AP Computer Science — Project 6 - Branching
Dr. Paul Bailey — Saturday, September 24, 2022

Due Sunday, October 2, 2022, at 11:59 PM.

The purpose of this project is practice branching commands `if` and `switch`, while continuing to get familiar with the complexities of date computations.

Create one directory called `P06_Branching` to store the `.java` files. Copy the `Tool`, `Date`, and `Program` classes from your last project into this one.

Create the following methods in the `Date` class, and in each case write code in the `Program` class to test the new methods.

Program 1. Create a method

```
public static String nameOfMonth(int M),
```

which takes the month number M (1 through 12) and returns a string which is the name of the month.

To do this, use a `switch` statement.

Program 2. Create a method

```
public static String nameOfWeekday(int W),
```

which takes a number W between 1 and 7 and returns the name of the day, where 1 is Sunday, 2 is Monday, and so forth, so that 7 is Saturday.

To do this, use a `switch` statement.

Program 3. Create a method

```
public static int daysInMonth(int M),
```

which will take a month number M (1 though 12) and returns the number of days in that month. February should return 28.

To do this, use a sequence of `if` statements.

Program 4. Create a method

```
public static boolean isLeapYear(int Y),
```

which takes a year Y (1000 through 9999) and returns `true` if Y is a leap year, and otherwise returns false.

A year is a leap year if it is a multiple of four, except that centuries are not leap years, except that every four hundred years is a leap year. For example, 1896 was a leap year, 1900 was NOT a leap year, but 2000 WAS a leap year.

Program 5. Create a method

```
public static int daysInMonth(int M, int Y),
```

which will take a month number (1 though 12) and returns the number of days in that month. February should return 29 if Y is a leap year, and 28 otherwise.

To do this, use the `daysInMonth(int M)` and `isLeapYear(int Y)` methods.

Program 6. Create a method

```
public static int daysInYear(int Y),
```

which returns the total number of days in a year. This will be 366 if the year is a leap year, and 365 otherwise.

Program 7. Create a method

```
public static int dayOfYear(int M, int D, int Y),
```

which takes a separated date, and returns the number of days in the year it represents.

For example, January 1 is day 1, and February 5 is $31 + 5 = 36$, and March 15 in a leap year is day $31 + 29 + 15 = 75$.

Program 8. Create a method

```
public static String fancyDate(int J)
```

which takes an internal date (Julian day number) and returns a description of the date. For example, if $J = 2459478$, the method will return the string

```
Monday, September 20, 2021.
```