



Nim on everything

Peter Munch-Ellingsen, M.Sc

@PMunch – peterme.net

What is Nim?



- » Compiled
- » Statically typed
- » Garbage collected
- » Speed of C,
ease of Python,
flexibility of Perl

```
# Compute average line length
# From nim-lang.org
var
  sum = 0
  count = 0

for line in stdin.lines:
  sum += line.len
  count += 1

echo("Average line length: ",
     if count > 0: sum / count else: 0)
```

Nims killer feature - Macros



```
template withLock(lock: Lock, body: untyped) =  
  acquire lock  
  try:  
    body  
  finally:  
    release lock
```

```
var ourLock: Lock  
initLock ourLock
```

```
withLock ourLock:  
  echo "Do something that requires locking"  
  echo "This might throw an exception"
```

Nims killer feature - Macros



```
import macros, strutils

macro toLookupTable(data: static[string]): untyped =
  result = newTree(nnkBracket)
  for w in data.split(';'):
    result.add newLit(w)

const
  data = "mov;btc;cli;xor"
  opcodes = toLookupTable(data)

for o in opcodes:
  echo o
```

Compilation targets



- » Compiles to other languages C/C++/JS
- » Can target any platform
- » Can use native libraries
- » Standing on the shoulders of giants
- » Creates fast code, not human code
- » Why not LLVM/WebAssembly?

Javascript vs. C/C++



- » No lowest common denominator
- » Builds on a common syntax and capabilities
- » Not all code can run on all targets

```
let sockPointer = case sock_addr.ss_family:
  of AF_INET.TSa_Family:
    cast[pointer](cast[int](sock_addr.addr)
      + offsetOf(Socket_in, sin_addr))
  of AF_INET6.TSa_Family:
    cast[pointer](cast[int](sock_addr.addr)
      + offsetOf(Socket_in6, sin6_addr))
  else:
    cast[pointer](cast[int](sock_addr.addr)
      + sizeof(TSa_Family))
if inet_ntop(sock_addr.ss_family.cint,
  sockPointer, result[0].addr, size) == nil:
  result = ""
result.setLen(result.find('\0'))
```

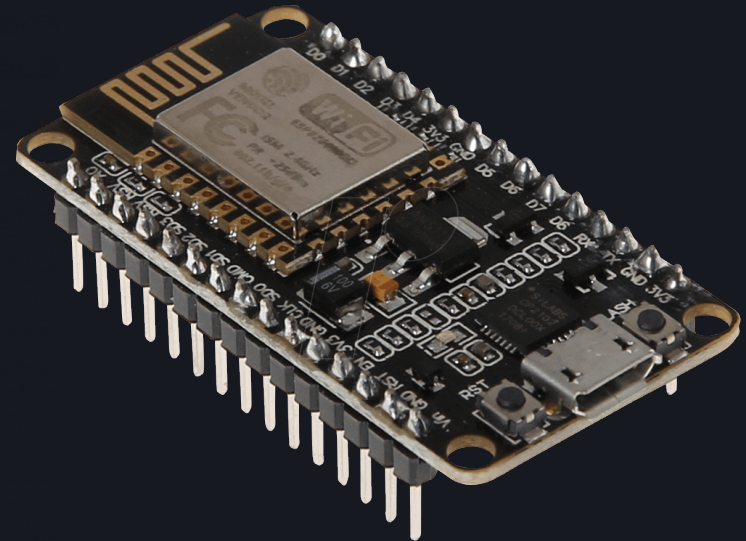
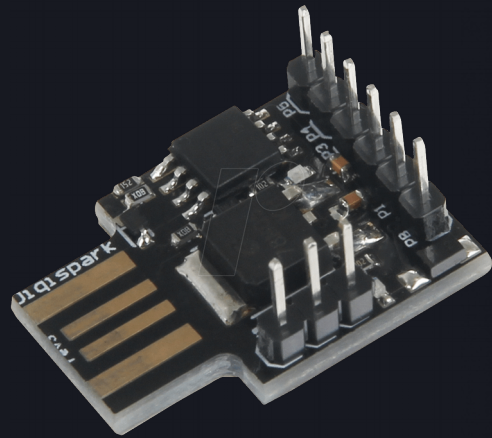
```
proc onLoad(event: Event) =
  let p = document.createElement("p")
  p.innerHTML = "Click me!"
  p.style.fontFamily = "Helvetica"
  p.style.color = "red"

  p.addEventListener("click",
    proc (event: Event) =
      window.alert("Hello World!")
  )

  document.body.appendChild(p)

window.onload = onLoad
```

Nim on the smallest



Nim on the smallest



```
loadSprite(logo, "arduboy_logo_border.bmp", addSize = false)
loadSprite(logoMask, "arduboy_logo_border_mask.bmp", addSize = false)
```

```
proc setup*() {.exportc.} =
  NimMain()
  drawBitmap(20, 10, logo, logoMask, 90, 18, 55, 18 div 2, SpriteMasked)
  boot()
  display()
```

```
proc loop*() {.exportc.} =
  display()
  let buttons = buttonsState()
  RedLed.off()
  GreenLed.off()
  if buttons.pressed(AButton):
    RedLed.on()
  if buttons.pressed(BButton):
    GreenLed.on()
```


Nim on the smallest



```
File Edit Sketch Tools Help
sketch_jan29b $
import arduino

setup:
  pinMode LED_BUILTIN, OUTPUT
  Serial.begin 9600
  Serial.print "Hello, Nim!\n"

loop:
  digitalWrite LED_BUILTIN, HIGH
  delay 500
  digitalWrite LED_BUILTIN, LOW
  delay 500

Done compiling.
/opt/arduino-1.8.9/hardware/tools/avr/bin/avr-gcc /tmp/arduino_build_74130/sketch/nimcache/@m...
/opt/arduino-1.8.9/hardware/tools/avr/bin/avr-objcopy -O ihex -j .eeprom --set-section-flags=.e
/opt/arduino-1.8.9/hardware/tools/avr/bin/avr-objcopy -O ihex -R .eeprom /tmp/arduino_build_741
/opt/arduino-1.8.9/hardware/tools/avr/bin/avr-size -A /tmp/arduino_build_74130/sketch_jan29b.in
Sketch uses 2326 bytes (7%) of program storage space. Maximum is 30720 bytes.
Global variables use 200 bytes (9%) of dynamic memory, leaving 1848 bytes for local variables.
```

Nim on the server/desktop



- » Can again use all libraries
- » Runs super fast
- » Forum, playground, and games servers
- » Many terminal tools, some GUI apps
- » Games

Nim on the server/desktop



Basic controls

Button

Checkbox

Entry

Label

Numbers

Lists

RadioButton 1

RadioButton 2

RadioButton 3

Nim on the server/desktop



Join Host Settings

Mods: bf2142

Game mode: Coop

Bot skill: 0.7

Ticket ratio: 300

Spawn time: 5


Rounds per map: 1

Bots: 30

Max players: 64

Players needed to start: 1

Friendly fire:



Maps

| Maps | Mode | Size |
|------------------|----------|------|
| minsk | gpm_coop | 16 |
| minsk | gpm_coop | 32 |
| sidi_power_plant | gpm_coop | 16 |

Selected maps

| Selected maps | Mode | Size |
|------------------|----------|------|
| sidi_power_plant | gpm_coop | 64 |
| minsk | gpm_coop | 64 |

Cancel

```
Http server running and waiting for clients!  
Gpcm server running and waiting for clients!  
Fesl server running and waiting for clients!  
[ ]
```

```
Battlefield 2142 Dedicated Server v1.10.112.0(x86_64)  
"Battlefield 2142"  
IP: 192.168.1.165 Port: 17567 (LAN)  
Game mode: gpm_coop/64  
Players: 0/64 (0 r) (0 connecting)  
Average FPS: 36 [ Map: sidi_power_pl  
Mod: bf2142  
Round: 1/1
```

Nim on the web



- » Compilation with JS
- » Has JS specific modules
- » Can use JS libraries
- » Uses the JS garbage collector

Nim on the web



Nim on the web

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| Hot code reloading | | 0 | 48 | 10h |
| Help: Zip (Creating / Opening) | | 1 | 108 | 11h |
| Introducing Norm: a Nim ORM | | 35 | 2.9k | 15h |
| Equivalent of VBA With <x> structure | | 5 | 131 | 15h |
| Jester: How to serve static files in production (Heroku)? | | 4 | 239 | 17h |
| Unicode support for Windows 10 console | | 0 | 86 | 20h |
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