

```
#include <iostream>
#include <vector>
using namespace std;

struct Process
{
    char Pname[3];
    int memory;
    bool allocated = false;
};

struct Block
{
    int size;
    bool used = false;
    int rem;
    struct Process processAllocated;
};

int main()
{
    cout << "No. of block : ";
    int n;
    cin >> n;
    vector<Block> blocks;
    cout << "Enter Size of the " << n << " Blocks: ";
    for (int i = 0; i < n; i++)
    {
        Block tempBlock;
        cin >> tempBlock.size;
        tempBlock.rem = tempBlock.size;
        blocks.push_back(tempBlock);
    }
    cout << "No. of Process : ";
    int m;
    cin >> m;
    vector<Process> Processes;
    cout << "Enter Name and size of the Processes: ";
    for (int i = 0; i < m; i++)
    {
        Process tempProcess;
        cin >> tempProcess.Pname;
        cin >> tempProcess.memory;
        Processes.push_back(tempProcess);
    }
}
```

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// memory allocation
int j = 0;
for (int i = 0; i < m; i++)
{
    int prv = j;
    do
    {
        if (Processes[i].memory <= blocks[j].rem && blocks[j].used ==
false)
        {
            Processes[i].allocated = true;
            blocks[j].used = true;
            blocks[j].rem = blocks[j].size - Processes[i].memory;
            blocks[j].processAllocated = Processes[i];
            break;
        }
        else
        {
            j = (j + 1) % n;
        }
    } while (j != prv);
}
cout << "\tBlock Number\tSize\tProcess Allocated\tInternal
Fragmentation" << endl;
for (int i = 0; i < n; i++)
{
    if (blocks[i].used == true)
    {
        cout << "\t\t" << i + 1 << "\t" << blocks[i].size << "\t\t" <<
blocks[i].processAllocated.Pname << "\t\t\t" << blocks[i].rem << endl;
    }
    else
    {
        cout << "\t\t" << i + 1 << "\t" << blocks[i].size << "\t\t"
<< "---"
<< "\t\t\t"
<< "---" << endl;
    }
}
bool flag = true;
for (int i = 0; i < m; i++)
{
    if (Processes[i].allocated == false)
    {
        flag = false;
        break;
    }
}

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    }
    else
    {
        continue;
    }
}

int IF = 0, EF = 0;
for (int i = 0; i < n; i++)
{
    if (blocks[i].used == true)
    {
        IF += blocks[i].rem;
    }
    else
    {
        if (flag == false)
        {
            EF += blocks[i].rem;
        }
    }
}

cout << "Total Internal Fragmentation = " << IF << endl;
cout << "Total External Fragmentation = " << EF << endl;
return 0;
}

```

OUTPUT

```

No. of block : 3
Enter Size of the 3 Blocks: 5 10 20
No. of Process : 3
Enter Name and size of the Processes: p1 10 p2 20 p3 30

```

| Block Number | Size | Process Allocated | Internal Fragmentation |
|--------------|------|-------------------|------------------------|
| 1 | 5 | --- | --- |
| 2 | 10 | p1 | 0 |
| 3 | 20 | p2 | 0 |

```

Total Internal Fragmentation = 0
Total External Fragmentation = 5
PS C:\Users\aadil\Desktop\CSE\OS Lab> 

```

Thank you