Topics: conditional statement, `for` and `while` loops, plotting

Reading: MATLAB Essentials, p.4 (handout)

Example: No. of days in a month

Variable `m` stores an integer value in [1..12]. Write a program fragment to print the number of days in month `m`. Assume a non-leap year.

Example: Random walk

Write a program that performs a "random walk." In a random walk, possible moves are left, right, up, or down (in a Cartesian plane). Prompt the user for the number of steps and the starting point.

What is the algorithm?

We will write two programs for the random walk to show two ways of checking the direction and updating the position. Version 1 uses selection statements; version 2 uses (direction) vectors.

```
% Perform n steps of random walk starting from (x0,y0)
% VERSION 1:  use SELECTION statements to check direction and update position

disp('Do a random walk!')
n = input('How many steps? ');
x0 = input('From what x-coordinate? ');
y0 = input('From what y-coordinate? ');

x =                                       % trajectory in x direction

y =                                       % trajectory in y direction


% Perform walk, each step is based on a random integer
```

```
% Show the walk, starting point, ending point
plot(x,y,x(1),y(1),'*',x(end),y(end),'o')
title([num2str(n) ' steps of random walk from * to o'])
```

```
% Perform n steps of random walk starting from (x0,y0)
% VERSION 2:  use (direction) VECTORS to check direction and update position

disp('Do a random walk!')
n = input('How many steps? ');
x0 = input('From what x-coordinate? ');
y0 = input('From what y-coordinate? ');

% possible movements:  ( xdir(i), ydir(i) )




x = [x0 zeros(1,n)];  % trajectory in x direction
y = [y0 zeros(1,n)];  % trajectory in y direction

% Perform walk, each step is based on a random integer
```

```
% Show the walk, starting point, ending point
plot(x,y,x(1),y(1),'*',x(end),y(end),'o')
title([num2str(n) ' steps of random walk from * to o'])
```