page 250001 to Page 300001..
--------------------------
Computed Value On Array1=33823534040
--------------------------
Computing on Array2...!
Working on Page 1 to Page 50001..
Working on Page 50001 to Page 100001..
Working on Page 100001 to Page 150001..
Working on Page 150001 to Page 200001..
--------------------------
Computed Value On Array2=7398356650000
--------------------------
Re-Computing on Array1...!
Working on Page 1 to Page 50001..
Working on Page 50001 to Page 100001..
Working on Page 100001 to Page 150001..
Working on Page 150001 to Page 200001..
Working on Page 200001 to Page 250001..
Working on Page 250001 to Page 300001..
--------------------------
Re-Computed Value On Array1=33823534040
--------------------------
Completed HAWK Test!
        Command being timed: "./hawk_demo.o"
        User time (seconds): 1.73
        System time (seconds): 0.46
        Percent of CPU this job got: 99%
        Elapsed (wall clock) time (h:mm:ss or m:ss): 0:02.21
        Average shared text size (kbytes): 0
        Average unshared data size (kbytes): 0
        Average stack size (kbytes): 0
        Average total size (kbytes): 0
        Maximum resident set size (kbytes): 1721644
        Average resident set size (kbytes): 0
        Major (requiring I/O) page faults: 0
        Minor (reclaiming a frame) page faults: 430140
        Voluntary context switches: 1
        Involuntary context switches: 125
        Swaps: 0
        File system inputs: 0
        File system outputs: 0
```

Microbenchmark Execution on FPGA programmed with HAWK integrated Openpiton:

```
vt-cs@OptiPlex-7020:~/raghavs/final_check_github/ophawk/build$ pitonstream -b genesys2 -d system -f ./tests.txt --core=ariane --storage=ddr -p ttyUSB0
hawk_demo.c
[INFO]  pitonstream,1.0:372: UART DIV Latch value: 0x24
[INFO]  pitonstream,1.0:375: Configuring port /dev/ttyUSB0
[INFO]  pitonstream,1.0:164: UART will be configured for 115200 baud rate
Press reset button on FPGA
Waiting...

Configuration is complete

[INFO]  pitonstream,1.0:402: Running hawk_demo.c: 1 out of 1 test
[INFO]  pitonstream,1.0:287: Compiling hawk_demo.c
sims -sys=manycore -novcs_build -midas_only              -midas_args='-DUART_DIV_LATCH=0x24 -DFPGA_HW -DCIOP -DNO_SLAN_INIT_SPC' hawk_demo.c -ariane -uart_dmw -x_tiles=1 -y_tiles=1
[INFO]  pitonstream,1.0:294: Compiling C test from mem.image for hawk_demo.c
[INFO]  pitonstream,1.0:300: Creating addr:data map for the test
[INFO]  pitonstream,1.0:268: Found 1 sections
[INFO]  pitonstream,1.0:314: Extracting test sections
[INFO]  make_mem_map.py:387: Checking correctness of section mapping...
[INFO]  make_mem_map.py:400: Correct!
[INFO]  make_mem_map.py:318: Used 62 out of 16777216 blocks of storage
Loading a test...
100%
TEST OUTPUT >>>
Performing HAWK Test ..
--------------------------
Start of Array1=0x80000f28
End of Array1=0xbf7f0f28
--------------------------
Start of Array2=0xbf7f0f28
End of Array2=0xe9000f28
--------------------------
Computing on Array1...!
Working on Page 1 to Page 50001..
Working on Page 50001 to Page 100001..
Working on Page 100001 to Page 150001..
Working on Page 150001 to Page 200001..
Working on Page 200001 to Page 250001..
Working on Page 250001 to Page 300001..
--------------------------
Computed Value On Array1=33823534040
--------------------------
E--------------------------
Working on Page 1 to Page 50001..
Working on Page 50001 to Page 100001..
Working on Page 100001 to Page 150001..
Working on Page 150001 to Page 200001..
--------------------------
Computed Value On Array2=7398356650000
--------------------------
Re-Computing on Array1...!
Working on Page 1 to Page 50001..
Working on Page 50001 to Page 100001..
Working on Page 100001 to Page 150001..
orking on Page 100001 to Page 150001..
Working on Page 200001 to Page 250001..
orking on Page 200001 to Page 250001..
--------------------------
Re-Computed Value On Array1=33823534040
--------------------------
Completed HAWK Test!
```

Conclusion : System with HAWK computes the same computation values as that of a normal machine which consumes 1.72 GB memory but using only 1GB available memory on genesys2 kintex FPGA board.

Compression and Decompression Count during execution:

ZsPgCnt: ZssPage Count. One ZsPage can hold 3 compressed pages

DeCompPgCnt: Decompression Page count