**package** AlgorithmDpPractise;

**class** coinChangeProblemUsingDp

{

**public int**[] **coins**;

**public int amount**;

**public int**[][] **solutions**;

**public** coinChangeProblemUsingDp(**int**[] coins, **int** amount) {

**this**.**coins** = coins;

**this**.**amount** = amount;

**this**.**solutions** = **new int**[coins.**length**+1][amount+1];

}

**public void** minimumWaysPrint()

{

**for** (**int** i = 0; i <=**coins**.**length** ; i++)

{

**solutions**[i][0] = 0;

}

**for** (**int** j = 1;j<=**amount**;j++)

{

**solutions**[0][j] = j;

}

**for** (**int** i=1;i<=**coins**.**length**;i++)

{

**for** (**int** j=1;j<=**amount**;j++)

{

**if** (**coins**[i-1]<=j)

{

**solutions**[i][j] = Math.*min*(**solutions**[i-1][j], 1 + **solutions**[i][j-**coins**[i-1]]);

}

**else**

{

**solutions**[i][j] = **solutions**[i-1][j];

}

}

}

System.***out***.println(**"The tabulation form is :"**);

System.***out***.println(**"---------------------------------------------------------------------------------------"**);

**for** (**int** i=0;i<=**coins**.**length**;i++)

{

**for** (**int** j=0;j<=**amount**;j++)

{

System.***out***.print(**solutions**[i][j]+**" "**);

}

System.***out***.println();

}

System.***out***.println(**"---------------------------------------------------------------------------------------"**);

System.***out***.println(**"Minimum Number of coins is required = "**+**solutions**[**coins**.**length**][**amount**]);

}

}

**public class** MinimumNumberOfWays {

**public static void** main(String[] args) {

**int**[] coins = {1, 2, 5, 10};

**int** amount = 48;

coinChangeProblemUsingDp coinChange = **new** coinChangeProblemUsingDp(coins,amount);

coinChange.minimumWaysPrint();

}

}