

## Problem 1 - 8 pts

Happy Chinese New Year! Every year on the lunar calendar is associated with a certain animal which follows the following cycle

1) Rat - 2) Ox - 3) Tiger - 4) Rabbit - 5) Dragon - 6) Snake - 7) Horse - 8) Goat - 9) Monkey - 10) Rooster - 11) Dog - 12) Pig

For example 1984 was the year of the rat and as the cycle repeats every 12 years so are the years 1996, 1972, etc.

The following code should take in a year and should return the number corresponding to the associated zodiac. For example `zodiac(1984)` should return 1. The function as written however may or may not contain bugs. If so point out all the bugs and correct them so the function behaves as expected. If not write "no bugs".

```
function zodiac( year )  
    reference = 1984 % 12  
    yearindex = year % 12 + 1  
    if yearindex > reference  
        return yearindex - reference  
    else  
        return yearindex + 8  
    end  
end
```

The problem here is really that % is base 0, but the answer should be base 1, like Julia arrays.

→ Add 1 to yearindex fixes it!

## Problem 2 - 12 Points

A given year is a leap year if it is divisible by 4 but not by 100 or if it is divisible by 400.

1. (8 pts) Write a Julia function `isLeapYear( year )` that takes in a year as an argument and returns true if it is a leap year and false otherwise.
2. (4 pts) Using the function `isLeapYear`, write some Julia code that prints out all leap years from the year 2022 to 2100. (You can receive full credit for this part even if your function `isLeapYear` is not entirely correct)

1) function `isLeapYear( year )`:

```
if year % 400 == 0  
    return true
```

```
elseif year % 4 == 0 && year % 100 != 0  
    return true
```

```
end  
return false
```

```
end
```

2) for year = 2022:2100

```
if isLeapYear(year)  
    println(year)
```

```
end
```

```
end
```