```c
//read from stdin
//only n pages loaded at given time
// a page 2^12 = 4kilobytes
//page table 2^20 entries. use array
//page offeset 2^12
//your process has been allocated n frames, n is given on command line
// keep track of number of page faults and print statistics
// use fifo
#include <stdio.h>
#include <stdlib.h>

unsigned int* createTable();
int getFrame(int, unsigned int [], int []);
int numberOfFaults = 0;

int main(int argc, char *argv[]){
    int globalTime = 0;
    int nFrames = atoi(argv[1]);
    unsigned int logicalAddress;
    int prevTable, currTable, offset, frame, i, physicalAllocation;
    unsigned frameArr[nFrames]; //get no of frames from command line
    int presentFrame[nFrames];
    unsigned int* pageTable = createTable(); // 2^20 entries

    for(i=0;i<nFrames;i++){
        frameArr[i] = -1;
        presentFrame[i] = -1;
    }

    while(!feof(stdin)){
        scanf("%ud", &logicalAddress);
        currTable = (logicalAddress >> 12) & 0x2FFF;
        // printf("%d -> %d\n", logicalAddress, currTable);
        // printf("Now the current offset\n");
        offset = logicalAddress & 0xFFFF;
        // printf("Offset -> %d\n", offset);
        if(pageTable[currTable] == 4096){
            frame = getFrame(nFrames, frameArr, presentFrame);
            if(frameArr[frame] != -1){
                prevTable = (frameArr[frame] >> 12)& 0x2FFF;
                pageTable[prevTable] = 4096;
                numberOfFaults++;
            }
            pageTable[currTable] = frame;

        }else{
            frame = pageTable[currTable];
        }
```

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        frameArr[frame] = logicalAddress;
        presentFrame[frame] = globalTime;
        globalTime++;
        physicalAllocation = (frame << 12) + offset;
        printf("This is the Logical Address: %u -> Physical Address: %d\n",
logicalAddress, physicalAllocation);
    }
        printf("------Page Fault statistics-------\n");
        printf("Frequency of page faults: %d\n", numberOfFaults);
        free(pageTable);
        printf("------End of Adress converter------");
        return 1;
}

unsigned int* createTable(){
    unsigned int * ptr = (unsigned int *) calloc(1048576, sizeof(unsigned int));
    //each page has a size of 2^12
    int x;
    for(x=0; x<1048576;x++){
        ptr[x] = 4096;
    }
    return ptr;
}

int getFrame(int nFramesIn, unsigned int frameArrIn[], int presentIn[]){
    int frameToUse = -1;
    int frameTobeRemoved = 0;
    int z;

    for(z=0;z<nFramesIn;z++){
        if(frameArrIn[z] == -1){
            frameToUse = z;
            return frameToUse;
        }
    }
    for(z=0;z<nFramesIn;z++){
        int frameToRemove = 0;
        if(sizeof(presentIn) == nFramesIn){
            presentIn[frameToRemove] = -1;
            frameToUse = frameToRemove;
            frameTobeRemoved++;
        }
    }
    return frameToUse;
}
```

```
This is the Logical Address: 2759203940 -> Physical Address: 3172
This is the Logical Address: 1068639956 -> Physical Address: 5844
This is the Logical Address: 4256608920 -> Physical Address: 41624
This is the Logical Address: 2237336340 -> Physical Address: -1260
This is the Logical Address: 118655624 -> Physical Address: 31368
This is the Logical Address: 3054073904 -> Physical Address: 26672
This is the Logical Address: 1624432120 -> Physical Address: 52728
This is the Logical Address: 3611480132 -> Physical Address: 49220
This is the Logical Address: 356929068 -> Physical Address: 15916
This is the Logical Address: 1882176876 -> Physical Address: 44396
This is the Logical Address: 2308109024 -> Physical Address: 58080
This is the Logical Address: 1557497296 -> Physical Address: 30160
This is the Logical Address: 1618926928 -> Physical Address: 52560
This is the Logical Address: 3952796660 -> Physical Address: 54260
This is the Logical Address: 398657784 -> Physical Address: -1800
This is the Logical Address: 986021100 -> Physical Address: 27884
This is the Logical Address: 2798120264 -> Physical Address: 56648
This is the Logical Address: 2792342948 -> Physical Address: 46500
This is the Logical Address: 1328445608 -> Physical Address: 26792
This is the Logical Address: 35320252 -> Physical Address: 57788
This is the Logical Address: 258356136 -> Physical Address: 9128
This is the Logical Address: 3941179856 -> Physical Address: 37328
This is the Logical Address: 3672934860 -> Physical Address: 31180
This is the Logical Address: 2405416500 -> Physical Address: 44596
This is the Logical Address: 446607520 -> Physical Address: 41120
This is the Logical Address: 347785544 -> Physical Address: 47432
This is the Logical Address: 565263144 -> Physical Address: 11048
This is the Logical Address: 3079179724 -> Physical Address: 32204
This is the Logical Address: 3608578764 -> Physical Address: 35532
This is the Logical Address: 3363385552 -> Physical Address: 16592
This is the Logical Address: 3915495584 -> Physical Address: 55456
This is the Logical Address: 2379282840 -> Physical Address: 88472
This is the Logical Address: 2700980052 -> Physical Address: 73556
This is the Logical Address: 2205040116 -> Physical Address: 48628
This is the Logical Address: 2205040116 -> Physical Address: 48628
This is the Logical Address: 2205040116 -> Physical Address: 48628
------Page Fault statistics-------
Frequency of page faults: 499330
------End of Adress converter------%
ayoolanurudeenetiko@Ayoolas-MBP 7 %
```