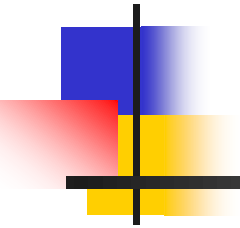


Project 5: Leap Years

Leap Years

- Write a program that reads an integer value from the user representing a year and determines if the year is a leap year in the Gregorian calendar (the normal calendar that we use.)
- A year is a leap year if it is divisible by 4, unless it is also divisible by 100 but not by 400.
- Output an error message for any input value less than 1582 (the year the Gregorian calendar was adopted.)

(This is Programming Project PP 5.1 in the textbook.)

Leap Years

Test your program using the following data:

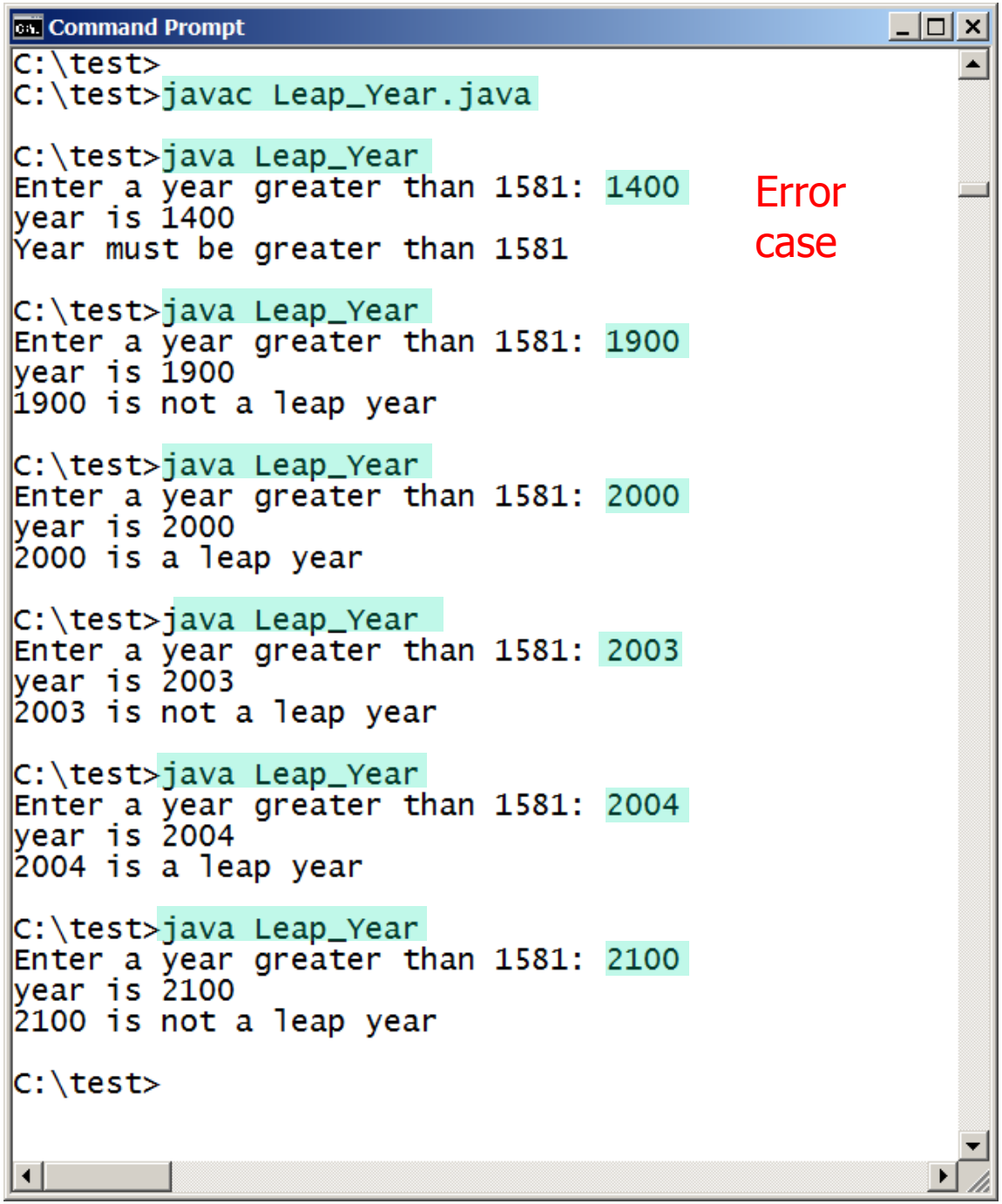
- 1400 Error
- 1900 Not leap year
- 2000 Is a leap year
- 2003 Not a leap year
- 2004 A leap year
- 2100 Not a leap year

General outline of your main function

- Declare your variables
  - The only variable you will need is an int to hold the year.
- Get the input from the user.
- Check for the year being valid
  - Greater than or equal to 1582.
- Determine if the year is a leap year, and output the result.

Sample Run

- Your output should be similar in format to that shown in the sample run shown on the next slide.


Command Prompt
C:\test>
C:\test>javac Leap_Year.java
C:\test>java Leap_Year
Enter a year greater than 1581: 1400
year is 1400
Year must be greater than 1581
C:\test>java Leap_Year
Enter a year greater than 1581: 1900
year is 1900
1900 is not a leap year
C:\test>java Leap_Year
Enter a year greater than 1581: 2000
year is 2000
2000 is a leap year
C:\test>java Leap_Year
Enter a year greater than 1581: 2003
year is 2003
2003 is not a leap year
C:\test>java Leap_Year
Enter a year greater than 1581: 2004
year is 2004
2004 is a leap year
C:\test>java Leap_Year
Enter a year greater than 1581: 2100
year is 2100
2100 is not a leap year
C:\test>
Error case

Writing the Program

- Start with a stub
  - Just output the prompt:
    - Enter a year greater than 1581
  - Compile and test after each step.
  - Always have a working program!

- Add code to get the input.
  - Instantiate a Scanner.
    - Remember to import java.util.Scanner
  - Declare an int variable for the input, year.
  - Read the input, year.
  - Output the year, so that you can verify that you read it correctly.

Writing the Program

- Check for the year being less than 1582. If it is, output an error message and terminate.
- If the year is greater than or equal to 1582, check if it is divisible by 4. If it is not, the year is not a leap year. Output the result and terminate.
- At this point you know that the year is valid and is divisible by 4. So it *could* be a leap year. Check if it is divisibe by 100. If not, it is a leap year. Output the result and terminate.

Writing the Program

- If you reach this step, the year is divisible by 100. Check if it is also divisible by 400. If it is, it is a leap year. Output the result and terminate.

- If you reach this point, the year is divisible by 100 but not by 400. That means that it is not a leap year. Output the result and terminate.

Implementation Hint

You will need multiple levels of **`if ... else`**

At each step, add another "else"

```
if (xxx)
{

}
else
{
        if (yyy)
        {
                ...
        }
        else
        {
                ...
        }
}
```

Submission

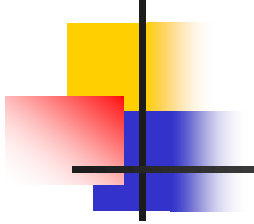
- Put your Java source file into a folder and zip it.
- Submit your zipped Java source file via Canvas Assignments.

- Project is due by 11:59 PM
  - Sunday, February 14 Sections 001 and 002
  - Monday, February 15 Sections 003 and 004

Ground Rules

- It is OK to *discuss* the project with other students BUT
  - Do not share your code with other students.
  - Before or after submitting the project.
- Do not copy any other student's code.
  - Or even look at it.
- Do not let anyone copy or examine your code.

Ground Rules



Except for code posted on the class web site

- Do not copy code from the Internet
  - or any other source (other than the textbook.)
- Do not ask for help on an Internet forum.
  - If you need help, ask your instructor or a TA.
  - Come to lab and help sessions.
- Write your own code.