

15213 Recitation Section C

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Outline

- Floating Point Review
- Last Year's Exam Problems

Important Dates

- Lab 3: due Monday (Oct. 7), 11:59pm
- Exam 1: Tuesday (Oct. 8), 6:00–7:30pm
Doherty Hall 2315

Floating Point Representation

- Numerical Form: $(-1)^S M 2^E$
 - Sign bit S :
 - positive(0)/negative(1)
 - Significand M :
 - in $[1.0, 2.0)$
 - Exponent E
- Encoding:



IEEE Floating Point Format

The diagram shows a horizontal bar divided into three sections: a small grey box labeled 's', a yellow box labeled 'exp', and a purple box labeled 'frac'.

	exp
Normalized values	00...01 ~ 11...10
Denormalized values	00...00
Special values	11...11

Normalized Values

$$(-1)^S M 2^E$$



- exp field must be **00...01 ~ 11...10**
- Encoding of E
 - $E = \mathbf{exp} - \text{bias}$
- Encoding of M
 - $M = 1.\underbrace{\mathbf{xxxxxxxx}}_{\text{frac}}$

Denormalized Values

$$(-1)^S M 2^E$$



- exp field must be **00...00**
- Encoding of E
 - $E = \mathbf{exp} - \text{bias} + 1 = 1 - \text{bias}$
- Encoding of M
 - $M = 0.\underbrace{\mathbf{xxxxxxxx}}_{\text{frac}}$

Special Values



- exp field must be **11...11**
- Values:



- $+\infty$



- $-\infty$
- NaN (Not a Number): the rest