

CSE 2003

Data Structures and Algorithms

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digital assignment - 1

# **Question 3 – Hashing in Array**

Consider an array with the following integers **{11, 324, 132, 144, 212, 442, 165, 754, 132, 546, 234, 88, 768, 576, 432, 333, 591, 712, 113, 312}**. Consider a 5×5 matrix that maintains a bucket for the hashing function defined ‘modulo 5’. For example, consider 11, 11 % 5 = 1. Therefore 11 is placed at the position (1,0) (i=1 and j=0) in the matrix. Similarly, the number 324, 324 % 5 = 4, is placed at the position (4,0) (i=4 and j=0) in the matrix. However, consider 144, 144 % 5 = 4. Now since (4,0) is already filled, this number is placed at (4,1) (i=4 and j=1). If, however, all the ‘j’th places in the row ‘i’ are filled, the number is discarded. Primarily, initialize the entire matrix to -1. Inscribe a code to display the bucket matrix for the array given above.

# **Code**

#include<iostream>

using namespace std;

void insert (int a[5][5], int n, int j)

{

int i;

i=n%5;

if(j<=4)

{

if(a[i][j]==-1)

{

a[i][j]=n;

return;

}

else

{

insert(a,n,j+1);

}

}

}

void pr(int a[5][5], int n)

{

int x,y;

cout<<"\n";

for(x=0;x<n;x++)

{

for(y=0;y<n;y++)

cout<<a[x][y]<<' ';

cout<<"\n";

}

}

int main()

{

int i,n,f;

int a[5][5] = {{-1,-1,-1,-1,-1},{-1,-1,-1,-1,-1},{-1,-1,-1,-1,-1},{-1,-1,-1,-1,-1},{-1,-1,-1,-1,-1}};

int al[] = {11, 324, 132, 144, 212, 442, 165, 754, 132, 546, 234, 88, 768, 576, 432, 333, 591, 712, 113, 312};

n=5;

f=20; // Total Number of values

for(i=0;i<f;i++)

{

insert(a,al[i],0);

}

pr(a,n);

}

# **Output**

