





Introduction to Game Development

Lecture 5



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The Microprocessor Cometh



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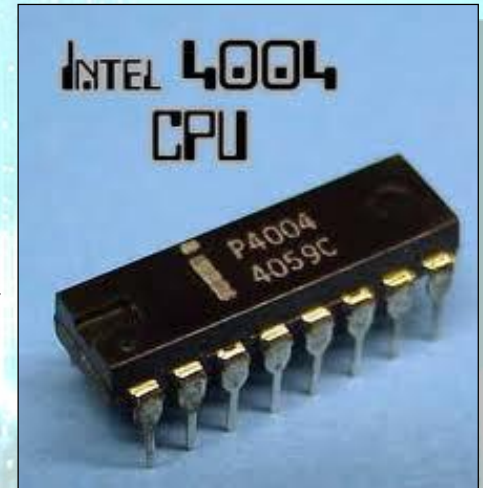
Late 1970s



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4004 Microprocessor

- Early 1975
- First functioning microprocessor
- Add and subtract only
- Demonstrated around the US by travelling Intel engineers
- Chicago demo attended by Dave Nutting
- He convinces Intel to give him one of the first 50 development units





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4004 Microprocessor

- Nutting teams up with Micro Games
- Creates *Spirit of 76* pinball game
- However, 4004 was not powerful enough to drive a screen

THE SPIRIT OF '76

computerized pinball from Mirco Games, Inc.

Finally. Something new in pinballs besides playfield cosmetics. Introducing THE SPIRIT OF '76 – MIRCO's pinball revolution. A smart, tough, 1-2 player machine. Packing a whole lot more into less with high technology, state-of-the-art microcomputer design. All the playability of conventional pinballs, plus totally *unconventional* extras. Features like:

- **Electronic semiconductor memory.** Not just a pinball to remember, but a pinball that remembers you. Players can retain bonus set-ups from one turn to the next because the computer remembers what they've done. The first playfield that doesn't quit between balls.
- **Special effects.** MIRCO's backglass adds a new dimension to exciting play. Free games, add-a-ball and high stakes bonus situations are announced by audio/visual attention grabbers. Drum rolls... whistles... light shows... a cannon that booms "the shot heard 'round the world." The only pinball with an electronic amplifier and quality speaker.
- **LED (digital display) readouts.** For all credit, scoring and ball-in-play functions. Easy to read, attractive, more reliable than electro-mechanical systems.
- **Free games/add-a-ball.** Win with high score, random match, or hit Special targets. Double bonus capabilities on last ball or optional add-a-ball.
- **Championship playfield.** Four-side kickers, 3-pop bumpers and 2-Special (free game) targets.
- **Distinctive graphics.** Crisp and clean. The look of the '70's in the game for the '70's.

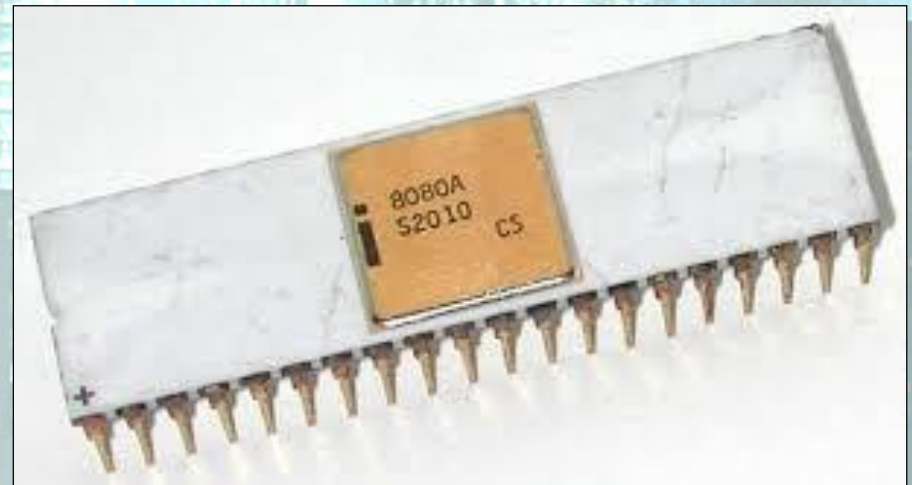




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8080 Microprocessor

- Late 1975
- More powerful
- Capable of driving a screen

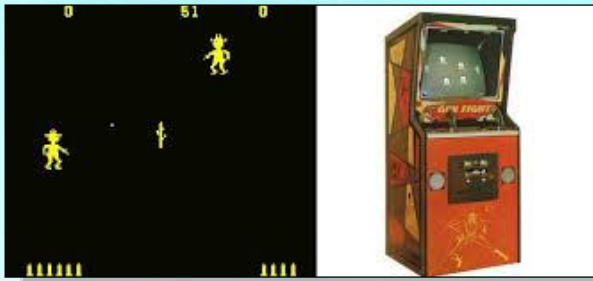




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8080 Microprocessor

- Nutting needed a game
- Bally Midway had bought *Western Gun* from Taito
- WG wouldn't work!
- BM asked Nutting to redesign it for the 8080
- Nutting revolutionised game dev overnight
- Software not Hardware!!!



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Gunfight

- Nutting hired two PROGRAMMERS!!
- Renamed *Western Gun*, *Gunfight*
- Nervously, BM buy 60% of the RAM in the world for \$3,000,000
- Gunfight not as good a game as WG
- Gunfight far better to play because of the 8080

Last two TTL games

- Transistor-Transistor Logic
- Program hard wired
- Hardware was single use
- Exidy's Death Race
- Atari's Breakout



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Exidy's Death Race

- Reworking of Destruction Derby, sold to Chicago Coin
- Players get points for running down pedestrians
- Cross shaped headstone
- Originally a joke idea!

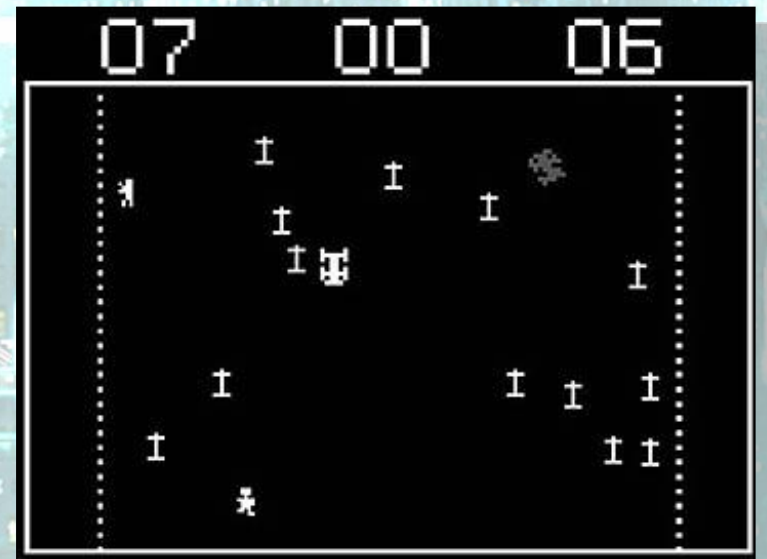




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Exidy's Death Race

- Storm of protest
- Exidy: "If people get a kick out of running down pedestrians, you have to let them"
- TV *60 Minutes*
- Exidy: "gremlins and ghouls, not people"
- Nobody fooled





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Exidy's Death Race

- Death threats
- Some Distributors and Arcades refuse to take Death Race
- Controversy lasts 2 months
- *During this time sales increase!*





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Breakout

- Brainstorming weekend away
- Not one of the most popular ideas but
- Bushnell liked it
- Not developed on weekend
- Initially looked to be too hardware intensive



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Breakout

- Bushnell gave the job to a young hippy technician at Atari who wanted extra money to go travelling to India
- Steve Jobs
- Offered Jobs a bonus for every circuit he could eliminate from the game





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Breakout

- Jobs recruited his friend, Steve Wozniak
- Jobs offers Wozniak half
- Wozniak very successful
- Jobs
 - earns several \$k
 - tells Wozniak \$700
 - gives Wozniak £350
 - goes to India alone
- Most successful game of 1976





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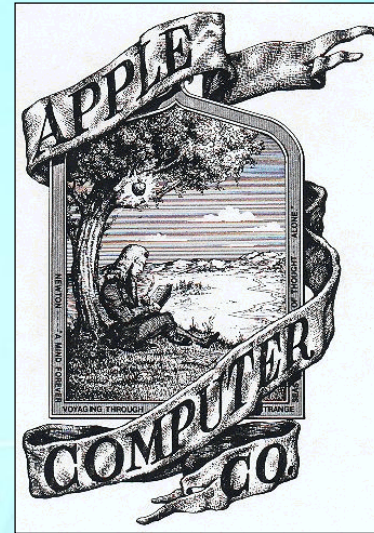
Wozniak

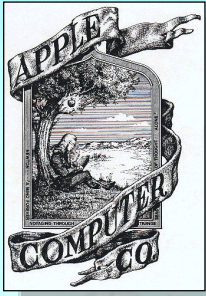
- While Jobs is in India, Wozniak puts what he learned on Breakout to good use
- He builds his own computer
- It connects to a TV and keyboard
- He called it Apple 1
- Jobs returns from India
- Suggests they form a company

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Apple Computer

- 1st April 1976
- 150 hand made Apple Is
- By the time they go on sale the better Apple II is almost ready
- Wozniak wanted
 - Colour graphics
 - Better sound
 - Game controllers
 - Connect to home TV

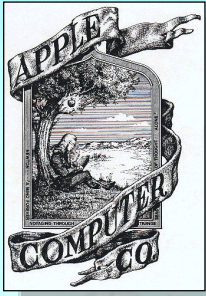




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Apple Computer

- Wozniak hopes to run Breakout, in Basic
- Jobs sees the business potential
- Approach Commodore Business Machines
 - Ask for several \$100K
 - Thrown out!
 - Commodore decide to build their own computer
- Approach Atari
 - Atari: “outside our area”



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Apple Computer

- Apple II
 - Build it themselves
 - Designed for video game
 - Wozniak's idea
 - Colour screen
- But they had competition





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Commodore Pet

- All-in-one system
- Monochrome screen
- \$599
- \$3,000,000 pre-orders





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Tandy TRS-80

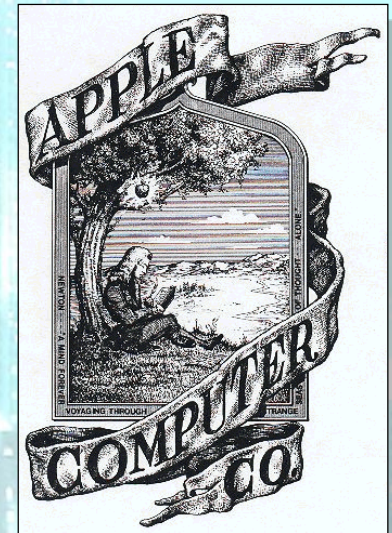
- Owned Radio Shack
- Electrical Retail outlets
- Monochrome screen



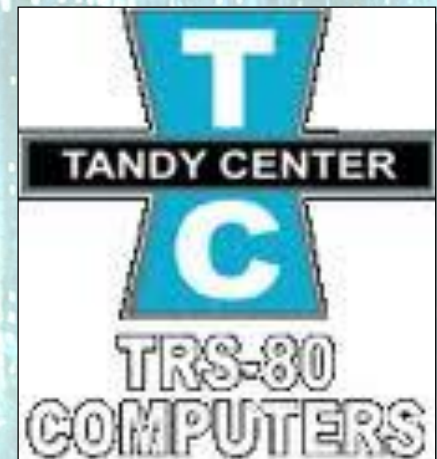
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By the end of the decade

- Apple II had 23% of the market
- Tandy had 16%
- Commodore had 10%



C-Commodore



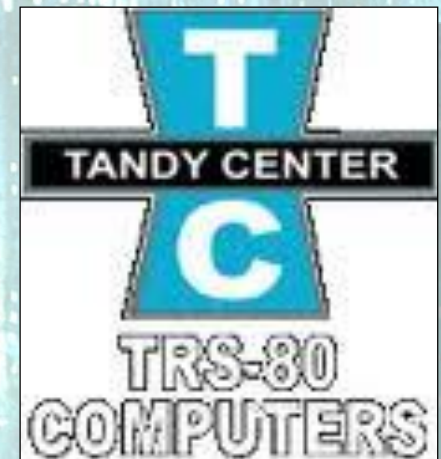
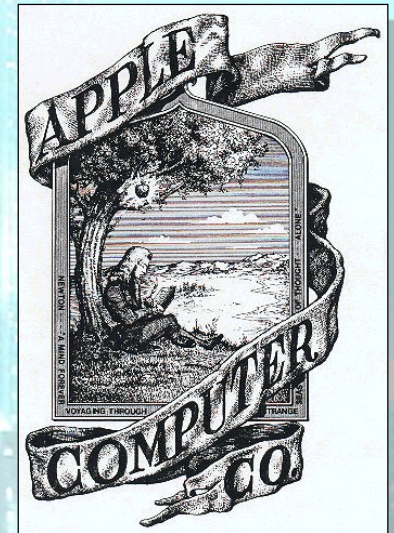
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By the end of the decade

- Many American homes had a computer
- Few people could think what to use them for!!
- Vast majority played games!

The Commodore logo, featuring a stylized 'C' with a red and white flag-like design inside the loop, followed by the word 'Commodore' in a bold, blue, sans-serif font.

Commodore





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Meanwhile ..

- In July 1978 Taito release ...



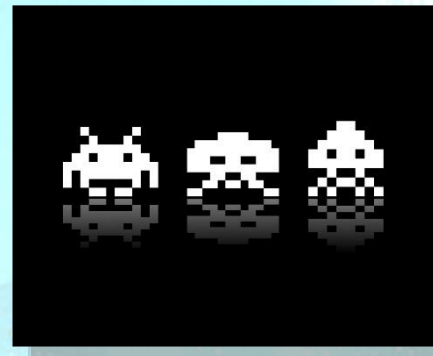


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Meanwhile ..

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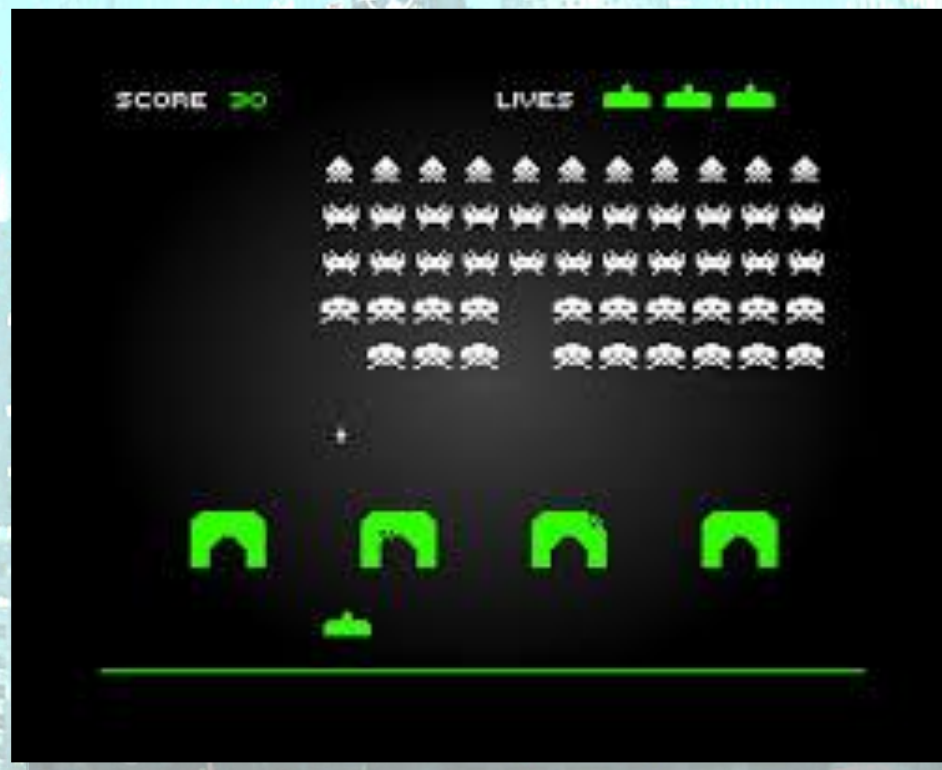


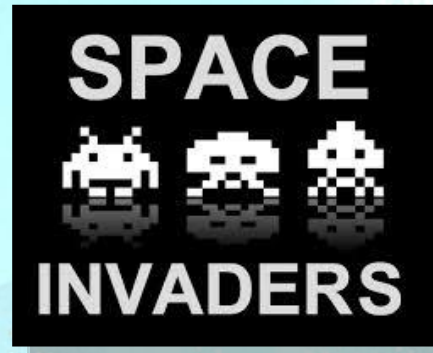


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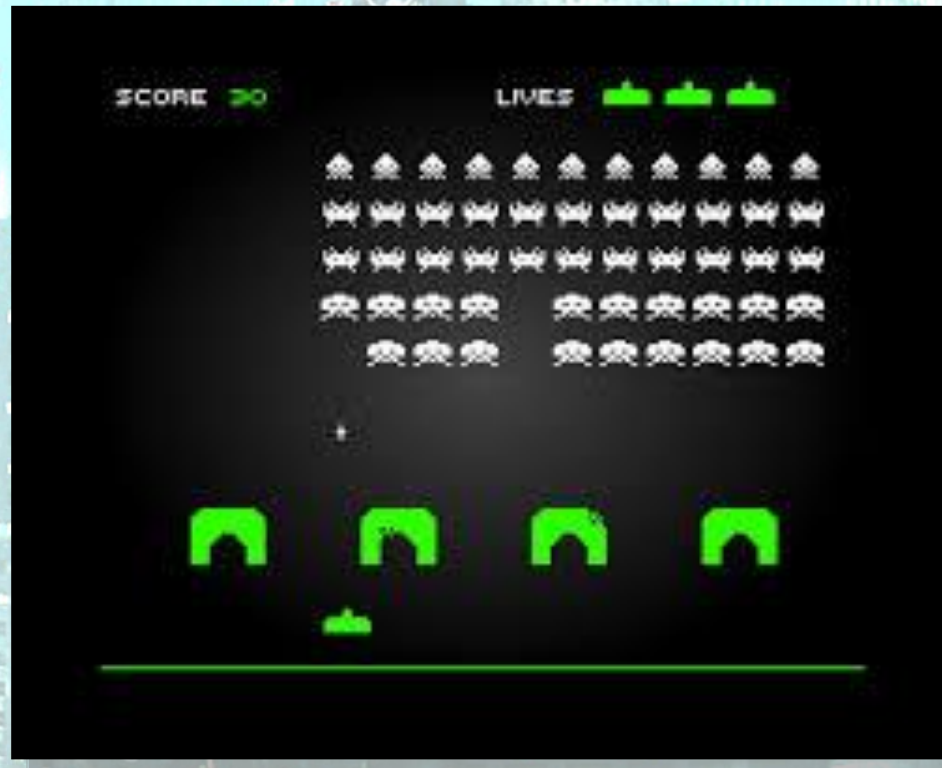


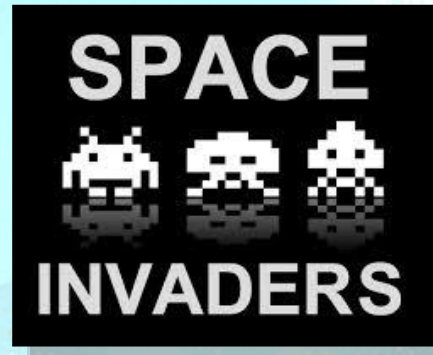


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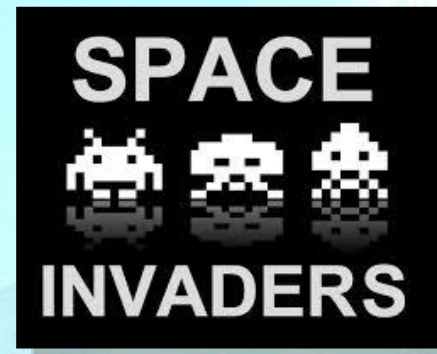




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Space Invaders

- In Japan within 3 months
 - 100,000 machines sold
 - Cafes swapping tables for SI machines
 - Disco Space Invaders is a hit
 - So many 100 yen coins used in SI machines that none left for subway or phones
 - Bank of Japan orders investigation!



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Space Invaders

- In US
 - Bally Midway sell 60,000 machines
 - Coin-op sales in 1978 were \$472,000,000
 - Coin-op sales in 1979 were \$1,333,000,000



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Atari

- Atari taken over by Warner Communications
- Bushnell becomes very rich
- Relations between Bushnell and Warner break down over differences in business practices
- Bushnell and Keenan leaves Atari
 - Open up a Pizza franchise!

ATARI

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Atari 2600

- Atari 2600 designed for home video gaming
- Competitors – e.g. Mattel's Intellivision



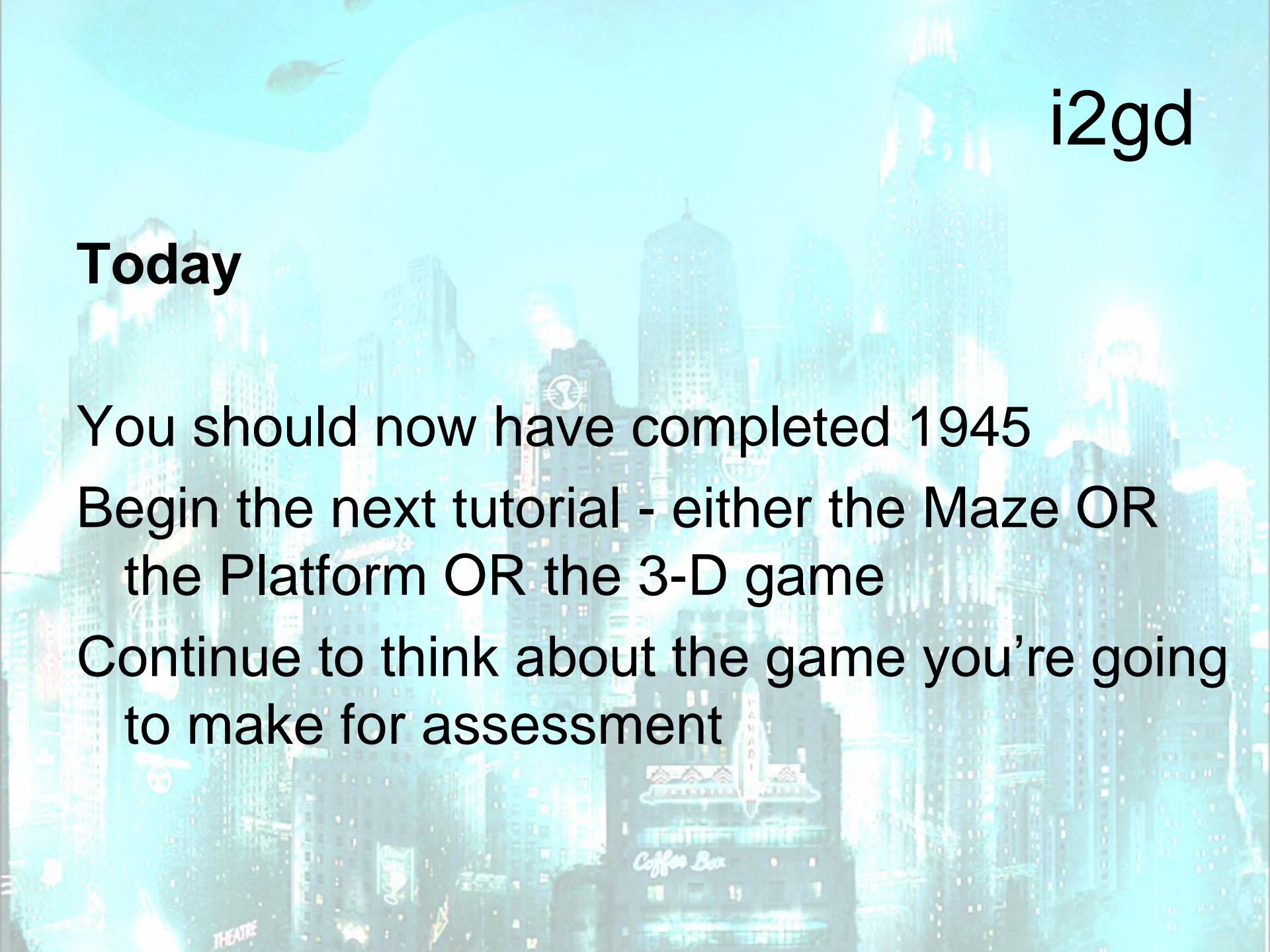
ATARI

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Atari 2600

- Atari had a brainwave
- Bought SI rights from Taito
- In January 1980 Atari release SI on the Atari 2600



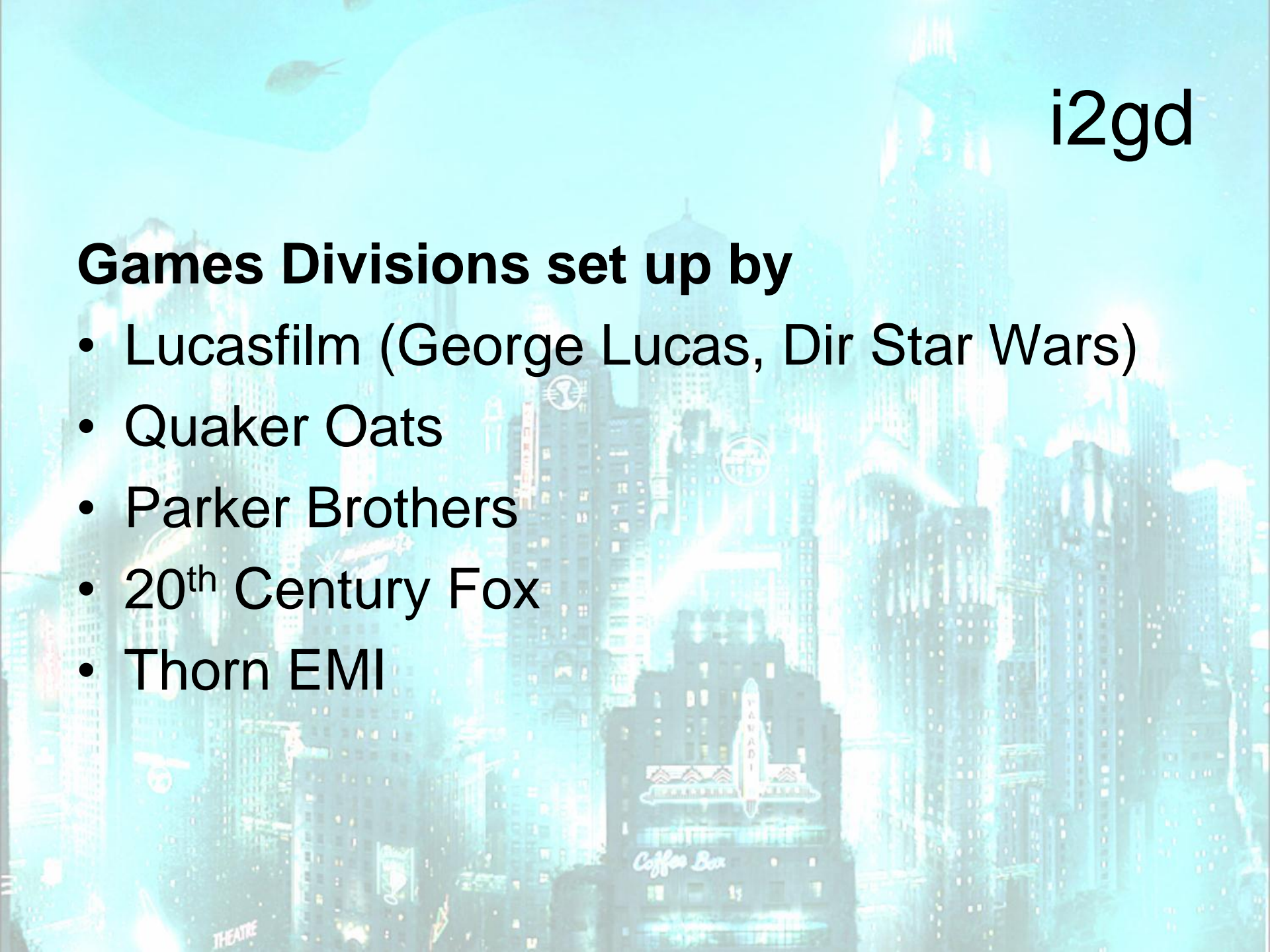


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Next lecture ..

1980s

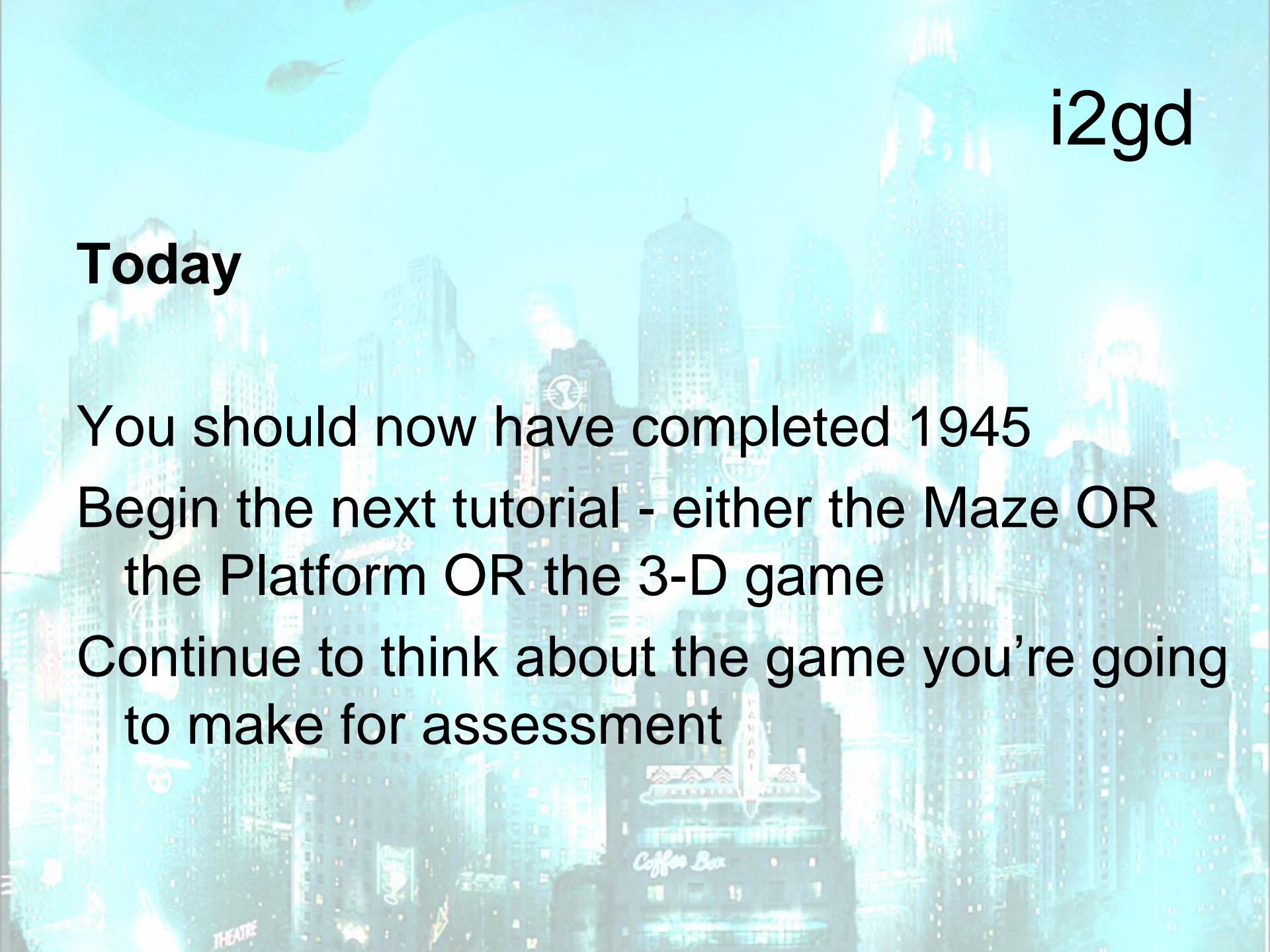
Space Invaders, Pacman, Disney, Star Wars,
McDonalds ...



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Today

You should now have completed your chosen tutorial
You should have begun your Design Document



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Today

You should now have completed your chosen tutorial

You should have begun your Design Document

Gentlemen (and Ladies!!), start your engines ...

.... let's make some games