Introduction to: Computers & Programming: Planning a Complex Program

Adam Meyers
New York University
Exercise from Beginning of Term

• Given
  – Today's date:
    • Month, day, year, and day of the week
  – An arbitrary number of days in the future (e.g., 1500)
• How should we go about identifying that day in the future?
  – Month, day, year and day of the week
How Can We Solve This Problem?

1. Some Pieces of the Problem
   a) Find the year
   b) Find the month
   c) Find the day
   d) Find the day of the week

2. Are all calculation dependent on each other or are any independent of the others, i.e., is there an order?
Basic Information

• `day_of_week_to_number(number)`
  – From 0–6 to Sunday—Saturday

• `get_day_of_week_from_number(day)`
  – From Sunday—Saturday to 0–6

• `months` → List of months in order

• `month_value(month, leap)`
  – 4 months have 30 days
  – February leap → 29 days
  – February else → 38 days
  – Else: 31 days
More Calculations

• `is_leap_year(year)` ## from Wikipedia :
  – Every 4 years, except on centuries that are not divisible by 400

• `get_month_and_date(day_in_year, year)`
  – keep subtracting month values, until the days left over are less than the month value
  – return month and day

• `get_day_of_year(current_month, day, leap)`
  – sum up the values of previous months and add the day.
Called by Main Function

- `which_day_of_the_week(current_day,days_in_future)`
  - We did this at the beginning of the term
  - Modulus 7 plus conversion from days to numbers and back

- `get_new_year_and_day(current_year,current_month,day_of_year,days_in_future)`
  - calculate the current day of the year (1 to 366)
Main Function

- `date_in_future(day_of_week, month, day_of_month, year, days_in_future)`
- determine leap year status of current year
- calculate day of week
- calculate current day of year
- calculate year in future and day in future year
- calculate month and day from day in future year
- print result