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BRANCH :- Comps -B. **BRANCH:** B.
EXPERIMENT 8: Implementation of Direct Mapping.
SUBJECT :- CAO (COMPUTER ARCHITECTURE AND ORGANIZATION)

CODE :-

```
import java.util.*;
class Memory{
Scanner sc = new Scanner(System.in);
int bs,mm,cm;
int bsarr[]=new int[100];
int mmarr[]=new int[100];
int cmarr[]=new int[100];
public Memory()
{
System.out.println("Enter block size:");
bs = sc.nextInt();
System.out.println("Enter main memory size:");
mm = sc.nextInt();
System.out.println("Enter cache memory size:");
cm = sc.nextInt();
mem_map();
}
void mem_map()
{
int no_of_blocks = mm/bs;
int no_of_lines = cm/bs;
int bi=get_power(no_of_blocks);
int ci=get_power(no_of_lines);
String main_mem[]= new String[no_of_blocks];
String cache_mem[]= new String[no_of_lines];
System.out.println("Displaying Main memory");
for(int i=0; i<no_of_blocks;i++)
{
String display =new String();
display=Integer.toBinaryString(i);
display=prec_zero(display,bi);
main_mem[i]=display;
System.out.println(display);
}
```

```
System.out.println("Displaying Cache memory");
for(int i=0; i<no_of_lines;i++)
{
String display =new String();
display=Integer.toBinaryString(i);
display=prec_zero(display,ci);
cache_mem[i]=display;
System.out.println(display);
}
String block_no = new String();
System.out.println("Enter the block no to be mapped in
binary:");
sc.nextLine();
block_no = sc.nextLine();
String lsb= new String();
int j=bi-1;
for(int i=ci-1 ; i>=0 ; i--)
{
char c = block_no.charAt(j);
lsb=c+lsb;
j--;
}
System.out.print("Block no "+block_no+" will be mapped to line
no: ");
System.out.println(lsb);
String tag = new String();
int k=bi-ci-1;
for(int i=k ; i>=0 ; i--)
{
char c = block_no.charAt(i);
tag=c+tag;
}
System.out.print("Tag bit of "+block_no+" is: ");
System.out.println(tag);
}
int get_power(int n)
{
int ans=0;
while(n!=0)
{
```

```
n=n/2;
ans++;
}
return ans-1;
}
String prec_zero(String str, int bi){
int len = str.length();
for(int i=0; i<bi-len ;i++)
{
str="0"+str;
}
return str;
}
}
class Main {
public static void main(String[] args) {
Memory m = new Memory();
}
}
```

OUTPUT :-

Run 36s on 22:11:47, 11/22 ✓

```
Enter block size:
8
Enter main memory size:
256
Enter cache memory size:
64
Displaying Main memory
00000
00001
00010
00011
00100
00101
00110
00111
01000
01001
01010
01011
01100
01101
01110
01111
10000
10001
10010
10011
10100
10101
10110
10111
11000
11001
11010
11011
11100
11101
11110
11111
Displaying Cache memory
000
001
010
011
100
101
110
111
Enter the block no to be mapped in binary:
10110
Block no 10110 will be mapped to line no: 110
Tag bit of 10110 is: 10
```

Conclusion: Hence by completing this experiment I came to know about Direct Mapping.