

Computer Organisation and Architecture Lab

REPORT ASSIGNMENT #6

Table for cycles of all policies:

Input_0	Open_0	Closed_0	Adaptive_0
black	228447648	218154100	219312320
comm1	302401460	281429212	281235104
comm2	402959473	375417625	376020809
face	281165956	263273636	263651340
ferret	296639309	278499505	278647613
fluid	316586849	302044069	300964825
freq	200764257	191565825	191822461
MT0	518855181	485160485	485370041
MT1	510427117	477579709	477420557
MT2	509969789	477211481	477924001
MT3	510233213	477654957	477375317
stream	226896108	215208456	215522192
swapt	334882841	320615393	320457933

Input_1	Open_1	Closed_1	Adaptive_1
black	223797236	222379224	221635828
comm1	272733028	270601076	272021208
comm2	373360581	367892056	369068165
face	337477008	333136296	331653980
ferret	328919277	319620333	320527617
fluid	317190529	312591381	312849989
freq	203126144	201057952	200862460
MT0	526775165	499728733	499113521
MT1	510944729	486450253	485073465
MT2	509991633	483960393	484453101
MT3	508720741	483845257	484484301
stream	229922168	227609028	226269280
swapt	334759260	333655940	336304380

Brief Implementation of Adaptive policy:

- We made use a integer variable(POKE=3) to represent the current count, integer variables (HIGH_THRESHOLD=6, LOW_THRESHOLD=1) to represent high and low thresholds.
- We made use of a bool variable(flag) to show whether we are in open or closed policy.
- By using if-else with flag in

```
void schedule(int channel)
```

we control entry to open or closed policy.
- If currently in Open-Page policy, and a page-hit is observed, no action to be taken.
- If currently in Open-Page policy, and a page-miss occurs, increment POKE.

- We check for page-hit by checking if the next command is ACT_CMD.

```
if (wr_ptr->next_command == ACT_CMD) {
    POKE++;
    if (POKE > HIGH_THRESHOLD)
        flag=false;
}
```

- The same implementation for `rd_ptr->next_command == ACT_CMD`
- If currently in Close-Page policy, and a page-miss occurs, no action to be taken.
- If currently in Close-Page policy, and if a page-hit with the last closed page occurs, then decrement the POKE
- We check if the previous page closed is a page-hit by storing three variables to hold the pages position(C for channel, R for rank, B for bank).

```
if (C==channel && wr_ptr->dram_addr.rank==R &&
wr_ptr->dram_addr.bank==B)
{
    POKE--;
    if (POKE < LOW_THRESHOLD)
    {
        flag=true;
        C=-1;
        R=-1;
        B=-1;
    }
}
else
{
    C=channel;
    R=wr_ptr->dram_addr.rank;
    B=wr_ptr->dram_addr.bank;
}
```

- If it is a page-hit then we decrement POKE, else we simply update the new previously closed page variables.

- Similar implementation for `C==channel && rd_ptr->dram_addr.rank==R && rd_ptr->dram_addr.bank==B`

Conclusion for Best policy:

- From the obtained values for cycles, we can conclude that **closed policy is the best policy** among open, closed, adaptive.

Conclusion for Best Address mapping:

Closed_0	Closed_1
218154100	222379224
281429212	270601076
375417625	367892056
263273636	333136296
278499505	319620333
302044069	312591381
191565825	201057952
485160485	499728733
477579709	486450253
477211481	483960393
477654957	483845257
215208456	227609028
320615393	333655940

- As observed from the table above it is observed that Address mapping 0 has better performance

CS20B052 Mohammed Rizan Farooqui

cs20b052@smail.iitm.ac.in

CS20B021 Chathurvedhi Talapaneni

cs20b021@smail.iitm.ac.in