COMPSCI 1JC3
Introduction to Computational Thinking
Fall 2017

03b Discussion Session

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Admin

- Office hours: To see me please send me a note with times.
- Are there any questions?

Review

1. Modular arithmetic.
2. Equivalence relations.
3. Two's complement representation of machine integers.
4. ASCII and unicode.
5. Linear vs. binary search.

Floating Point Numbers? (iClicker)

Can the number 0.1 be exactly represented by a member of the `Float` or `Double` type?

A. Yes.

B. No.

C. It depends on the computer.

Case Study: Patriot Missile Disaster

- During the Gulf War (1991) a Patriot missile missed an incoming Scud missile.
  - 28 American soldiers were killed.
  - Around 100 people were injured.

- The failure was due to an inaccurate time calculation.
  - 0.1 seconds was chopped at 24 bits.
  - After 100 hours the error was 0.34 seconds — a Scud travels more than half a km in this time.

- Details at http://ima.umn.edu/~arnold/disasters/

- Shows that computing professionals must understand how numbers are represented on a computer!