

Java Programming AP Edition

U2R2 Review on Unit 2

FLOW CHART AND BOTTOM UP IMPLEMENTATION

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Lecture: Flow Chart and Bottom-Up Implementation

In this lecture: we will build up the printCalendar program by bottom up implementation.

Dia Diagramming Tool:

<http://sourceforge.net/projects/dia-installer/>

A screenshot of the SourceForge project page for Dia Diagram Editor. The page has a dark grey header with the SourceForge logo, a search bar, and links for Browse, Enterprise, Blog, and Jobs. Below the header, there are links for SOLUTION CENTERS, Go Parallel, Resources, and Newsletters. The main content area features the project name "Dia Diagram Editor" with a star rating of 4.5 (72 reviews) and a "Read Reviews" link. A large green "Download" button is prominent, with a "20,200 Downloads (This Week)" badge next to it. At the bottom, there are links for Windows, Mac, and Linux.

sourceforge Search Browse Enterprise Blog Jobs

SOLUTION CENTERS Go Parallel Resources Newsletters

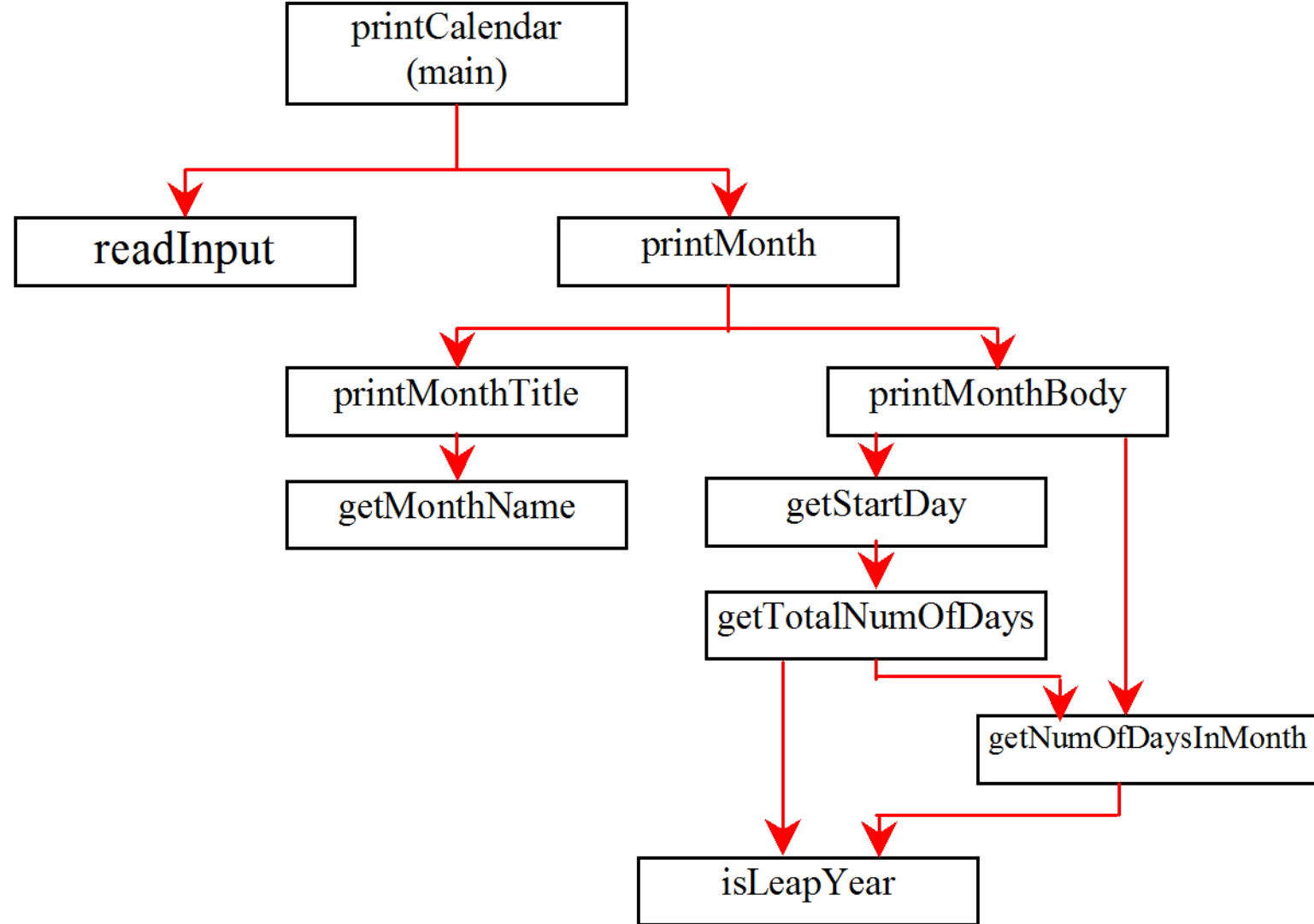
Enterprise / Graphics / Graphics / Editors / Vector-Based / Dia Diagram Editor

 **Dia Diagram Editor**

★★★★★ (72) Read Reviews | Last Updated 2014-08-14

 **Download** 20,200 Downloads (This Week)

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Stubs (like Header File)

```
/** Print the calendar for a month in a year */  
public static void printMonth(int year, int month) {}  
/** Print the month title, e.g., May, 2015 */  
public static void printMonthTitle(int year, int month) {}  
/** Print month body */  
public static void printMonthBody(int year, int month) {}  
/** Get the English name for the month */  
public static String getMonthName(int month) {}  
/** Get the start day of month/1/year */  
public static int getStartDay(int year, int month) {}  
/** Get the total number of days since January 1, 1800 */  
public static int getTotalNumberOfDays(int year, int month) {}  
/** Get the number of days in a month */  
public static int getNumberOfDaysInMonth(int year, int month) {}  
/** Determine if it is a leap year */  
public static boolean isLeapYear(int year) {}
```

Flow Chart Symbols



Terminator

Indicates the beginning or end of a program flow in your diagram.



Process

Indicates any processing function.



Decision

Indicates a decision point between two or more paths in a flowchart.



Delay

Indicates a delay in the process.



Data

Can represent any type of data in a flowchart.



Document

Indicates data that can be read by people, such as printed output.



Multiple documents

Indicates multiple documents.



Subroutine

Indicates a predefined (named) process, such as a subroutine or a module.



Preparation

Indicates a modification to a process, such as setting a switch or initializing a routine.



Display

Indicates data that is displayed for people to read, such as data on a monitor or projector screen.



Manual input

Indicates any operation that is performed manually (by a person).



Manual loop

Indicates a sequence of commands that will continue to repeat until stopped manually.



Loop limit

Indicates the start of a loop. Flip this shape vertically to indicate the end of a loop.



Stored data

Indicates any type of stored data.



Connector

Indicates an inspection point.



Off-page connector

Use this shape to create a cross-reference and hyperlink from a process on one page to a process on another page.



Off-page connector



Off-page connector



Off-page connector



OR logic



Summing junction logic



Collate

Indicates a step that organizes data into a standard format.



Sort

Indicates a step that organizes items list sequentially.



Merge

Indicates a step that combines multiple sets into one.



Database

Indicates a list of information with a standard structure that allows for searching and sorting.



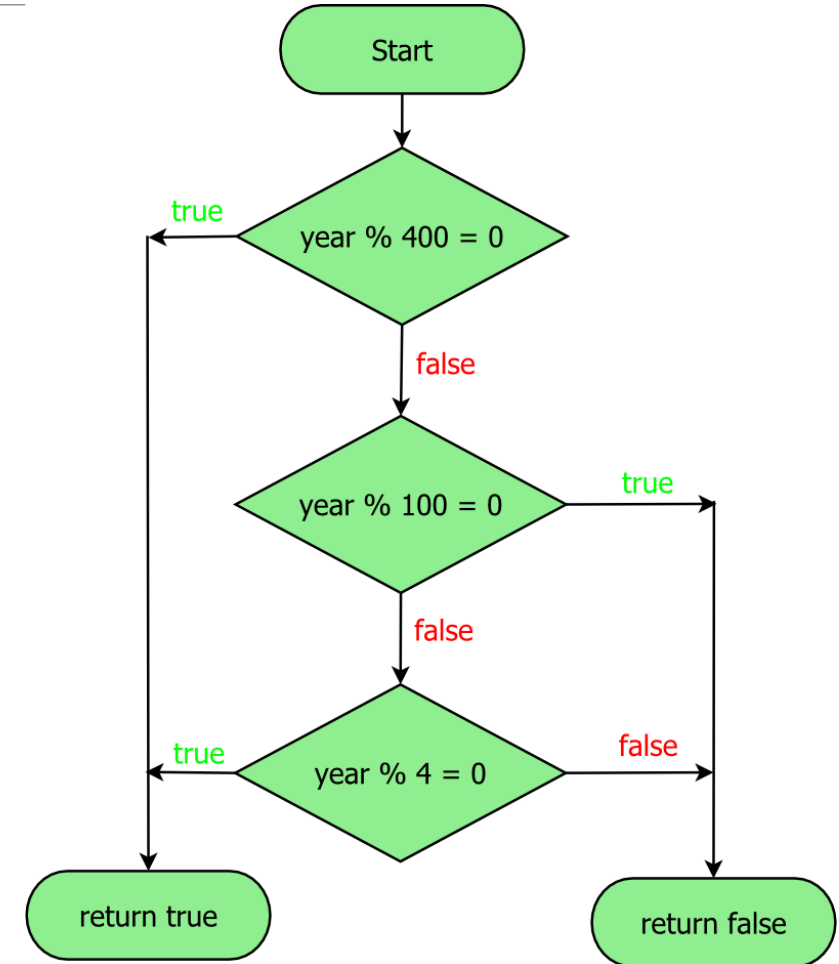
Internal storage

Indicates an internal storage device.



boolean isLeapYear(int year)

```
public static boolean  
isLeapYear(int year) {  
    return year % 400 == 0 ||  
        (year % 4 == 0 &&  
        year % 100 != 0);  
} // go dia diagram !!!
```

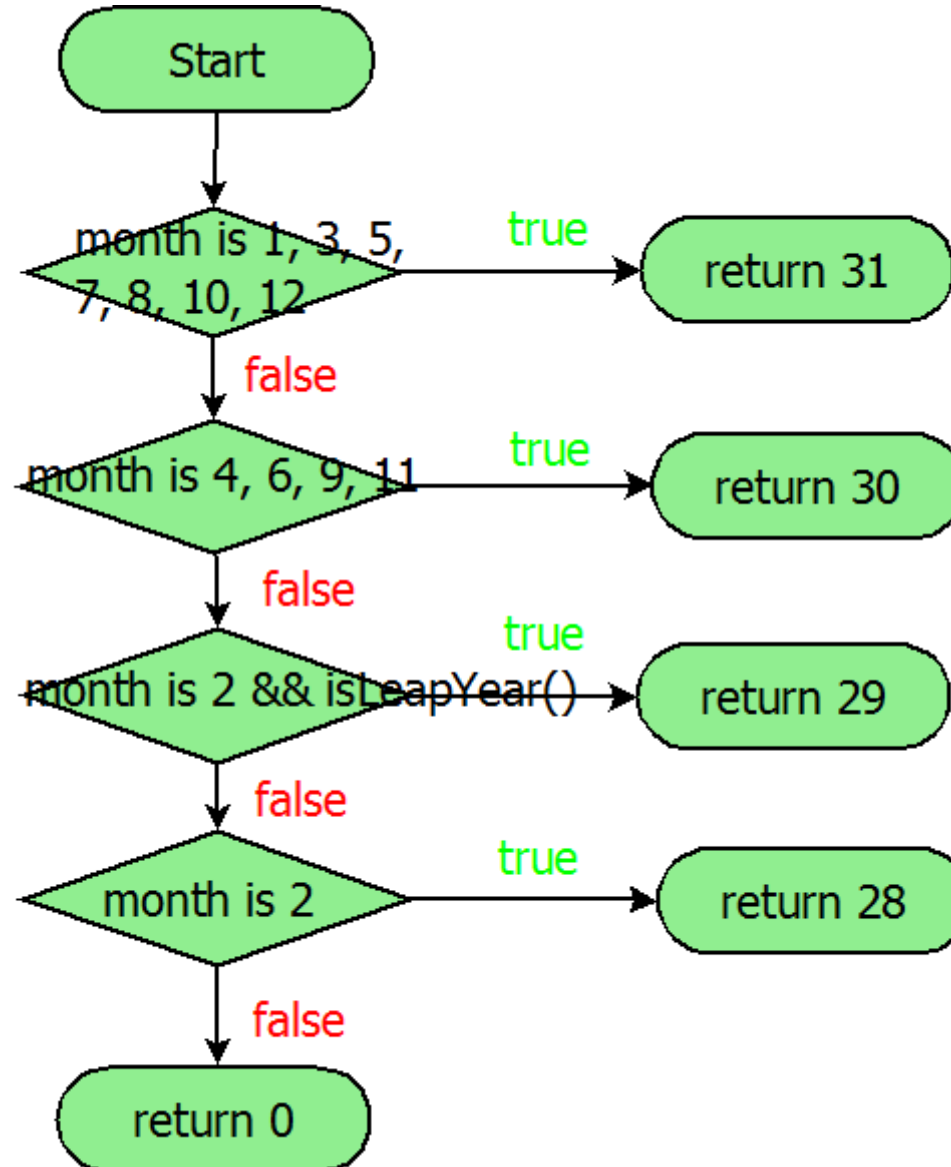




`int getNumberOfDaysInMonth(int year, int month)`

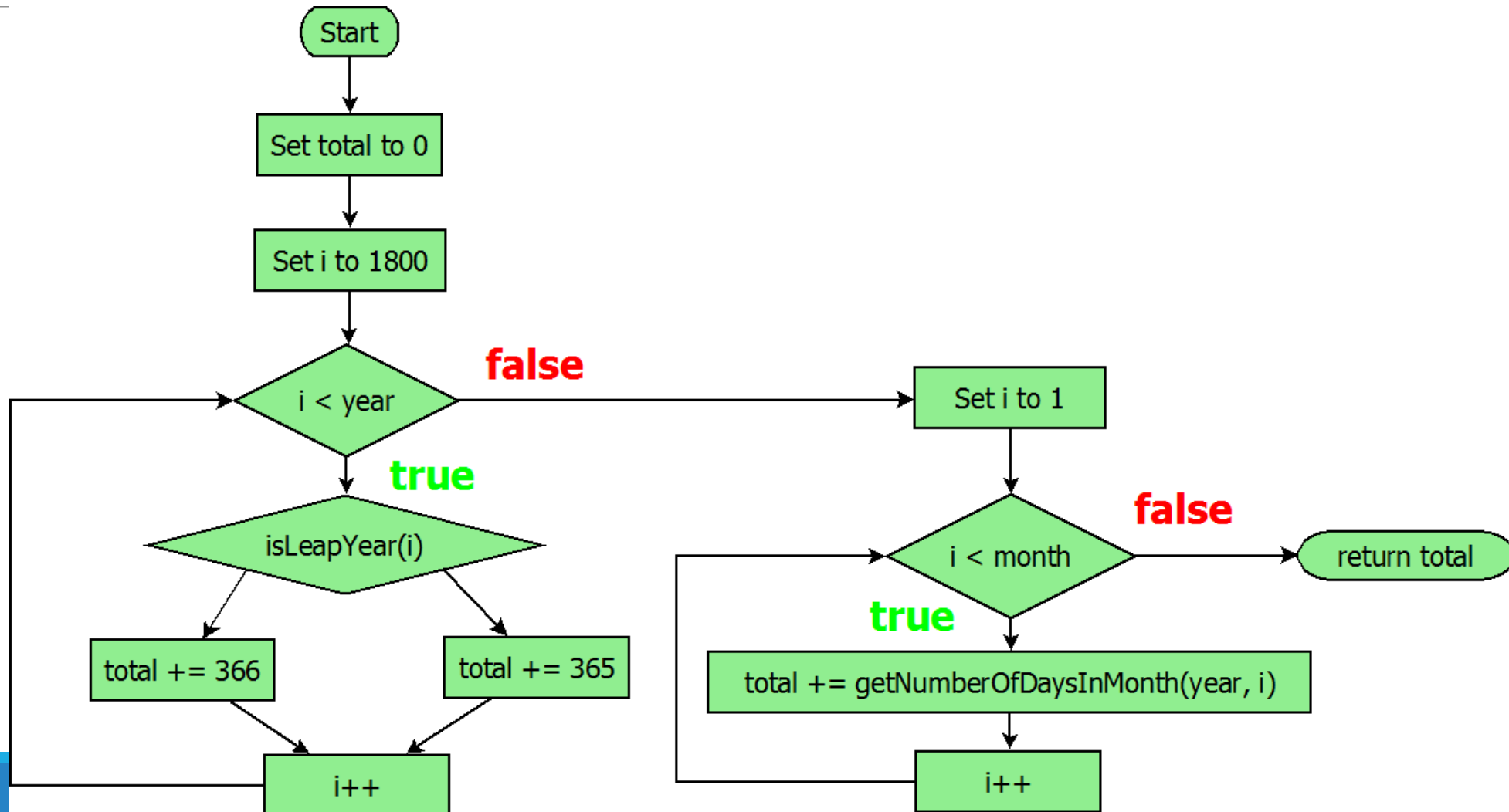
```
public static int getNumberOfDaysInMonth(int year, int month) {  
    if (month == 1 || month == 3 || month == 5 || month == 7 ||  
        month == 8 || month == 10 || month == 12)  
        return 31;  
    if (month == 4 || month == 6 || month == 9 || month == 11)  
        return 30;  
    if (month == 2) return isLeapYear(year) ? 29 : 28;  
    return 0; // If month is incorrect;  
}
```

getNumberOfDaysInMonth()



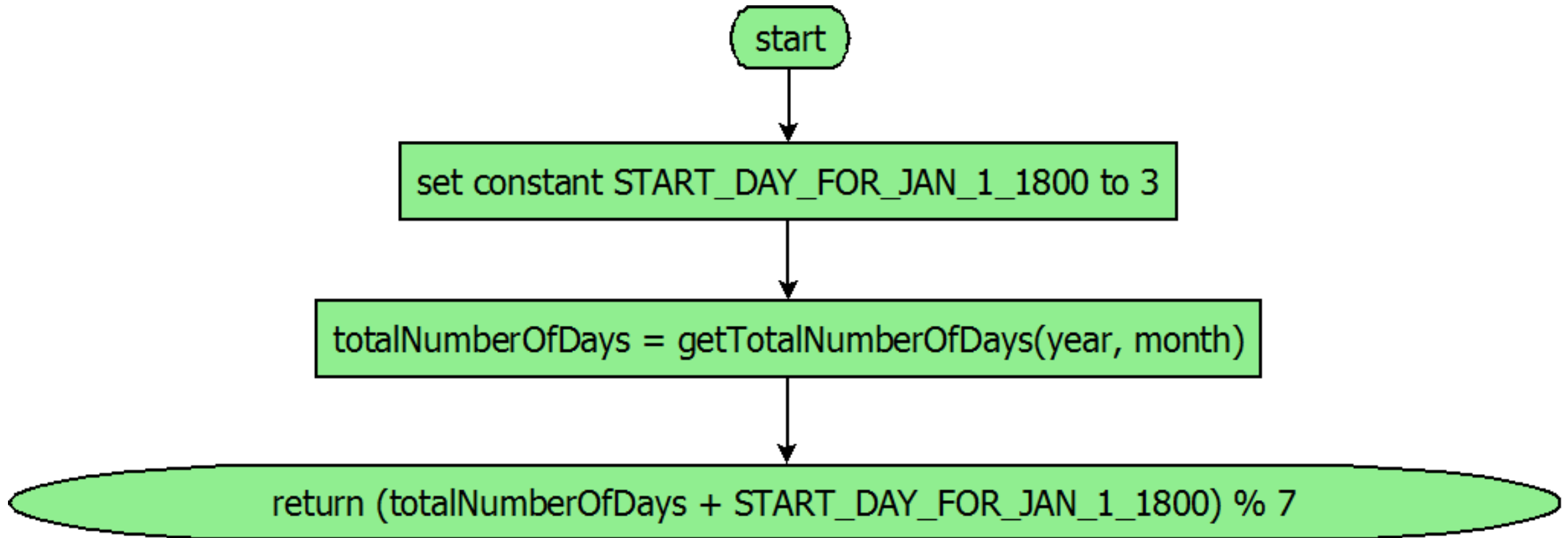


int getTotalNumberOfDays(int year, int month)



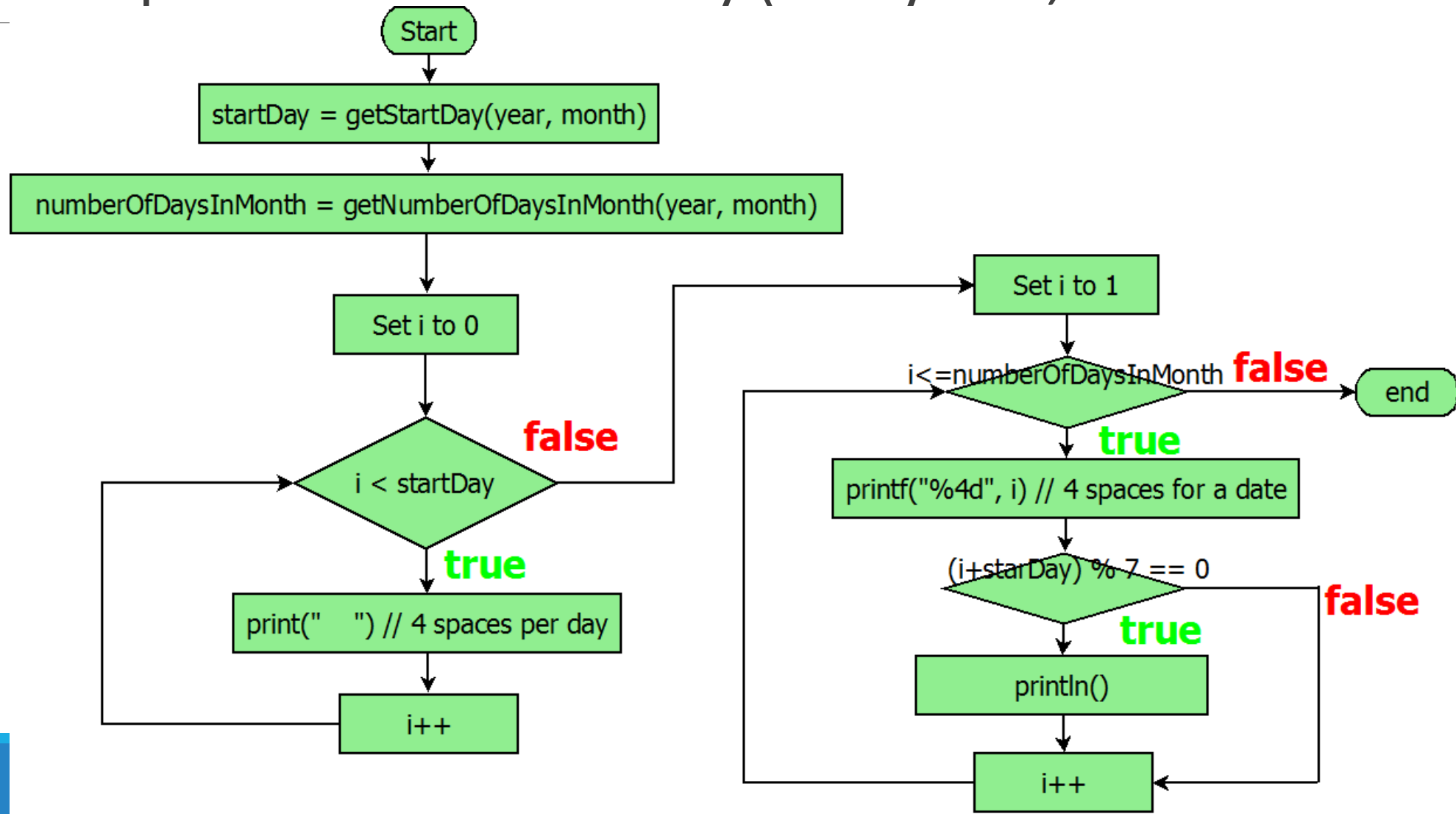


`int getStartDay(int year, int month)`





void printMonthBody(int year, int month)





String getMonthName(int month)

Code is easier than flow chart.

```
public static String getMonthName(int month) {  
    String monthName = "";  
    switch (month) {  
        case 1: monthName = "January"; break;  
        case 2: monthName = "February"; break;  
        case 3: monthName = "March"; break;  
        case 4: monthName = "April"; break;  
        case 5: monthName = "May"; break;  
        case 6: monthName = "June"; break;  
        case 7: monthName = "July"; break;  
        case 8: monthName = "August"; break;  
        case 9: monthName = "September"; break;  
        case 10: monthName = "October"; break;  
        case 11: monthName = "November"; break;  
        case 12: monthName = "December";  
    }  
    return monthName;  
}
```



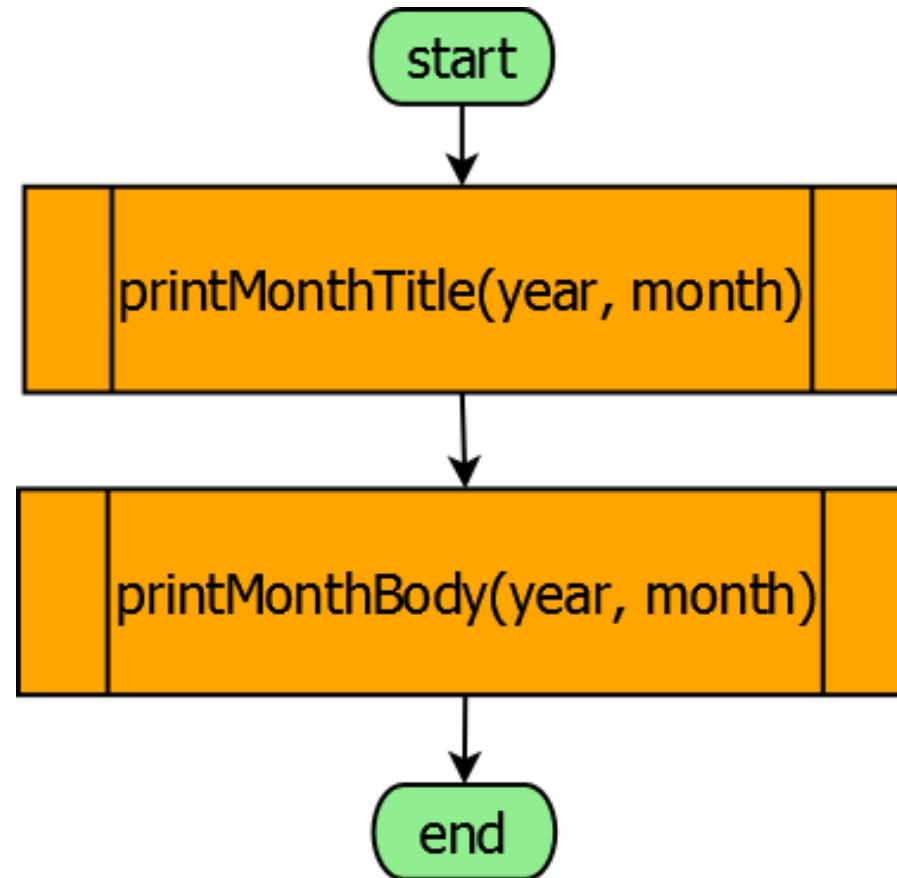
void printMonthTitle(int year, int month)

Code is easier than flow chart.

```
public static void printMonthTitle(int year, int month) {  
    System.out.println();  
    System.out.println("      " + getMonthName(month) + " " + year);  
    System.out.println("=====");  
    System.out.println(" Sun Mon Tue Wed Thu Fri Sat");  
}
```

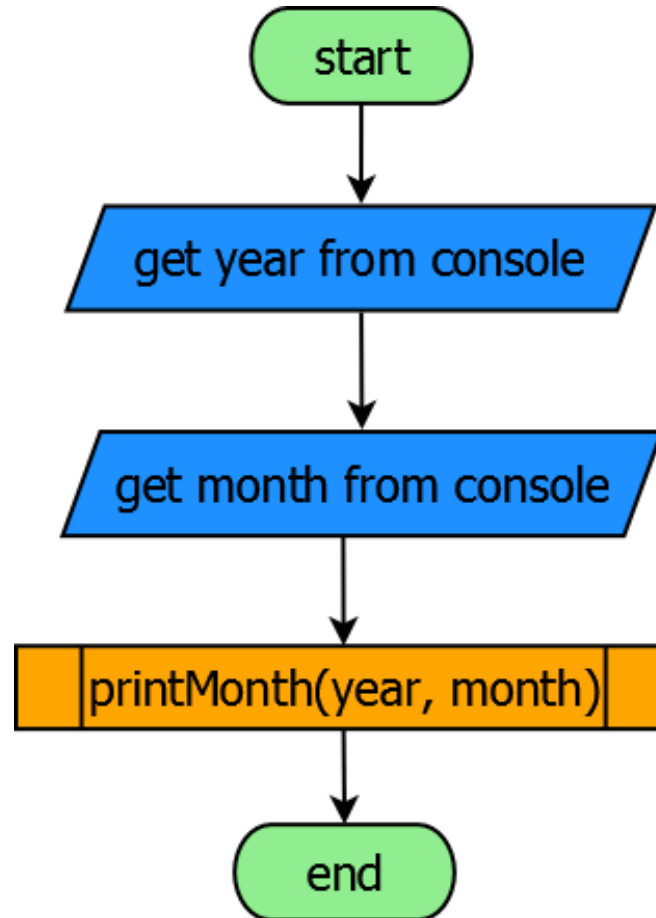


`void printMonth(int year, int month)`





void main(String[] args)





Download Dia.zip

(.dia files for this lecture, Use these flow chart for the Unit Project)

Go Dia !!!