

Introduction to Information Technology

Lecture 8

IT 111

The Internet and the World Wide Web

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Lecture Topics

- Define what the Internet is
- Learn about browser s/w and Web pages
- Download from the Web
- History of internet
- Tips for Effective Search Strategies
- Define Internet of Things IoT
- Brain Health



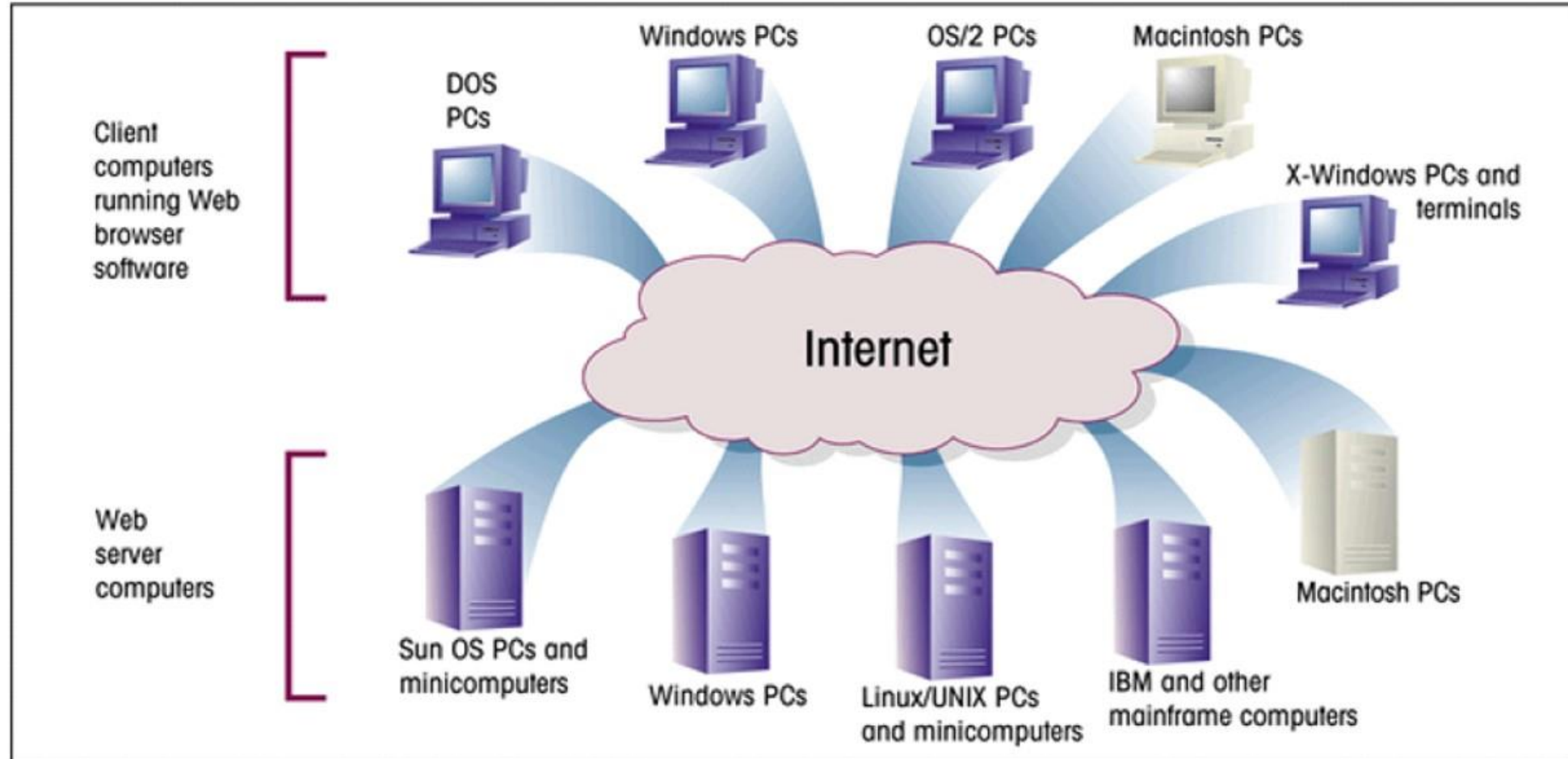
An introduction to networks and TCP/IP

- Are the Internet and the World Wide Web:
 - The same thing?
 - Or different?
 - If different, how?

The Web is one piece of the Internet

How does the Web work?

Client/Server Structure of the World Wide Web



How does the Web work?

- A Web browser is a software (s/w) application that runs on a device to make it work as a Web client.
- Web servers: computers that run server s/w that enable them provide files through the Web.
- Web pages are stored in files that contain HTML (HyperText Markup Language) instructions, text, images, sound, etc.

How does the Web work?

- You need:
 - A device with a browser (client s/w)
 - MS Edge, Firefox, Safari, Chrome
 - Internet Service Provider (ISP)
 - Cable, Phone company, router
- You request a web resource in the browser by:
 - Clicking on a link
 - Specifying a resource address

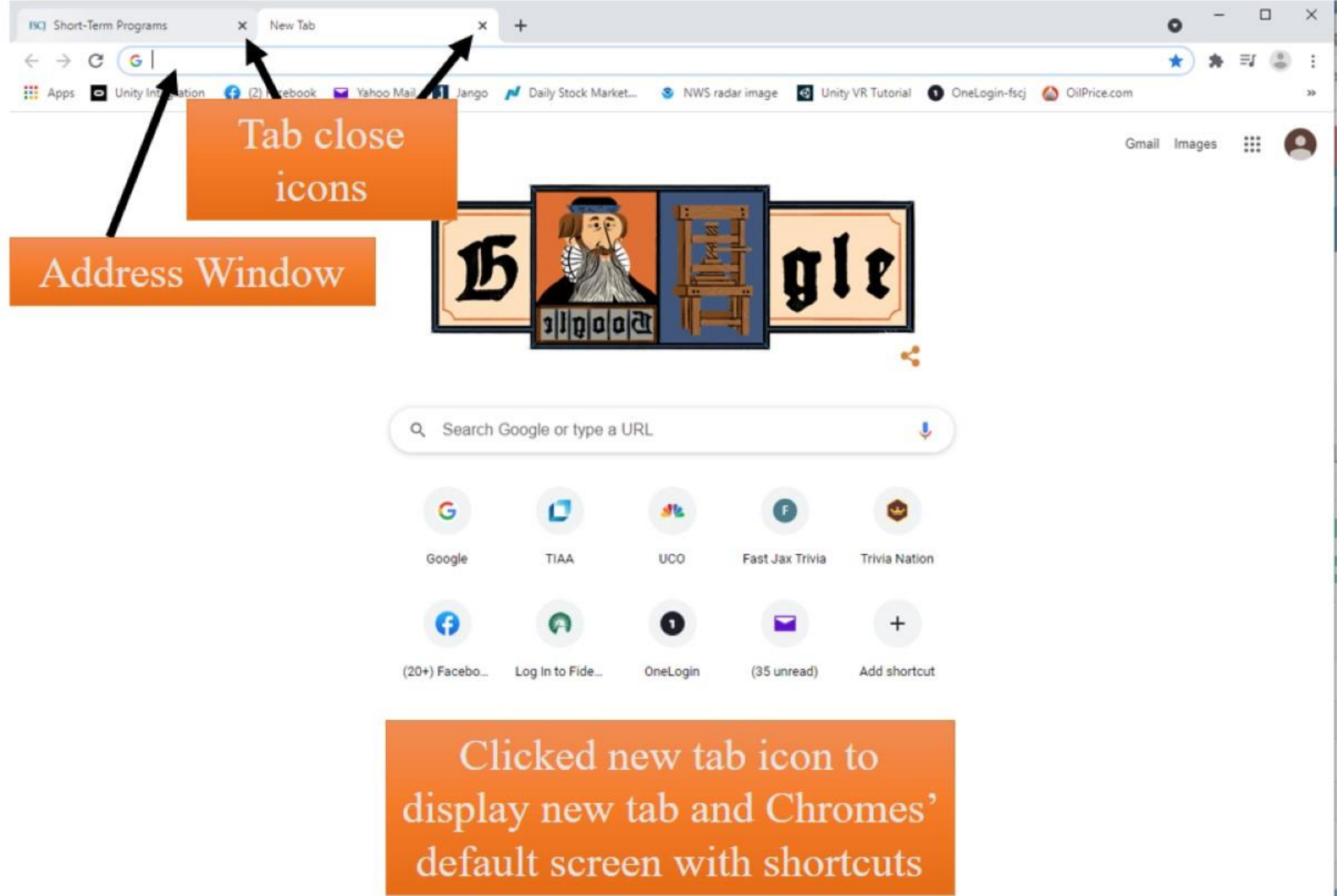
How does the Web browser work?

- A web page is displayed in a tab in the browsers' main window
- Can have many tabs in the browsers' main window
- Click new tab icon (+) to add a tab
 - Click tab close icon (x) to delete tab
 - Click tab to move between tabs



How does the Chrome browser work?

- To display a new web page you can
 - Click one of the shortcut icons
 - Or enter a web page address in the address window
 - Huh? What's a web page address?



Uniform Resource Locator - URL

- Each web page/resource has a unique address called a URL
- URL's can be comprised of:
 - Protocol://Host/Path/File.name

Host Identification

- Host can be identified by an IP address or a Domain name
- Path is the directory (folder) and subdirectories (subfolders) where the web page is located on the host

IP address: four numbers (ranging from 0 to 255) separated by periods

Example: 104.46.104.203

Domain name has at least three parts (subsubdomain, subdomain, top level domain) separated by periods

Non-hyperlink Access

- You must specify
 - Protocol, Host, Path, File Name
- What are these?

• Protocol, Host, Path, File Name



<https://google.com/wp-content/uploads/2021/07/Student-Manual-1.pdf>

The diagram illustrates the components of the URL <https://google.com/wp-content/uploads/2021/07/Student-Manual-1.pdf>. Four colored arrows point from the labels 'Protocol', 'Host', 'Path', and 'File Name' to their respective parts in the URL: a red arrow points from 'Protocol' to 'https://', a green arrow points from 'Host' to 'google.com', a blue arrow points from 'Path' to '/wp-content/uploads/2021/07/', and a yellow arrow points from 'File Name' to 'Student-Manual-1.pdf'.

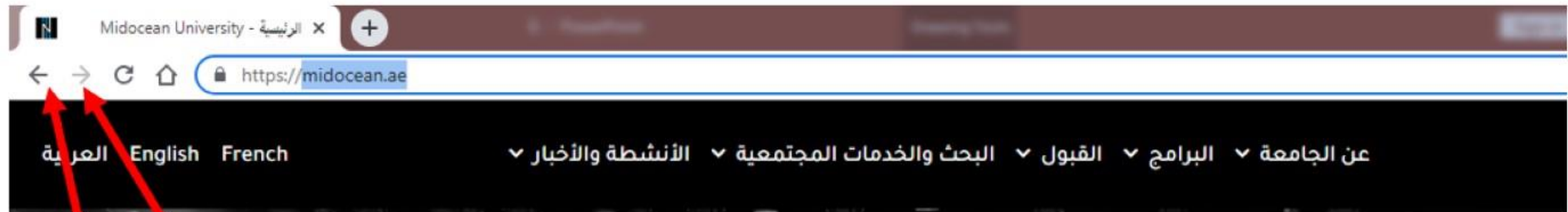
جامعة ميدأوشن

برامج أكاديمية مبنية على أفضل نماذج التعليم العالي

سجل الآن

Navigating the web

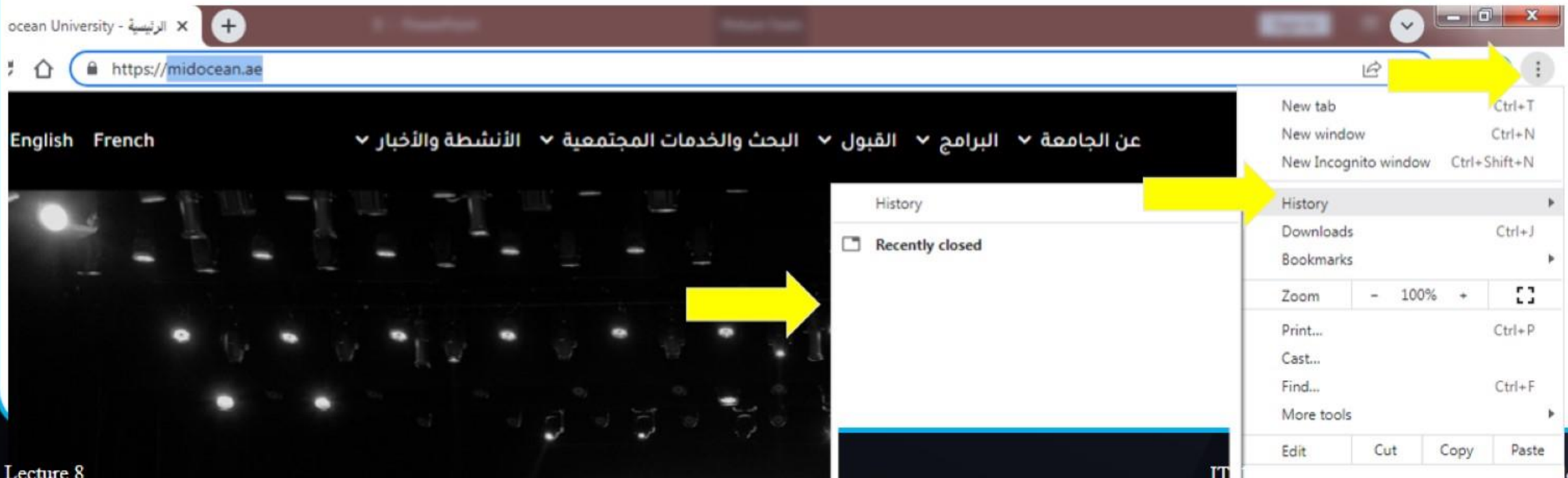
- As you go from site to site, the browser stores the location of each page you visit in the history list.
- Use the Back and Forward buttons to move through the history list



Back/Forward

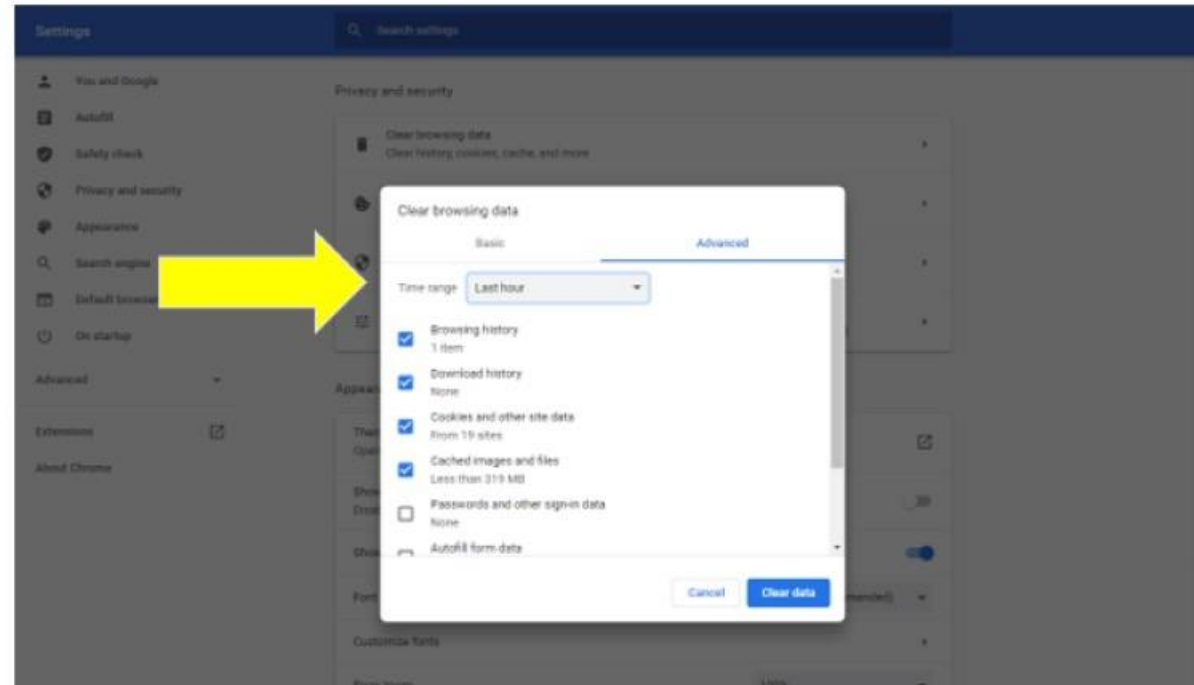
History List

- Can manage the history list from settings
 - To display history, click Customize icon, then History



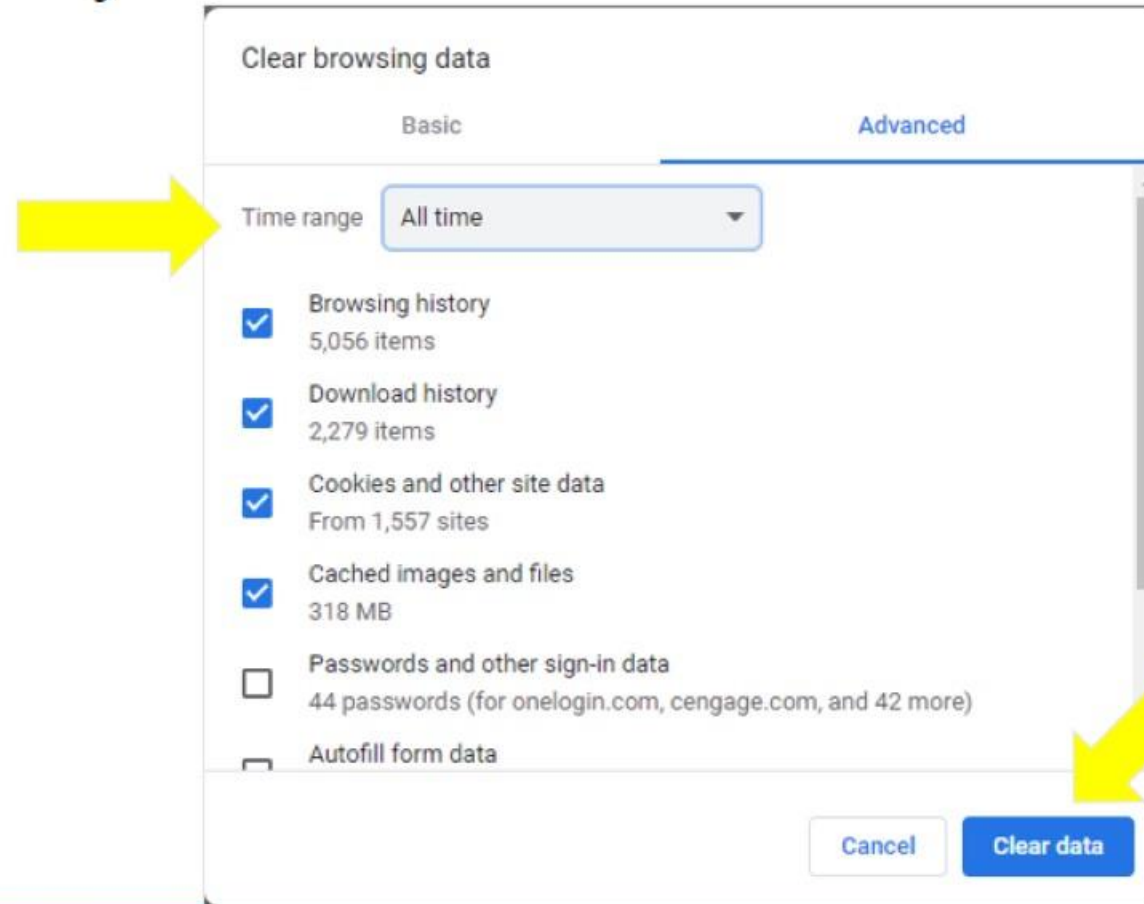
History List

- To clear the history, click Customize icon, then Settings
 - Scroll down to Privacy and security and click Clear browsing data



History List

- Select how far back you want to delete and click Clear data



Mouse Hyperlink Navigation

- Hyperlinks are text that when clicked will direct the browser to a web resource
 - Indicated with text that is a different color and underlined
 - The following is an example of a hyperlink: this_is_hyperlink_text

Navigating the Web

- Browser does a lot of things to make surfing the Web faster and easier
 - Example: Caching
- Frequently visited web pages are stored on your computer in a memory area called cache
 - When you visit the site again, the page will be retrieved from cache and show up faster in the browser

Navigating the web

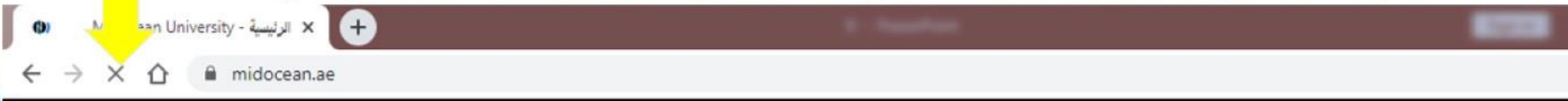
- However, if the page has changed you will get the old page version
- Use Refresh button to force the browser to retrieve page from server



- While page is loading, refresh icon changes to Stop icon (x)

- Click to stop the page load

- E.g. if you accidentally click a hyperlink that you don't want to follow, you can stop it





A bookmark is a link to a web site

Create bookmarks for sites you like/need/use often:
click the Edit Bookmarks star icon, specify bookmark name text and click
the Done button

How does the Chrome browser work?

- You can control a lot things about Chrome's appearance and functions
 - Most comprehensive way is through settings
- Access settings by clicking the Customize Chrome icon (⋮) then Settings

Click Customize Chrome

Then Settings

Google

TIAA

UCO

Fast Jax Trivia

Trivia Nation

(20+) Facebo...

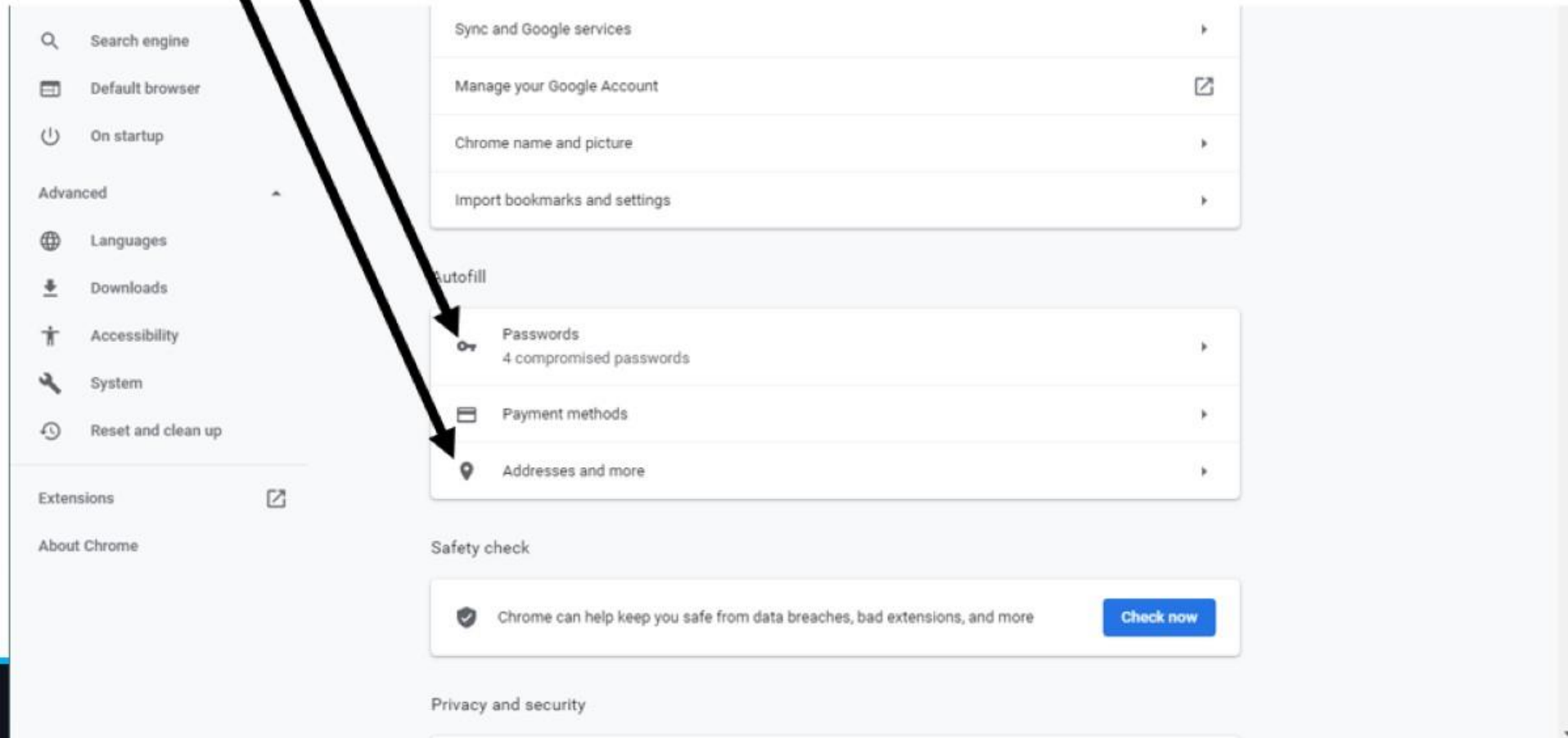
Log In to Fide...

OneLogin

(35 unread)

Add shortcut

Several convenience settings like autofill (i.e. specify passwords and text Chrome uses to fill out web forms)

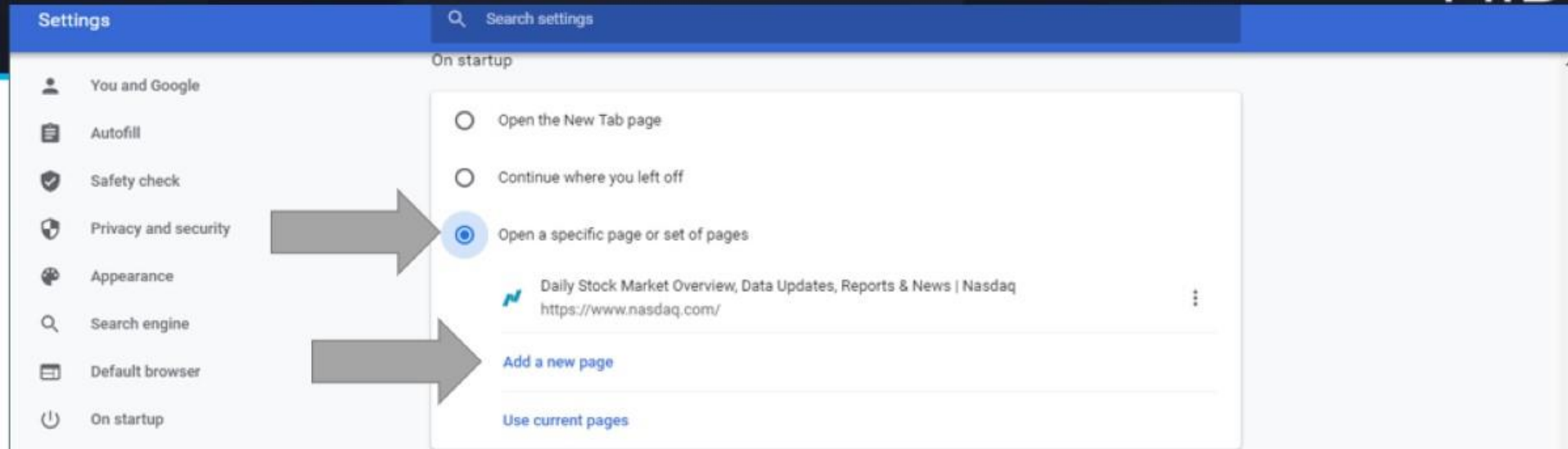


Chrome settings

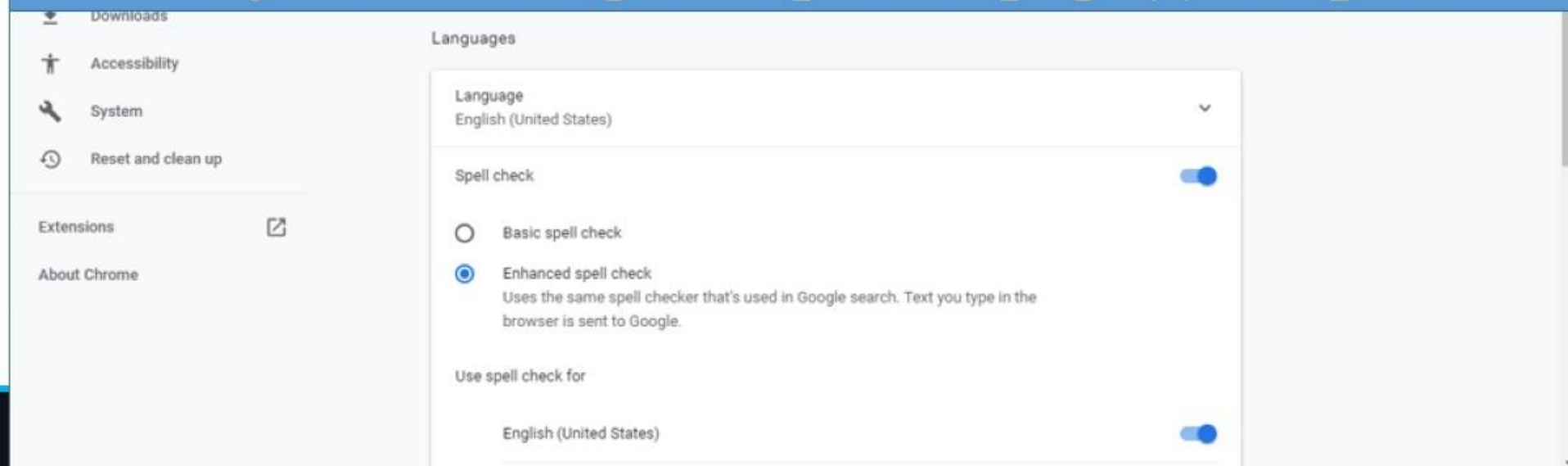
- A couple settings that you will probably want to set up
 - What to do on startup
 - Where to store downloaded files
- The “on startup” primary options
 - Redisplay all pages you were looking at when you ended last
 - Open a specific page

The image shows the Google Chrome settings interface. On the left sidebar, the 'On startup' option is selected. The main content area shows the 'On startup' settings with three radio button options: 'Open the New Tab page', 'Continue where you left off' (which is selected), and 'Open a specific page or set of pages'. A grey arrow points from the 'On startup' option in the sidebar to this section. Below this, the 'Languages' section is visible, showing a dropdown menu set to 'English (United States)'. Another grey arrow points from the 'On startup' option in the sidebar to the 'Continue where you left off' option. A large blue banner with white text is overlaid on the middle of the image, stating: 'If system restarts (like after a power outage), will bring up all pages you were viewing'. Below the banner, the 'Advanced' section of settings is partially visible, showing 'Use spell check for' with a toggle for 'English (United States)' turned on and 'English' turned off.

If system restarts (like after a power outage), will bring up all pages you were viewing



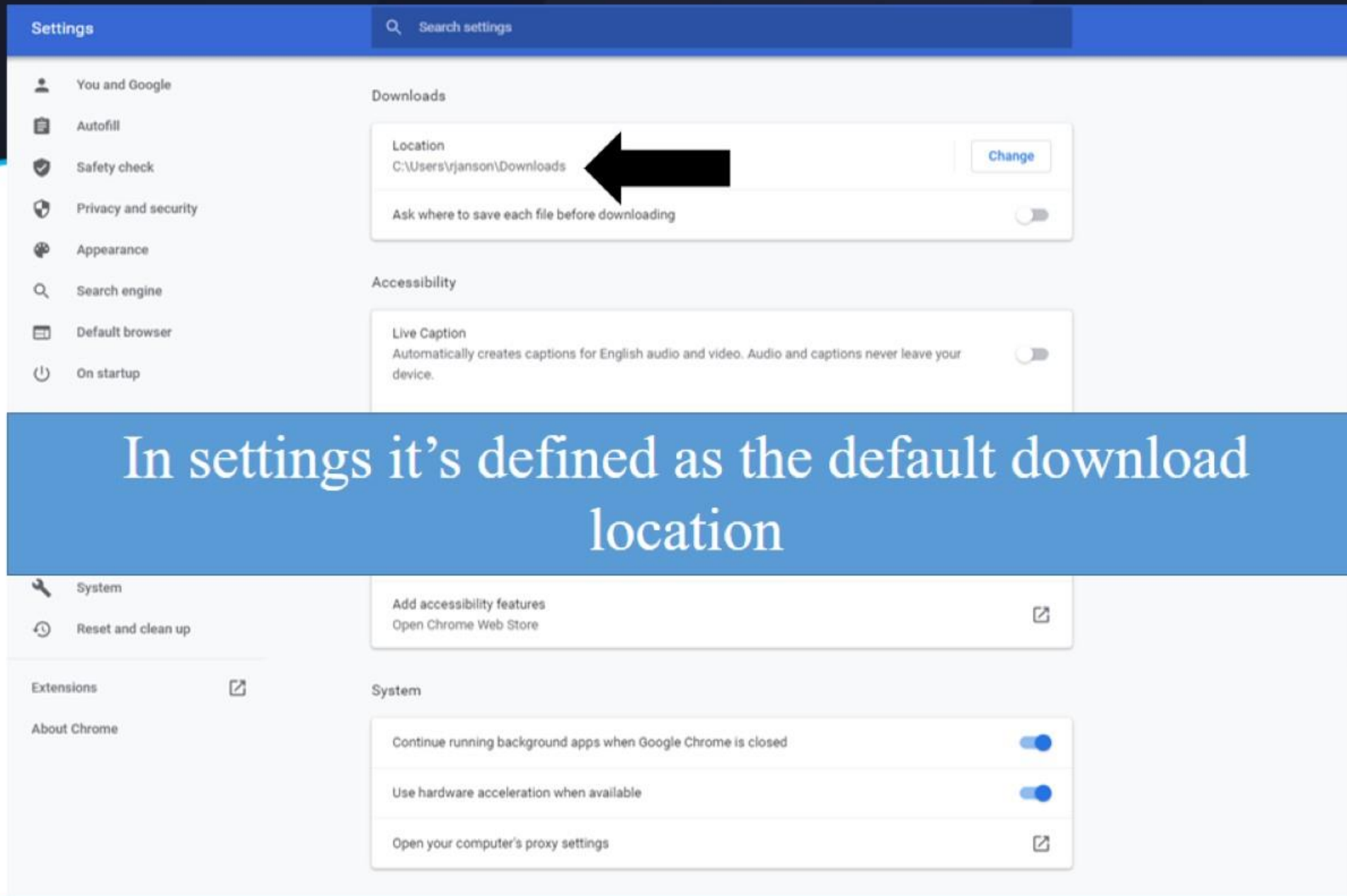
Or you can designate specific page(s) to open



Downloading files from the WWW

- Another method to move information over the Internet.
- Most browsers provide basic download function.
- Notice the following URL is a pdf document not a web page.

<https://midocean.ae/wp-content/uploads/2025/11/Policy-and-Procedures.pdf>



Short-Term Programs | web.fscj.edu/janson/cgs1060/Lin | Settings

chrome://settings/downloads

Settings

Search settings

Downloads

Location
C:\Users\rjanson\Downloads
Change

Ask where to save each file before downloading

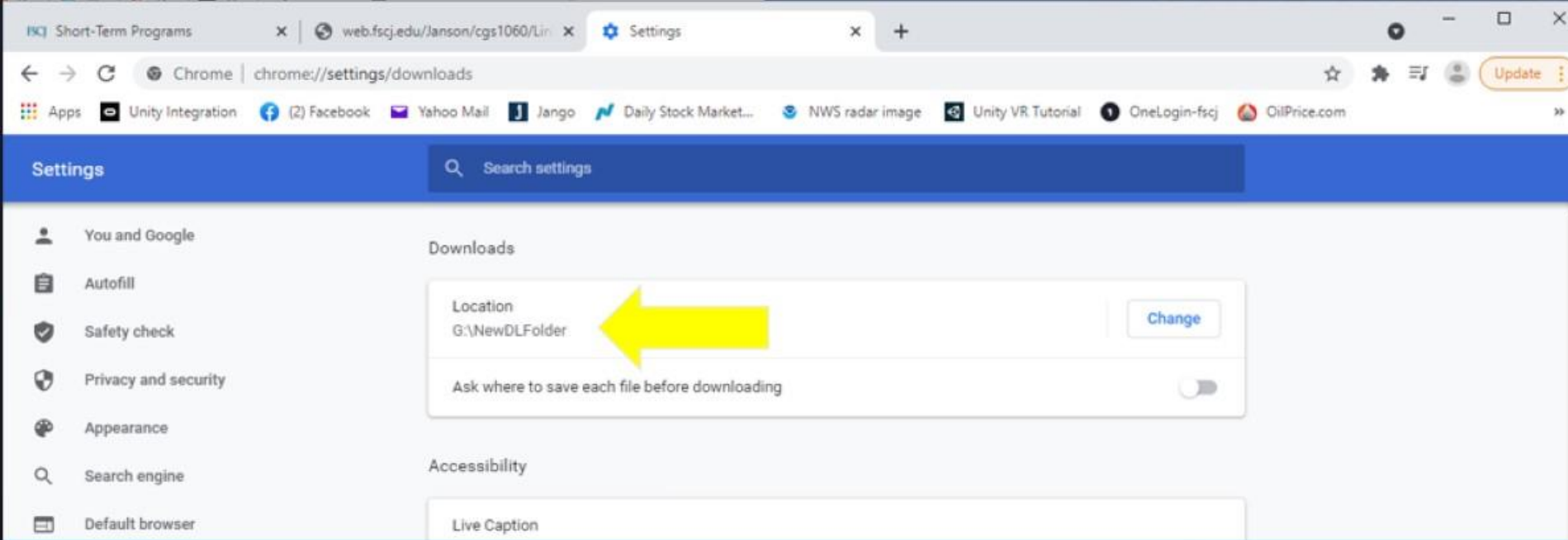
Location

This PC > USB20FD (G:) > NewDLFolder

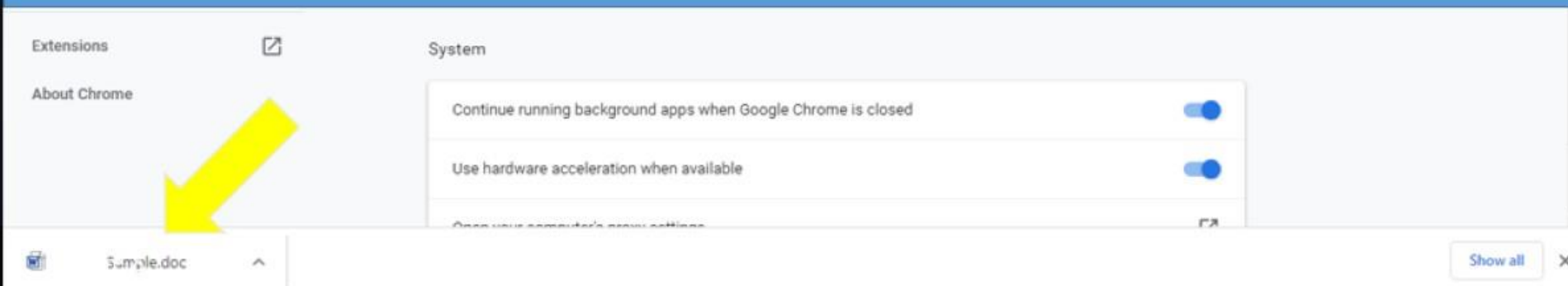
Will change

Folder: NewDLFolder
Select Folder Cancel

Open your computer's proxy settings



Download location changed
Enter the Word doc URL and hit Enter
File is downloaded (lower left tab indicates the download)



Click tabs, drop down arrow & choose Show in folder

Apps Unity Integration (2) Facebook Yahoo Mail Jango Daily Stock Market... NWS radar image Unity VR Tutorial OneLogin-fscj OilPrice.com

Settings Search settings

You and Google Downloads

Autofill Location Change

Safe Location

Private NewDLFolder

File Home Share View

Search NewDLFolder

This PC > USB20FD (G:) > NewDLFolder

Name	Date modified	Type	Size
Sample.doc	4/21/2021 2:38 PM	Microsoft Word 9...	50 KB

Documents Pictures CGS1060 CGS1100 Grading StuProjs OneDrive This PC 1 item 1 item selected 50.0 KB

Reset and clean up Open Chrome Web Store

Extensions About Chrome

System

Continue running background apps when Google Chrome is closed

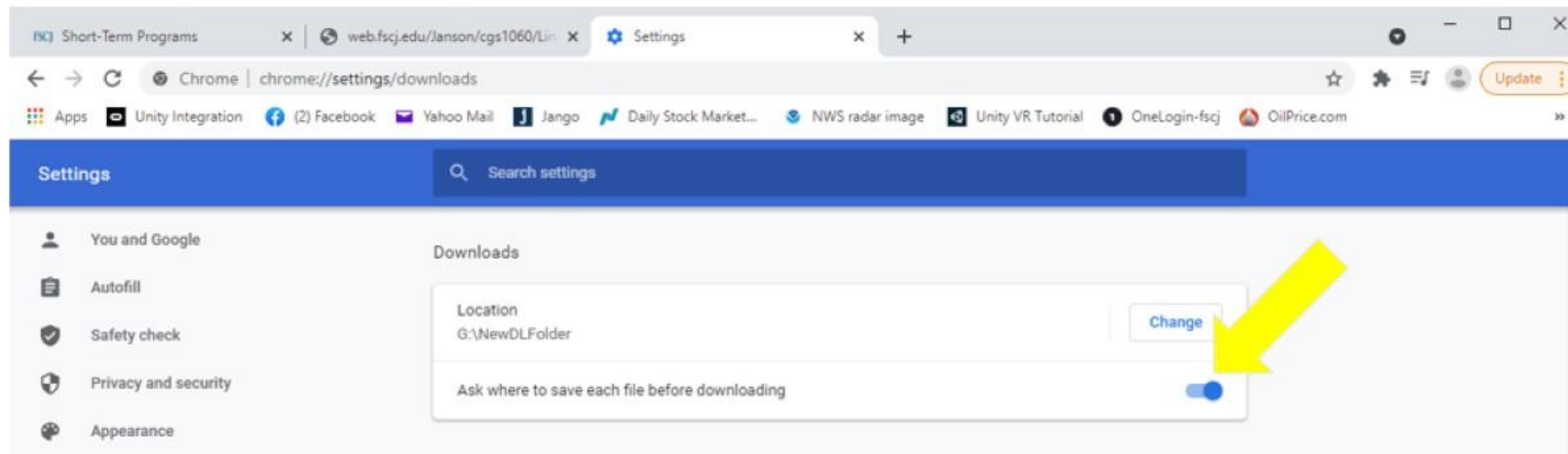
Use hardware acceleration when available

Open your computer's system settings

Sample.doc Show all

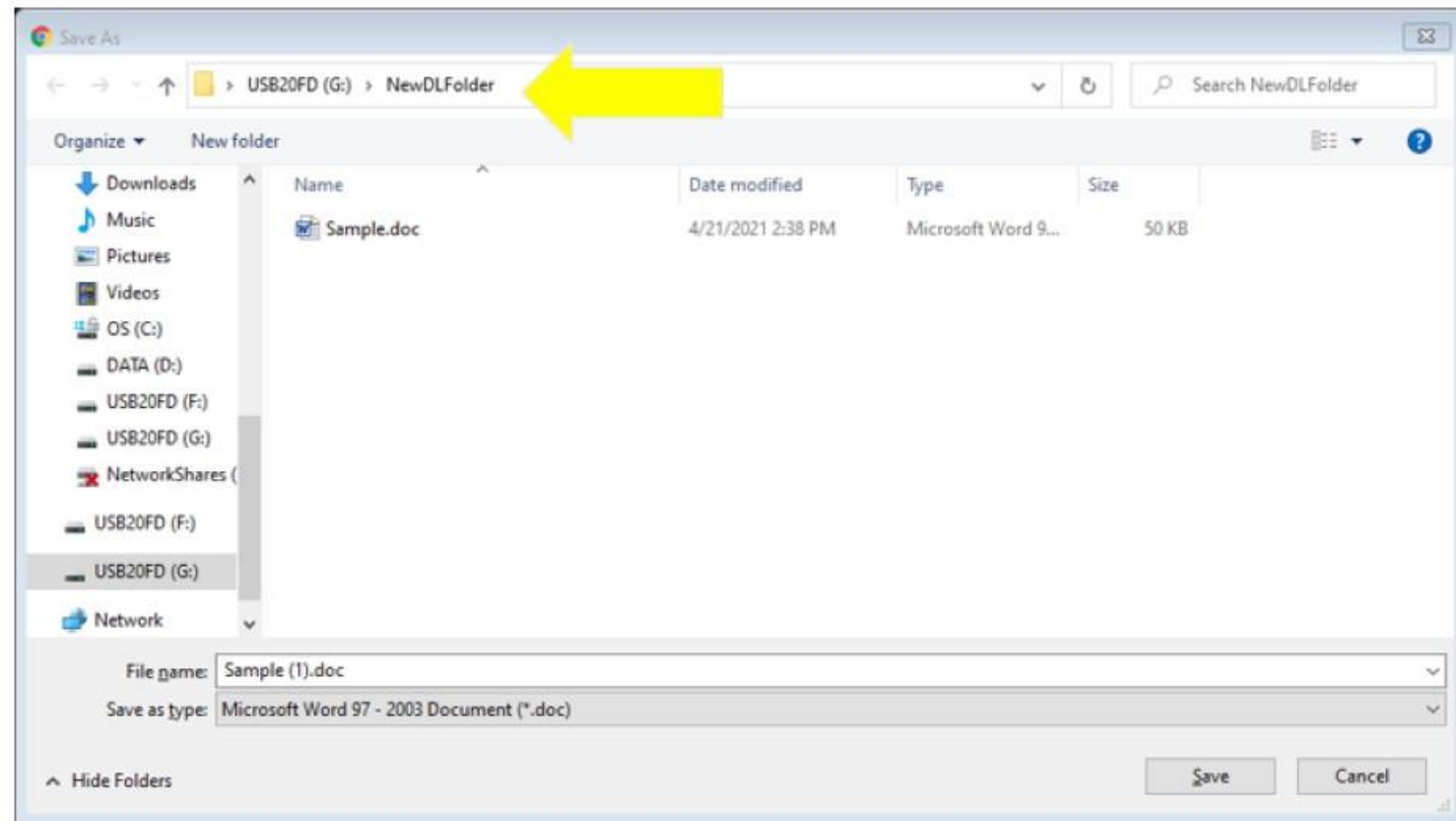
Downloading from WWW

- If you turn on the “Ask where to save...” option
 - For each download, you will be prompted for a location



Downloading from WWW

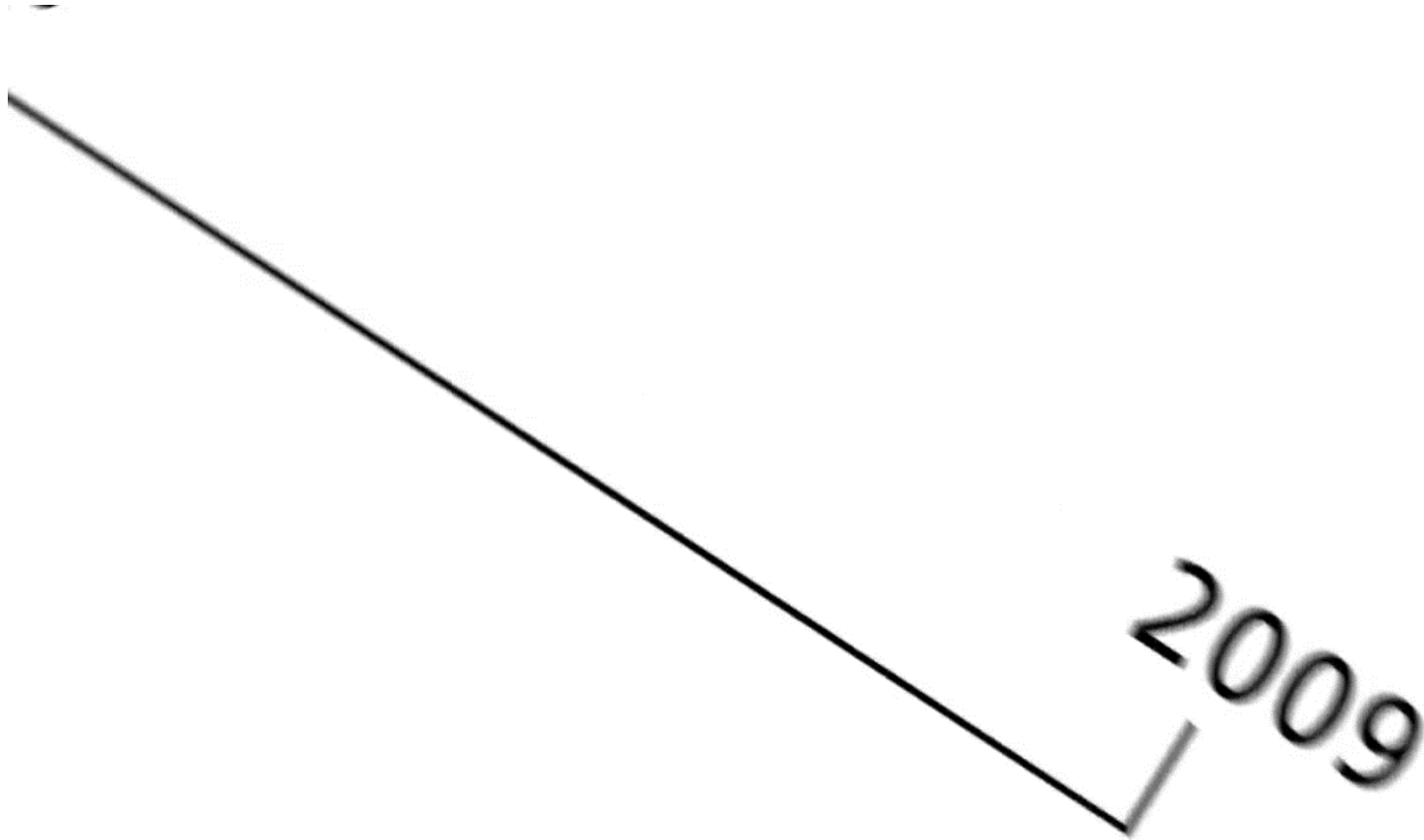
- Notice default location is already specified when you are prompted for a location to save to.



TEN BENEFITS OF INTERNET ACCESS



History of Internet



Evolution of the Internet

- ARPANET: The predecessor of the Internet, named after the Advanced Research Projects Agency (ARPA), which sponsored its development
 - Initially connected four supercomputers
 - Eventually evolved into today's Internet
- The World Wide Web: The collection of Web pages available through the Internet
 - Proposed by Tim Berners-Lee in 1989
 - Originally only text-based content; release of the Mosaic browser in 1993 led to graphical content
 - Wide variety of content available via Web pages today (social networking, RSS, podcasts, blogs and wikis)

The Internet Community Today

- Most members of the Internet community fall into one or more of the following groups:
 - Users: People who use the Internet
 - Internet service providers (ISPs): Provide access to the Internet, typically for a fee
 - Internet content providers: Provide Internet content
 - Businesses, non-profit organizations, educational institutions, Individuals

The Internet Community Today

- Application service providers (ASPs): Companies that manage and distribute software-based services over the Internet
 - Web-based software, Software as a Service (SaaS), cloudware
 - Often fee-based business software
- Web service: Added to a Web page to provide specific services for end users
- Infrastructure companies: Own or operating the physical structure of the Internet
 - Conventional and mobile phone companies, cable companies, and satellite Internet providers

The Internet Community Today

- Hardware and software companies
 - Provide the hardware and software used in conjunction with the Internet and Web
- Government and other organizations
 - Some countries limit information and access
 - Internet Society (ISOC): Addresses issues impacting the future of the internet
 - Internet Corporation for Assigned Names and Numbers (ICANN): Domain and IP management
 - World Wide Web Consortium (W3C): Protocols and standards

Getting Set Up to Use the Internet

- Typically involves three decisions:
 - Determining the type of device you will use to access the Internet
 - Selecting the type of connection desired
 - Deciding on the Internet service provider to be used
- Once these determinations have been made, your computer can be set up to access the Internet

Type of Device

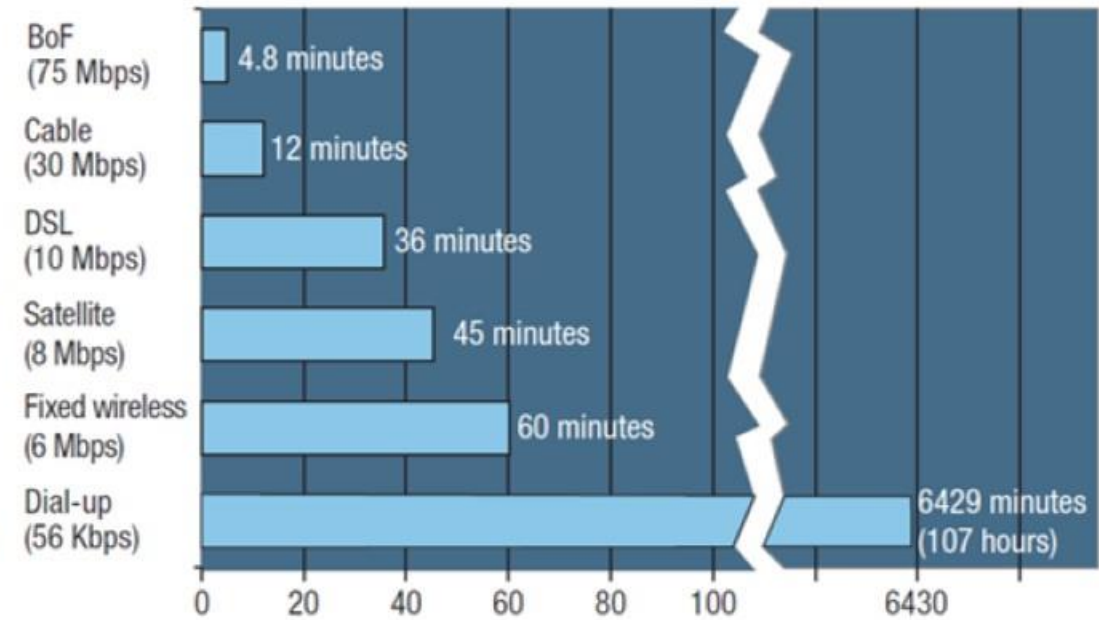
- Possible devices include:
 - Personal computers
 - Mobile phones
 - Gaming devices and televisions
 - Smart devices (IoT)

Type of Connection and Internet Access

- Computer must be connected to access the Internet
 - Most connections today are broadband
- Connections can be:
 - Dial-up
 - Uses standard phone lines
 - Uses modem to dial-up ISP
 - Inconvenient
 - Slower, but cheaper
 - Ties up phone lines
 - Relatively secure from hackers

Type of Connection and Internet Access

- Direct (always on)
 - Device is continually connected to the Internet
 - Direct connections are typically broadband; fast speeds needed for many Web activities today
 - Because you are always connected, it is important to protect your computer from hackers



Approximate time to download a 2.7 GB (about 2-hour HD) movie using different home Internet options.

Direct Connections

- Cable: Most widely used home broadband connection
 - Fast, between 5 and 20 Mbps
 - Requires a cable modem
- DSL: Broadband delivered over telephone lines
 - Must be less than 3 miles from a switching station
 - Transmits over telephone lines but does not tie up the line
 - Typically 1-7 Mbps
- Satellite: Broadband option for rural areas
 - Slower and more expensive than cable or DSL
 - Available in many areas other broadband options are not
 - Requires satellite modem, and transceiver dish

Direct Connections

- Fixed wireless: Uses radio transmission towers rather than satellites
 - Not available in all areas
 - Uses Wi-Fi or WiMAX
- Broadband over Fiber (BoF): Delivers over fiber-optic cabling all the way to the building
 - Fast, available in limited areas
 - Requires special networking equipment
- Mobile wireless: Access via mobile phone or device
 - Both free and fee-based are available

Tips for Effective Search Strategies



Searching the Internet

- Effective Internet searching: A very important skill
- Search sites: Web sites specifically designed to help users search for Web pages that match specified keywords or selected categories
 - Typically use a search engine in conjunction with a database containing information about Web pages to locate appropriate Web pages
 - Many search sites available (Google, Bing, Yahoo, Ask.com, Cuil, etc)
 - Real-time search engines are emerging
 - Search the Web live rather than relying on a database

Searching the Internet

- Keyword search
 - Keywords are typed in a search box to locate information on the Internet
 - Matching Web pages are called hits
 - Clicking on a Web page name displays that page
- Directory search
 - Categories are selected to locate information on the Internet
- Many search sites contain additional tools
 - Search for music files, image files, newsgroups, news articles, maps, people, telephone numbers
 - Google is one of the most versatile search sites

Search Strategies

- Boolean operators (AND, OR, NOT)
- Appropriate keywords
- Synonyms (different words that mean the same thing)
- Wildcards (such as * to search for keyword patterns)



Iot Definition

- “The **Internet of Things (IoT)** is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.”

How IoT works?

- **1) Sensors/Devices**
- **2) Connectivity**
- **3) Data Processing**
- **4) User Interface**



Sensors
Collecting data



Connectivity
Sending data to cloud



Data Processing
Making data useful



User Interface
Delivering information to user

1) Sensors/Devices

- Sensors or devices are a key component that helps you to collect live data from the surrounding environment.
- All this data may have various levels of complexities.
- It could be a simple temperature monitoring sensor, or it may be in the form of the video feed.



2) Connectivity

- All the collected data is sent to a cloud infrastructure.
- The sensors should be connected to the cloud using various mediums of communications.
- These communication mediums include mobile or satellite networks, Bluetooth, WI-FI, WAN, etc.



3) Data Processing

- Once that data is collected, and it gets to the cloud, the software performs processing on the gathered data.
- This process can be just checking the temperature, reading on devices like AC or heaters.
- However, it can sometimes also be very complex like identifying objects, using computer vision on video.



4) User Interface

- The information needs to be available to the end-user in some way which can be achieved by triggering alarms on their phones or sending them notification through email or text message.
- The user sometimes might need an interface which actively checks their IoT system.
- For example, the user has a camera installed in his home. He wants to access video recording and all the feeds with the help of a web server.



IoT Applications

- Smart Thermostats
- Connected Cars
- Activity Trackers
- Parking Sensors
- Connect Health
- Smart City



Challenges of Internet of Things (IoT)

- Insufficient testing and updating
- Concern regarding data security and privacy
- Software complexity
- Data volumes and interpretation
- Integration with AI and automation
- Devices require a constant power supply which is difficult
- Interaction and short-range communication

Advantages of IoT

- Ability to access information from anywhere at any time on any device
- Improved communication between connected electronic devices
- Transferring data packets over a connected network saving time and money
- Automating tasks helping to improve the quality of a business's services and reducing the need for human intervention.

Disadvantages IoT

- As the number of connected devices increases and more information is shared between devices, the potential that a hacker could steal confidential information also increases.
- Enterprises may eventually have to deal with massive numbers -- maybe even millions -- of IoT devices, and collecting and managing the data from all those devices will be challenging.
- If there's a bug in the system, it's likely that every connected device will become corrupted.
- Since there's no international standard of compatibility for IoT, it's difficult for devices from different manufacturers to communicate with each other.

What the Internet is Doing to Our Brains



