Operating System Practicals

Final Practical Exam

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Write a C program for implement the following algorithm:
Step 1: Start the program.
Step 2: Get the number of files.
Step 3: Get the memory requirement of each file.
Step 4: Allocate the required locations to each in sequential order
Randomly select a location from availablelocation s1= random(100);

```
#include <bits/stdc++.h>
#define ll long long int
#define MAX_SIZE 100
using namespace std;

int main()
{
   cout << "Operating System Practical Exam" << endl;
   cout << "Sequential Memory Allocation" << endl;
   unordered_map<ll, ll> memory;

   ll moreFiles = 1;
   ll allocatedMemory = 0;
   ll fileIdx = 0;
   while (moreFiles)
   {
       cout << "Do you want to Allocate Memory for Files? (Y-1, N-0): ";
       cin >> moreFiles;
       if (!moreFiles)
           break;
       if (moreFiles != 1)
       {
           cout << "Invalid Option" << endl;
           continue;
       }
       ll startingBlock, fileSize;
       cout << "Please enter File starting Block(in Units): ";
       cin >> startingBlock;
       cout << "Please ener File Size(in Units): ";
       cin >> fileSize;
       ll pass = 0;
       for (int i = startingBlock; i < startingBlock + fileSize; i++)
```

```
        {
            if (memory.find(i) != memory.end() || i < 0 || i >= MAX_SIZE)
            {
                cout << "Unable to occupy Memory! Either Memory is occupied or exceeds
Main Memory Size!" << endl;
                pass = 1;
                break;
            }
        }
        if (!pass)
        {
            for (int i = startingBlock; i < startingBlock + fileSize; i++)
            {
                memory[i] = fileIdx;
            }
            fileIdx++;
        }
    }
    srand(time(NULL));
    ll randomLocation = rand() % MAX_SIZE;
    string ans = memory.find(randomLocation)==memory.end()?"No File Occupies this
Unit":to_string(memory[randomLocation]) ;
    cout << "Chosen Random Unit: " << randomLocation << endl;
    cout << "File Index that occupies Unit: " << ans << endl;
}
```

```
krhero@hellblazer:/mnt/0FB812900FB81290/BTech/Assignments/3rd_Year/OS/Practical_Exam$ ./a.out
Operating System Practical Exam
Sequential Memory Allocation
Do you want to Allocate Memory for Files? (Y-1, N-0): 1
Please enter File starting Block(in Units): 3
Please ener File Size(in Units): 17
Do you want to Allocate Memory for Files? (Y-1, N-0): 1
Please enter File starting Block(in Units): 4
Please ener File Size(in Units): 5
Unable to occupy Memory! Either Memory is occupied or exceeds Main Memory Size!
Do you want to Allocate Memory for Files? (Y-1, N-0): 1
Please enter File starting Block(in Units): 21
Please ener File Size(in Units): 70
Do you want to Allocate Memory for Files? (Y-1, N-0): 0
Chosen Random Unit: 77
File Index that occupies Unit: 1
```