

# Fundamentals of Physical Computing

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# Plan for Today

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- Prototypes for Midterm
- Serial
- ASCII
- Readings & Assignments

Prototypes for Midterm

# Serial Communications



# Serial vs. Parallel

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- How does each work?
- Which needs less wires?



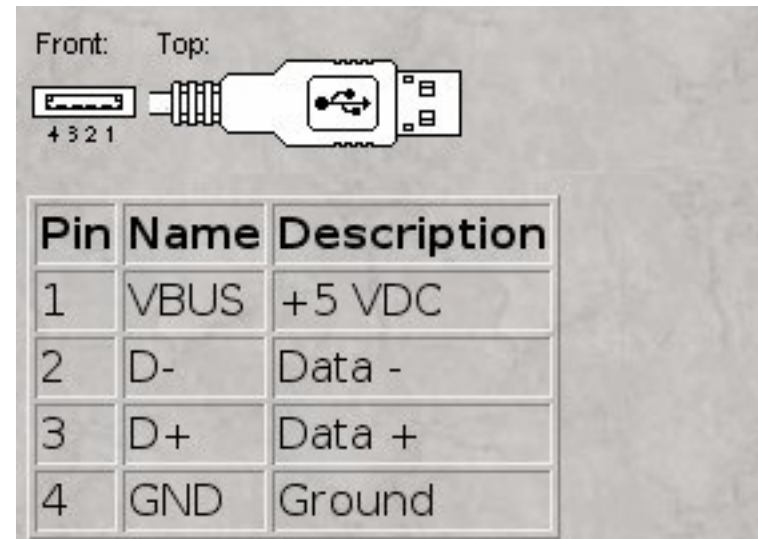
- USB is a new version of the same old thing: Universal Serial Bus



# USB

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- In and out, one byte at a time
- host controller required



# Why Serial?

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- Common language
- GPS, microcontroller, computer, printer, cell phone, accelerometer, LCD, text-to-speech

# Bytes

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- How many bits?
- Largest number in a byte?
- Transmitting numbers
- Transmitting large numbers
- What else can a byte represent?



# ASCII

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- remember it's a code
- sending letters
- sending numbers

```
02SttY177wvii,,.....:,.,,.....,;i7cYct11Yt77U17
'EIC2777Y;;i;.,..... .,..:v2UEOW@#Eb688E2tcnot
'0zSo7cYc7;c;i,,.....,i;i;tA$B$E61o1A1AEBWU7oC
ZI1oC1tIO#QWEW8Aci.,.,.,:iiii;;YXC;i.,.:iic780UXt
InIoE80Q$bU2E0QAo7;iii;.,.ii;ivcntYi7X1;S1Y;iiviYonY
'nzzB@$At;i,.,i;;cno1viii...iicCI7cccY@$M@EEBzc:,.,c11
:Un2BQnY,iictnoS7cic7o7cii,i;7CI;:77 .Ab8977z0Sv:::X1
iSt97vivoWUz#MB@.:;i;9tY;;;71I7:iv;7;i...:,icY;.:;i;1
UvYX;:z#WX;ZZz7i:77;X27c;:tI7i,...:,.,.i:iiivc7
9c;X;:1Yi,.,.,.,.iCn Cv;:i;zzSYci,i;:iii;i;iiiv7t
@Ccv;iv;iii:::.,.ivtCSYvi.:Yz157viv;cvcviiiicc;cX
M8Yc;vi;ivcc;:vc7c77C77;i,;iYxtXtcci;i;i;i;i;iY7t;c
6@I7vicvYvc;wYvviVY7c7Ycii;i;cXY;:i:i:i;i;i;Y1Sc
```

# ASCII

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- American Standard Code for Information Interchange
- 65 = A
- 48 = character zero, 49 = character one
- 32 = space, 10 = line feed, 13 = carriage return

# One Question Quiz

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- what is this: 10

Programming with Serial



# Arduino Serial Library

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- `Serial.begin(speed)`
- `Serial.available()`
- `Serial.read()`
- `Serial.flush()`
- `Serial.print(data)`

# Processing Serial Library

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- **Serial.list()**
  - Serial.available()**
  - Serial.read()**
  - Serial.readChar()
  - Serial.readBytes()
  - Serial.readBytesUntil()
  - Serial.readString()
  - Serial.readStringUntil()
  - Serial.buffer()*
  - Serial.bufferUntil()*
  - Serial.write()**
  - Serial.clear()
  - Serial.stop()
  
- ***serialEvent()***

Ports in Processing



# Stable Library

=====  
Native lib Version = RXTX-2.1-7

Java lib Version = RXTX-2.1-7

[0] "/dev/tty.usbserial-A4001ufz"

[1] "/dev/cu.usbserial-A4001ufz"

[2] "/dev/tty.Blueetooth-Modem"

[3] "/dev/cu.Blueetooth-Modem"

[4] "/dev/tty.Blueetooth-PDA-Sync"

[5] "/dev/cu.Blueetooth-PDA-Sync"

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# Readings and Assignments

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- Readings

- Physical Computing, chapter 7

- Assignment

- Serial Lab

- Revision for Midterm Project: *Design a new solution for an existing problem. Work in groups to observe the situation, create an early prototype, test the prototype and **incorporate your findings into a revised solution system.***