PFDS: FINAL EXAM -- TERM ONE (QUESTION 5)

What is a leap year?

The year which contains an extra day (366 days instead of 365 days) is known as a leap year. The day is added in February and it is 29th February (as per Gregorian Calendar). That's why 29th February is called the leap day.

Why does leap year happen?

Earth completes a single rotation around the sun exactly by 365.242375 days. But we count 365 days in a year. So there have an extra 0.242375 days in a complete rotation. After 400 years there are about 96.95 or 97 days extra. To catch up these extra days we count a year of 366 days in every 4th year. If we count an extra day in every 4th year, we can get 100 (400/4) leap years in 400 years. That means 100 extra days are added in 400 years to catch up with the extra 97 days. But this is not also accurate as there are added extra 3 days. To resolve this problem we count 97 leap years in 400 years instead of 100 leap years. So we exclude 100th, 200th and 300th years (which are exactly divided by 100) from the list of leap years.

How to calculate leap year?

To calculate a year whether it leap or not, you have to go through 3 simple steps.

1. If the year is not divisible by 4, then it is not a leap year. If the year is divisible by 4, then go to the next step.
2. If the year is not divisible by 100, then it is a leap year. If divisible, then go to the last step.
3. If the year is divisible by 400, then it is a leap year. If not, then it is not a leap year.

By these three steps, we can find out if a year is a leap or not.

Your Task: Write a program that asks a user for their name and birth year and then returns a statement similar to the following statement.

Your name is Tom and you were born in 1992, which is a leap year.

How to test your program:

Find two years that are leap years and two years that aren't leap years and use those 4 years to test your program.

Note: As an alternative you can makea table that has two columns -- one for Year (where 1990 <= Year <= 2025) and one for Leap Year (which will return either True or False). Also include a statement that gives the number of leap years from 1990 to 2025, inclusive.

In [11]:
```
def is_leap_year(year):
    if year % 4 != 0:
        return False
    else:
        if year % 100 != 0:
            return True
        else:
            if year % 400 == 0:
                return True
            else:
                return False

total = 0
for year in range(1990,2026):
    if is_leap_year(year):
        total += 1
    print(f"{year: <20} {is_leap_year(year)}")

print(f"Total number of leap years: {total}")
```

```
1990                False
1991                False
1992                True
1993                False
1994                False
1995                False
1996                True
1997                False
1998                False
1999                False
2000                True
2001                False
2002                False
2003                False
2004                True
2005                False
2006                False
2007                False
2008                True
2009                False
2010                False
2011                False
2012                True
2013                False
2014                False
2015                False
2016                True
2017                False
2018                False
2019                False
2020                True
2021                False
2022                False
2023                False
2024                True
2025                False
Total number of leap years: 9
```

In [ ]: