Web Programming and Problem Solving

Getting Started
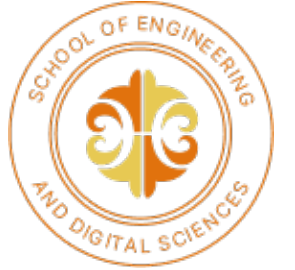
Date: 15.08.2022

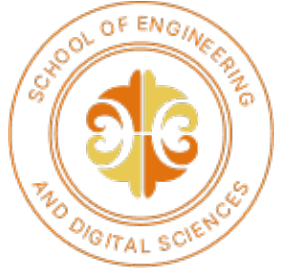Instructor: Zhandos Yessenbayev

Content

- Introduction
- About the Course
- Class Policies
- How the Web works
  - IP addresses and Domain names
  - DNS and getting domain
  - Client-Server Model
  - Websites and their architecture
  - HTML, CSS, JavaScript
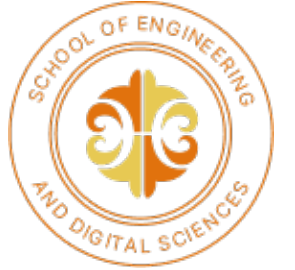
About the Course

- This is a gentle introduction to *Web Programming*

- What you are expected to learn:

  - Understand how the **Web** works

  - Create web pages using **HTML** and **CSS**

  - Add some interactivity to the web pages with **JavaScript**

  - Solve problems using **Excel** and use data in your web pages

Course Materials

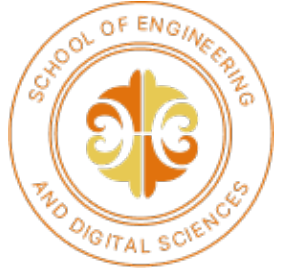Extensive on-line digital resources (readings, references, tutorials) will be utilized throughout the course.

Recommended sources:
- Lectures (attendance)
- Lecture notes (slides)
- A book: Creating a website
- Tutorials: w3schools.com or developer.mozilla.org
- [Best Web Development Courses for Beginners in 2022](#)

Grading
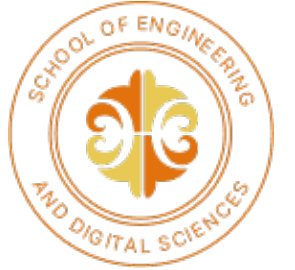
- The final grade is calculated as follows:

  - Homework (1 course project)   30%.

  - Lab Assignments (weekly)   30%

  - Quizzes (3 times)   30%
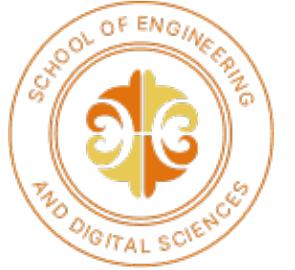
  - Participation (at least 80%)   10%

Late Submission

- Deadlines are important !!!

- There will be Soft and Hard Deadlines

- Late submissions (later than 20 minutes) after the **Soft** deadline are penalized by 50%

- Late submissions after the **Hard** deadline are not accepted
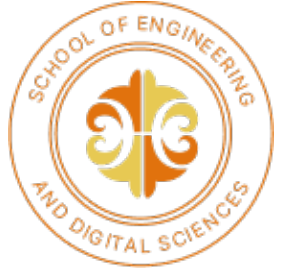
Plagiarism

- "A piece of writing that has been copied [or closely paraphrased] from someone else and is presented as being your own work"

- "The act of plagiarizing; taking someone's words or ideas as if they were your own"

- **Plagiarism results in an automatic F in the course and may result in your suspension from the program!**

- Whenever in doubt, ask the instructor

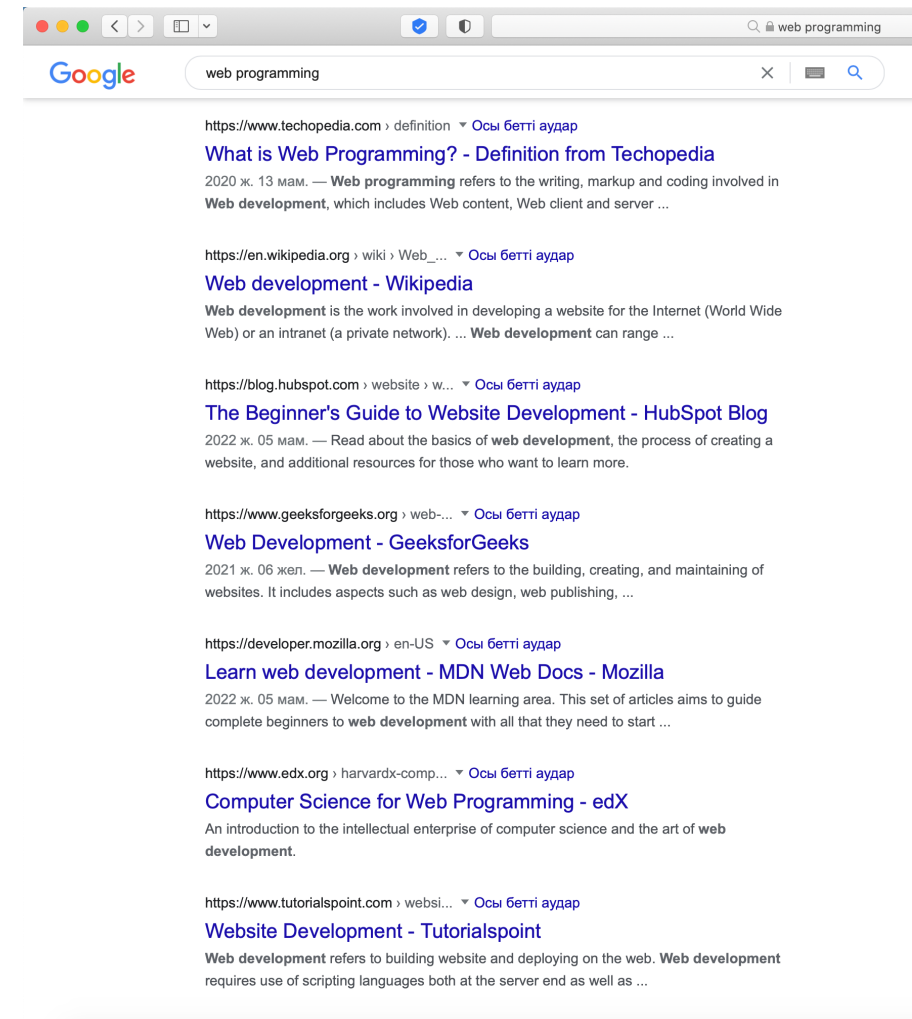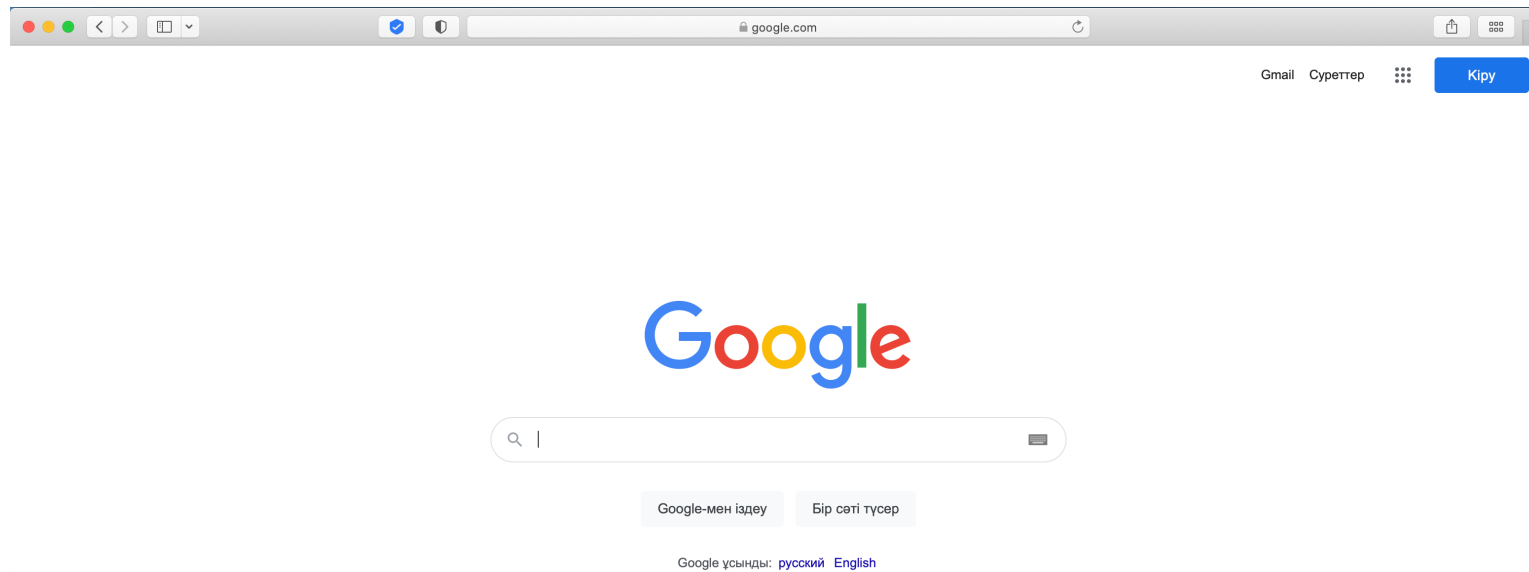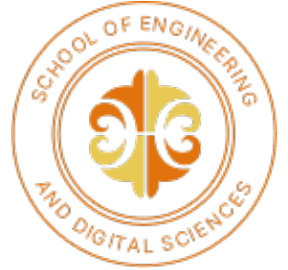# Expectations for Behavior

- Personal responsibility (Self study!!!)

- Behave professionally & respectfully

- In class: English only

- You will make mistakes (and that's okay)

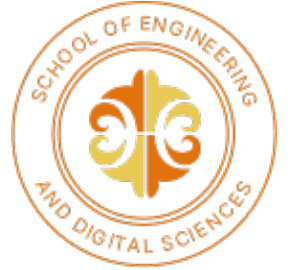- Get involved and have fun!

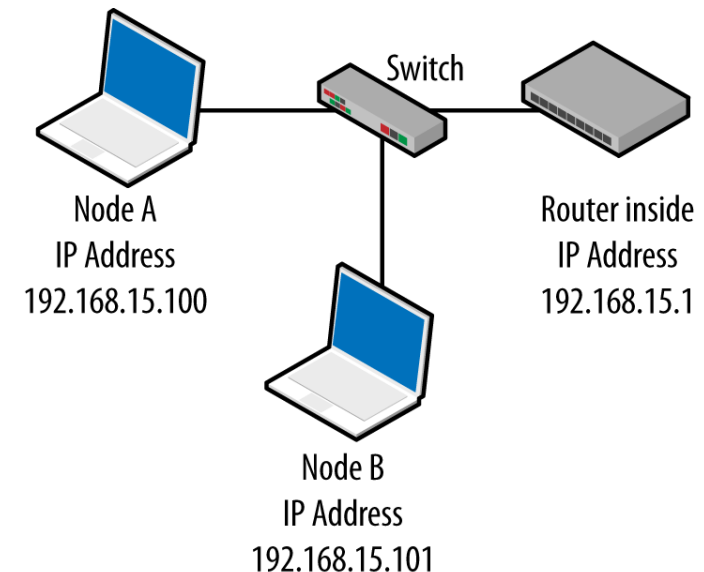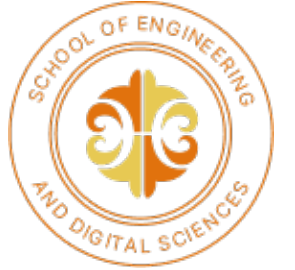# How does the Web work?

Web surfing

IP addresses

- An **Internet Protocol** (IP) address is a unique identifier of a particular device on the Internet network
  - PC, mobile, router, smart watch, TV
  - Example: 178.91.253.180 [Format is A.B.C.D]

- IP addresses are mathematically produced and allocated by the **Internet Assigned Numbers Authority (IANA)**

- **Types** of IP addresses:
  - public/private (global/local)
  - static/dynamic
  - dedicate/shared

Switch

Node A
IP Address
192.168.15.100

Router inside
IP Address
192.168.15.1
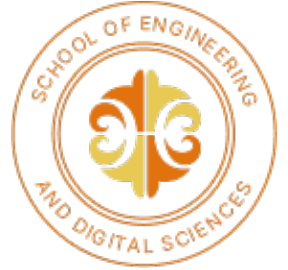
Node B
IP Address
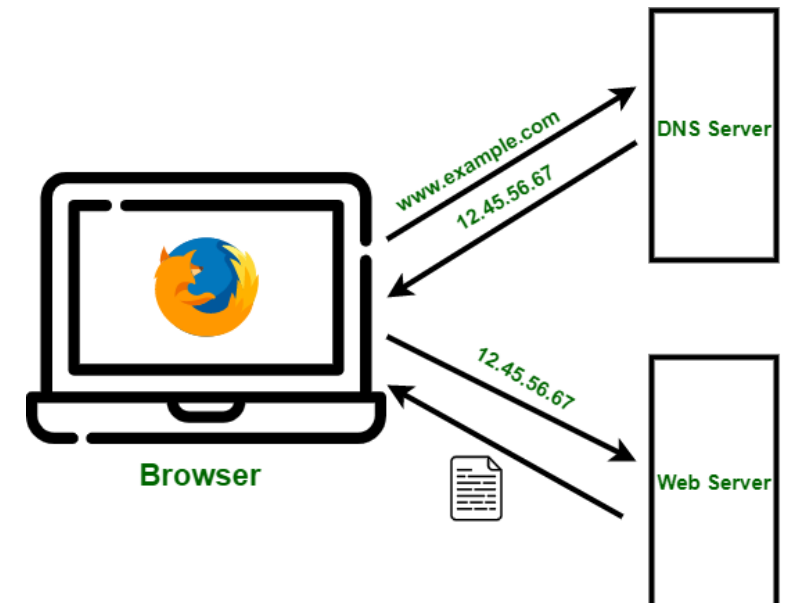192.168.15.101

Domain Names

- A **domain name** (or domain) is an text string (name) that's associated with an IP address on the Internet.

  - It is a unique name

  - Easy to remember for human

  - Example: *nu.edu.kz, google.com*

- **Types** of Domain names:

  - Root domain (top-level) – *.com, .kz, .ru, .io*

  - Subdomains (other levels) – *google.com, nu.edu.kz, library.nu.edu.kz*
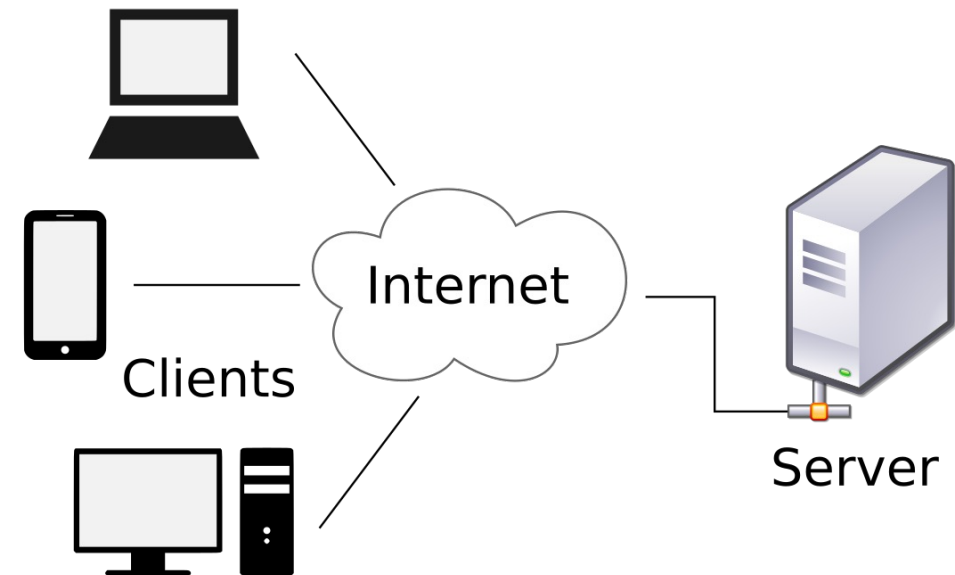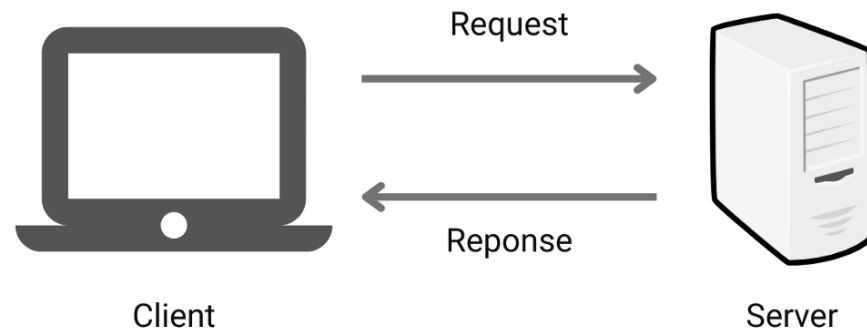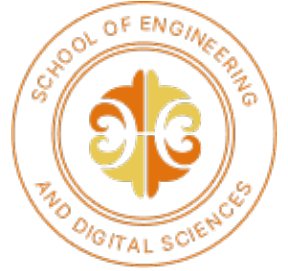
Domain Name System

- The **Domain Name System (DNS)** is the hierarchical and decentralized naming system (database) used to identify computers reachable through the Internet or other Internet Protocol (IP) networks. [Wikipedia]

- DNS is a "phonebook" or "librarian" that converts domain names to IP addresses
  - nu.edu.kz --> 178.91.253.180

- There are **WHOIS** services to lookup domains
  - godaddy.com, hoster.kz, domaintoipconverter.com
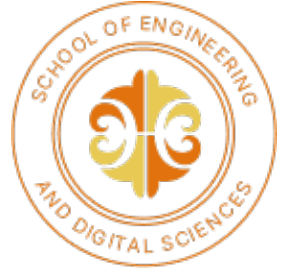
- The browser does a domain lookup for you
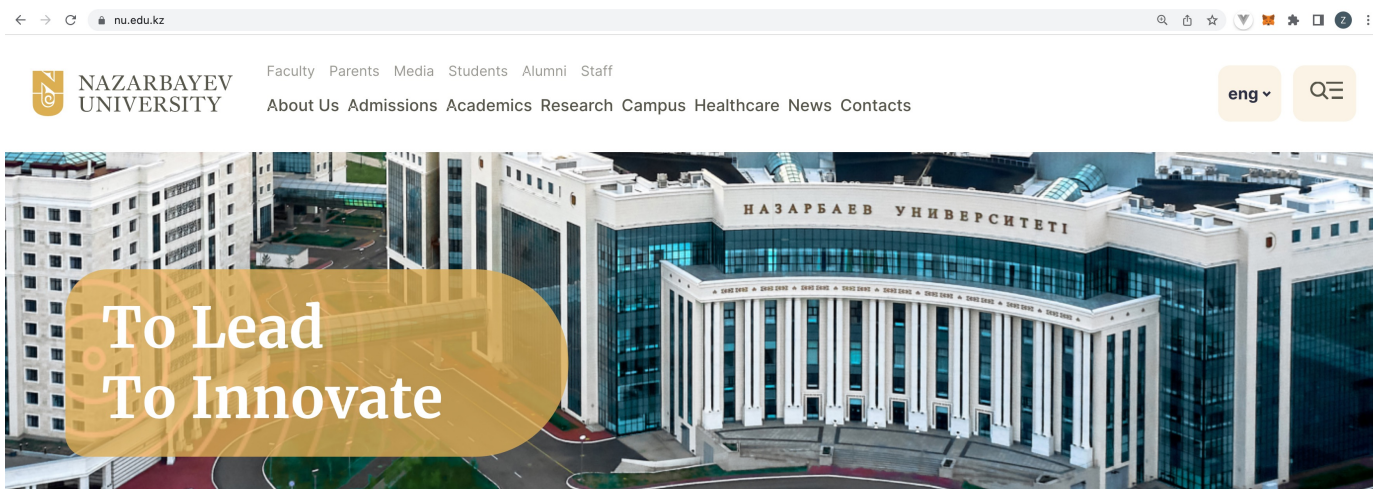
Client-Server Model
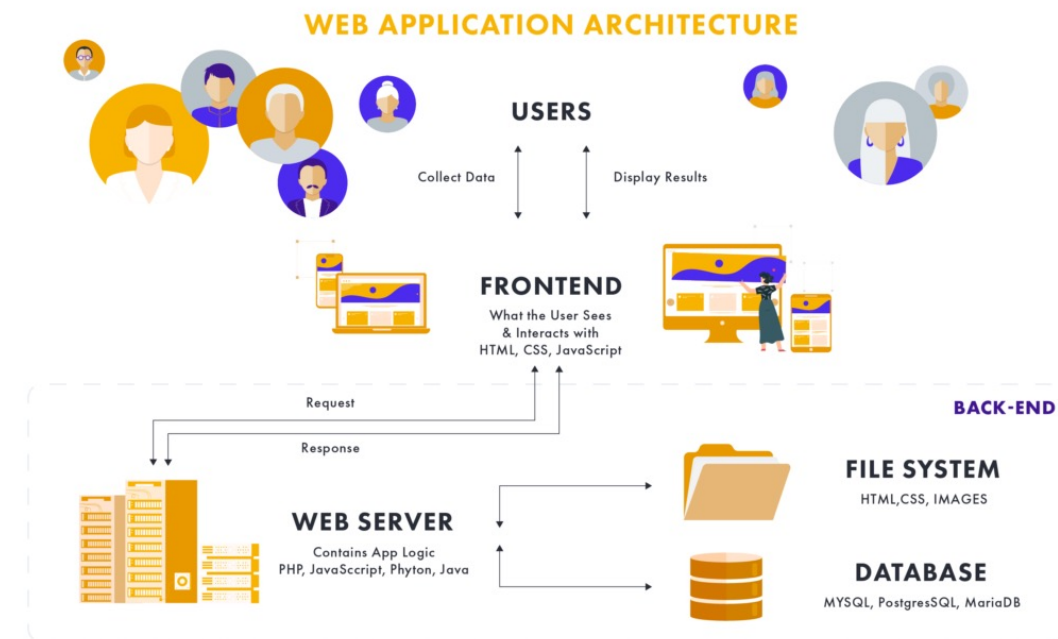
Websites

- A **website** is a collection of <u>web pages</u> and related content that is identified by a common <u>domain name</u> and published on at least one <u>web server</u> with an <u>IP address</u>.

- Domain: nu.edu.kz

- IP address: 178.91.253.180

- Web pages and their URLs:
  - About Us - https://nu.edu.kz/about)
  - Admission - https://nu.edu.kz/admissions
  - Academics - https://nu.edu.kz/academics
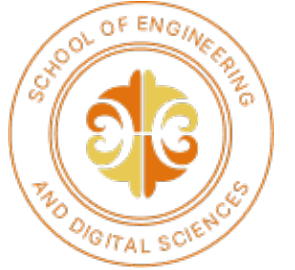 - etc.

Website Architecture

- A typical **architecture** of a website consists of:

  - Front-end part (user interface): HTML, CSS, JavaScript

  - Back-end part (business logic): Python, Java, PHP, etc.

  - Database: MySQL, PostgreSQL, MS SQL, Oracle

  - File System: images, audio, video, web pages

- A website can be **static** or **dynamic** depending
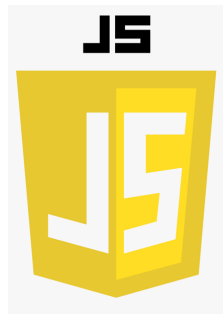
  on the content generated
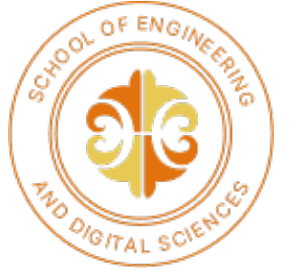
HTML, CSS, Javascript

- **Hyper-Text Markup Language (HTML)** is the standard markup language for documents designed to be displayed in a web browser.
  - It describes the structure of the web page

- **Cascading Style Sheets (CSS)** is a stylesheet language used to describe the presentation of a document written in HTML.
  - It describes the style of the web page

- **JavaScript (JS)** is a lightweight and interpreted programming (or scripting) language for Web pages.
  - It adds interactivity to the web page

Summary

- Key takeaways:
  - IP address
  - Domain name
  - DNS
  - Client-Server Model
  - Web Server
  - Websites
  - Web Architecture
  - Frontend/Backend
  - HTML, CSS, JavaScript

Thanks for Attention!