> **Assignment #A5P2**
> Computer Networks, Monsoon 2018. Mahavir Jhawar, Ashoka University
> Submission Due: December 02, 2018
> Total Marks: 20

This assignment requires you to implement a TCP client-server system where the server side application provides fare coin tossing service to clients remotely. You must submit both client and service side applications.

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**Execution Flow**

| The server side application is listening at port number 3125.

→ Client side application initiates connection with the server hosting server side application to use its coin tossing service.

← The server accepts the connection and ask the client to make the first move.

→ Client <u>allows a user to type in and send a number $z$</u> where $z$ is computed, offline, by the user as follows: <span style="color:red">(For final code, get user input)</span>

  (a) It picks a 49 digit number $a$.
  (b) It sets $y_1 = ax$, where $x = 3$ or $5$. (Note that $ax$ is not multiplying $a$ and $x$, it is putting $x$ after $a$. Thus $ax$ becomes a 50 digit number with $x$ as its least significant digit.)
  (c) It then picks a $y_2$, a 50 digit number such that its least significant digit is different from 3 and 5.
  (d) It finally computes $z = y_1 y_2$.

← The server on receiving $z$, executes the following steps:

  (a) It picks a number $w$ randomly from the set $\{3, 5\}$. This symbolizes coin tossing.
  (b) It sends back $w$ to the client.

→ Having received $w$ from the server, client allows a user to send both $y_1$ and $y_2$ to the server.

← Having received $y_1, y_2$ from the client, the server executes the following steps:

  (a) It checks if $z = y_1 \times y_2$
  (b) If yes, it computes $w_1$, $w_2$, the least significant digits of $y_1$ and $y_2$ respectively.
  (c) It sends back the following message to the client:
    "You Win" if $w \in \{w_1, w_2\}$, or
    "You lost" if $w \notin \{w_1, w_2\}$
    And in addition it also sends back one of the last three TCP segments coming from client side. Please note that your server might needs to run a network application such as tcpdump to capture incoming TCP segments.

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