Prolog

1972

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A logic-based programming language associated with symbolic artificial intelligence.

CMPT 383
Summer 2022
SFU Surrey

What was going on in 1972?

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1972: First Appearances

HP-35 Pocket Scientific Calculator

How much would you pay for it?

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$395 in 1972

$2559 in 2021

1972: First Appearances

ODYSSEY

Magnavox Odyssey

First Home Video Game System

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Table Tennis

How much would you pay for it?

$99.95 in 1972

$647 in 2021

1972: First Appearances

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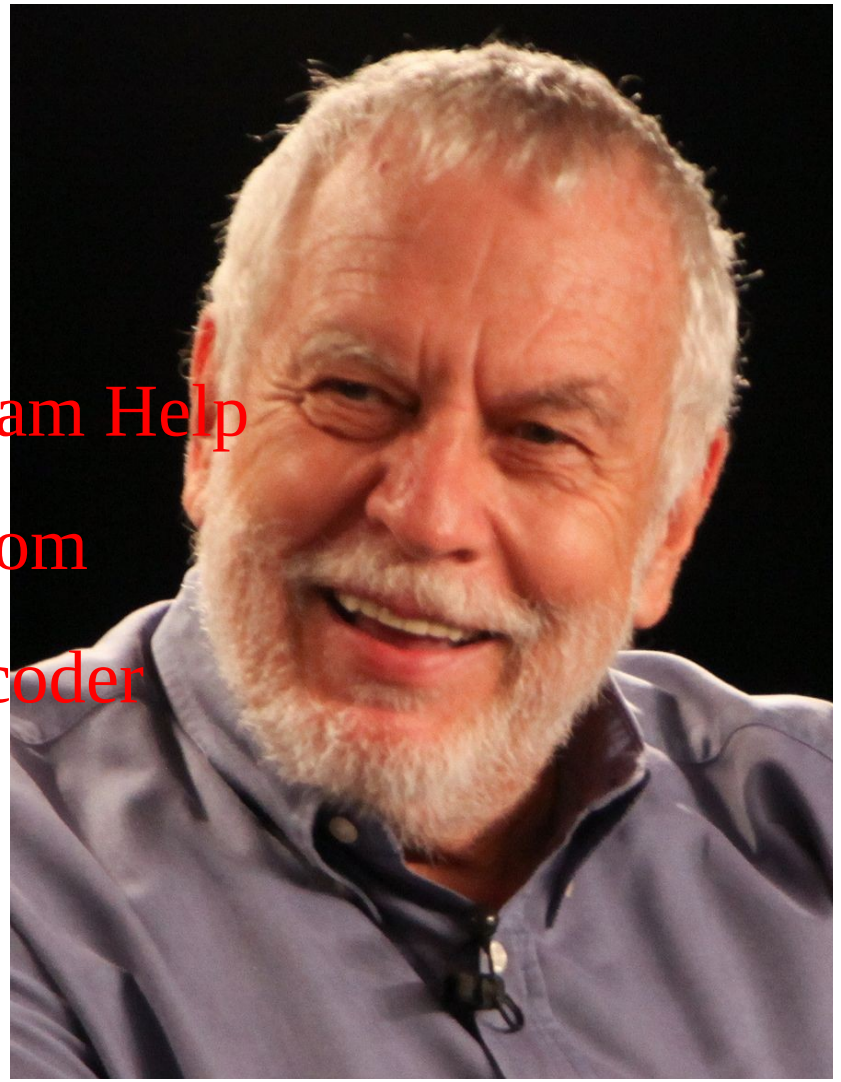

Nolan Bushnell

1972: First Appearances

Pong

Atari's 1st commercially successfully video game

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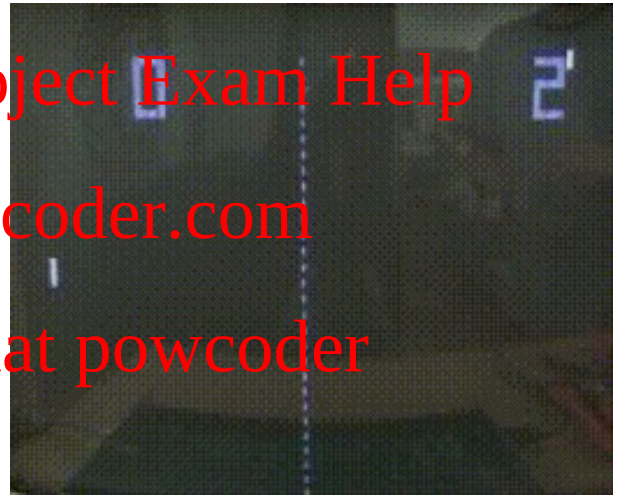

1972: Highest-grossing Arcade Games

#1 Computer Space – 200 cabinets

#2 Pong – 1 cabinet

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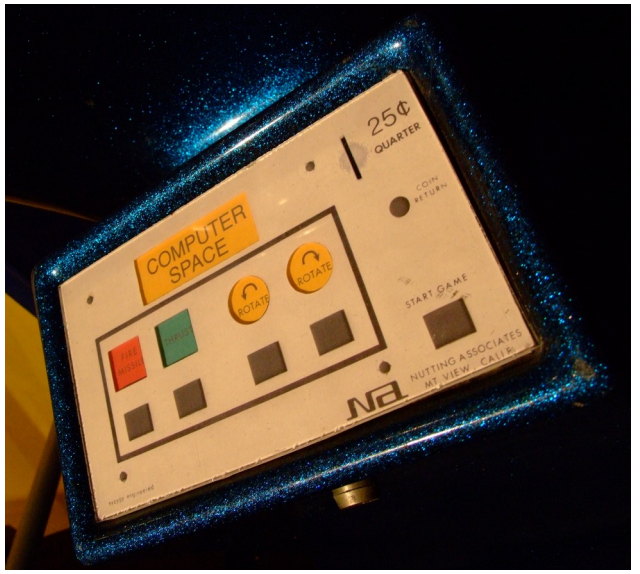

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1972: Highest-Grossing Movie

1972: Most Popular Song

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The First Time Ever I Saw Your Face

Roberta Flack

1972: First Appearances

THE

C

PROGRAMMING

LANGUAGE

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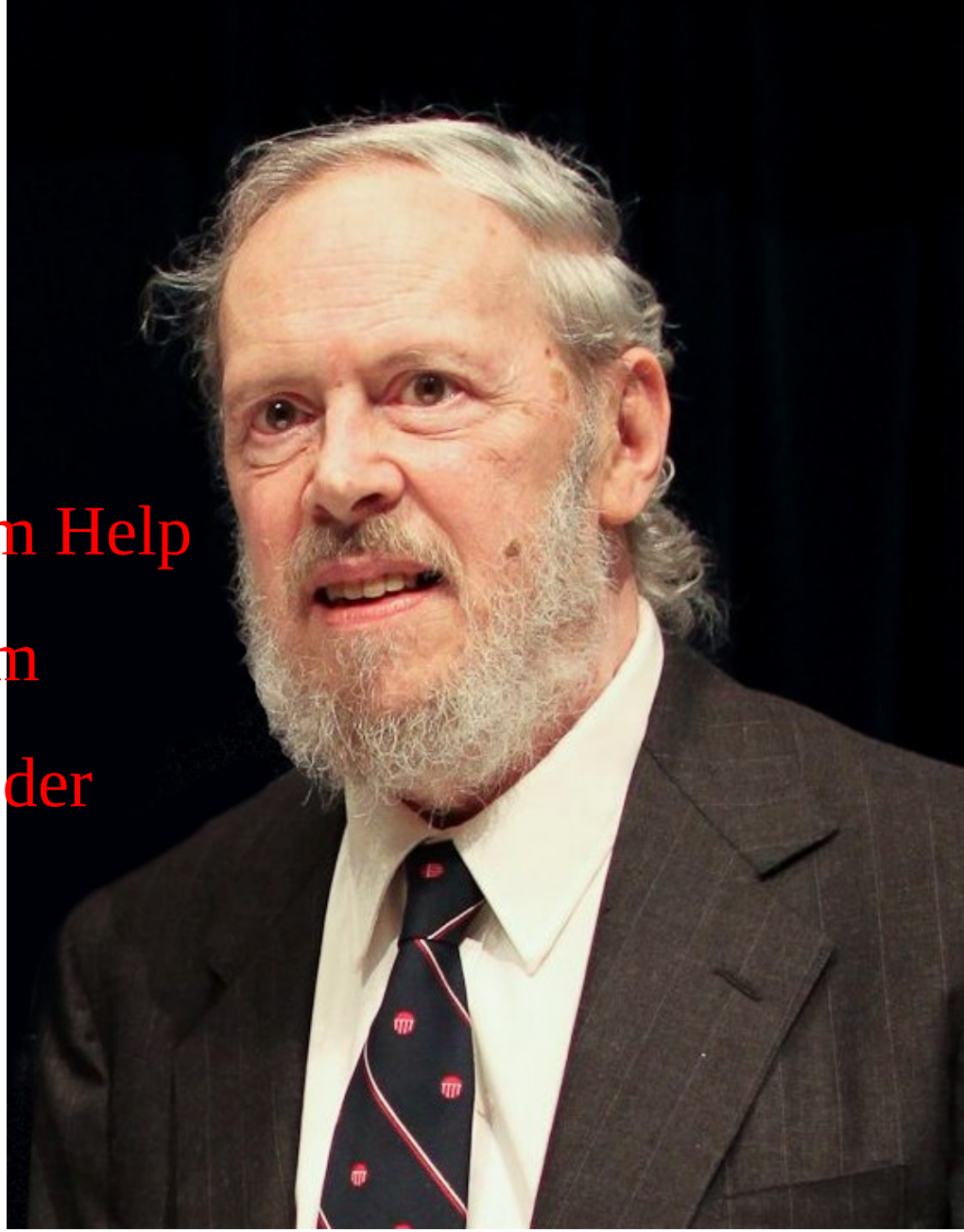
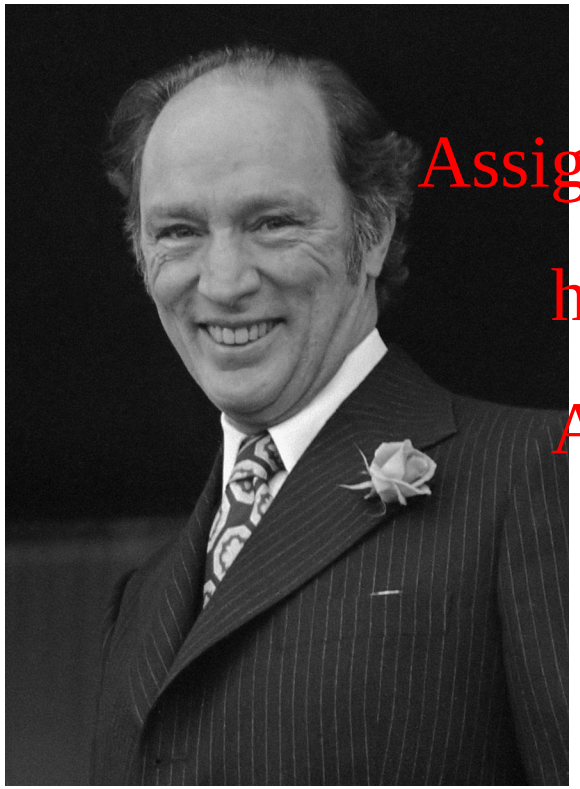


Dennis Ritchie

1972

Canadian PM



Pierre Trudeau

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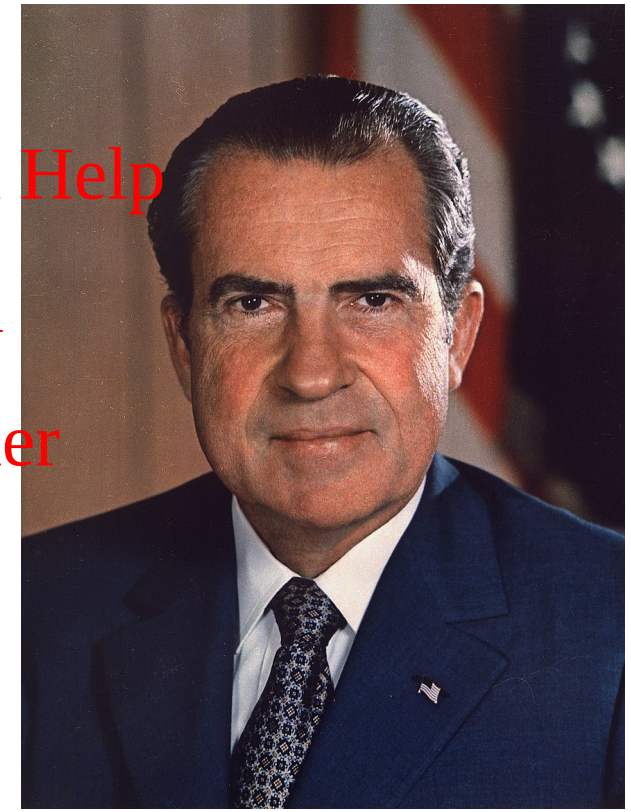
US President



Richard Nixon

Prolog

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1972

A logic-based programming language associated with symbolic artificial intelligence.

Prolog's Creators

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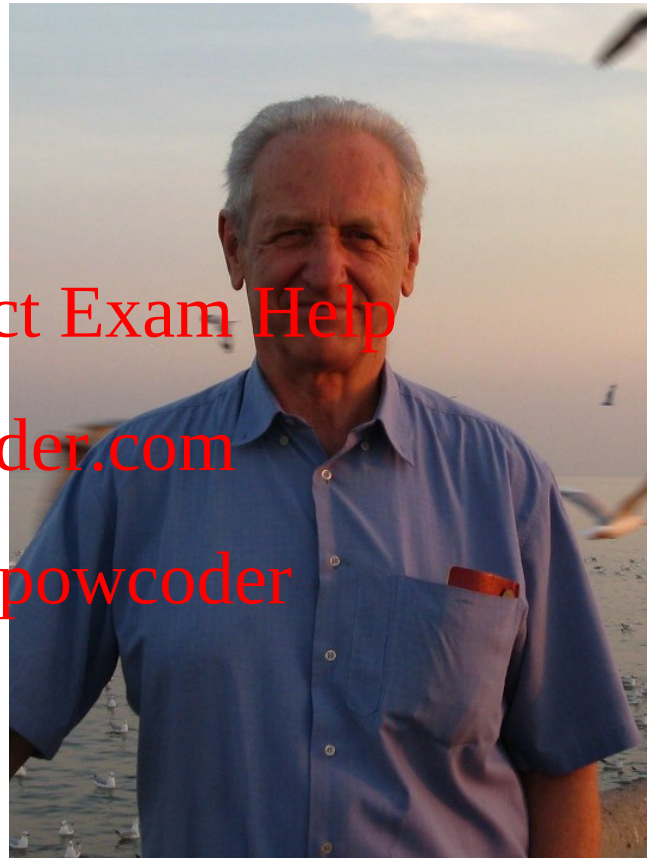
Alain Colmerauer
(1941 – 2017)



Robert Kowalski

Prolog Probably **Can't** Get You a Job!

Prolog has been most influential as a **research language** used by AI researchers.

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It also has some relevance to database processing, and declarative languages such as SQL.

What's Prolog Good for?

Computational logic,
e.g. theorem-proving.

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Symbolic artificial intelligence.

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Parsing natural language.

What's Prolog Not so Good For?

- Prolog is often not as efficient as other languages.
  - Prolog uses simple depth-first search, and needs heuristics to improve that.
  - Often stores large databases, and efficiently querying those databases can be difficult.
- Prolog is not used much in practice, so it can be hard to find support for it.
- Prolog has a very logical flavor, which appeals to some people, but turns others off.
- Prolog syntax and semantics is quite different than other languages.

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Measuring the performance of different programming languages is surprisingly difficult to do fairly. Check out

the Computer Language Benchmarks Game

.

Major Features of Prolog

Functions are first-class objects

- Functions can be passed and returned (closures)

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Interpreted

- Easy to evaluate individual expressions

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Memory-safe and garbage-collected

- No manual memory deletion

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Major Features of Prolog

Types

Dynamically typed, i.e. types checked **at** run-time

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Pattern matching (unification)

Given two expressions with variables in them, Prolog can find values for those variables that make them the same (very useful!)

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Declarative (sometimes)

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You can often think of a Prolog program as describing a goal state without saying exactly how to find it. It automatically searches for a solution using depth-first search.

Automatic backtracking

After finding a solution to a problem, Prolog can automatically **backtrack** to decision points and make different choices.

Major Features Not in Prolog

Features **not** part of Prolog

- No functional programming (at least not in the style of Racket/Haskell)
- No object-oriented programming
- No loops

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Hello World in Prolog

Please use install and run SWI-Prolog. See the course notes or SWI-Prolog website for installation instructions.

```
?- write('Hello, world!').
Hello, world!
true.
```

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