CS888: Introduction to Profession and Communication Skills
-- Theoretical CS

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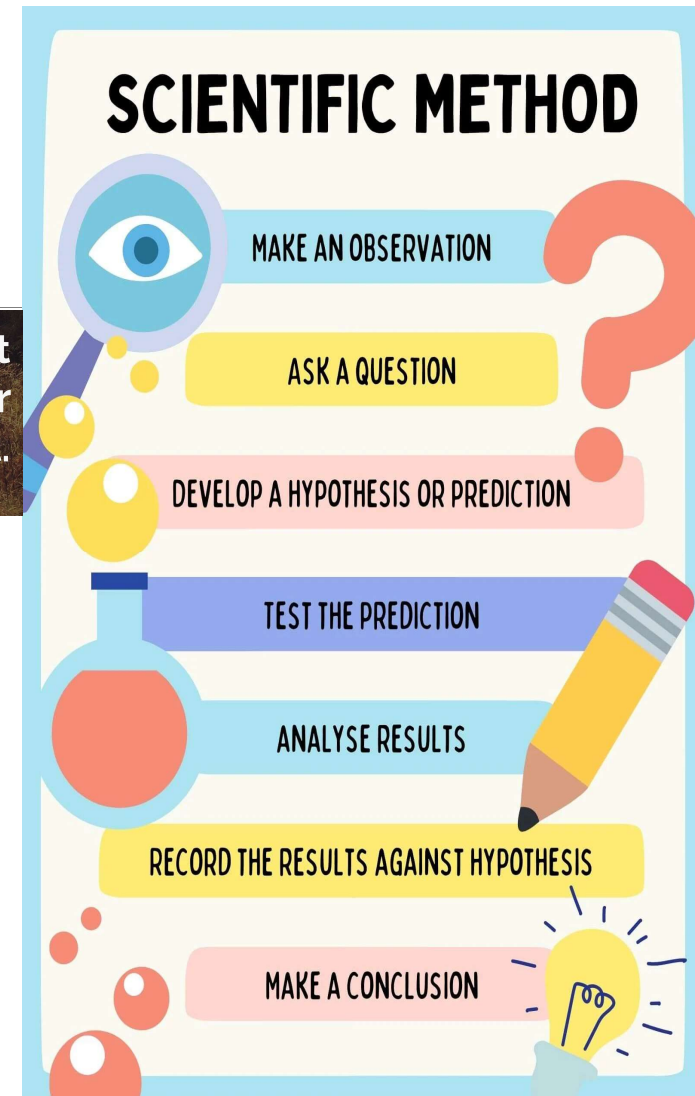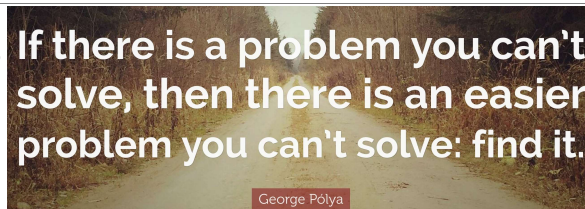
[*WITH HELP FROM INTERNET SOURCES]

2024; AUG 21, 23, 28, 30; SEP 4, 6

How to initiate research?

❖ Recognize your area of interest (say **A**).

❖ Identify open problem **P** in area **A**.
  ❖ Survey **P** and its *vicinity*.

❖ Guess an approach $\mathbb{S}$ – a first stab at the problem.

❖ Identify strength of $\mathbb{S}$.

❖ Identify weakness of $\mathbb{S}$.

❖ Look back:
  ❖ does $\mathbb{S}$ explain the literature *better*?
  ❖ does $\mathbb{S}$ solve a new *special-case*?

❖ Challenge the status-quo:
  ❖ decomplicate and clarify!

If there is a problem you can't solve, then there is an easier problem you can't solve: find it.

George Pólya

SCIENTIFIC METHOD

MAKE AN OBSERVATION

ASK A QUESTION

DEVELOP A HYPOTHESIS OR PREDICTION

TEST THE PREDICTION

ANALYSE RESULTS

RECORD THE RESULTS AGAINST HYPOTHESIS

MAKE A CONCLUSION

Time for a result or a preprint?

❖ Look back:
  ❖ does approach $\mathbb{S}$ explain the literature *better*?
  ❖ does $\mathbb{S}$ solve a new *special-case*?

❖ if you've a nontrivial result, double-check and
  ❖ write a *draft*
  ❖ do multiple iterations of *editing*!

❖ Double-check: Target audience eager to read it?
  ❖ Is it a result you're proud of?
  ❖ Is there a venue where people publish such results?

❖ Polish the preprint and submit it in a conference.
  ❖ In CS, conference submissions are important
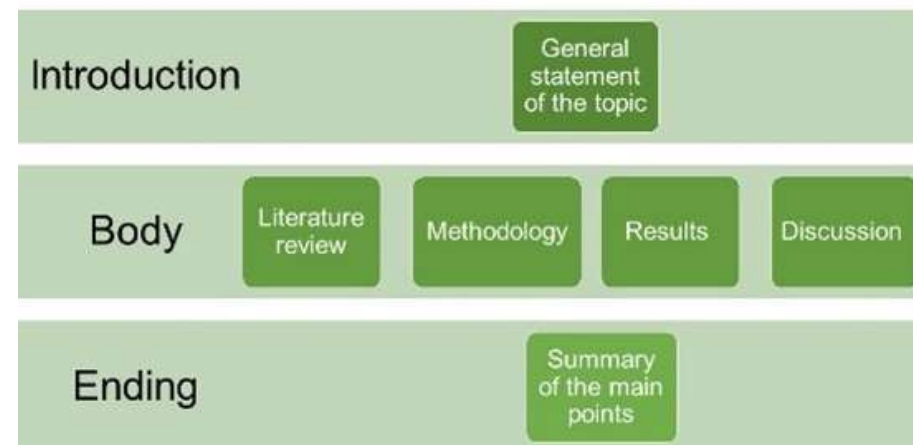

"It's all original research. I had no assistance when I looked it up on Wikipedia."

Write a paper for non-experts

❖ In CS, conference submissions are important.

❖ Assume your reader to be a non-expert
  ❖ *impatient*: has little time to read
  ❖ *critic*: may not share your excitement about the problem
  ❖ *nitpick*: may not like if you don't follow the traditions of the conference
    ❖ E.g. language, organization, paper-length, etc.

❖ Introduction: divide into subsections
  ❖ motivation; history
  ❖ results in simple words; main ideas

❖ Technical details: divide into sections

❖ Conclusion, Acknowledgements, References, Appendix

Basic Structure of a Research Paper

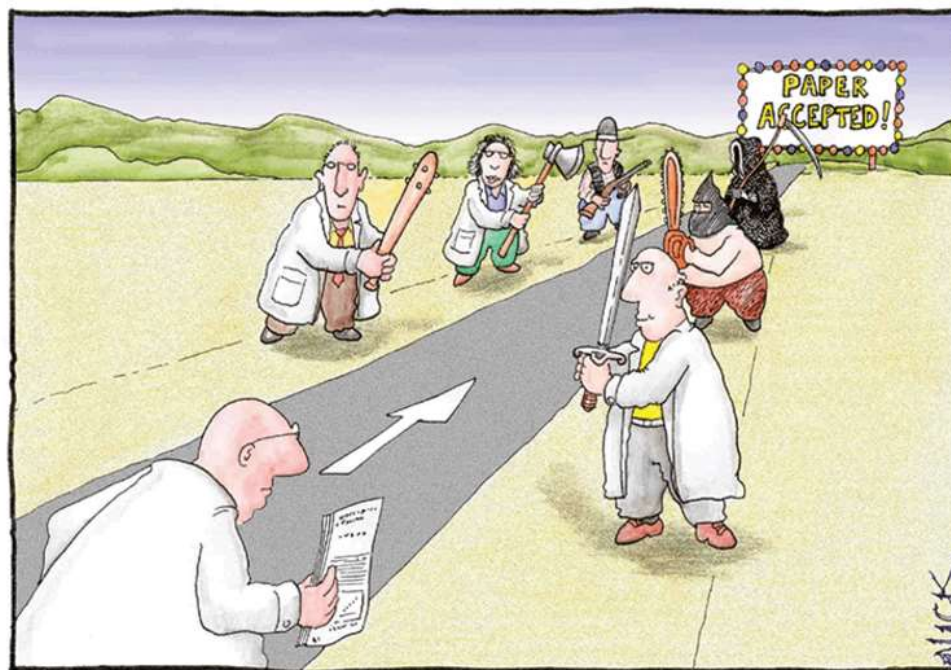| Introduction	General statement of the topic			
Body	Literature review	Methodology	Results	Discussion
Ending	Summary of the main points			

Think of a good story to tell

First impression may be the last

High-level & low-level edits

Incorporate feedback

❖ CS is a highly collaborative field.

   ❖ esp. compared to other theory fields

❖ Get your colleagues to read the first section (/10 pages).

❖ Gather their candid feedback. Did they

   ❖ understand the result?

   ❖ understand the idea?

   ❖ value the problem?

❖ Make amends to generally weaken the criticism.

Most scientists regarded the new streamlined peer-review process as "quite an improvement."

Assignment 10
https://hello.iitk.ac.in/
deadline <12pm (end of class)