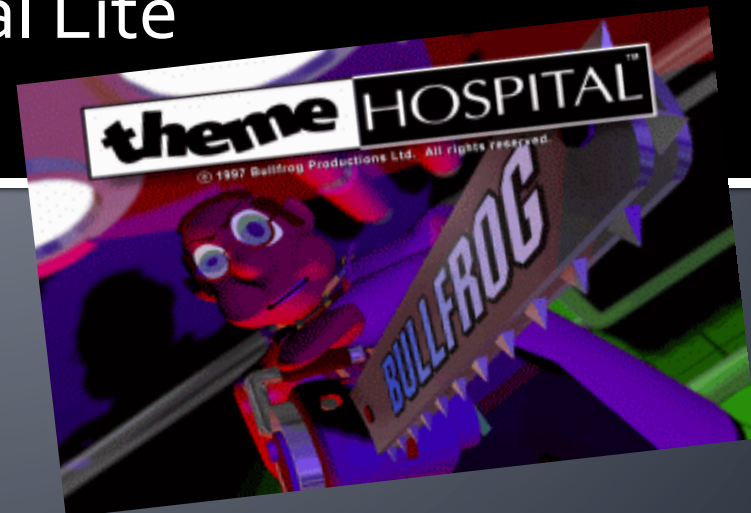Faculty of Mathematics and Physics
Charles University in Prague
16th March 2015

C# Made Easy!

Programming II

Workshop 05 –Theme Hospital Lite
Part 1 – Hospital Map

1. Test
2. Topic
   - Theme Hospital Lite
3. Assignment 05
   - Graph + Navigation

Find the test here (no-ads):

http://goo.gl/hIwDya

Permanent link:

https://docs.google.com/forms/d/14t3X3_UTzZuZAxPHYNfi_E3P3ar
fnBYv44t7mravFGk/viewform

Time for the test:

12 min

Best Snake Revisited
By Tomáš Novotný


```
Zvol rozměry pole (ve tvaru šířka(mezera)výška; v intervalu 10-80):

                                     -


                          Instrukce:

  -->  =  had (hráč)              ■  =  zeď

  x  =  běžné jídlo                P  =  jed (smrtelný)

  X  =  tučné jídlo (2x výživnější)  w  =  víno (opilost 30 kroků)

  +  =  hostina (5x výživnější)    W  =  sud vína (opilost 90 kroků)
```
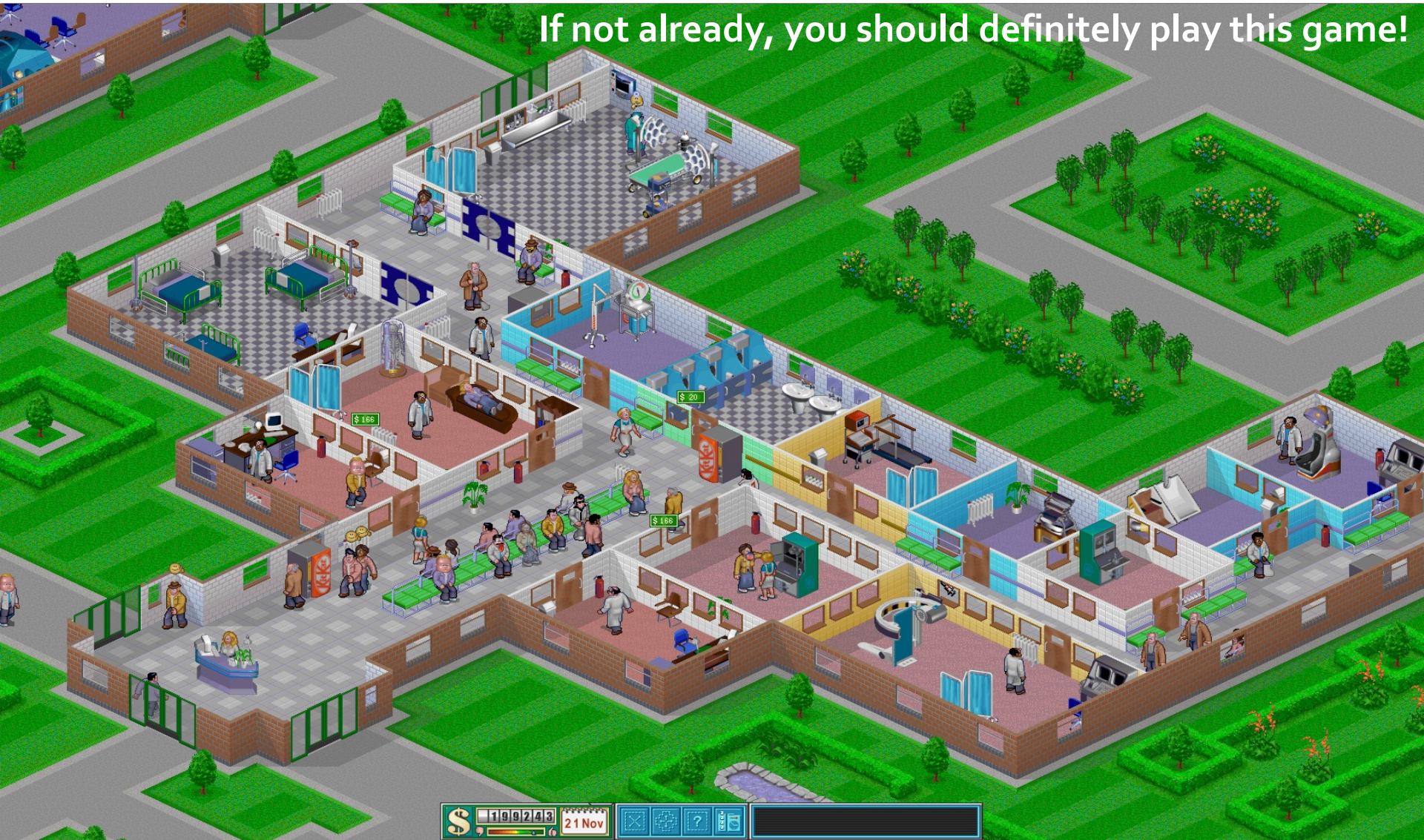
Topic
Theme Hospital Lite

If not already, you should definitely play this game!

- Rooms / Places
  - Info Desk, GP, EEG, Sono, X-Ray, Psycho, Treatment
- Staff
  - Secretaries, Doctors, Nurses
- Various hospitals
  - Different topologies between rooms
  - Walking / Lift-riding
- Source of income
  - Patients
    - Various age (speed of walking)
    - Various health problems (need special type of diagnoses)
- Our objective
  - Maximize the profits!
  => Minimize the number of doctors that you need for a given day

- Oriented graph with costs at edges

- Nodes are "Rooms/Places"
  - `ENTRANCE`
  - `INFODESK`
  - `GP`
  - `EEG`
  - `SONO`
  - `XRAY`
  - `PSYCHO`
  - `TREATMENT`
  - `NODE`

- There can be multiple places of a given type!

- Oriented graph with costs at edges

- Edges are of two types
  1. Corridors/Stairs
     - Oriented edges
     - Has a base cost in "time" (integer)
     - Cost is modified by person's `WalkingMultiplier`!
  2. Lifts
     - Non-oriented edges (rides both ways)
     - Always runs between two nodes only
     - Has a maximum capacity
     - Has a base cost in "time" (integer)

- You will be given a "hospital plan" in the form of the graph

- You will be given a list of "patients"

- And you will be asked to find a "time-shortest" path for a patient "route"

- Your output will be the time needed for a given route based on the patient's health problem

INPUT: [<node> <link> <node>'\n']+ [<patient> '\n']+ [<nav-request> '\n'] 'END'

<node>: <node-type> '-' <id>

<node-type>: 'ENTRANCE' | 'INFODESK' | 'GP' | 'EEG' | 'SONO' | 'XRAY' | 'PSYCHO' | 'TREATMENT' | 'NODE'

<id>: non-negative integer number

<link>: <walk-link> | <lift-link>

<walk-link>: <non-oriented-walk-link> | <oriented-walk-link>

<non-oriented-walk-link>: '<--(walk:' <int> ')-->'

<oriented-walk-link>: '--(walk:' <int> ')-->'

<lift-link>: '<--(lift:c' <int> ':t'<int> ')-->'

INPUT: [<node> <link> <node>'\n']+ [<patient> '\n']+ [<nav-request> '\n'] 'END'

<patient>: <patient-name> ':' <speed-multiplier> ':' <health-problem>

<patient-name>: [a-zA-Z]+

<speed-multiplier>: int

<health-problem>: 'CARDIAC' | 'PNEUMONIA' | 'HIP-PAIN' | 'NEUROTIC'

<nav-request>: <patient-name> ':' <node of entrance>

Patient route from his "Entrance"
-> Nearest INFODESK
-> Nearest GP
-> Nearest diagnose room for patient's health problem
-> Nearest GP
-> Nearest Treatment
-> Nearest Entrance

Health problems:

- CARDIAC -> EEG
- PNEUMONIA -> XRAY
- HIP-PAIN -> SONO
- NEUROTIC -> PSYCHO

There is no time associated with "nodes" in this assignment yet… neither any stuff.
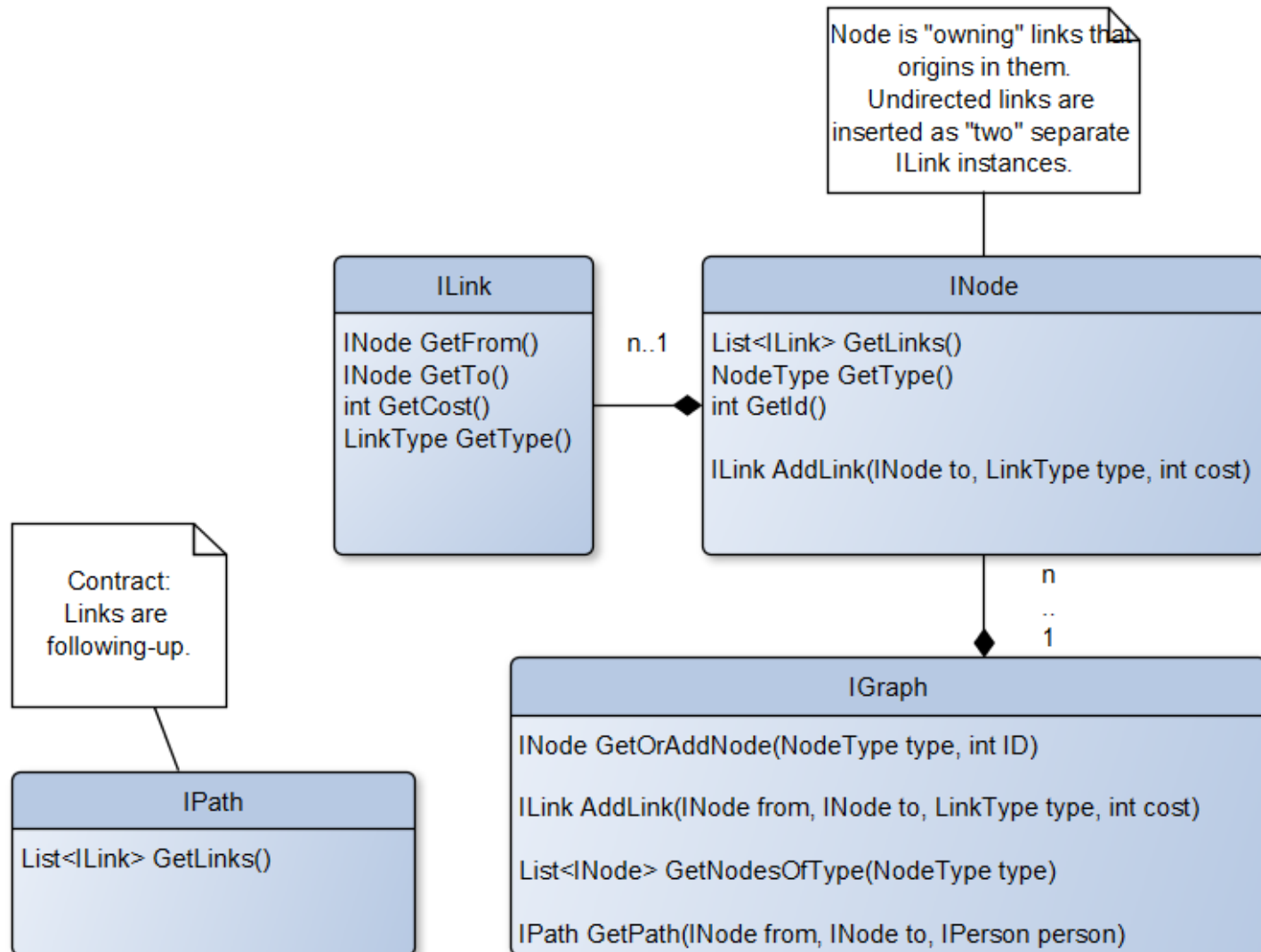
Always treat lifts as "ready to be used at given location.

Output:
Time (integer number) required to travel through the hospital with respect to the patient's "speed". Mind the lifts! Lift riding time is not altered by the patient's speed at all!

Assignment 5
CoDex

- Will appear in CoDex tomorrow morning

- Watch workshop's website for additional information (example inputs)

- You will be using your code in Assignment 6 as well! (As you have already guessed…)

- During next workshop, we will be programming a discrete simulation that will use the graph for ETAs

- And it will be further complicated by doctors and lifts …

Questions?
I sense a soul in search of answers...

- Sadly, I do not own the patent for perfection (and will never do)

- In case of doubts about the assignment or some other problems don't hesitate to contact me!

  - Jakub Gemrot

    - gemrot@gamedev.cuni.cz