CS/ECE 374 B

Algorithms & Models of Computation

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1. Administrivia
2. Overview of Alg's
3. Strings

Sec: A & B separate

B → hwls, labs, exams

HW 0 → out this afternoon
 due 8pm Tue Sep 3
  — done individually

Laptop policy
 — may be used in side sections
 — no laptops in middle section

Notes will be posted on website
 http://algorithms.wtf
 — lecture notes

HW   24%
Mid term 2 × 22%

final   32%

Hw   cannot   be late
Can   drop   # problems
Hw   14   groups   of   up to 3

Lab section   guided problem solving
        — bring   pen + paper

Advice: 30 minute

Alg : series of steps to solve a problem
        quick sort
        binary search
Alg: pass 374
        1. Get all questions right
        2. Don't cheat

Alg : pass 374 - simple
        1. pass 374.

Two   n-digit   numbers   x, y
        Compute   x+y
    1. add 1's digits , save carry
    2. add 10's digits + carry , save new carry

    steps : adding   one - digit numbers

Strings: a series of characters

series: an array
array: ordered collection

1. Def character
   Alphabet: finite set of symbols
   $$\Sigma = \{0, 1\} \quad \Sigma = \{a, b, c, \ldots, z\}$$
   $$\Sigma = \{blue, red\}$$

2. Define string: finite sequence of
   symbols in Σ
   "010110" over $\{0, 1\}$
   "cat" over $\{a, b, c \ldots\}$
   "blue red blue" over $\{red, blue\}$

3. ϵ empty string
4. length of symbols w as $|w|$
   # of symbols $|010| = 3$
   $|\epsilon| = 0$

Strings over Σ:
   1. ϵ is a string
   2. if $a \in \Sigma$ and x is a string
      then ax is a string

Length:
   1. $|\epsilon| = 0$
   2. if $a \in \Sigma$ and x is a string

a.

then $|ax| = 1 + |x|$

Concatenation

$x \cdot y$ is x concatenated with y

1. $xy = y$ if $x = \epsilon$

2. $xy = a(wy)$ if $x = aw$

$a \in \Sigma$