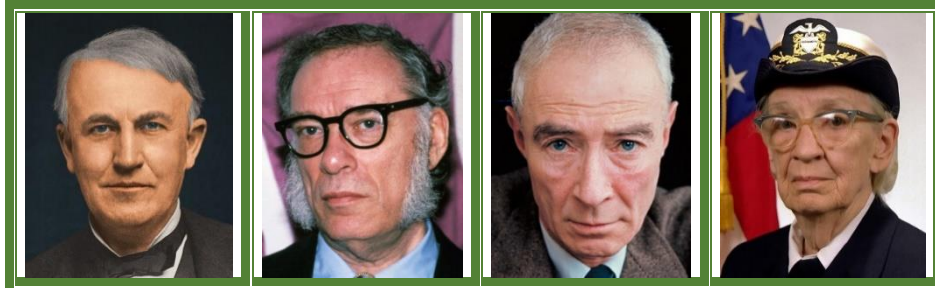## 4. DEBUGGING

What is Debugging?

Thomas Edison, Isaac Asimov, J. Robert Oppenheimer, Grace Hopper
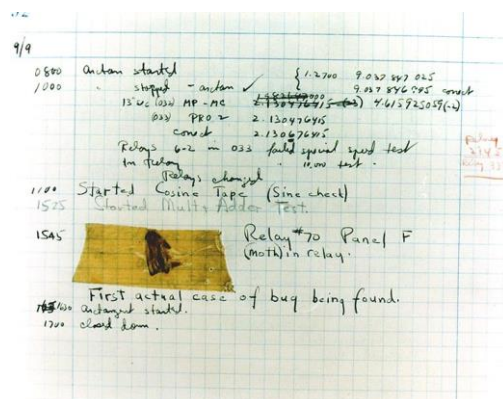
Debugging is …

Sometimes errors in programs are called "bugs", so we have a special name for finding and fixing errors in computer programs, we call it "debugging" (in other words, taking the bugs out). These terms are not exclusive to computers, as far back as the 1870s, Thomas Edison uses the term in a letter, where he says: "*then that "Bugs"—as such little faults and difficulties are called—show themselves*".

This term was used extensively in the 1930s and 1940s to describe *flaws* or *glitches* in mechanical devices. In 1944, the writer Isaac Asimov used the term in a fictional context describing potential errors in robots, in his short story "*Catch That Rabbit*", published in 1944: "*U. S. Robots had to get the bugs out of the multiple robots, and there were plenty of bugs, and there are always at least half a dozen bugs left for the field-testing.*"

That same year, on October 27th, in a letter from theoretical physicist, J. Robert Oppenheimer, when he was discussing the building of the first atomic bomb, he mentions, when discussing staff recruitment, that most of the existing staff are "*occupied in getting into operation and debugging*" the bomb.

On September 9th, 1947, computer developer Grace Hopper was tracing an error on the Harvard Mark II electromechanical computer.

Along with one of the operators, Bill Burke, they found a moth trapped in a relay that was the cause of the error, so they taped the moth into the logbook, and recorded it as the first actual bug.

The notation reads:
"*First actual case of bug being found.*"