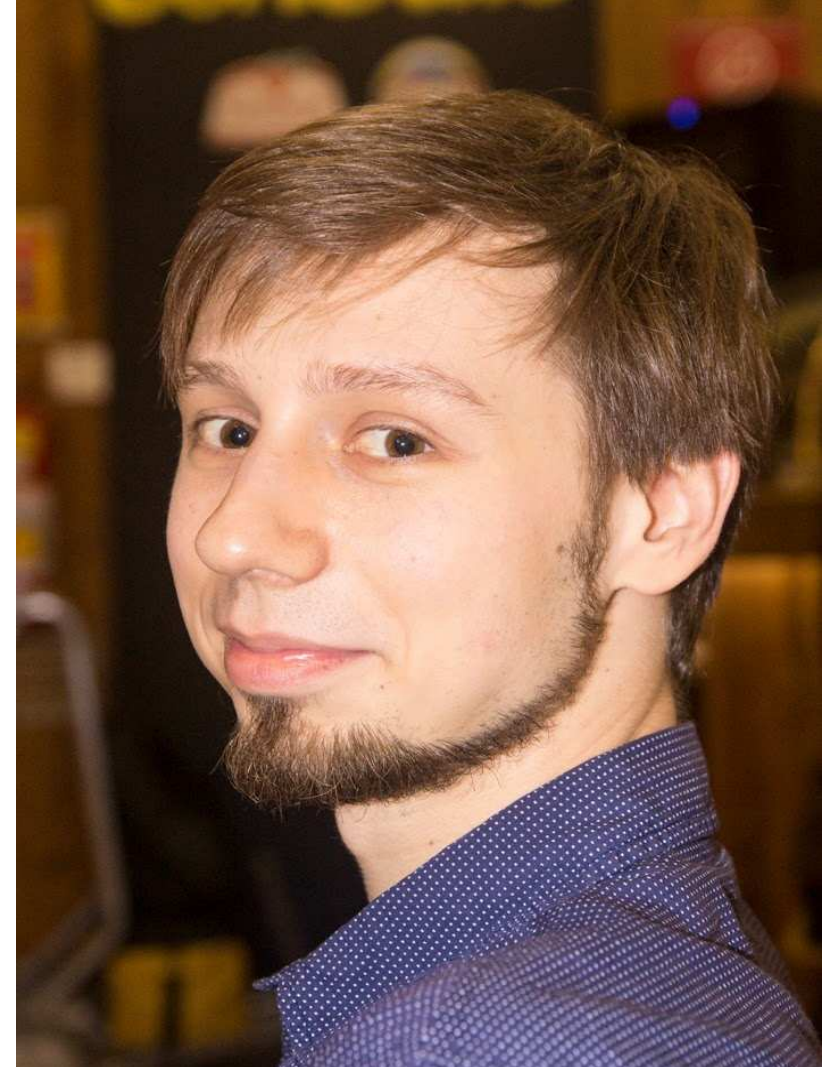




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**Языки программирования vs языки общения**

# Языки программирования

VS

# языки общения

Артём Пеленицын, Мехмат ЮФУ

# Программное обеспечение





# На самом деле...

```
001111110000001111100100110001101110010100111111111101
1110111111000011101011111101100011110111111010101100110
1101111100001110001101010010111010011111000110001000110
110001110111101111110111111111010001111110111011111110
1111100110111011110001111011101011101000111111101111110
110011011111101100010010000001011101110111011111111111
1111100011111100011111111111110011110011111100101111111
01111110110011101111011111110101111101111111101100111010
1111111110001111111001010010100011111011110110100111101
0001111111111011000101000011110010000000111100100100011
1011111001111111110101011111100010111011100000100111110
011100001111011101111110011111110011111111001100000110111
1011101101000010011001100011101110000110010000001100111
1101100110001010111101101000111110100011010111110010111
1111111110011000111100111101010000110100111000100100010
1110100001011100111111100000111110111111011110101111100
111001001101011111111111001111111111111111111001010111111
0000000001111111100001100111101100100011011011010110001
01000100111111110011111111111111110011111000111110011110101
010001111001001111111100001011110111001101111110110011111
```

— бинарный код

# Как получают бинарный код

```
reportForADir :: FilePath -> IO WorkingDirReport
reportForADir workingDir = do
  workingDirContents <- getAbsDirectoryContents workingDir
  studentDirs        <- filterM isDir $ sort workingDirContents
  studentReports      <- mapM studentDirReport studentDirs
  return              $ WorkingDirReport studentReports

studentDirReport :: FilePath -> IO StudentReport
studentDirReport studentDir = do
  studentDirContents <- getAbsDirectoryContents studentDir
  let taskFiles       = filter isLikeTaskFile $ sort studentDirContents
  fileReports        <- mapM fileReport taskFiles
  return              $ StudentReport (filename studentDir) fileReports

fileReport :: FilePath -> IO FileReport
fileReport file = do
  let taskId         = taskNumFrom file
  sInFromTag         <- (,) <$> readFile file
  sOut               <- runFile file
  getVarFrom file >>= maybe
    (return $ NoVar taskId)
    (\varId -> let tag = (varId, taskId) in
      FileReport tag <$>
        checkSubmission (sInFromTag tag) sOut)
```

# Языки программирования это сложно?

:(

# «Только без паники» (Н. Хомский)





# Н. Хомский: «ЯПы проще»



- языки программирования → контекстно-свободные,
- языки общения → контекстно-зависимые.

# Считаем до 10

```
i = 1
while i <= 10:
    print "Досчитали до %d" % (i)
    i += 1
```

# Считаем до 10

```
i = 1
while i <= 10:
    print "Досчитали до %d" % (i)
    i += 1
```

# Сортируем

```
qsort [] = []
qsort (x : xs) = qsort (filter (< x) xs)
                ++ [x]
                ++ qsort (filter (>= x) xs)
```

# Сколько?

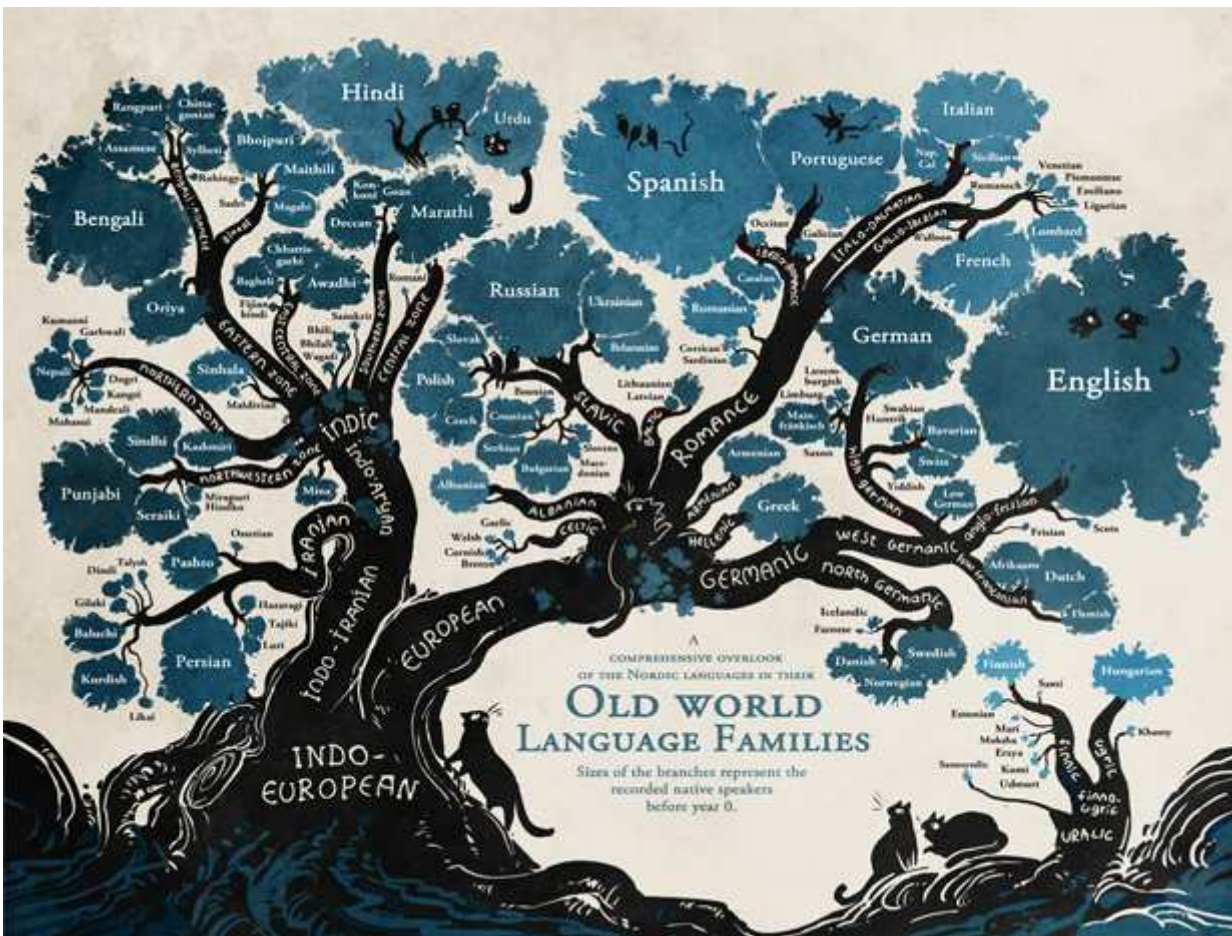
## Естественные языки:

- Энциклопедия Британика 1911 г.: ~ 1000.
- Каталог «Этнолог», 2009 г.: 6909.

## Языки программирования:

- Википедия: ~ 500.
- Другие источники: ~ 4000.

# Взаимосвязи



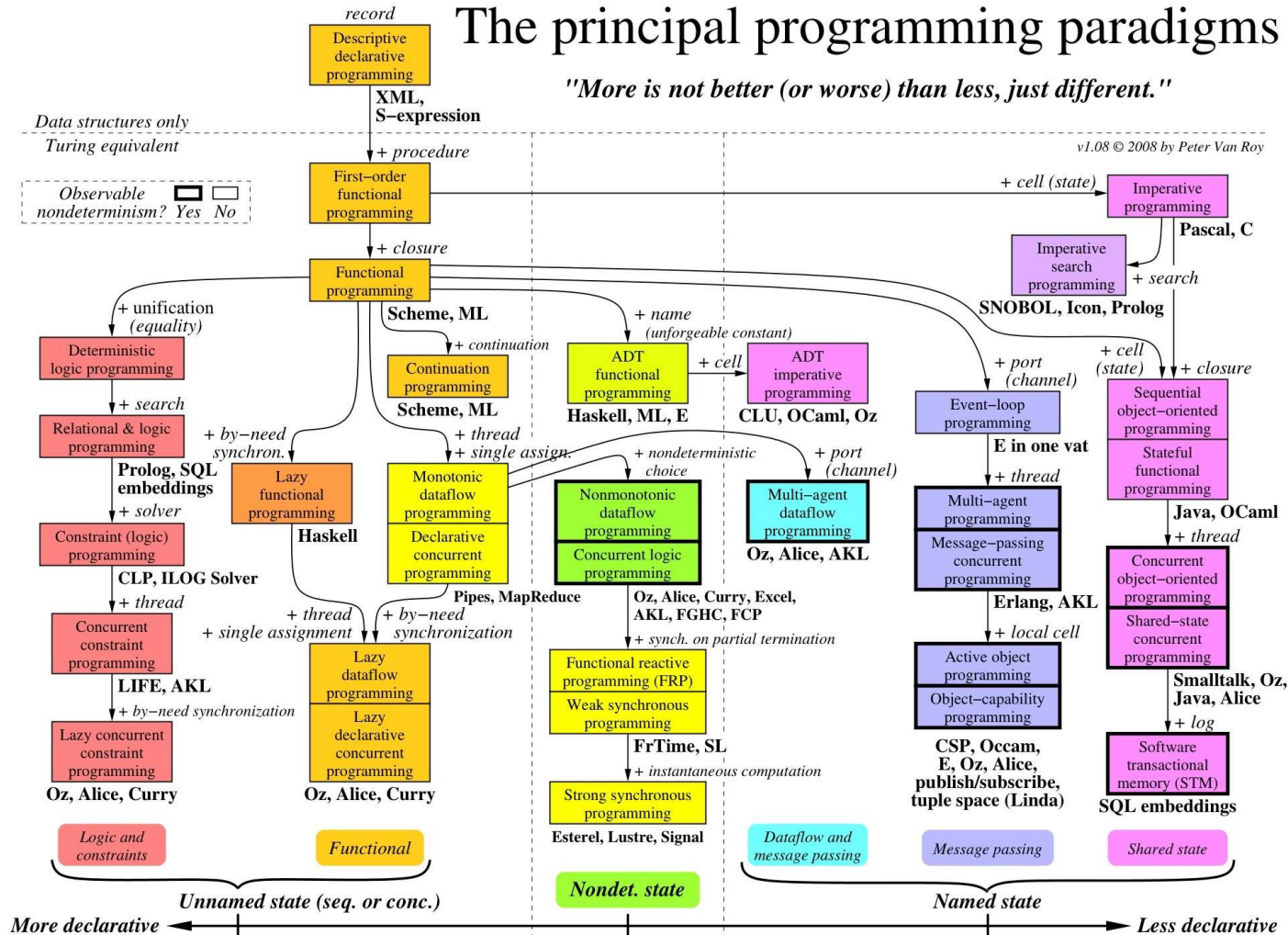


# Взаимосвязи (ЯП)

## The principal programming paradigms

"More is not better (or worse) than less, just different."

v1.08 © 2008 by Peter Van Roy



# #ВКШ, Computing at School и Саймон Пейтон Джонс



# Lifelong learning и революция MOOC

*Lifelong learning is the ongoing, voluntary, and self-motivated pursuit of knowledge...*

— Wikipedia

## Ресурсы MOOC (Massive Open Online Courses)

- [coursera.org](https://www.coursera.org)
- [edx.org](https://edx.org)
- [universarium.org](https://universarium.org)
- [lektorium.tv](https://lektorium.tv)

# Курс на Coursera

The screenshot shows the Coursera website interface. At the top, the Coursera logo is on the left, and a navigation bar contains a 'Catalog' button, a search bar with the text 'Search catalog', and a magnifying glass icon. On the right side of the navigation bar, there is a link to 'Institutions' and a blue circular button labeled 'AP'. Below the navigation bar, the main content area features a dark header with the course title 'Programming for Everybody (Getting Started with Python)' in white text. To the left of the main content is a sidebar with a list of links: 'Overview', 'Syllabus', 'Creators', and 'Ratings and Reviews'. Below these links is a blue button labeled 'Enroll Now' with the text 'Starts May 23' underneath it. The main content area also includes a breadcrumb trail: 'Home > Computer Science > Software Development'. Below the header, there is a paragraph of text about the course, followed by a link that says 'Show less'.

**coursera**

Catalog Search catalog

Institutions AP

Home > Computer Science > Software Development

## Programming for Everybody (Getting Started with Python)

**About this course:** This course aims to teach everyone the basics of programming computers using Python. We cover the basics of how one constructs a program from a series of simple instructions in Python. The course has no pre-requisites and avoids all but the simplest mathematics. Anyone with moderate computer experience should be able to master the materials in this course. This course will cover Chapters 1-5 of the textbook "Python for Informatics". This course is equivalent to the first half of the 11-week "Programming for Everybody (Python)" course. Once a student completes this course, they will be ready to take more advanced programming courses.

[Show less](#)

**Enroll Now**  
Starts May 23