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**Software Engineering II**

### **Week 5 – Random Testing**

For this document, you will need to fill out the information below. Ensure you have 5 triggering numbers for each bug or you will receive zero points for the bug. Your theory must fit the 5 provided numbers to receive any points. To receive full points, your theory must match the actual coded error, so you may need more than 5 data points for each bug to successfully determine the causes.

- **Bug 1**
  - **Triggering credit card numbers (at least 5)**
    - 5035906507977094
    - 2127898643403026
    - 3053365882448043
    - 2950408027521229
    - 3225090740621135
  - **Theory that explains what triggered the bug**
    - None of the following numbers begin with the right prefixes for either of the three cards (Visa (Prefix: 4), Master Card (Prefix: 51-55, 2221-2720), or American Express (Prefix: 34, 37)). This would mean that this bug is triggered for 16-digit values that don't fall within the set of parameters that the cards need to be in order to be valid card numbers. They do pass the checksum algorithm though.
- **Bug 2**
  - **Triggering credit card numbers (at least 5)**
    - 4052404419711422
    - 4052287277879591
    - 4052900838241404
    - 4052518421271875
    - 4052839304045784
  - **Theory that explains what triggered the bug**
    - All of the following numbers begin with the prefix 4, but they have the number 0 after. All of them have those two numbers the same '40'. This means that this bug is probably triggered by the presence of card numbers that start with those two numbers, I checked to see if they pass the checksum of the Luhn Algorithm and they do.

- **Bug 3**
  - **Triggering credit card numbers (at least 5)**
    - 376052377950263
    - 346492344611795
    - 345500173726269
    - 370621808127901
    - 370136834797791
  - **Theory that explains what triggered the bug**
    - All the credit card numbers begin with the prefixes 37 and 34, which implies they are American Express numbers. The credit card numbers are all of length 15. This bug is triggered by numbers that are credit card numbers for American Express.
- **Bug 4**
  - **Triggering credit card numbers (at least 5)**
    - 1990623598731990
    - 4914403970764914
    - 4564158132284564
    - 4194782280834194
    - 4754661810174754
  - **Theory that explains what triggered the bug**
    - All the prefixes are 4, 1, or 3. Most don't seem to fall within credit card prefixes. This would imply that they are numbers that aren't valid. They are all 16 digits long. They also don't pass the Luhn algorithm test. This means that they are invalid card numbers. This bug is triggered by invalid credit card numbers.
- **Bug 5**
  - **Triggering credit card numbers (at least 5)**
    - 4025675111146736
    - 4799844005231111
    - 4481820251111192
    - 4704111117178448
    - 2345525898111154
  - **Theory that explains what triggered the bug**
    - The numbers on this case are all of length 16. They vary on their prefix; this means that I have seen Master card (prefix 2345) and Visa (prefix: 4). They all pass the checksum test. Which means this bug is triggered by valid Master Card and Visa credit card numbers.