# Exercise: Leap years

You might know that roughly every four years, we have a leap year. 2000 was a leap year, so we can use this to write an if statement about this fact.

First let's ask the user of our program to enter a year. To do this, use `input`. This prompts the user with some text and stores their response in a variable, in this case `year`.

```
year = input("Enter a year: ")
print(year)
```

Put this code into a program, save it and run it. It should ask you to enter a year and say it back to you.

The variable stored from `input()` is a string, but we want to work with a number. To convert the string to an integer, use `int()`.

```
year = input("Enter a year: ")
year = int(year)
print(year)
```

The output should be the same, but now we have a number we can do arithmetic on. First we want to see how many years have passed since 2000.

```
years_since = year-2000
print(years_since)
```

We want to know whether this number is a multiple of 4. Python has an operation `%` which returns the remainder after division. To find the remainder after division by 4, do this.

```
rem = years_since % 4
print(rem)
```

Try entering a few years - 2024, 2025, 2026, etc. Do you get the answer you expect?

If the number is a multiple of four, the remainder we stored as `rem` will be `0`. We can test for this with an `if` statement.

```
if rem == 0:
    print("leap year!")
```

Running your whole program, you should now be able to enter a year since 2000 and if it is a multiple of 4 your program will say `"leap year!"`. Enter 2028 and see what happens.

But if the year isn't a leap year, nothing happens. We can report the non-leap years using `else`.

```
if rem == 0:
    print("leap year!")
else:
    print("not a leap year")
```

# Exercise

Actually, leap years are more complicated than this. The conditions in which a leap year occurs are:

- any year that is divisible by 400 is a leap year;

- of the remaining years, any year that is divisible by 100 is not a leap year;
- of the remaining years, any year that is divisible by 4 is a leap year;
- all other years are not leap years.

The code we have written above gives you everything you need to adapt to calculate leap years properly. Can you do this?