

CS 241

Data Organization

Uuencoding

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What is uuencode?

- uuencode name is derived from “Unix-to-Unix encoding”
- Binary to text encoding used to send binary files via email and newsgroups
- uudecode recreates original binary file from the text
- Largely replaced by other encodings these days.

Binary to text

- Every 3 bytes of the binary data will be converted to 4 printable characters.
- Split 3 bytes into 6 bit groupings.
- Evaluate value for each grouping. (6 bits allows range of 0 to 63)
- Add 32 to each value to bring them within printable ASCII range.
- Output ASCII characters for these values.

Example

Original characters	C	a	t
Original ASCII, decimal	67	97	116
ASCII, binary	01000011	01101101	00011011
New decimal values	16	54	5
+32	48	86	37
Uuencoded characters	0	V	%

Splitting bytes

- Mask then shift

```
b[0] = a[0] >> 2;  
b[1] = (a[0] & 0x3) << 4 | (a[1] & 0xF0) >> 4;  
b[2] = (a[1] & 0xF) << 2 | (a[2] & 0xC0) >> 6;  
b[3] = a[2] & 0x3F;
```

- Shift then mask

```
b[0] = a[0] >> 2;  
b[1] = (a[0] << 4) & 0x30 | (a[1] >> 4) & 0xF;  
b[2] = (a[1] << 2) & 0x3C | (a[2] >> 6) & 0x3;  
b[3] = a[2] & 0x3F;
```