Faculty of Mathematics and Physics
Charles University in Prague
5th May 2016

C# Made Easy!

Programming II

Workshop 10 – XP

Workshop 10
Outline

1. Test
2. Extreme Programming
3. Homework

Test 10

Test

Find the test here (no-ads):

https://goo.gl/xJVsRH

Permanent link:

https://docs.google.com/forms/d/177cyBCR07Zw1uLH2YNKmsH64ARGmrXt1Ttg7fepyVlU/viewform

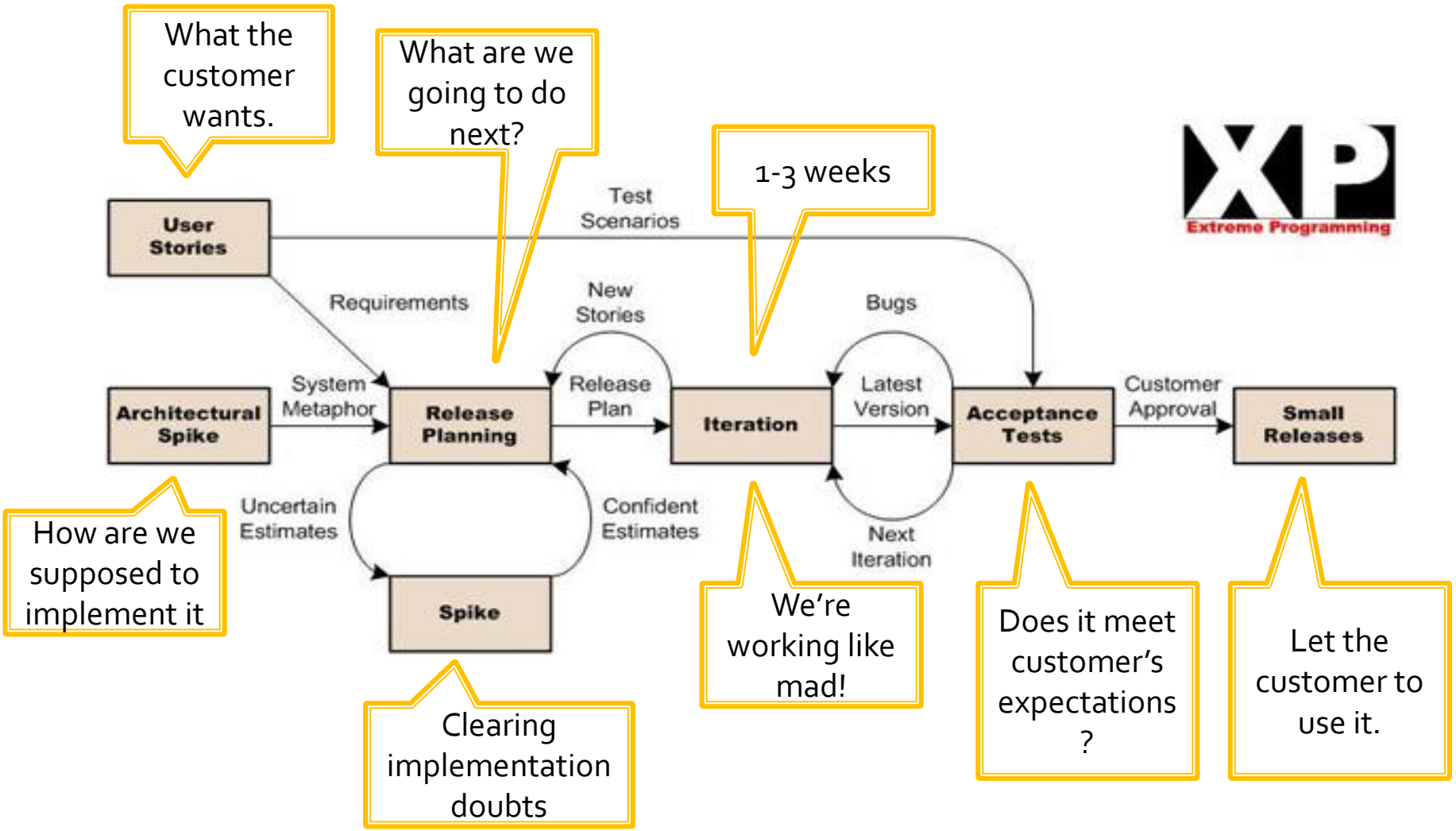
Time for the test:

5 min

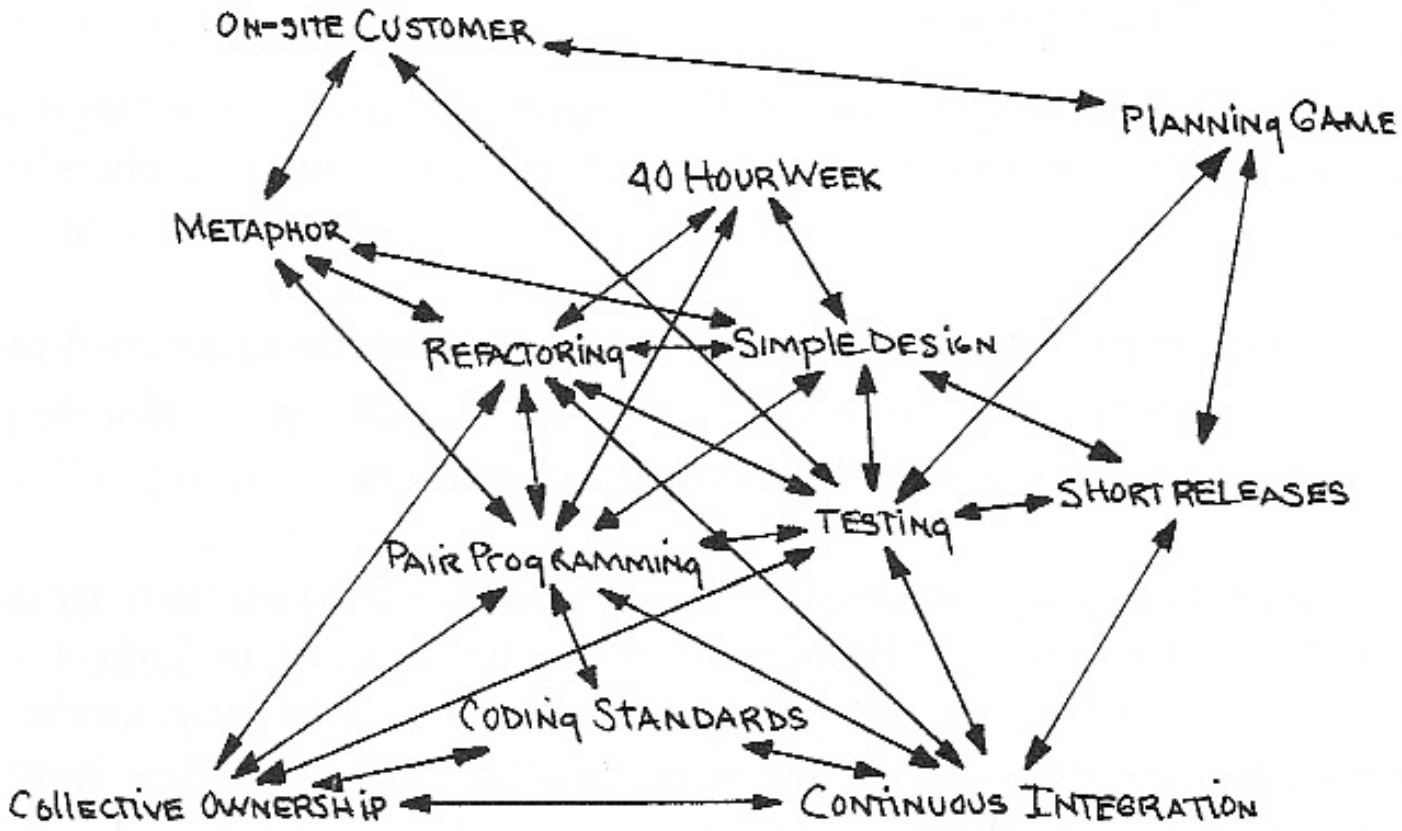
Extreme Programming

Software Development Methodology

Extreme Programming
Software Development Methodology



Extreme Programming
Software Development Methodology



Today, a programmer needs to be able to do all kinds of "jobs".

Extreme Programming
Software Development Methodology

- Important for teams!
  - Which we sort-of lack here…
- Alas, we're going to investigate the following:
  - The Code is The Documentation

    => The code should speak for itself
  - Pair Programming

    => Helps you to focus your thoughts and write bug-less code

Extreme Programming
The Code is The Documentation

- Apart from obvious naming conventions…
- Name your temporary variables well

```
public Node Add(int num) {
    Node n = new Node(num);
    …
    return n;
}
```

```
public Node Add(int num) {
    Node result = new
                  Node(num);
    …
    return result;
}
```

Extreme Programming
The Code is The Documentation

- Apart from obvious naming conventions…
- Avoid obvious I, J, K variable names in for-loops

```
for (int i = 0;
     i < lines.Count();
     ++i) {
…
}
```

```
for (int lineIndex = 0;
     lineIndex < lines.Count();
     ++ lineIndex ) {
…
}
```

Extreme Programming
The Code is The Documentation

- Apart from obvious naming conventions…
- Document the idea behind the code, not what the code is doing
- Document **contracts**

```
// Returns ROOT node
public NODE GetRoot();
```

```
// Returns ROOT of the tree that is guaranteed to remain the same throughout the life of the TREE object
public NODE GetRoot()
```

Extreme Programming
The Code is The Documentation

- WHY WE NEED DOCUMENTATION?
- *The code is the imperfect translation into a programming language of the programmer's imperfect understanding about what the program should do.*

⇒ If unsure how to code your idea, write down your idea/objective in plain language (e.g. as a comment to a class, a method or code block) and leave it there after you code it
  - And after you code your idea/objective, review your comment if it still holds!

- WHY WE SOMETIMES HATE DOCUMENTATION?
- *The documentation is a set of hypotheses to be tested and not a set of axioms to be trusted. And it ages…*

⇒ You will never know whether the method/class/sub-system behaves as documented / expected until you try == first-hand experience is the best

⇒ If you are unsure about the technology, do not go on wild implementing features in real-project, play with the technology elsewhere, safely
(~ sort of SPIKEs in XP terminology)

Extreme Programming
Pair Programming

- Two roles: Driver and Navigator

- Driver
  - Writes the code
- Navigator *(preferably in this order)*
  1. Reviews each line of the code
     - Typos
     - Coding standards
     - Bugs!!!
  2. Thinks about "next step"
  3. Thinks about the overall architecture

- Let's form pairs!

Extreme Programming
Task – Visualization of Binary Search Tree

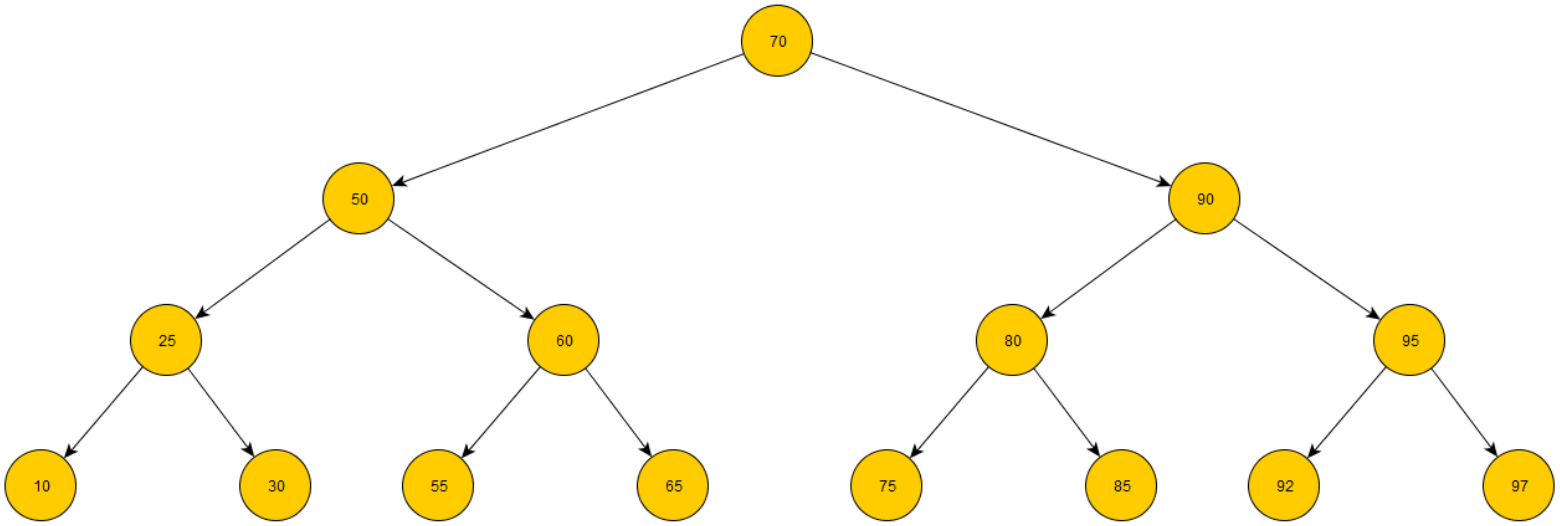
- Download the template: http://goo.gl/WkLMWR

- Provide a way to visualize a binary search tree
  - Come up with a metaphore for the visualization
  - Binary tree-like layout
    - Node as a circle with a number in its center
    - Edges between parent-child
  - Repaint on screen resize
  - Always fit into "the entire window"
  - And be warned… the customer will likely need to change this layouting in the future!

    => Try to separate "drawing commands" from the "layouting algorithm"

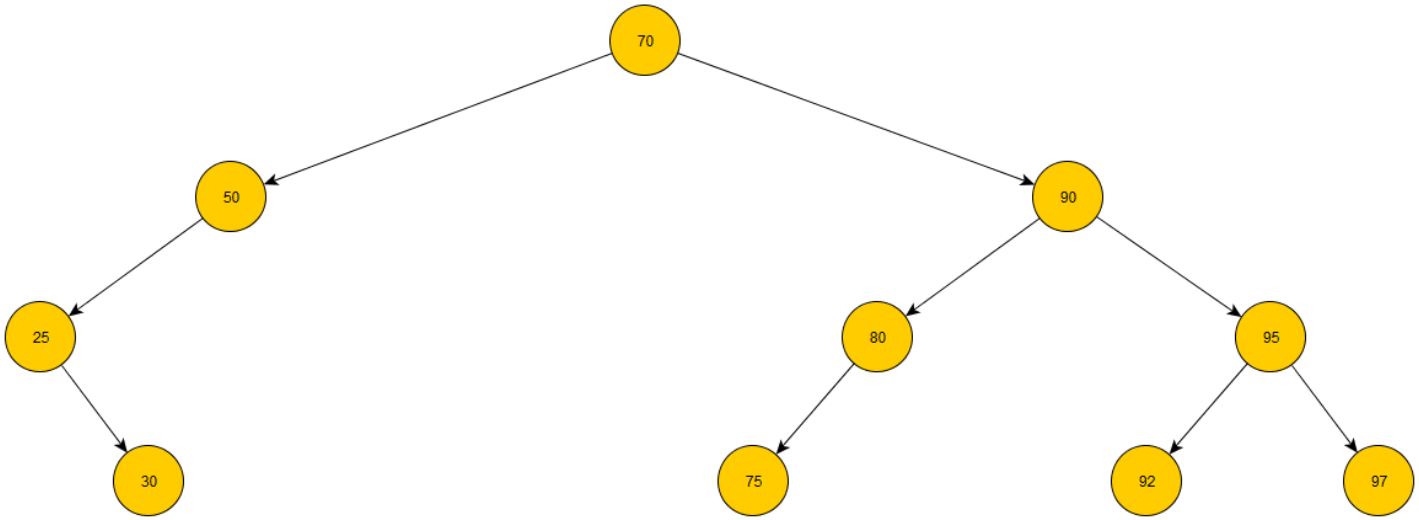
Extreme Programming
The Task – Visualization of Binary Search Tree

- Fixed Layout
  - Tree Height / Layer-depth determines the layout



Extreme Programming
The Task – Visualization of Binary Search Tree

- Fixed Layout
  - Tree Height / Layer-depth determines the layout
  - Even if the tree is not full, the positions of respective nodes do not changes



Extreme Programming
The Task – Visualization of Binary Search Tree

- GOOD LUCK!

1. Decide on Driver & Navigator
2. Analyze existing code base together
3. Analyze the task together and come up with solution for the layouting algorithm
4. Design an architecture for algorithm implementation
   - Beware, the layouting algorithm will likely be changed in the future
   - But do not over-engineer this!
5. Code it!

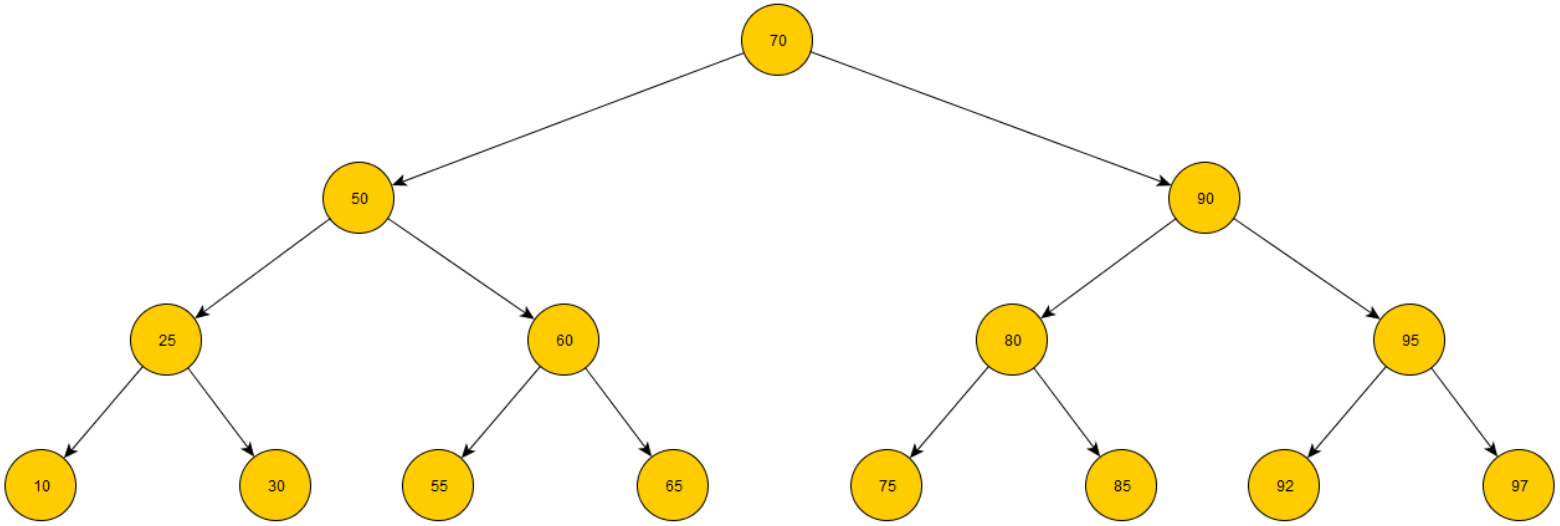
Extreme Programming
Homework – Flexible Layout for Binary Tree

Continue the work on your code alone and:

1. Provide a way to add "multiple numbers comma separated" at once (new text box, new button)
2. Implement flexible layout for the tree

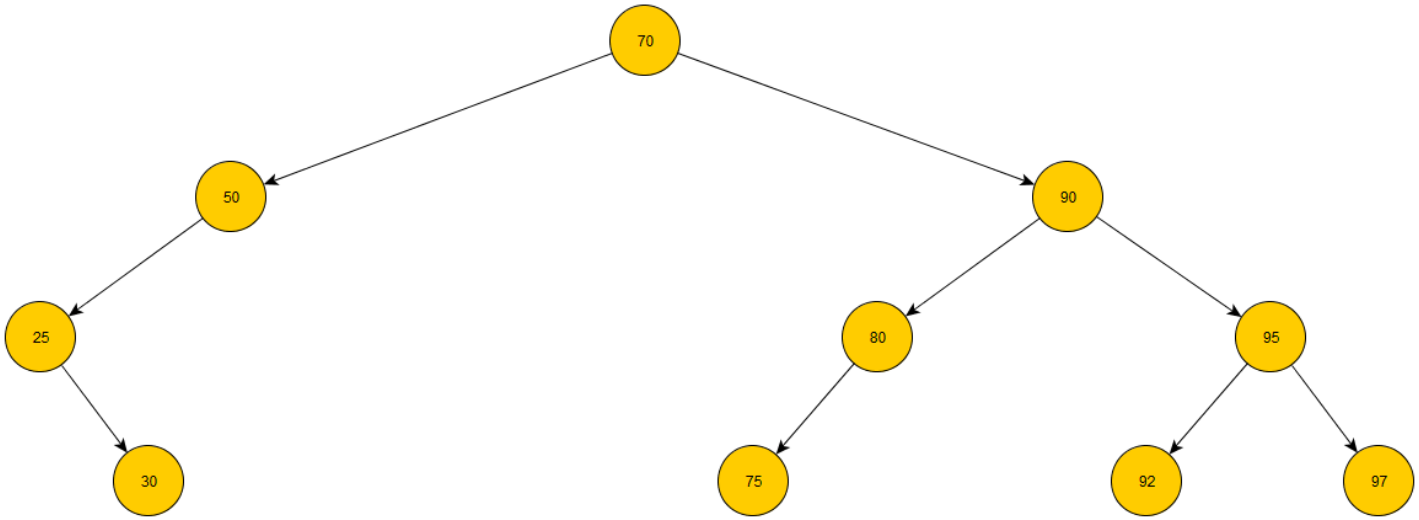
Extreme Programming
Homework – Flexible Layout for Binary Tree

- Fixed Layout



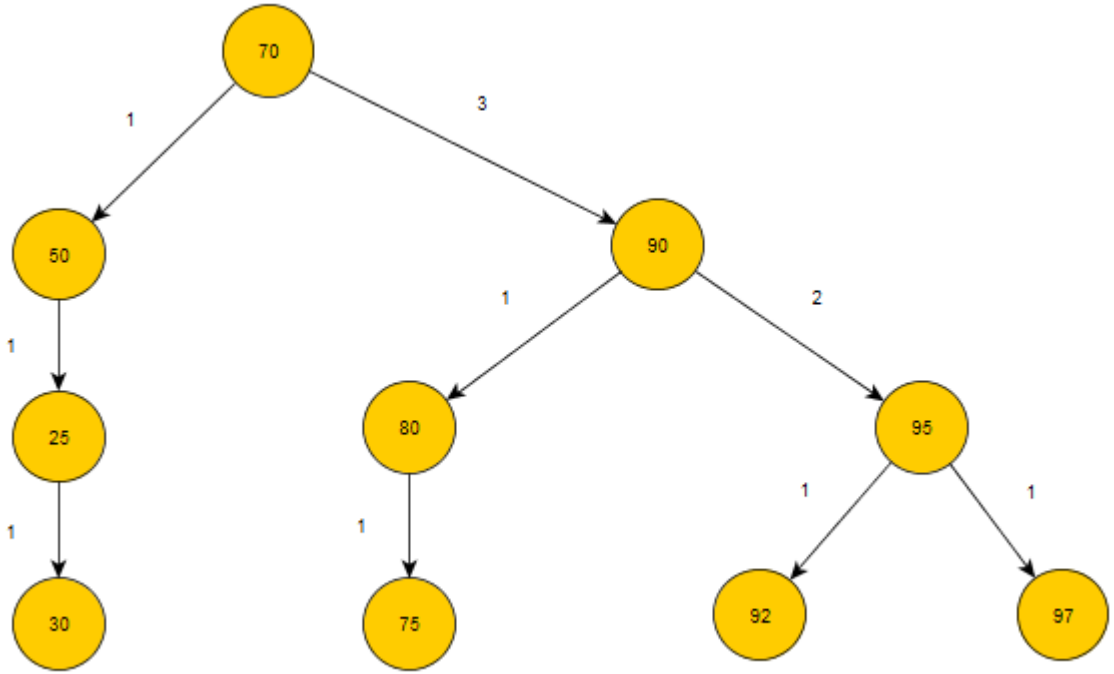
Extreme Programming
Homework – Flexible Layout for Binary Tree

- Fixed Layout
  - Tree Height / Layer-depth determines the layout



Extreme Programming
Homework – Flexible Layout for Binary Tree

- Flexible Layout
  - Sub-tree width determines the layout



Assignment 10
Send me an email

- Email: jakub.gemrot@gmail.com
- Subject: **Programming II – 2016 – Assignment 10**
- Body: state who you have coded the assignment with
- Zip up the whole solution and send it
- You WILL NOT find the assignment in CoDex!
- Deadline:
  - **12.5.2015 23:59**
- Points: 10 + 5 (meeting the deadline)

Questions?

I sense a soul in search of answers…

- In case of doubts about the assignment or some other problems don't hesitate to contact me!
  - Jakub Gemrot
    - gemrot@gamedev.cuni.cz