Assignment 4 1 - Program

```
#open the output file in 'w'rite mode
fout = open('assign_4_1.out','w')

#loop over relevant range for the song
for i in range(22,0,-1):
  if (i > 2):
    #if both are plural, write song like this...
    myline = str(i)+' bottles of beer on the wall '+str(i)+' bottles of beer, you take one down, pass it around, '+str(i-1)+' bottles of beer on the wall'
  elif (i == 2):
    #...if second is singular, write it like this...
    myline = str(i)+' bottles of beer on the wall '+str(i)+' bottles of beer, you take one down, pass it around, '+str(i-1)+' bottle of beer on the wall'
  elif (i == 1):
    #...if first is singular, write it like this.
    myline = str(i)+' bottle of beer on the wall '+str(i)+' bottle of beer, you take one down, pass it around, '+str(i-1)+' bottles of beer on the wall'
  print myline #print to screen
  fout.write(myline+'\n') #write to file. Remember the extra ' +'\n' ', needed to produce a line break between the song lines


######*OR*

#define the whole line including formatting statements for values/words to be inserted later.
# '%d' means integer, '%s' means string
myline = '%d %s of beer on the wall %d %s of beer, you take one down, pass it around, %d %s of beer on the wall'
for i in range(22,0,-1):
  if (i > 2):
    #if both are plural, both words are 'bottles'
    word1 = word2 = 'bottles'
  elif (i == 2):
    word1 = 'bottles'
    word2 = 'bottle'
  elif (i == 1):
    word1 = 'bottle'
    word2 = 'bottles'
  print myline%(i,word1,i,word1,i-1,word2)#the %() bit indicates what values/strings are meant to be filled into the waiting formatting statements
  fout.write(myline%(i,word1,i,word1,i-1,word2)+'\n')

fout.close
```

Assignment 4 1 - Output

```
22 bottles of beer on the wall 22 bottles of beer, you take one down, pass it around, 21 bottles of beer on the wall
21 bottles of beer on the wall 21 bottles of beer, you take one down, pass it around, 20 bottles of beer on the wall
20 bottles of beer on the wall 20 bottles of beer, you take one down, pass it around, 19 bottles of beer on the wall
19 bottles of beer on the wall 19 bottles of beer, you take one down, pass it around, 18 bottles of beer on the wall
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18 bottles of beer on the wall 18 bottles of beer, you take one down, pass it around, 17 bottles of beer on the wall
17 bottles of beer on the wall 17 bottles of beer, you take one down, pass it around, 16 bottles of beer on the wall
16 bottles of beer on the wall 16 bottles of beer, you take one down, pass it around, 15 bottles of beer on the wall
15 bottles of beer on the wall 15 bottles of beer, you take one down, pass it around, 14 bottles of beer on the wall
14 bottles of beer on the wall 14 bottles of beer, you take one down, pass it around, 13 bottles of beer on the wall
13 bottles of beer on the wall 13 bottles of beer, you take one down, pass it around, 12 bottles of beer on the wall
12 bottles of beer on the wall 12 bottles of beer, you take one down, pass it around, 11 bottles of beer on the wall
11 bottles of beer on the wall 11 bottles of beer, you take one down, pass it around, 10 bottles of beer on the wall
10 bottles of beer on the wall 10 bottles of beer, you take one down, pass it around, 9 bottles of beer on the wall
9 bottles of beer on the wall 9 bottles of beer, you take one down, pass it around, 8 bottles of beer on the wall
8 bottles of beer on the wall 8 bottles of beer, you take one down, pass it around, 7 bottles of beer on the wall
7 bottles of beer on the wall 7 bottles of beer, you take one down, pass it around, 6 bottles of beer on the wall
6 bottles of beer on the wall 6 bottles of beer, you take one down, pass it around, 5 bottles of beer on the wall
5 bottles of beer on the wall 5 bottles of beer, you take one down, pass it around, 4 bottles of beer on the wall
4 bottles of beer on the wall 4 bottles of beer, you take one down, pass it around, 3 bottles of beer on the wall
3 bottles of beer on the wall 3 bottles of beer, you take one down, pass it around, 2 bottles of beer on the wall
2 bottles of beer on the wall 2 bottles of beer, you take one down, pass it around, 1 bottle of beer on the wall
1 bottle of beer on the wall 1 bottle of beer, you take one down, pass it around, 0 bottles of beer on the wall
22 bottles of beer on the wall 22 bottles of beer, you take one down, pass it around, 21 bottles of beer on the wall
21 bottles of beer on the wall 21 bottles of beer, you take one down, pass it around, 20 bottles of beer on the wall
20 bottles of beer on the wall 20 bottles of beer, you take one down, pass it around, 19 bottles of beer on the wall
19 bottles of beer on the wall 19 bottles of beer, you take one down, pass it around, 18 bottles of beer on the wall
18 bottles of beer on the wall 18 bottles of beer, you take one down, pass it around, 17 bottles of beer on the wall
17 bottles of beer on the wall 17 bottles of beer, you take one down, pass it around, 16 bottles of beer on the wall
16 bottles of beer on the wall 16 bottles of beer, you take one down, pass it around, 15 bottles of beer on the wall
15 bottles of beer on the wall 15 bottles of beer, you take one down, pass it around, 14 bottles of beer on the wall
14 bottles of beer on the wall 14 bottles of beer, you take one down, pass it around, 13 bottles of beer on the wall
13 bottles of beer on the wall 13 bottles of beer, you take one down, pass it around, 12 bottles of beer on the wall
12 bottles of beer on the wall 12 bottles of beer, you take one down, pass it around, 11 bottles of beer on the wall
11 bottles of beer on the wall 11 bottles of beer, you take one down, pass it around, 10 bottles of beer on the wall
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10 bottles of beer on the wall 10 bottles of beer, you take one down, pass it around, 9 bottles of beer on the wall
9 bottles of beer on the wall 9 bottles of beer, you take one down, pass it around, 8 bottles of beer on the wall
8 bottles of beer on the wall 8 bottles of beer, you take one down, pass it around, 7 bottles of beer on the wall
7 bottles of beer on the wall 7 bottles of beer, you take one down, pass it around, 6 bottles of beer on the wall
6 bottles of beer on the wall 6 bottles of beer, you take one down, pass it around, 5 bottles of beer on the wall
5 bottles of beer on the wall 5 bottles of beer, you take one down, pass it around, 4 bottles of beer on the wall
4 bottles of beer on the wall 4 bottles of beer, you take one down, pass it around, 3 bottles of beer on the wall
3 bottles of beer on the wall 3 bottles of beer, you take one down, pass it around, 2 bottles of beer on the wall
2 bottles of beer on the wall 2 bottles of beer, you take one down, pass it around, 1 bottle of beer on the wall
1 bottle of beer on the wall 1 bottle of beer, you take one down, pass it around, 0 bottles of beer on the wall
```

Assignment 4 2 - Program

```
#open file for output
fout = open('assign_4_2.out','w')

#read in two integers from user
num_students = int(raw_input('Specify number of students: '))
num_assignments = int(raw_input('Specify number of assignments: '))

#initialise counter to be used for counting all successful outputs
total_outputs = 0

#create a formatted header for the table; a string (%s), which is 12 characters wide (%12s)
header = '%12s %12s'%('Student','Assignment')
print header
fout.write(header+'\n')

#nested loops for going through all assignments for a student, then next student, and so on
for i in range(num_students):
  for j in range(num_assignments):
    # +1 because python default is to count and index from zero up, not from one up
    line = '%12d %12d'%(i+1,j+1)
    print line
    fout.write(line+'\n')
    total_outputs += 1

#line with the total number of outputs
footer = 'Total of %d output lines'%(total_outputs)
print footer
fout.write(footer+'\n')

fout.close()
```

Assignment 4 2 - Output

```
      Student    Assignment
            1             1
            1             2
            1             3
            1             4
            2             1
            2             2
            2             3
            2             4
            3             1
            3             2
            3             3
            3             4
            4             1
            4             2
            4             3
            4             4
            5             1
            5             2
            5             3
            5             4
            6             1
            6             2
            6             3
            6             4
            7             1
            7             2
            7             3
            7             4
Total of 28 output lines
```