#### **ASCII**

#### **American Standard Code for Information Interchange**

This is all great for storing and representing numbers, but what about letters and symbols?

One common way is using an *encoding*. We associated each character with a certain binary number.

Link to full ASCII table: <a href="http://www.asciitable.com/">http://www.asciitable.com/</a>

Dec Hx Oct Html Chr Decimal Representation 64 40 100 @ 0 65 41 101 A A 66 42 102 B B Hexadecimal Representation 67 43 103 C C 68 44 104 D D 69 45 105 E E 70 46 106 F F Octal Representation 71 47 107 @#71; G 72 48 110 H H 73 49 111 I I HTML Representation 74 4A 112 6#74; J 75 4B 113 K K 76 4C 114 @#76; L 77 4D 115 6#77; M Character being Represented 78 4E 116 N N 79 4F 117 O 0 80 50 120 P P 81 51 121 6#81; 82 52 122 R R 83 53 123 4#83; \$ 84 54 124 6#84;

> 85 55 125 U U 86 56 126 V V 87 57 127 W W

Decimal Representation

Hexadecimal Representation

Octal Representation

HTML Representation

Character being Represented

```
Dec Hx Oct Html Chr
64 40 100 a#64; 🛭
65 41 101 A A
66 42 102 B B
  43 103 C C
   44 104 D D
69 45 105 E E
70 46 106 F F
71 47 107 @#71; G
72 48 110 @#72; H
73 49 111 I I
74 4A 112 @#74; J
75 4B 113 K K
76 4C 114 @#76; L
77 4D 115 6#77; M
78 4E 116 N N
79 4F 117 O 0
80 50 120 P P
81 51 121 6#81;
82 52 122 R R
83 53 123 4#83; $
84 54 124 6#84:
85 55 125 U U
86 56 126 V V
87 57 127 @#87; W
```

Decimal Representation

Hexadecimal Representation

Octal Representation

HTML Representation

Character being Represented

```
Dec Hx Oct Html Chr
64 40 100 6#64; 0
65 41 101 A A
66 42 102 B B
67 43 103 C C
   44 104 D D
69 45 105 4#69;
70 46 106 F F
71 47 107 G G
72 48 110 @#72;
73 49 111 6#73;
74 4A 112 @#74; J
75 4B 113 K K
76 4C 114 @#76; L
77 4D 115 @#77; M
78 4E 116 @#78;
79 4F 117 O 0
80 50 120 P P
81 51 121 6#81;
82 52 122 6#82; R
83 53 123 4#83;
84 54 124 6#84:
85 55 125 6#85;
   56 126 4#86;
87 57 127 @#87; W
```

Decimal Representation

Hexadecimal Representation

Octal Representation

HTML Representation

Character being Represented

```
Dec Hx Oct Html Chr
64 40 124 6#64: 0
      101 4#65:
   42 102 B
67 43 103 C C
68 44 104 D D
69 45 105 4#69;
70 46 106 F
71 47 107 G G
72 48 110 @#72;
   49 111 6#73;
74 4A 112 @#74; J
75 4B 113 K K
76 4C 114 @#76; L
77 4D 115 @#77; M
78 4E 116 N
79 4F 117 O 0
80 50 120 P P
81 51 121 6#81;
82 52 122 @#82: R
83 53 123 4#83;
84 54 124 6#84:
85 55 125 4#85:
   56 126 4#86;
87 57 127 @#87; W
```

Decimal Representation

Hexadecimal Representation

Octal Representation

HTML Representation

Character being Represented.

```
Dec Hx Oct Html Chr
64 40 100 &#6
 70/46 106 4#70;
   47 107 G G
   48 110 6#72;
73 49 111 6#73:
 74 4A 112 @#74;
75 4B 113 K K
76 4C 114 &#76:
 77 4D 115 M M
78 4E 116 N
79 4F 117 O 0
   50 120 P P
81 51 121 6#81;
82 52 122 6#82;
83 53 123 4#83;
84 54 124 6#84:
85 55 125 4#85:
   56 126 V
87 57 127 @#87; W
```

# ASCII isn't big enough!

ASCII encodings are only 7 bits long. This only allows up to 128 different encoded characters.

Why would we need more encodings?

#### Unicode is the new standard

Unicode is a *superset* of ASCII. This means that everything in ASCII is in Unicode (the first 128 encodings).

Emoji Encodings in Unicode

http://apps.timwhitlock.info/emoji/tables/unicode

Full Unicode can be found online.

#### Some facts...

- Your computer keyboard can generate most ASCII characters.
- Some extra characters (language-specific) can be typed using ALT encodings. Press ALT and any combination of numbers from the number pad (on the far right of the keyboard). A full listing of available characters is shown here: <a href="http://www.alt-codes.net/how\_to\_use\_alt\_codes/">http://www.alt-codes.net/how\_to\_use\_alt\_codes/</a>
- Some great info on Unicode available here: <a href="http://www.joelonsoftware.com/articles/Unicode.html">http://www.joelonsoftware.com/articles/Unicode.html</a>