

# Haskell

1990

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purpose, statically-typed

pure functional programming

language with type inference and  
lazy evaluation

CMPT 383  
Summer 2022  
SFU Surrey

What was the situation in 1990?

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# 1990: First Appearances

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**Hubble Space  
Telescope**

# 1990: First Appearances

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**Windows 3.0**

# 1990: First Appearances

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## Photoshop 1.0

# 1990: Highest-grossing Arcade Game

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**Teenage Mutant  
Ninja Turtles**

# 1990: Highest-grossing Home Game

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**Super Mario  
World**

1990: Highest-  
Movie

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# 1990: Most Popular Song

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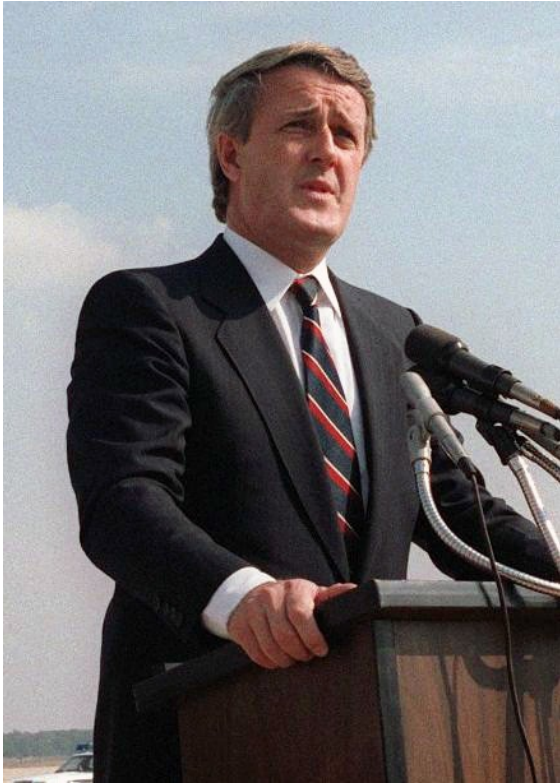
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Hold On

*Wilson Philips*

# 1990

Canadian PM



Brian Mulroney

US President

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George H. W. Bush

This TV show started

ROWAN ATKINSON

# Mr. Bean



# Haskell

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1990

<https://eduassistpro.github.io/> pure, statically-typed,  
functional programming  
Add WeChat [edu\\_assist\\_pro](#) type inference and  
lang lazy evaluation

# Haskell's Namesake

## Haskell Curry

1900 – 1982

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mathematician who did much of foundational work in lambda calculus, the mathematical foundation of functional programming.

He wasn't involved with the Haskell language itself.

# Haskell's Original Designers

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**1992  
Haskell  
Working  
Group**

# Haskell Probably **Can't** Get You a Job!

Haskell has been most influential as a  
**research language** used by a subset of  
academ age

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Similar to LISP, Haskell is filled with lots of  
ideas that have influenced many other  
languages.

# What's Haskell **Good** for?

Programming language  
type systems.

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Further development of the  
functional programming  
paradigm, aiming towards  
practicality.

# What's Haskell **Not** so Good For?

- Haskell is often **not** as efficient as other languages.
  - Immutability can lead to inefficient solutions to problems that can be easily implemented efficiently in other languages.
- Compared to the most popular mainstream languages, Haskell is **not** used much in industry to find support for it.
- Haskell's was born in academia and has a **very mathematical** flavor, which many programmers find different than C-style languages.
- Haskell syntax can be extremely terse, and can use many obscure operators.
- Haskell's strict typing can take some getting used to, and may be frustrating at first.

Measuring the performance of different programming languages is surprisingly difficult to do fairly. Check out [the Computer Language Benchmarks Game](https://the-computer-language-benchmarks-game.com/).

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# Major Features of Haskell

## Functions are first-class objects

Functions can be passed and returned (closures)

## Interpreted and Compiled

Easy to evaluate individual expressions <https://eduassistpro.github.io/>

## Memory-safe and garbage-collected

No manual memory deletion

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# Major Features of Scheme

## Types

**Statically typed**, i.e. types checked **before** run-time

**Type inference**, i.e. often Haskell infer what types must be with the programmer needing to

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## Purely Functional

All values are **immutable**: once you create a value, it cannot be changed

All functions are **pure**: no side-effects, output depends only on input

## Lazy Evaluation

When you pass an expression to a Haskell function, the expression is passed **unevaluated** to the function

# Major Features **Not** in Haskell

## Features **not** part of Haskell

**No** pointers

**No** object-oriented programming

**No** exceptions

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# Hello, World!

Follow the download instructions at  
<https://www.haskell.org/downloads/>

We'll mainly use **ghci**, the Glasgow Haskell interpreter. You can compile Haskell programs with **ghc**.

## Assignment Project Exam Help

```
> ghci
```

```
GHCI, version 8.6.5
```

```
for help
```

```
Prelude> putStrLn "Hello, World!"
```

```
Hello, World!
```

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[haskell.org/ghc/](https://www.haskell.org/ghc/) :?

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