/\*\*

\* Java program to implement Hash Table

\*\*/

import java.util.Scanner;

class HashTable

{

int[] arr;

int capacity;

/\*\* constructor \*\*/

public HashTable(int capacity)

{

this.capacity = nextPrime(capacity);

arr = new int[this.capacity];

}

/\*\* function to insert \*\*/

public void insert(int ele)

{

arr[ele % capacity] = ele;

}

/\*\* function to clear \*\*/

public void clear()

{

arr = new int[capacity];

}

/\*\* function contains \*\*/

public boolean contains(int ele)

{

return arr[ele % capacity] == ele;

}

/\*\* function to delete \*\*/

public void delete(int ele)

{

if (arr[ele % capacity] == ele)

arr[ele % capacity] = 0;

else

System.out.println("\nError : Element not found\n");

}

/\*\* Function to generate next prime number >= n \*\*/

private static int nextPrime( int n )

{

if (n % 2 == 0)

n++;

for (; !isPrime(n); n += 2);

return n;

}

/\*\* Function to check if given number is prime \*\*/

private static boolean isPrime(int n)

{

if (n == 2 || n == 3)

return true;

if (n == 1 || n % 2 == 0)

return false;

for (int i = 3; i \* i <= n; i += 2)

if (n % i == 0)

return false;

return true;

}

/\*\* function to print hash table \*\*/

public void printTable()

{

System.out.print("\nHash Table = ");

for (int i = 0; i < capacity; i++)

System.out.print(arr[i] +" ");

System.out.println();

}

}

/\*\* Class HashTableTest \*\*/

public class HashTableTest

{

public static void main(String[] args)

{

Scanner scan = new Scanner(System.in);

System.out.println("Hash Table Test\n\n");

System.out.println("Enter size");

/\*\* Make object of HashTable \*\*/

HashTable ht = new HashTable(scan.nextInt() );

char ch;

/\*\* Perform HashTable operations \*\*/

do

{

System.out.println("\nHash Table Operations\n");

System.out.println("1. insert ");

System.out.println("2. remove");

System.out.println("3. contains");

System.out.println("4. clear");

int choice = scan.nextInt();

switch (choice)

{

case 1 :

System.out.println("Enter integer element to insert");

ht.insert( scan.nextInt() );

break;

case 2 :

System.out.println("Enter integer element to delete");

ht.delete( scan.nextInt() );

break;

case 3 :

System.out.println("Enter integer element to check if present");

System.out.println("Contains : "+ ht.contains(scan.nextInt() ));

break;

case 4 :

ht.clear();

System.out.println("Hash Table Cleared\n");

break;

default :

System.out.println("Wrong Entry \n ");

break;

}

/\*\* Display hash table \*\*/

ht.printTable();

System.out.println("\nDo you want to continue (Type y or n) \n");

ch = scan.next().charAt(0);

} while (ch == 'Y'|| ch == 'y');

}

}

Hash Table Test

Enter size

10

Hash Table Operations

1. insert

2. remove

3. contains

4. clear

1

Enter integer element to insert

28

Hash Table = 0 0 0 0 0 0 28 0 0 0 0

Do you want to continue (Type y or n)

y

Hash Table Operations

1. insert

2. remove

3. contains

4. clear

1

Enter integer element to insert

24

Hash Table = 0 0 24 0 0 0 28 0 0 0 0

Do you want to continue (Type y or n)

y

Hash Table Operations

1. insert

2. remove

3. contains

4. clear

1

Enter integer element to insert

14

Hash Table = 0 0 24 14 0 0 28 0 0 0 0

Do you want to continue (Type y or n)

y

Hash Table Operations

1. insert

2. remove

3. contains

4. clear

1

Enter integer element to insert

19

Hash Table = 0 0 24 14 0 0 28 0 19 0 0

Do you want to continue (Type y or n)

y

Hash Table Operations

1. insert

2. remove

3. contains

4. clear

1

Enter integer element to insert

94

Hash Table = 0 0 24 14 0 0 94 0 19 0 0

Do you want to continue (Type y or n)

y

Hash Table Operations

1. insert

2. remove

3. contains

4. clear

1

Enter integer element to insert

17

Hash Table = 0 0 24 14 0 0 17 0 19 0 0

Do you want to continue (Type y or n)

y

Hash Table Operations

1. insert

2. remove

3. contains

4. clear

3

Enter integer element to check if present

94

Contains : false

Hash Table = 0 0 24 14 0 0 17 0 19 0 0

Do you want to continue (Type y or n)

y

Hash Table Operations

1. insert

2. remove

3. contains

4. clear

3

Enter integer element to check if present

17

Contains : true

Hash Table = 0 0 24 14 0 0 17 0 19 0 0

Do you want to continue (Type y or n)

y

Hash Table Operations

1. insert

2. remove

3. contains

4. clear

2

Enter integer element to delete

17

Hash Table = 0 0 24 14 0 0 0 0 19 0 0

Do you want to continue (Type y or n)

y

Hash Table Operations

1. insert

2. remove

3. contains

4. clear

1

Enter integer element to insert

94

Hash Table = 0 0 24 14 0 0 94 0 19 0 0

Do you want to continue (Type y or n)

y

Hash Table Operations

1. insert

2. remove

3. contains

4. clear

4

Hash Table Cleared

Hash Table = 0 0 0 0 0 0 0 0 0 0 0

Do you want to continue (Type y or n)

n