Why Software Quality Matters & A Unique Career Path in STEM
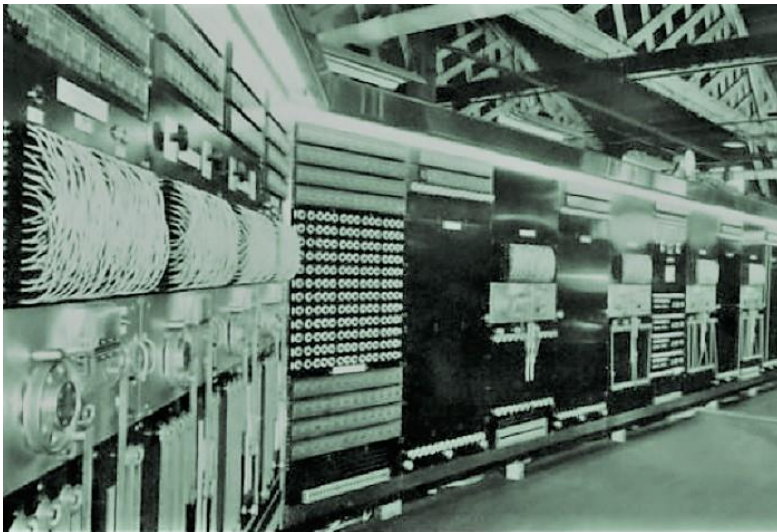
Exploring the world of QA and Software Testing

Archana Raghu

What is Software Quality?
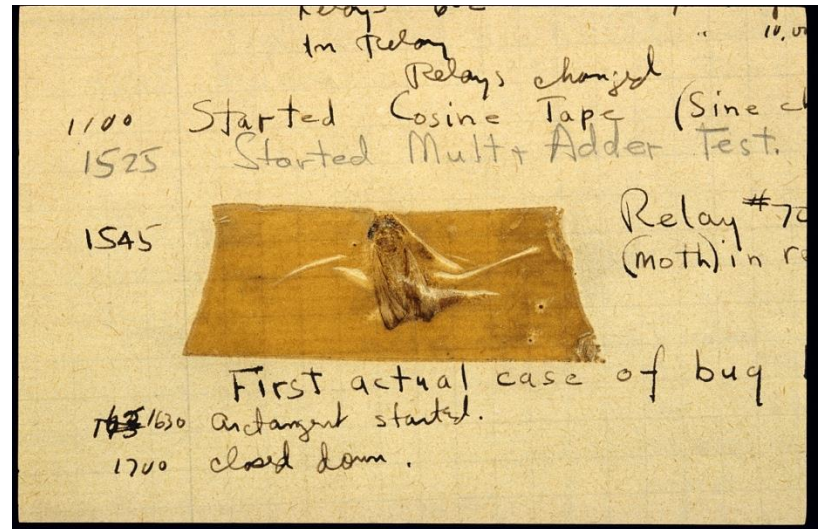
• Ensures apps, websites, and games work as expected

• Prevents frustrating user experiences and major failures

• Have you ever used an app that crashed or a game with glitches?

Fun Facts About Software Testing

In **1947**, a team working on the **Harvard Mark II** computer discovered a malfunction caused by an actual **moth** trapped in a relay.

Harvard Mark II

The team removed the moth and taped it into a logbook, labeling it as the **"first actual case of a bug being found."**
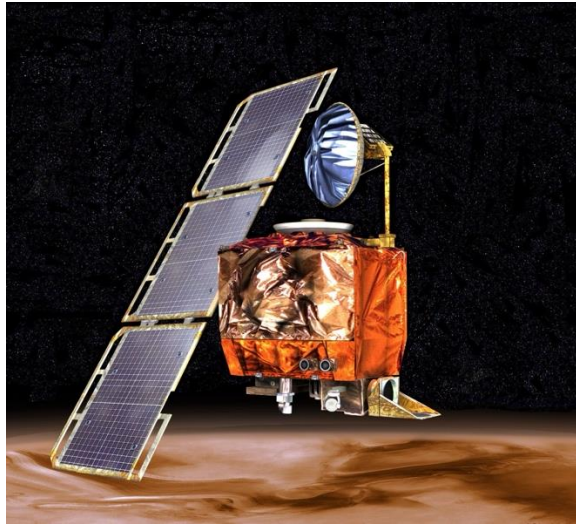
Grace "Amazing Grace" Hopper

While the term **"debugging"** had existed before, Grace Hopper helped popularize it in computing, making this incident a famous part of computer history.
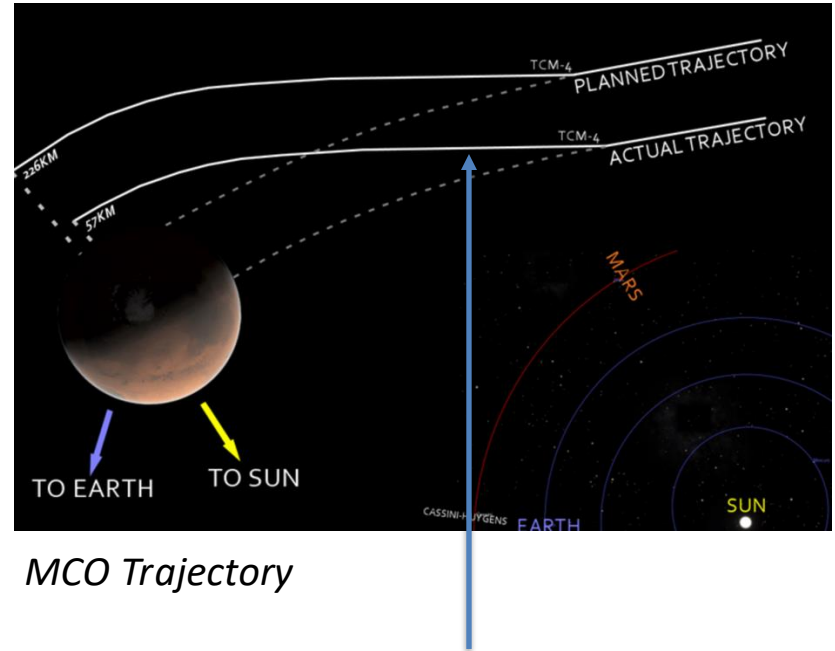
The Mars Climate Orbiter, part of the Mars Surveyor '98 program, was designed to study Mars' climate, atmosphere, and surface changes

A mismatch between the **metric units used by** *NASA* and **the imperial units used by the spacecraft builder**, *Lockheed Martin*

Mars Climate Orbiter (artistic illustration)

MCO Trajectory

This unit mismatch caused the spacecraft to enter Mars' atmosphere at a much lower altitude than intended, resulting in its destruction

NASA lost $327.6 Million

The Ariane 5 Explosion (1996) – A software bug caused the European Space Agency's rocket to self-destruct seconds after launch, costing **$370 million**.

The Y2K Bug (1999-2000) – A date storage issue that caused global panic and led to massive software fixes worldwide.

Therac-25 Radiation Machine (1985-1987) – A software bug in a medical radiation machine led to **overdoses and patient deaths**.

Knight Capital's $440 Million Trading Bug (2012) – A financial software glitch caused a massive market loss in **45 minutes**.

Many companies offer **bug bounties**, where they **pay hackers** (ethical ones!) to find security bugs.

Source: hackerone.com

Google, Facebook, and Apple have paid out **millions** in bug bounty programs

What Do QA Engineers & Testers Do?

- Find and report software bugs before users do

- Work with developers to improve software reliability

- Use automation, performance, and exploratory testing

- Think of it as being a "detective" for software problems!

Why is Software Quality a Great Career?

• High demand in tech industries (games, healthcare, finance, etc.)

• Opportunities in automation, AI testing, security testing

• Great for problem-solvers and detail-oriented thinkers

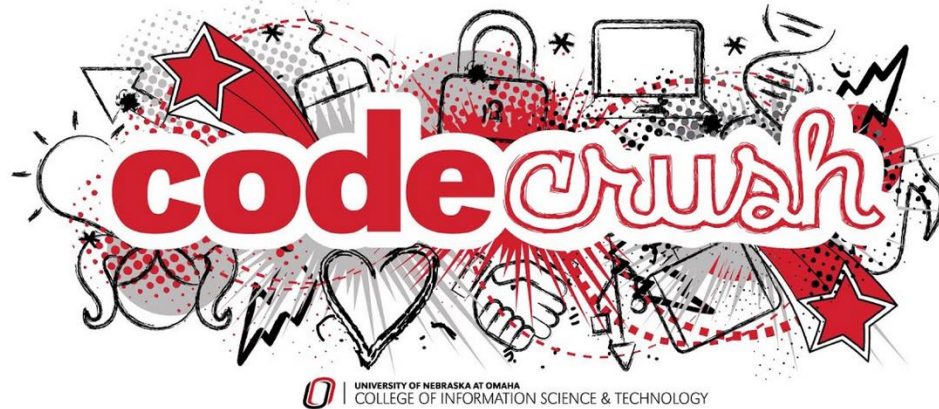• Can lead to roles in development, DevOps, or cybersecurity

How You Can Start in QA?

- Learn basic coding (Python, JavaScript)
- Try bug hunting in real apps (like today's activity!)
- Explore free courses on software testing (Udemy, Test Automation University)
- Look for internships or open-source testing projects

Bug Detective Game Introduction

- You will act as QA testers today!

- Your mission
  Find as many bugs as possible in a buggy web app

- Work in teams, report bugs clearly, and compete for points

- Let's see who the best bug detectives are!

kaleoyster.github.io/code-crush/

Code-Crush 2025

Find and report bugs in these web apps!

Buggy Calculator

Buggy Login Screen

Buggy Temperature App

Buggy Shopping Cart

Buggy Calendar

Final Thoughts & Q&A

- Software quality affects everyone
- A career in QA can be exciting and rewarding
- Any questions?