Homework 2 (Individual Homework)
Total 100 Points
This homework will contribute to 10% of your final grades.

Due date & time: 11:59 pm on April 2nd, 2021.

Late Policy: You have three extra days in total for all your homeworks and projects. Any portion of a day used counts as one day; that is, you have to use integer number of late days each time. If you exhaust your three late days, any late homework or project won't be graded.

Submission: The submitted homework must be typed. Using Latex is recommended, but not required. Please submit a PDF document containing your answers in ICON. Scanning handwritten answers are discouraged because this creates confusion on understanding the handwriting often.

Please submit a PDF file (not *.docx, *.doc, *.txt, *.md files).

1   Problem

This homework requires you to read the paper titled "*DNS Cache Poisoning Attack Reloaded: Revolutions with Side Channels*" and based on it answer the following questions. The paper can be found here `https://www.cs.ucr.edu/~zhiyunq/pub/ccs20_dns_poisoning.pdf` whereas slides are available at `https://www.saddns.net/slides.pdf`. Note that, this paper was awarded a distinguished paper award at ACM CCS 2020, which is one of the top academic conferences that focuses on Computer Security and Privacy.

For the attack description question, try to provide as much details as you can. One possible way to describe an attack is to describe the attack steps. Once you have described the attack steps, then you can go into more details. Draw images if needed.

Note that, you may have to read additional resources to answer some of the questions.

Attacker Objective (**5 Points**) According to this paper, what is the objective of the attacker of carrying out this attack?

Threat Model (**5 Points**) According to this paper, what capabilities are assumed of the attacker for successfully carrying out the attack?

Attack Impact (**5 Points**) In your own words, what are the impacts of the attack? Just writing a single word "DNS cache poisoning" is not sufficient. Use your imagination to figure out what bad things could happen if the attacker could successfully launch this attack.

Side-Channel Attack (**15 Points**) In your own words, explain what is a side-channel attack? **Use a small example to explain the attack.**

Attack Applicability (**5+5 Points**) According to this paper, explain the situations when it is applicable? Are there cases when the attack mentioned in the paper does not work?

Attack Description (**50 Points**) According to this paper, describe the attack and their detailed steps?

Paper Strengths (**5 Points**) In your own words, write some strengths of this paper.

Paper Weaknesses (**5 Points**) In your own words, write some weaknesses or limitations of this paper.