Assignment One: DP Nim multiple piles

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Problem instance – bool win(int A, int B, int C)

Input – Pile sizes (int A,B,C)

Output – Boolean (True/False)

Simple problem – win(int A, int B, int C) when, A=0, B=0, C=0

Simple solution – return True

Problem reduction – win(A,B,C) -> Case 1: win(A-i,B,C), where (i=1, i<=A, i++)

Case 2: win(A,B-j,C), where (j=1, j<=B, j++)

Case 3: win(A,B,C-k), where (k=1, k<=C, k++)

Solution construction :–

```
bool win(int A, int B, int C)
{
        if (A==0 && B==0 && C==0)
        return true; //base case
        for(i=1; i<=A; i++)
                if(win(A-i, B, C) == false)
                        return true;
        for(j=1; j<=B; j++)
                if(win(A, B-j, C) == false)
                        return true;
        for(k=1; k<=C; k++)
                if(win(A, B, C-k) == false)
                        return true;
        return false; //if none of the conditions are correct
}
```