Lab 2 Gps 1-8 Solutions

1. Vowels 15

Write a program to print if the given character string s is a vowel or not. Print **YES** if it is a vowel and **NO** otherwise.

Input Format

A character string s

Constraints

Length of s will be 1

Output Format

Print **YES** if s is a vowel and **NO** otherwise.

Sample Input 0

```
a
```

Sample Output 0

```
YES
```

Explanation 0

As "a" is a vowel

Solution

```
s=input()
if(s=='a' or s=='e' or s=='i' or s=='o' or s=='u'):
    print("YES")
else:
    print("NO")
```

2. Am I a Triangle?

Given three sides of a triangle a, b and c (where a, b and c are integers), check if it is a valid triangle inequality property which is that the sum of any two sides is greater than the third side. Print **VALID** for a valid triangle and **NOT VALID** otherwise.

Input Format

The first line contains the value of a
The second line contains the value of b
The third line contains the value of c

Constraints

$0 < a \leq 1000$
$0 < b \leq 1000$
$0 < c \leq 1000$

Output Format

Print **VALID** for a valid triangle and **NOT VALID** otherwise.

Sample Input 0

```
1
2
4
```

Sample Output 0

```
NOT VALID
```

Explanation 0

Here, $a = 1$, $b = 2$ and $c = 4$. As the value of $a + b = 1 + 2 = 3$ and as here, $c > a + b$. It violates the triangle inequality property, so we print **NOT VALID**

Solution

```
a = int(input())
b = int(input())
c = int(input())
if(a+b<c):
    print("NOT VALID")
elif(b+c<a):
    print("NOT VALID")
elif(a+c<b):
    print("NOT VALID")
else:
    print("VALID")
```

3. Motorbike Shopping

Himanshu is looking for a new motorbike to race at the National Motocross Championship held in Patna, Bihar. He visits the nearby Decathlon store in the mall to purchase the motorbike out of a variety of motorbikes

Write a program to accept the cost price of the motorbike and display the final Amount to be paid by Himanshu according to the following criteria :

```
Cost price (in Rs)                                  Tax

> 100,000                                           15 %
> 75,000 and <= 100,000                             12 %
> 50,000 and <= 75,000                              10 %
<= 50,000                                           5 %
```

Input Format

Take integer-valued input for Cost Price of Motorbike

Constraints

0<=cost_price<=1,000,000

Output Format

Return integer-valued Final Amount to be paid

Sample Input 0

```
60000
```

Sample Output 0

```
66000
```

Explanation 0

For Cost Price = 60,000,

Tax % = 10 %

Total Amount= 60,000 + 6,000= 66,000

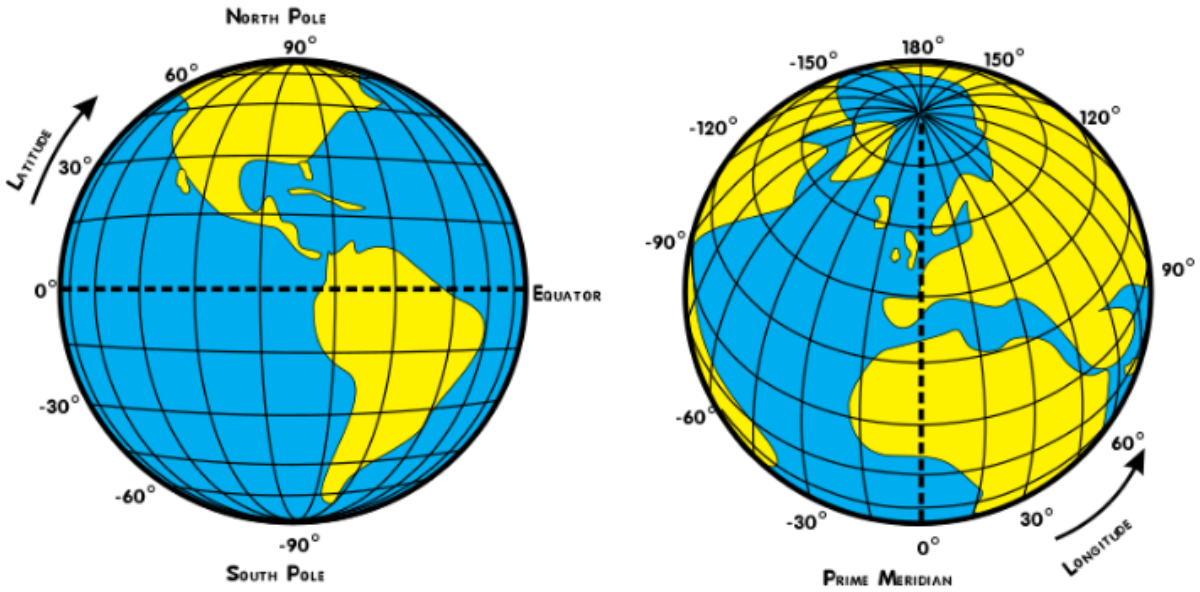
Solution

```
price=int(input())
if price<=50000:
    print(int(price+ (5/100)*price))
elif price<=75000:
    print(int(price+ (10/100)*price))
elif price<=100000:
    print(int(price+ (12/100)*price))
else:
    print(int(price+ (15/100)*price))
```

4. Lat and Long

Given latitude and longitude coordinates, print out whether it's in the northern or southern hemisphere, and whether west or east from the prime meridian.

Use this image to know for which all cases the latitude/longitude should be positive or negative.



Input Format

There will be 2 float values for input.

- Latitude (float)
- Longitude (float)

Constraints

- -90 <= Latitude <= 90
- -180 <= Longitude <= 180

There won't be any test cases which lie 'on' the equator or the prime meridian.

Output Format

The output will be a string from one of these options:

- "North West"
- "North East"
- "South West"
- "South East"

Sample Input 0

```
34.877
-26.562
```

Sample Output 0

```
North West
```

Explanation 0

According to the image, the latitude 34.877 lies above the equator, and the longitude -26.562 lies to the left of the prime meridian.

Solution

```python
lat = float(input())
lon = float(input())

if lat > 0 and lon < 0:
    print("North West")

elif lat > 0 and lon > 0:
    print("North East")

elif lat < 0 and lon < 0:
    print("South West")

elif lat < 0 and lon > 0:
    print("South East")
```

5. Jon Snow vs Night King

Jon Snow is trying to fight the Night King. He decides to use his "Valyrian Steel" sword to attack his enemy and inflict excruciating damage. The Night King has a health 10,000 HP and he intends to survive Jon Snow's attacks. The Night King doesn't survive the duel if the total_damage $\geq$ 10,000 HP. You will be given a $time\_unit$ ('second', 'minute' or 'hour'), which means for how long will Jon Snow attack. For example, if $time\_unit$ is 'hour' then Jon Snow will attack the Night King for an hour.

Print the total amount of damage inflicted by Jon Snow, and print a Boolean variable determining whether the Night King survives the duel or not.

Input Format

Take 3 inputs as follows:

- 1st line: Damage per attack (Integer)
- 2nd line: Attacks per second (Integer)
- 3rd line: Time unit (String: {'second', 'minute' or 'hour'})

Constraints

$0 \leq damage \leq 100$

$0 \leq attacks\_per\_second \leq 100$

$time\_unit : \{'second', 'minute', 'hour'\}$

Output Format

1st line contains Total Damage inflicted (integer)

2nd line contains whether the Night King survives or not (boolean)

Sample Input 0

```
20
10
minute
```

Sample Output 0

```
12000
False
```

Explanation 0

Total Damage= 20 * (10*60)= 12,000

12,000HP > 10,000HP => Night King doesn't survive = False

Solution

```
damage=int(input())
attack=int(input())
time=input()

if time=='second':
    final=damage*attack
    print(final)
    if final>=10000:
        print(False)
    else:
        print(True)

elif time=='minute':
    final=damage*attack*60
    print(final)
    if final>=10000:
        print(False)
    else:
        print(True)

else:
    final=damage*attack*3600
    print(final)
    if final>=10000:
        print(False)
    else:
        print(True)
```

6. Mini Quiz

Let's say you are giving a quiz consisting of only two questions.

1. "What is the capital of England?" ("London" is the answer)
2. "What is the capital of Italy?" ("Rome" is the answer)

You take in an input.

- If you get the answer correct on the first try, then print "Q1 10 points"
- If the answer is wrong, take another input.
- And if you answer it correctly in the second try, then print "Q1 5 points"
- If the answer is still wrong, take another input.
- Now, if you answer it correctly in the third try, then print "Q1 2 points"
- If the answer is still wrong, then print "Q1 0 points"

Note: Ask the second question **only** if the previous question is answered in the first 2 tries. Thus, do not simply take inputs for the second question.

The scoring/printing method is still the same. i.e.

- If you get the answer correct on the first try, then print "Q2 10 points"
- If the answer is wrong, take another input.
- And if you answer it correctly in the second try, then print "Q2 5 points"
- If the answer is still wrong, take another input.
- Now, if you answer it correctly in the third try, then print "Q2 2 points"
- If the answer is still wrong, then print "Q2 0 points"

Input Format

You have to take in inputs for possible answers to the above questions, i.e. you have to take in inputs for possible capital cities.

Constraints

All inputs will be **strings**. Eg: "London", "Berlin", "Rome".

Output Format

Depending upon the scenario, you have to output a **string** such as "Q1 10 points" and/or "Q2 5 points".

Sample Input 0

```
Berlin
London
Rome
```

Sample Output 0

```
Q1 5 points
Q2 10 points
```

Explanation 0

The first question was answered with 2 tries. (First attempt was wrong. Second attempt was right.) Thus "Q1 5 points" was printed.

The second question was answered with only 1 try. Thus "Q2 10 points" was printed.

Solution

```
q1_first = input()
if q1_first == "London":
    print("Q1 10 points")
    q2_first = input()
    if q2_first == "Rome":
        print("Q2 10 points")
    else:
        q2_second = input()
        if q2_second == "Rome":
            print("Q2 5 points")
        else:
            q2_third = input()
            if q2_third == "Rome":
                print("Q2 2 points")
            else:
                print("Q2 0 points")
else:
    q1_second = input()
    if q1_second == "London":
        print("Q1 5 points")
        q2_first = input()
        if q2_first == "Rome":
            print("Q2 10 points")
        else:
            q2_second = input()
            if q2_second == "Rome":
                print("Q2 5 points")
            else:
                q2_third = input()
                if q2_third == "Rome":
                    print("Q2 2 points")
                else:
                    print("Q2 0 points")
    else:
        q1_third = input()
        if q1_third == "London":
            print("Q1 2 points")
        else:
            print("Q1 0 points")
```

7. My Calculator v2.0

In this problem you need to make a calculator which has the following operations -

- **1** for integer division - When chosen this operation, the calculator inputs two integers a and b. Finally, print the result of their integer division.
- **2** for subtraction - When chosen this operation, the calculator inputs two integers a and b. Finally, print the result of their subtraction.
- **3** for absolute - When chosen this operation, the calculator inputs a single integer a. Finally, print the absolute value of a.
- **4** for divisibility test - When chosen this operation, the calculator inputs two integers a and b. Finally, print True if a is divisible by b and False otherwise.
- **5** for a special operation - When chosen this operation, the calculator inputs two integers a and b. Then, the operation works as follows -
  - If a is divisible by 4, print the value of $(a+b)^2$
  - Otherwise, print the value of $min(a, b)$

Input Format

First line will take the operation number to perform
Following lines take input as per defined in the operations

Constraints

$-1000 < a < 1000$
$-1000 < b < 1000$

Output Format

Print in accordance with the operation number and the following input values

Sample Input 0

```
1
2
3
```

Sample Output 0

```
0
```

Explanation 0

The operation number here is 1 which is integer division.
Integer division requires two inputs a and b. Here, the value of $a = 2$ and $b = 3$.
The result of float division of a and b is $\frac{a}{b} = \frac{2}{3} = 0.666667$
And as, we are looking for integer division the integer value of 0.666667 is 0
So, we print 0

Solution

```
choice = int(input())
if(choice!=3):
    a = int(input())
    b = int(input())
    if(choice==1):
        print(a//b)
    elif(choice==2):
        print(a-b)
    elif(choice==4):
        if(a%b==0):
            print(True)
        else:
            print(False)
    elif(choice==5):
        if(a%4==0):
            print((a+b)**2)
        else:
            if(a>b):
                print(b)
            else:
                print(a)
else:
    a = int(input())
    print(abs(a))
```