Sai Kham Sheng 5717607

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package BankerAlgorithm;

import java.util.Scanner;

public class banker {
	private int need[][], allocate[][], max[][],avail[], numPro, numRe;

	private void input(){
		Scanner sn = new Scanner (System.in);
		System.out.print("Enter no. of processes : ");
		numPro = sn.nextInt();
		System.out.print("Enter no. of resources: ");
		numRe = sn.nextInt();
		need = new int [numPro][numRe];
		max = new int [numPro][numRe];
		allocate = new int [numPro][numRe];
		avail = new int [numRe];

		System.out.println("Enter allocation number");
		for (int i=0;i<numPro;i++)
			for (int j=0;j<numRe;j++)
				allocate[i][j] = sn.nextInt();

		System.out.println("Enter max number");
		for (int i=0;i<numPro;i++)
			for (int j=0;j<numRe;j++)
				max[i][j] = sn.nextInt();

		System.out.println("Enter available number");
			for (int j=0;j<numRe;j++)
				avail[j] = sn.nextInt();

		sn.close();
	}

	private int [][] cal_need(){
		for (int i=0;i<numPro;i++)
			for (int j=0;j<numRe;j++)
				need[i][j] = max[i][j]-allocate[i][j];
		return need;
	}

	private boolean check (int i){
		for (int j=0;j<numRe;j++)
			if (avail[j]>need[i][j])
				return true;
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            return false;
      }

      public void isSafe(){
            input();
            cal_need();
            boolean done [] = new boolean [numPro];
            int  j = 0;
            while (j<numPro){ //until all process allocate
                  boolean allocated = false;
                  for(int i=0;i<numPro;i++)
                     if(!done[i] && check(i)){
                        for (int k=0;k<numRe;k++)
                              avail[k] = avail[k]-need[i][k]+max[i][k];
                        System.out.println("Allocated process : "+i);
                        allocated = done[i] = true;
                        j++;
                     }
                        if (!allocated) break;
            }
            if (j == numPro)
                  System.out.println("\n Safely allocated");
            else
                  System.out.println("All process cant be allocated
safely");
            }

      public static void main (String [] args){
            new banker().isSafe();
      }
}
```