# Continuous Integration/CD
# Lecture 1-Shoulders of Giants

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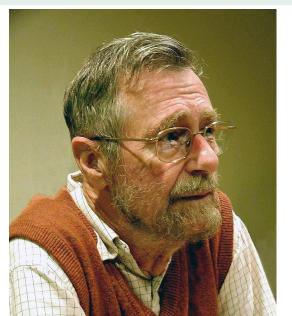**University of Petroleum and Energy Studies**

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If I have seen further it is by standing on the shoulders of Giants.

# Outline

- Giants

- SE Primer

- CI/CD

# Part I: Giants

# Programming



The art of programming is the art of organizing complexity.

# Software Engineering



## Apollo 11

Moon landing almost did not happen.

# Test Driven Development



Listening, Testing, Coding, Designing.

Thats all there is to software.

*I am not a great programmer. I'm just a good programmer with great habits.*

# Clean code



Would you rather
Test-first,
or debug-Later.

# Good Practices in software development



Any fool can write code that a computer can understand. Good programmers write code that humans can understand.

# Version Control System



...there's almost always a range of responses, and

"**it depends**" is almost always the right answer in any big question.

# Part II: Primer on Software Engineering

# Software

## Includes

- Several programs
- Configurations
- System Documentation-structure of the system
- User Documentation-how to use software
- Websites to support additional requirements

# Software Engineering

## A set of techniques

- To support professional software development
- Supports
  - Program specification
  - Design
  - Evolution

# Activities in SE

- Requirements analysis
- Design
- Development
- Testing
- Deployment
- Evolution and Maintenance

# Challenges

- Developing trustworthy softwares
- Managing the increasing diversity
- Timely delivery
- Cost (around 50% goes to Maintenance)

# Part III: CI/CD

# Continuous Integration

- A popular origin is from Extreme Programming by Kent Beck
- Integrate code changes multiple times daily
- Test cases and automated testing is required/beneficial
- Bugs are reported quickly and can be resolved in short time

# Continuous Delivery

- Focus on making the build ready for deployment
- Merge the tested code to repository and keep ready for deployment

# Continuous Deployment

- Placing the ready build on cloud
- Shortens the duration between developer ready code and code deployed live for users

# Image Sources

- Edgar Dijkstra : wikipedia
- Margaret Hamilton : www.nasa.gov
- Kent Beck : medium.com
- Robert C Martin : https://sites.google.com/site/unclebobconsultingllc/
- Martin Fowler : https://martinfowler.com/articles/agile-aus-2018.html
- Linus Torvald : wikipedia