



**LIONHEAD
STUDIOS**

Lionhead Placement

April 2010 – September 2010

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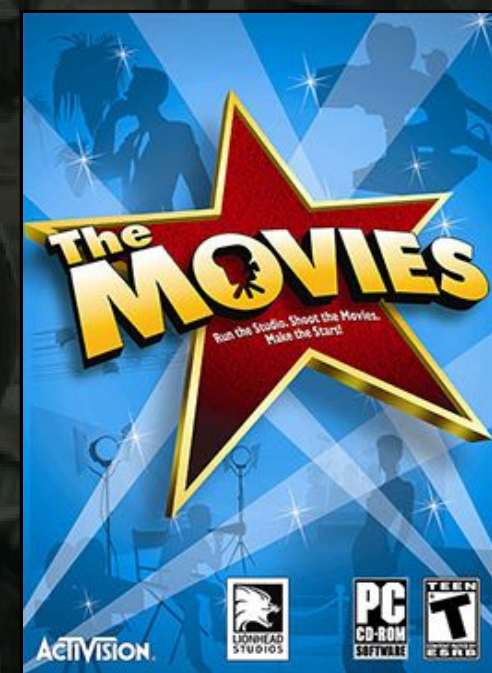
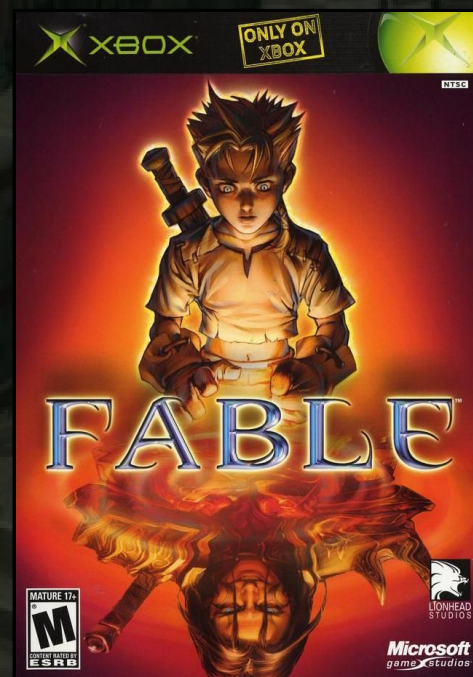
Lionhead Studios

- Based in Guildford
- Founded in 1997 as a breakaway company from Bullfrog
- Known for ambitious projects, originality, and a very British sense of humour



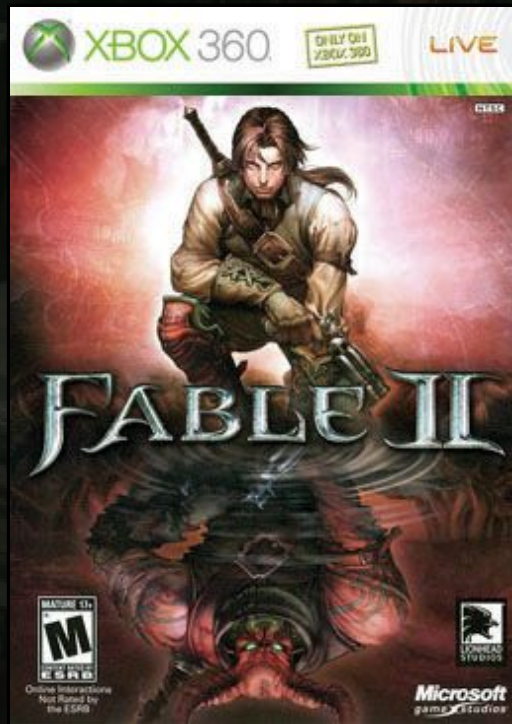
Lionhead Studios

Major games released so far:



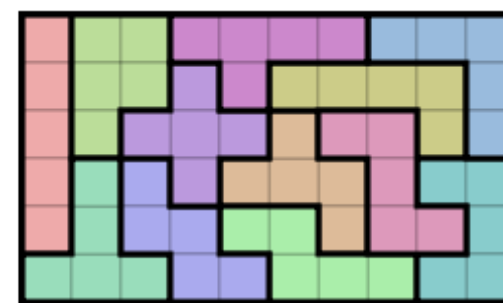
Lionhead Studios

Major games released so far:



Pentomino Challenge

- A programming challenge for new members of staff
- Useful for familiarising yourself with the tools
- Must rapidly find all solutions
- Encouraged to create something visually



6 × 10



5 × 12



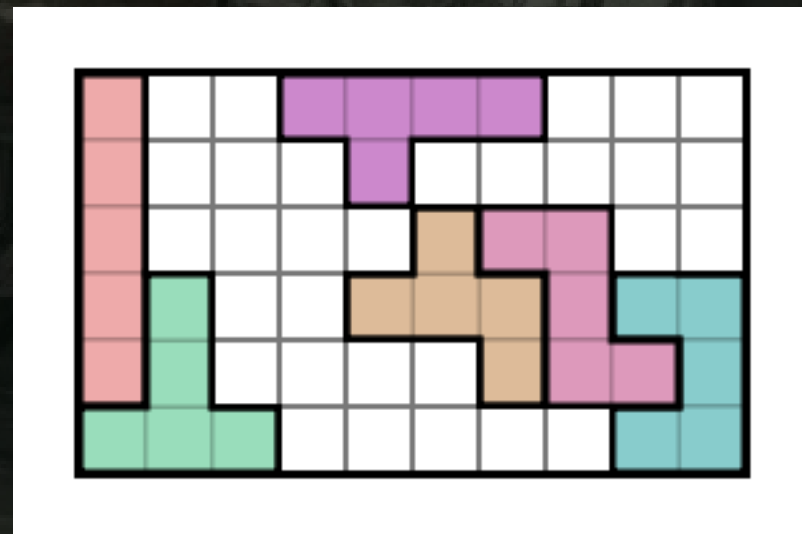
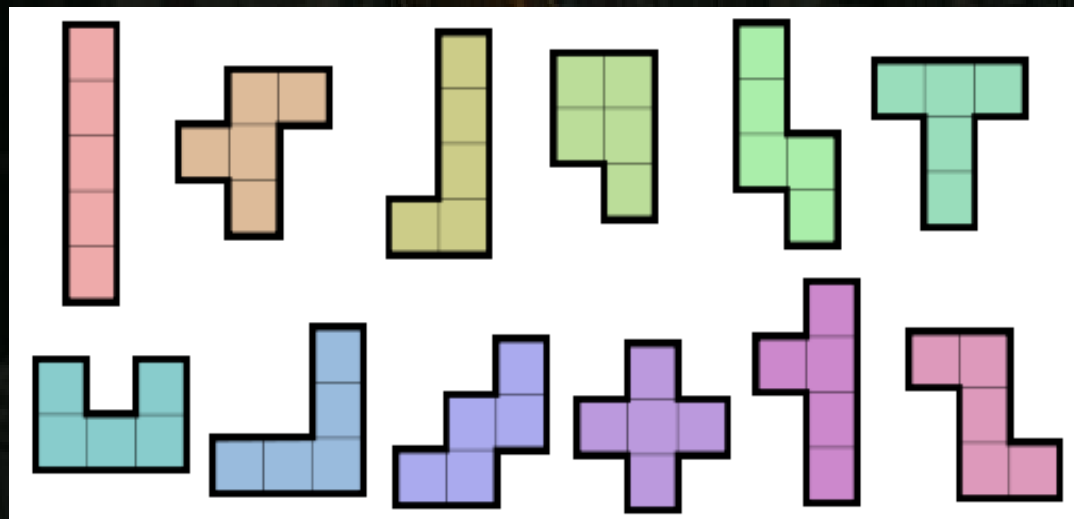
4 × 15



3 × 20

Pentomino Challenge

There are twelve “free” pentominoes, and each must be used exactly once when filling the grid. They can be rotated and flipped freely.



- A recursive, backtracking solution can be written to search through every configuration of the 12 free pentominoes
- Can prune many branches of the search tree quite easily
- Always has a depth of 12, but the branching factor varies

Assignment to Fable III

- Immediately after completing the Pentomino Challenge
- Fable III was entering the final stages of development at this point; the period that is typically known as “crunch time”
- I was assigned to both the gameplay programming team and the network programming team



Refactoring the Live System

- Live System establishes a connection between two players
- Target player might be found via the Xbox Live friends system, or from a matchmaking system
- Another system then takes over and begins sending and receiving game data
- Needed to use an Xbox networking library instead of sockets

Refactoring the Live System

Issues encountered:

- Some very complicated code that no programmer who still worked for Lionhead was familiar with
- Removing unnecessary complexity from the existing code

Refactoring the Live System

Issues encountered:

- Networking library worked in quite a different way to sockets
- Extending the wrapper that had been written around the new networking library
- Dodging some nasty threading issues

Refactoring the Orb System

- The same thing then needed to be done for the Orb system
- This was a similar task, with similar challenges



Gameplay Programming

- Still working primarily on network code, mostly for the “Sim” stuff
- Fable II had a very limited cooperative mode, but Fable III does not



Gameplay Programming

“The client cannot evict tenants from shared housing in a cooperative Live game”

“If the client kills the host's fiancé after the host has selected a ceremony, she will not be present for the wedding”

“After getting married twice the baby cot from the first marriage randomly appears around Bowerstone Market”

Gameplay Programming

General work-flow:

- Bugs typically come from producers, Matt Hanlon, or from whatever isn't being worked on by someone else
- Often worked on several bugs at once
- Occasionally stumbled into a large amount of programming unexpectedly

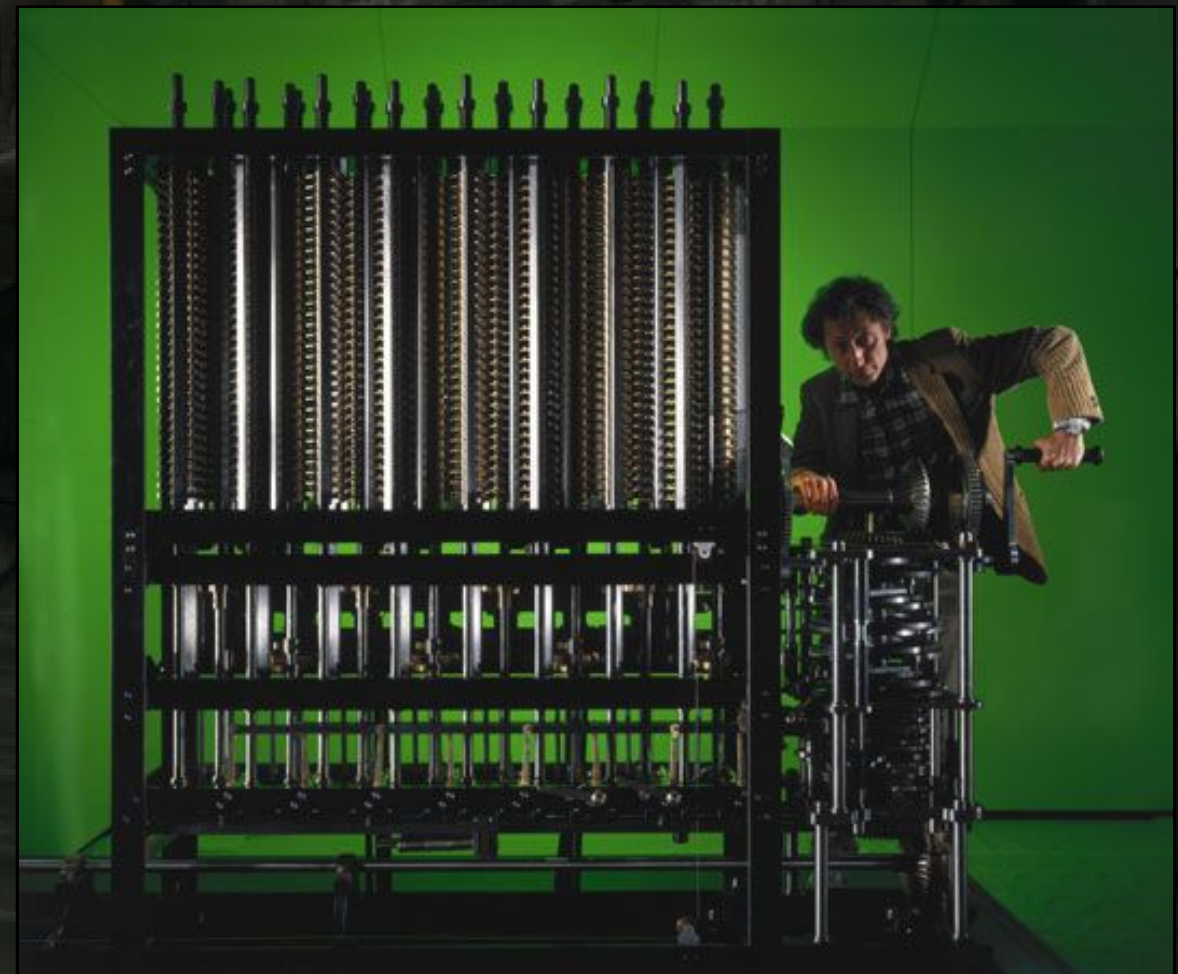
Gameplay Programming

General work-flow:

- If a solution is tested successfully
 - Submit the solution for review
 - Rework any defects found
- Commit the changes
 - Bug is sent back to tester, and may come back

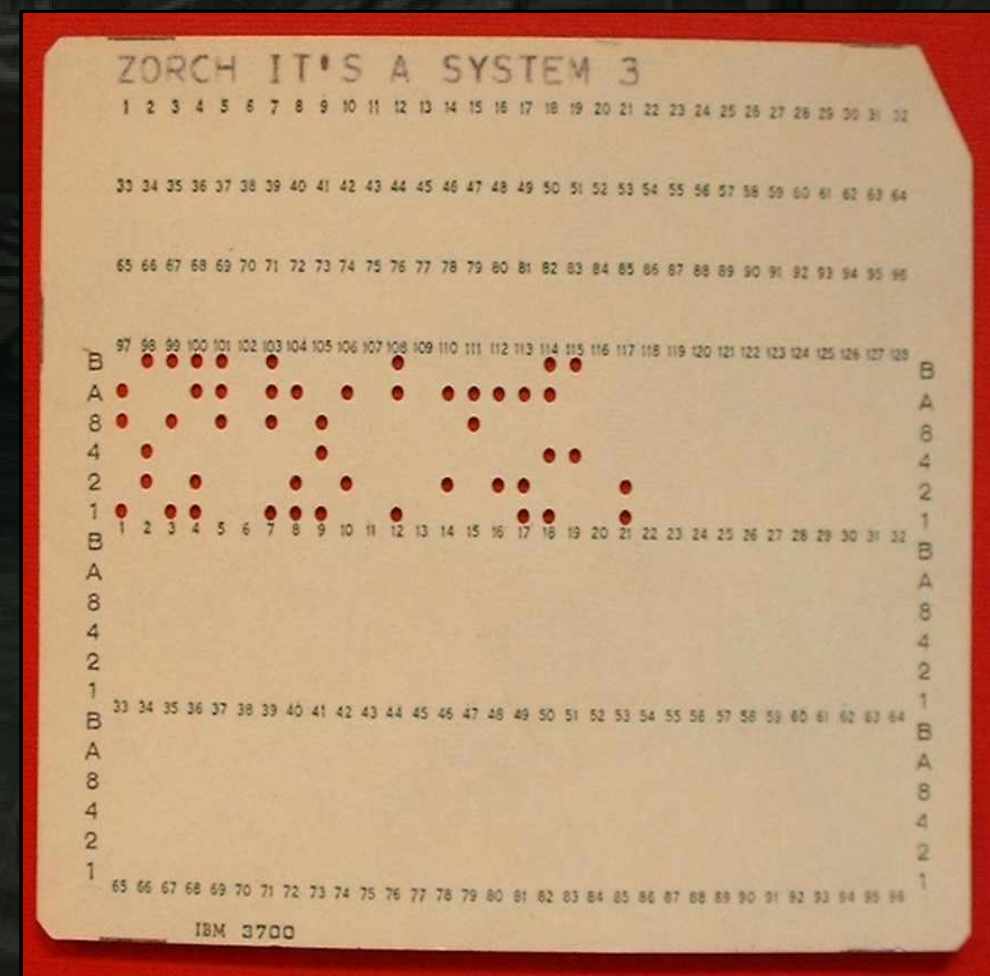
Development Environment

- C++ in Visual Studio
- Scripting in Lua
- Software for:
 - Version control
 - Bug tracking
 - Code reviewing
- Lots of tool integration
- Lots of in-house tools



Debugging

- Working with testers
- Trial and error is very impractical
- Using the right tool for the job
- Jumping in and out of Lua
- Jumping from one Xbox to another...



Experience Gained

- Greater familiarity with C++
- Working in a huge team of people
- Design considerations for large teams
- Some experience with Lua
- Comprehending other people's code
- An inside view of game development



Course Relevance

- Networks and Communications
- Concurrency
- Operating Systems
- Algorithms
- Software Engineering - Design
- Linux Lab
- Compilers
- Software Engineering Methods

Working at Lionhead

- Kitchens on each floor
- A cafeteria on the ground floor
- Grassy outdoor area with some benches
- Working hours were from 10am until 6pm, with an hour for lunch at 1pm
- Free fruit, soft drinks and biscuits
- LAN games at lunch



Living in Guildford

- Moved into a flat in the middle of the town centre
- Right next to the high street
- Very close to the bus station
- Ten minute walk from the train station



Living in Guildford

- Lots of shops
- Nice park areas
- Local cinema
- Ice Rink and Bowling at the Guildford Spectrum



In Summary

- Working for Lionhead was fun
- Game development is hard
- Game development is fun
- A six month placement is not long
- Placements are a very good idea

