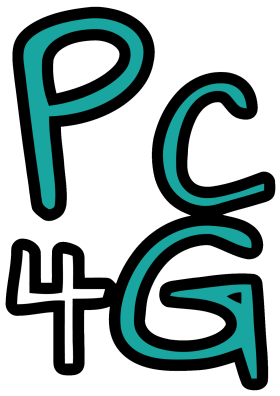

Programming Contest for Girls

Example Problems v2.1

Contents

Cheat Sheet #1

Text above code is example **input**. Text below code is **output**.

One Line as a String

```
Line of text.
```

```
string = input()
```

One Line as an Integer

```
42
```

```
a = int(input())
```

Line-separated

```
42
7
```

```
a = int(input())
b = int(input())
```

Space-separated

```
42 7
```

```
parts = input().split()
a = int(parts[0])
b = int(parts[1])
```

Note that `parts` is a list of strings.

Integer Division

```
a = 14
b = 5
print(a // b)
```

```
2
```

Remainder

```
a = 14
b = 5
print(a % b)
```

```
4
```

Conditions

```
a = 3
if a == 1:
  ...
elif a >= 5 and a < 10:
  ...
else:
  ...
```

For Loop

```
for i in range(0, 3):
  print(i)
```

```
0
1
2
```

While Loop

```
i = 0
while i != 3:
  print(i, end=" ")
  i += 1
print()
```

```
0 1 2
```

Indexing

```
pos = 1

word = "abcde"
print(word[pos])

lst = [1, 2, 3]
print(lst[pos])
```

```
b
2
```

Length

```
word = "abcd"
print(len(word))

lst = [1, 2, 3]
print(len(lst))
```

```
4
3
```

Contains

```
lst = [1, 2, 3]
print(1 in lst)

word = "abc"
print('a' in word)
```

```
True
True
```

Cheat Sheet #2

Text above code is example **input**. Text below code is **output**.

Quotes

```
print('Say "Hello".')
```

```
Say "Hello".
```

F-Strings

```
num = 4
b = "G"
print(f"PC{num}{b}")
```

```
PC4G
```

Multiply Strings

```
print(3 * "Meow ")
```

```
Meow Meow Meow
```

Combine Strings

```
a = "PC"
num = 4
b = "G"
s = a + str(num) + b
print(s)
```

```
PC4G
```

Sort a List

```
lst = [1, 3, 2]
lst.sort()
print(lst)
```

```
[1, 2, 3]
```

Append to List

```
mylist = [1, 2]
mylist.append(3)
print(mylist)
```

```
[1, 2, 3]
```

Insert in List

```
lst = [1, 2, 3]
lst.insert(1, 'x')
print(lst)
```

```
[1, 'x', 2, 3]
```

Remove from List

```
lst = ["x", "y", "z"]
last = lst.pop(1)  # "y"
print(lst)
```

```
['x', 'z']
```

Set Item in List

```
lst = [1, 2, 3]
lst[1] = "x"
print(lst)
```

```
[1, 'x', 3]
```

Index of Item in a List

```
lst = ['a', 'b', 'c']
pos = lst.index('b')
print(pos, lst[pos])
```

```
1 b
```

The Moon

Problem 1 (5 points)

Print, as a single integer on a single line, the total number of moons in orbit around the third planet from the sun.

Hint

- Use `print()` to output your answer.

Multi-Pie

Problem 2 (5 points)

You work at a bakery making pies. Pies are arranged in rows on a large baking tray. Given the number of pies that fit in each row and the number of rows that fit on each tray, how many pies can you fit on a tray? As input, you will receive two positive **integers** each on their own line, representing the pies per row and the number or rows, respectively. Print the total number of pies you can fit on a tray.

Input

```
3
5
```

Output

```
15
```

Input

```
4
7
```

Output

```
28
```

Hints

- Use `int(input())` to read a line of text into your program and convert it to an integer.
- **Do not** use a prompt like `input("Person 1: ")` as these will cause your submission to be incorrect.

Tech Support

Problem 3 (5 points)

Your friend is always asking for help using her phone. She asks the same questions so frequently that you've decided to write a program to automate your replies. As input, you will receive two space-separated strings on a single line, representing the the words to insert into your reply. Print the phrase "`Don't worry! Go to X and then find Y.`", where `X` is replaced with the first given string and `Y` is replaced with the second given string.

Input

```
Settings Bluetooth
```

Output

```
Don't worry! Go to Settings and then find Bluetooth.
```

Hint

- Take care to match spelling and punctuation exactly.

Ribbons

Problem 4 (5 points)

You and your friend are making decorations for a birthday party using ribbon. Write a program that calculates how many decorations you can make with a given length of ribbon.

The first line of input is a single non-negative integer, the length of ribbon you have. The next line contains the length, as a non-negative integer, of ribbon you need to make a single decoration.

Output the number of decorations you can make with the ribbon you have on a single line. On the next line, output the amount of ribbon you will have left over.

Input

```
5
3
```

Output

```
1 2
```

Input

```
30
10
```

Output

```
3 0
```

Hint

- What mathematical operations could help here?

Party Hats

Problem 5 (15 points)

Write a program to draw a party hat of a given size. A party hat forms an equilateral triangle with a given number of * on each side. There is a single space between each star on the last row. There is no leading space on the last row. A hat is symmetric about its vertical centreline. A hat of size 1 is just a single star. Input is a single positive integer (greater than zero) on a single line, the number of asterisks along each side. Your output must match the expected output exactly.

Input

```
3
```

Output

```
  *
 * *
* * *
```

Input

```
4
```

Output

```
   *
  * *
 *   *
* * * *
```

Harder questions may not have hints.