**The Patch file was created as follows**:

Clone the gem5 folder into another directory using the command

**git clone** [**https://github.com/gem5/gem5**](https://github.com/gem5/gem5)

Create new github branch **“CSE 520”**

Build using this command ->  **scons -j4 build/X86/gem5.opt**

Apply the patch file provided in CANVAS using the command

**patch -p0 -i gem5\_v2.patch**

Go to the directory with unmodified gem5

Create a patch file using the command

**diff -Naur folder\_old folder\_new > PATCH\_FILE**

Test the new PATCH\_FILE by applying it to the unmodified gem5 folder.

**The simulation is run as follows:**

**RefCount Replacement Policy**

**Cache Size = 1MB**

**Benchmark : Fluidanimate**

./build/X86/gem5.opt --outdir=fluidanimate\_RefCount\_1MB configs/example/se.py --cpu-type=AtomicSimpleCPU -n 5 --caches --l1i\_size=32kB --l1d\_size=32kB --l2cache --l2\_assoc=16 --l2\_size=1MB --l2\_rpp="REFCOUNTRP()" -c benchmarks/fluidanimate/fluidanimate -o "4 5 benchmarks/fluidanimate/in\_5K.fluid"

**Benchmark : BodyTrack**

./build/X86/gem5.opt --outdir=bodytrack\_RefCount\_1MB configs/example/se.py --cpu-type=AtomicSimpleCPU -n 6 --mem-size=4096MB --caches --l1i\_size=32kB --l1d\_size=32kB --l2cache --l2\_assoc=16 --l2\_size=1MB --l2\_rpp="REFCOUNTRP()" -c benchmarks/bodytrack/bodytrack -o "benchmarks/bodytrack/sequenceB\_1 4 1 100 5 2 4"

**Cache Size = 4MB**

**Benchmark : Fluidanimate**

./build/X86/gem5.opt --outdir=fluidanimate\_RefCount\_4MB configs/example/se.py --cpu-type=AtomicSimpleCPU -n 5 --caches --l1i\_size=32kB --l1d\_size=32kB --l2cache --l2\_assoc=16 --l2\_size=4MB --l2\_rpp="REFCOUNTRP()" -c benchmarks/fluidanimate/fluidanimate -o "4 5 benchmarks/fluidanimate/in\_5K.fluid"

**Benchmark : BodyTrack**

./build/X86/gem5.opt --outdir=bodytrack\_RefCount\_4MB configs/example/se.py --cpu-type=AtomicSimpleCPU -n 6 --mem-size=4096MB --caches --l1i\_size=32kB --l1d\_size=32kB --l2cache --l2\_assoc=16 --l2\_size=4MB --l2\_rpp="REFCOUNTRP()" -c benchmarks/bodytrack/bodytrack -o "benchmarks/bodytrack/sequenceB\_1 4 1 100 5 2 4"

**LRU Replacement Policy**

**Cache Size = 1MB**

**Benchmark : Fluidanimate**

./build/X86/gem5.opt --outdir=fluidanimate\_LRU\_1MB configs/example/se.py --cpu-type=AtomicSimpleCPU -n 5 --caches --l1i\_size=32kB --l1d\_size=32kB --l2cache --l2\_assoc=16 --l2\_size=1MB --l2\_rpp="LRURP()" -c benchmarks/fluidanimate/fluidanimate -o "4 5 benchmarks/fluidanimate/in\_5K.fluid"

**Benchmark : BodyTrack**

./build/X86/gem5.opt --outdir=bodytrack\_LRU\_1MB configs/example/se.py --cpu-type=AtomicSimpleCPU -n 6 --mem-size=4096MB --caches --l1i\_size=32kB --l1d\_size=32kB --l2cache --l2\_assoc=16 --l2\_size=1MB --l2\_rpp="LRURP()" -c benchmarks/bodytrack/bodytrack -o "benchmarks/bodytrack/sequenceB\_1 4 1 100 5 2 4"

**Cache Size = 4MB**

**Benchmark : Fluidanimate**

./build/X86/gem5.opt --outdir=fluidanimate\_LRU\_4MB configs/example/se.py --cpu-type=AtomicSimpleCPU -n 5 --caches --l1i\_size=32kB --l1d\_size=32kB --l2cache --l2\_assoc=16 --l2\_size=4MB --l2\_rpp="LRURP()" -c benchmarks/fluidanimate/fluidanimate -o "4 5 benchmarks/fluidanimate/in\_5K.fluid"

**Benchmark : BodyTrack**

./build/X86/gem5.opt --outdir=bodytrack\_LRU\_4MB configs/example/se.py --cpu-type=AtomicSimpleCPU -n 6 --mem-size=4096MB --caches --l1i\_size=32kB --l1d\_size=32kB --l2cache --l2\_assoc=16 --l2\_size=4MB --l2\_rpp="LRURP()" -c benchmarks/bodytrack/bodytrack -o "benchmarks/bodytrack/sequenceB\_1 4 1 100 5 2 4"