Week 5 Homework Q22

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CE480 - Java and Internet Application

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# Author Note

# The Question

1. Create a class for Date.

2. The class should have member functions:

\* A constructor (i.e., manager function)

\* One get function for each data member

\* One set function for each data member

\* A predicate function to answer these two questions:

(1) Is this date the new year eve?

(2) Is this date Christmas?

\* An implementor function which calculates the accumulate date.

Thus, the function should convert the date into its corresponding.

N-th day of this year. When implementing this program, you may

assume that there are 365 days in a year. That is.

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| Month | Number of days |

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| 1 | 31 |

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| 2 | 28 |

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| 3 | 31 |

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| 4 | 30 |

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| 5 | 31 |

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| 6 | 30 |

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| 7 | 31 |

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| 8 | 31 |

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| 9 | 30 |

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| 10 | 31 |

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| 11 | 30 |

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| 12 | 31 |

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3. Test this class by creating two objects, today and tomorrow, in main().

4. Display the content of these two objects in main()

5. Check whether today is Christmas.

6. Check whether tomorrow is new year eve.

7. Display the N-day of the object today.

A screenshot of a computer program

Description automatically generated

Source Code

public class Date{

    private int day;

    private int month;

    private int year;

    // Constructor

    public Date(int day, int month, int year){

        this.day = day;

        this.month = month;

        this.year = year;

    }

    // Getters

    public int getDay(){

        return day;

    }

    public int getMonth(){

        return month;

    }

    public int getYear(){

        return year;

    }

    // Setters

    public void setDay(int day){

        this.day = day;

    }

    public void setMonth(int month){

        this.month = month;

    }

    public void setYear(int year){

        this.year = year;

    }

    // Predicate function to check if it's New Year's Eve

    public boolean isEve(){

        return (day == 31 && month == 12);

    }

    // Predicate function to check if it's Christmas

    public boolean isChristmas(){

        return (day == 25 && month == 12);

    }

    // Predicate function to check if it's Halloween

    public boolean isHalloween(){

        return (day == 31 && month == 10);

    }

    // Predicate function to check if it's Valentine's Day

    public boolean isValentine(){

        return (day == 14 && month == 2);

    }

    // Predicate function to check if it's April Fool's Day

    public boolean isAprilFools(){

        return (day == 1 && month == 4);

    }

    // Predicate function to check if it's my birthday

    public boolean isBirthday(){

        return (day == 12 && month == 3);

    }

    // Predicate function to check if it's a holiday

    public boolean isHoliday(){

        return (isEve() || isChristmas() || isHalloween() || isValentine() || isAprilFools() || isBirthday());

    }

    // Predicate function to check if it's a leap year

    public boolean isLeapYear(){

        return (year % 4 == 0 && year % 100 != 0 || year % 400 == 0);

    }

    // Implementor function to calculate the N-th day of the year

    public int calculateAccumulatedDate(){

        int[] daysInMonth = {0,31,28,31,30,31,30,31,31,30,31,30,31};

        int accumulatedDate = day;

        for(int i = 1; i < month; i++){

            accumulatedDate += daysInMonth[i];

        }

        return accumulatedDate;

    }

public static void main (String[] args){

    Date today = new Date(17,10,2023);

    Date tommorow = new Date(18,10,2023);

    //Disp;ay the content of these two objects

    System.out.println("Today is " + today.getDay() + "/" + today.getMonth() + "/" + today.getYear());

    System.out.println("Tommorow is " + tommorow.getDay() + "/" + tommorow.getMonth() + "/" + tommorow.getYear());

    if (today.isHoliday()){

        System.out.println("Today is a holiday");

    }

    else{

        System.out.println("Today is not a holiday");

    }

    if(tommorow.isHoliday()){

        System.out.println("Tommorow is a holiday");

    }

    else{

        System.out.println("Tommorow is not a holiday");

    }

    int nDay = today.calculateAccumulatedDate();

    System.out.println("Today is the " + nDay + "th day of the year");

}}