This session focuses on how games can fit into a CS curriculum at various levels and in various ways.
Why?

Enrollment
Engagement
Motivation
Connection
Learner-Centered
Applied
Real-World
Contexts
Start where learners are

Ready, Set, GO!!

Games as Assignments - Year 1
A Game Programming Course
Computer Science and Arts
Collaborative Efforts
Games as Assignments - Year 1

Use of Classic Arcade Games

- Students understand the problem
- Classic games make use of older and simple technology
- Recognizable cultural objects
- Known Rules
- Exemplars exist
Assignments

Standard Set:
1. Read percentage grades and print corresponding letter grades.
2. Create a class that represents a point in a two dimensional Cartesian coordinate system.
3. Create subclasses shape, rectangle, circle, and test from the point class defined in assignment 2.
4. Swing-based mortgage calculator.
5. Simulate a greenhouse: Has sensors and effectors, uses threads and a simple GUI.

Game-based Assignment Set:
1. An implementation of a simple calculator (no classes).
2. First class - integrate a BigNum class into the calculator.
3. Write an ACSII-graphics version of the Four Seasons Solitaire game.
4. Design and write a recursive parser for expressions.
5. Design and implement an ASCII-graphics, turn-based version of the Centipede arcade game.

Games Vs Other Assignments

(N) Number of Tokens
(v) Vocabulary
(L) Length
(LOC) Lines of Code
(E) Effort
(TC) Time to Code
(CC) Cyclomatic complexity

<table>
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<tr>
<th>Table 1: Assignment Metrics</th>
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\( n_1 \) = the number of distinct operators
\( n_2 \) = the number of distinct operands
\( N_1 \) = the total number of operators
\( N_2 \) = the total number of operands

**Vocabulary:** This is the number of distinct symbols used in the definition of the program. It is defined as:
\[
n = n_1 + n_2
\]

**Length:** The length is a relationship between the token length \( N \) and the vocabulary \( n \). It is defined as:
\[
N = n_1 \log(n_1) + n_2 \log(n_2)
\]

**Programming Effort (Halstead measure)**
\[
E = \frac{V}{PL}
\]
where the symbol \( V \) represents a quantity named program volume, an estimate of the volume of information required to specify a software program; and the symbol \( PL \) is the program level, a measure of the relation between the volumes of the most compact representation and the actual program.

\[
PL = \frac{1}{((n_1/2) \cdot (N_2/n_2))}
\]

\[
V = N \cdot (\log_2 n)
\]

**Time to Code:** This is an estimate of how long it would generally take to write the program. This measure correlates very well with the actual measured time to write programs, and is also an established measure of program difficulty or effort needed to write a particular program. This measure is a function of the programming language use. For Fortran, the programming time \( T \) is computed as:
\[
T = \frac{E}{K}
\]
where the constant \( K \) depends on the language. For the Java language, the constant 0.9 was used; this was estimated by computing the effort for a sample set of programs for which the programming time was known.

CPSC 585
[4th year capstone]

A Game Programming Course

Course Outline

- Block Week classes, 9-5
- Term project
- Site visit
- Final demos

- driving game
- 5-person teams
- No engines
- Access to Maya, assets

Crash of the Titans
Driving & Racing Games

- Representative sound, graphics, play
- Graphics can be simple
- No need for complex character animation
- No need for complex objects (like trees)
- Can be done in one semester
- Physics is challenging

The Result

Figure 1. Screenshot from the student created game called MiniMayhem
Ocean Quest
Joint CS/Drama
2 campuses

High School Physics
Rural / remote learners.
Low motivation
Small schools

Collaborative Efforts
The Orphans of Galileo Island

CPSC 701.03
Serious Games

http://www.ucalgary.ca/~jparker/cs70103/

http://canadianpress.google.com/article/ALeqM5h7ZGB54n3qOP9UFCLR8bo7qOQYVOTQ
http://www.cbc.ca/cp/technology/071002/2100215s.html
http://technology.canoe.ca/2007/10/02/4544192-cp.html
http://ca.newsvacation.com/ctv/reuters/071005/technology/tech_booze_cruise.col
http://dailygleaner.canadaeast.com/livet/article/88960
http://www.ctv.ca/servlet/ArticleNews/print/CTVNews/20071003/video_game_071002/20071003/
to teach teens important lessons/print/
I AM SO HAMMERED!

BUT I GOTTA GET HOME

101 CONSEQUENCE AVENUE

Booze Cruise
Booze Cruise

BUSTED!

You pay $17300 more in insurance, receive 32 demerits, lose your license for 12 years, and go to jail for 8 years.

Hey—at least you had a good time.

Ran out of time. Game Over.

Booze Cruise
Thanks!!

Game Images courtesy of:
Official Game Sites (Images are identified by game)
Fan Art
Mobygames.com
Gamespot.com
IGN.com
JRParker & His Students