

Program planning and design

Computer Science I — The College of Idaho

Spring 2016

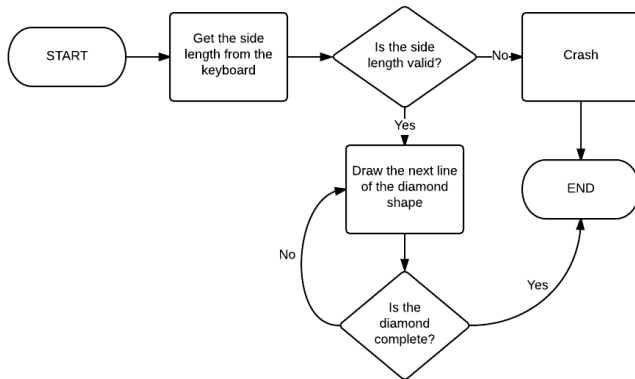
Writing a large program

- ▶ When writing a large program it is essential to plan.
- ▶ Otherwise, design flaws will not be realized until late in the process.
- ▶ Planning minimizes the amount of rewriting you have to do.
- ▶ Today, you will work in groups to make plans for some upcoming program.

Plan strategy: flowchart

- ▶ Flowcharts are decision diagrams for complicated processes.
- ▶ They have *start*, *decision*, *process*, and *end* symbols (at least).
- ▶ Start and end tell where the program starts and ends.
- ▶ Decision symbols ask questions. The answers lead to different paths, containing processes and perhaps more decisions.
- ▶ Processes are action steps. They are things the program must do.

Example flowchart: draw a diamond

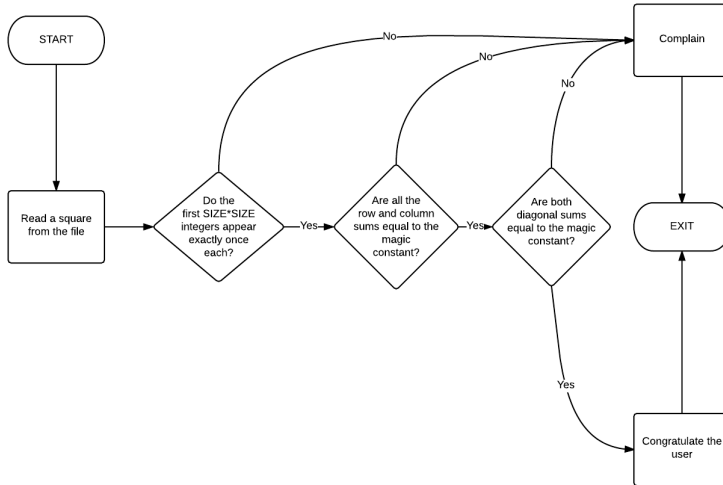


Notice the structure:

- ▶ Three functions,
- ▶ one conditional,
- ▶ one loop.

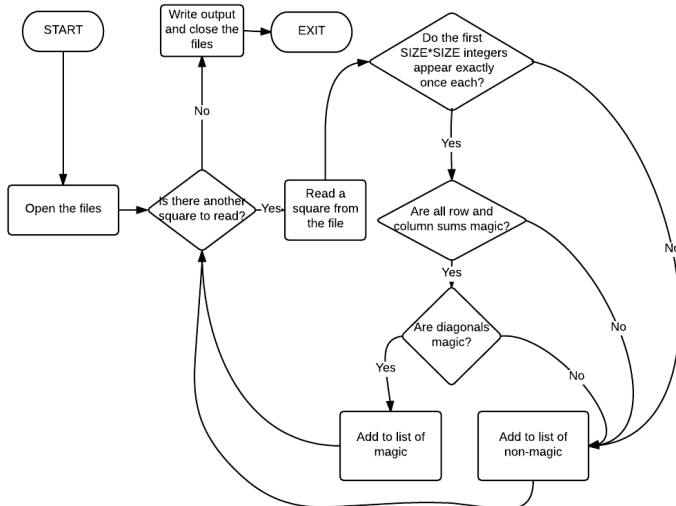
You can also see some indication of how data must pass between functions, and in which direction. The chart helps us implement the loop correctly.

Another example



This chart is a little simpler, but each of the diamonds could be expanded into a subprocess involving a loop. Charts can also help spot “edge cases” that need special handling.

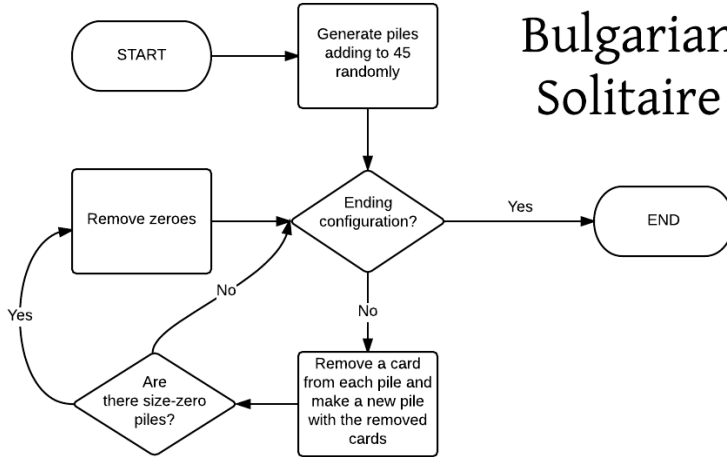
From HW 08



Don't say I never did anything for you

Bulgarian solitaire

Bulgarian Solitaire



Your job today

In your groups of no more than 3...

- ▶ Draw a flowchart for Dots and Boxes that you can all agree on.
- ▶ It should have a reasonable level of granularity, so that
 - ▶ you can see the function calls, loops, etc., and
 - ▶ there aren't too many cells.
- ▶ Each loop needs an update—a way to get closer to exiting the loop.
- ▶ Each decision needs a branch for each possible kind of answer.
- ▶ Get Rosoff to sign off on your flowchart to receive workshop credit for today. Take a picture of it!
- ▶ Dots and Boxes is HW 10, due on Friday, May 6.

Group assignments

GROUP 1 Jordan, Andres, Paula

GROUP 2 Kelsey, Leo, Jake

GROUP 3 Matthew, Keaton

GROUP 4 Flo, Maddy, Robert

GROUP 5 Dusten, Moha, Ahmed

GROUP 6 Jen, Nosipho, Saraswati