Peter Kirkpatrick

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CS 110 Assignment 3

Question # 1: Day Number in a Year

**Problem Definition**

The program should print the day number of the year, given the date is in the form month-day-year, while also checking for a leap year.

**Problem Analysis**

-Inputs

* month, (mnth)
* day, (dy)
* year, (yr)

-Outputs

* the day number of the year, (day)

-Relate I/O

* if yr is divisible by (100 and 400) or divisible by (4 and not 100)
  + the year is a leap year
* day is equal to the number of days in the months before the month indicated + the days indicated
  + day = monthS[mnth -1] + dy

-Other Constraints

* must use GUI

**Algorithm Design**

-Get Inputs

-Process Inputs

-Display Outputs

**Step-Wise Refinement**

-Get Inputs

* Get the month, (mnth)
* Get the day, (dy)
* Get the year, (yr)

-Process Inputs

* Determine whether it is a leap year or not
  + If yr is divisible by (100 and 400) or by (4 and not by 100), it is a leap year
  + Thus February has 29 days
* Compute day number in a year
  + day = months[mnth – 1] + dy

-Display Outputs

* Display the day number of the year

-Desk Checking

Assumed Inputs:

03-05-2000 && 05-03-2001

{31, 28, 31, 30, 31, 30, 31, 31, 30, 31, 30, 31}

2000 / 100 = 20 && 2000 / 400 = 5

Therefore 2000 is a leap year

day = 29 + 31 + 5 = 65

2001 / 4 = 500.25 && 2001 / 100 = 20.01

2001 / 100 = 20.01 && 2001 / 400 = 5.0025

Therefore 2001 is not a leap year

day = 30 + 31 + 28 + 31 + 3 = 123