CSC165 fall 2017

begin algorithm analysis

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Using Course notes: more Induction

Outline

notes

time resource

How much time does this take?

```
def f(list_):
    for i in list_:
        print(i)
```

assumptions, assumptions...

- “steps”
- ignore constant factors
- ignore “noise” for small input

We care about growth **rate** of time consumption

formalizing assumptions

- f absolutely dominates g
- f dominates g up to a constant factor
- f eventually dominates g up to a constant factor

What should domain and range of f, g be?

big-Oh, big-Omega, big-Theta

... and you're started on the Greek alphabet...

big-Oh hierarchy

$\log_a n$ versus $\log_b n$ (logarithmic)

n^a versus n^b (polynomial)

a^n versus b^n (exponential)

$\log_a n$ versus n^a

n^a versus b^n

explore!

properties

- reflexivity
- transitivity of big-Oh
- **not** symmetry (anti-symmetry...)

products and sums

- af

- $f \cdot g$

- $f + g$

Notes