**Be the Boss of your OS**Use [Windows Task Manager](https://www.howtogeek.com/405806/windows-task-manager-the-complete-guide/) or macOS [Activity Monitor](https://macpaw.com/how-to/mac-task-manager) to take control of software that does not play well with others. *Accessing Windows Task Manager may* *not be possible on Seneca lab PCs.*Windows Task Manager is accessed either by Ctrl+Alt+Del (the infamous [three finger salute](https://en.wikipedia.org/wiki/Control-Alt-Delete)), Right-Clicking on the Taskbar at bottom of screen, + X, or directly by Ctrl+Shift+Esc.

**Create a new blank Word document for your activity answers. (Ctrl-N)**As you go through this document, practice your keyboard shortcuts by selecting, copying, and pasting the questions starting with 🡺 along with the answer box to your new document. *Copy the arrow “*🡺” *Ctrl-F and paste. This will open Navigation to help you check for all the questions.*

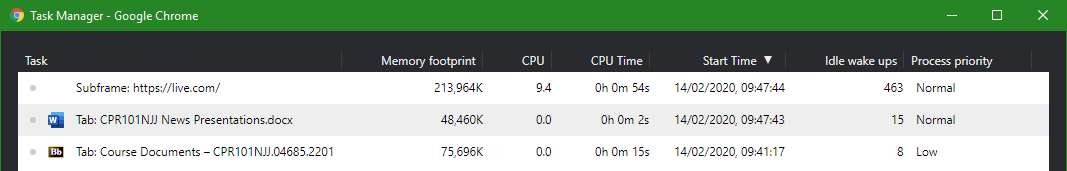
**K****indly delete the instructions and notes.** **−10% cost if you make me wade through all the stuff you were asked to delete.**

🡺 Your name: Student No.: UserID: @mySeneca.ca

***4 points each*** *for the following 25 tasks and questions.*

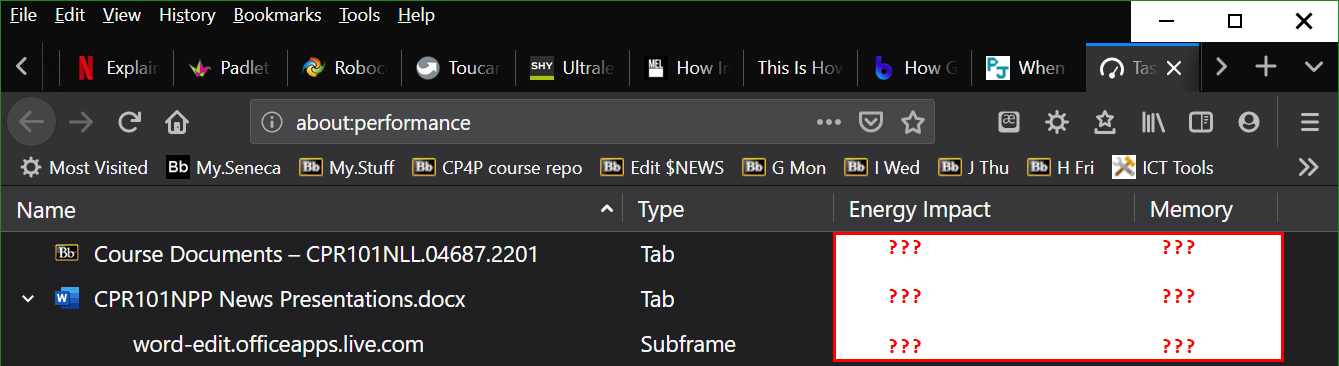
**Be the Boss of your Browser** whenthings go wrong. This is becoming especially true of web apps and pages with animated GIFs or videos. Don't close your browser just because of one runaway tab. Use the browser's Task Manager (see below) to see tabs and their sub-processes. Sort by clicking on any column heading. CPU/Energy Impact will usually help you find the misbehaving tab; select it and end/close it.

**Chrome Task Manager**Use **Shift+Esc** to open its task manager (or menu / More Tools / Task Manager ). See [How to Use](https://www.howtogeek.com/437681/how-to-use-chromes-built-in-task-manager/)



??? ???   
 ??? ???   
 ??? ???

**Firefox**Open the hamburger bars menu , click Help, click Troubleshooting Information, scroll down and click about:performance. Details are at [Task Manager - see what tabs or extensions are slowing down Firefox](https://support.mozilla.org/en-US/kb/task-manager-tabs-or-extensions-are-slowing-firefox)



**Using either Chrome or Firefox, access our course Blackboard page, go to Course Documents. Click "ICT News Item Presentation" which should open in a new tab. Open the browser's Task Manager.**

🡺 Which of our tabs/subframe has the highest CPU/Energy Impact and what is the value?   
Which is consuming the most memory and what is the value?

*[technically none. They both consumed 0.00 of my CPU]* has the highest CPU/Energy Impact with a value of [*sometimes the Word document would consume 3.1 of CPU and then again it would decline to 0*]

*[Tab: Course Documents]* consumes the most memory with a value of 123,500K

[**API**](https://en.wikipedia.org/wiki/Application_programming_interface) **– Application Program Interface**

Navigate to YouTube and watch this video about APIs (less than 3 ½ minutes)  
<https://www.youtube.com/watch?v=s7wmiS2mSXY>

🡺 What is sent from the API to a system?

🡺 What is sent from the system back through the API?

**FYI:** You will often see the REST [TLA](https://en.wikipedia.org/wiki/Three-letter_acronym) in relation to Internet [APIs](https://en.wikipedia.org/wiki/Application_programming_interface). REpresentational State Transfer ([REST](https://en.wikipedia.org/wiki/Representational_state_transfer)) is a software architectural style describing RESTful Web services which provide interoperability between computer systems on the Internet using HTTP protocol and APIs. [REST API](https://www.youtube.com/watch?v=7YcW25PHnAA) concepts and examples in under 9 minutes. [REST documentation](https://idratherbewriting.com/learnapidoc/docapis_what_is_a_rest_api.html)

An HTTP URL with a query string is a simple way to activate an API on another system. The requester does not need to know how the API is implemented on the other system, it only needs to know the HTTP encoding and the key=value pair parameters as defined by the API. You have probably done this many times, for example, every time you [Google something](https://moz.com/blog/the-ultimate-guide-to-the-google-search-parameters).

An API query begins with the usual HTTPS domain or sub-domain name.   
https://somewhere.com or https://api.somewhere.com

🡺 Following the [top-level domain](https://en.wikipedia.org/wiki/Top-level_domain)/and/sub/directories, what character signals the beginning of a [query string](https://en.wikipedia.org/wiki/Query_string)?

🡺 What character separates multiple key=value parameters?

🡺 What are three other terms for a [key=value pair](https://en.wikipedia.org/wiki/Attribute%E2%80%93value_pair)?

The response to an API query is usually returned in the form of a [JSON](https://en.wikipedia.org/wiki/JSON) object. XML is another slightly older format. Both use an arbitrarily defined schema which is a set of hierarchical key=value pairs.

🡺 What does JSON mean?

**Please use Firefox for the next steps.**

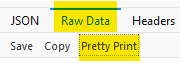
Many APIs require a *key* to prevent abuse of their free services and/or to charge for billable services. E.g. [GoogleAPIs.com](https://developers.google.com/apis-explorer/) The API key code is passed in the query string.

[OpenWeather](https://openweathermap.org/) provides weather and satellite data worldwide through free and paid [APIs](https://openweathermap.org/api).

This API key fe781e059e25c50f460f226e052aaa0d works for their free service; it is limited to 60 calls/minute and 1,000,000 calls/month which should be good enough for our purposes.

Try their [Current Weather Data API](https://openweathermap.org/current) and get the weather for Toronto in metric units.   
Details of the API call to do that through your browser’s URL/address/location bar are in that link.

🡺 What was your API request to get the weather for Toronto in metric units?

* What JSON data was returned from your API request?   
  Using Firefox, copy the Raw Data from "Pretty Print" format, and paste below please.   
  

What time is used in [Unix systems](https://en.wikipedia.org/wiki/Unix_time)? It is always a [UTC-Unix timestamp](https://en.wikipedia.org/wiki/Coordinated_Universal_Time) (Universal Time Coordinated) which is converted for use in the local [time zone](https://www.epochconverter.com/timezones?q=1592521200&tz=America%2FToronto). See this for an [entertaining explanation of time zones.](https://www.youtube.com/watch?v=uW6QqcmCfm8)

There are numerous APIs to deal with UTC & local time. <http://worldtimeapi.org/> is one. World Time API is a simple API to request the UTC current time along with related local data.

This Request URL <http://worldtimeapi.org/api/timezone> returns the various *area*/*location*[/*region*] values for the world's major cities. Find the *area*/*location* for "Toronto"

Format an API Request URL to worldtimeapi.org for the current time and related information http://worldtimeapi.org/api/timezone/?area?/?location?

🡺 TZ.1 What is the URL of your time zone API request for Toronto?

🡺 TZ.2 What JSON data was returned from your Toronto time zone API request? Using Firefox, copy the Raw Data from "Pretty Print" format, and paste here please.

The calculations to determine the local date/time from the UTC date/time plus the UTC time zone offset (in HH:MM) are very involved for software although humans can do it with little effort. It is *much* easier to program using simple arithmetic converting the UTC-Unix timestamp into a local Unix timestamp and use a built-in programming function to return the human date/time.

🡺 TZ.3 What is the pseudocode logic to convert the UTC-Unix timestamp to a local timestamp? Use the [schema](http://worldtimeapi.org/pages/schema) to interpret the JSON data. The only thing not in that data is the local timestamp.

A Unix timestamp can be plugged into any number of programming functions to return the equivalent human date/time. Annoyingly, almost every website that does this *assumes* the timestamp you enter is UTC and automagically adjusts it to your local time. Clearly, they were thinking of end-users, not programmers. *How many end-users encounter a Unix timestamp?* None! Test your TZ.3 pseudocode by plugging the result into [THIS](https://timestampgenerator.com/date-from-timestamp) calculator (leave the Timezone as GMT) and check if the date/time matches the local datetime in the TZ.2 JSON object.

🡺 TZ.4 In the TZ.2 JSON schema, find the values identified in the answer box below and paste. The only value not returned is Toronto’s local timestamp. Calculate and insert Toronto’s local timestamp value. Check it as noted above.

UTC Unix timestamp:   
*represents*  
UTC date & time:

Values to convert from Unix to Toronto timestamp:

**Toronto Unix timestamp:**

There are free APIs, [Open APIs](https://www.google.com/search?q=Open+APIs), and [Open Data sources](https://www.google.com/search?q=open+data) which can be used in your future applications. E.g. <https://myttc.ca/developers>; e.g. <https://www.themealdb.com/api.php> might be fun and useful.

People Data Labs is one of many companies offering "THE SOURCE OF TRUTH FOR PERSON DATA", known as Data Enrichment in the industry. They came to notoriety in this story: <https://www.wired.com/story/billion-records-exposed-online/>.

See what the surveillance economy knows about Seneca's president, David Agnew. Submit this API <https://api.peopledatalabs.com/v4/person?pretty=true&api_key=c33da995d69e7a09c5f75bea202bc6dbda2db41cf2a3fbd08bbbdfee25d37b86&email=david.agnew@senecacollege.ca>

What does the surveillance economy know about you? Try the above API with your personal email address. People Data Labs is **limiting usage to 1,000 free matches TOTAL** rather than 1000 free per month as of February 1, 2020. If the above API\_KEY stops working and you are interested, sign up for your own API.

[Data Enrichment APIs](https://rapidapi.com/blog/top-company-information-apis/), [Data Enrichment Tools](https://www.copper.com/tools/data-enrichment-tools), [Google search](https://www.google.com/search?q=data+enrichment).  
For more information on the surveillance economy, see [this](https://www.cigionline.org/articles/what-you-need-know-about-grand-committee-big-data-privacy-and-democracy) and [this](https://www.ourcommons.ca/Content/Committee/421/ETHI/Brief/BR10573725/br-external/ZuboffShoshana-e.pdf) and [this](https://www.troyhunt.com/data-enrichment-people-data-labs-and-another-622m-email-addresses/).

**SDLC – System Development Life Cycle**

You can apply the SDLC process to anything that requires investigation, planning, and execution. e.g. your decision to come to Seneca, moving residences. In our case, apply the SDLC to the work you do for workshops in IPC144. How will you use the steps of software development to do your assignments more efficiently and effectively? Illustrate with an example from a recent assignment. (25 points in 5 steps below)

***What is the problem?***

🡺 **Determine**: This is largely given by the assignment specs but how do you become comfortable with the scope of the assignment? How do you create a plan to complete it?

🡺 **Define** the detailed requirements. What do you do to fully understand the problem? How do you ensure you have a firm grasp of all inputs, processing, and outputs?

***What is the solution?***

🡺 **Design**: Please, don't jump into coding yet. How will you design a solution? Do you know the technical skills the solution requires? What about creating pseudocode or a flowchart to document the algorithm? Is there value in writing all the coding comments first? (The answer is yes.) How will the process of design help the development process?

🡺 **Develop**: How do you translate your solution's design into source code and commands, that is, how will the solution be implemented? What is your process of writing, building, testing, and debugging code or commands? *(Please do not send any source code...just a description of your development process.)*

🡺 **Deliver**: How do you manage the delivery and deployment of your project? Yes, there are required steps on the matrix server. How do you resolve issues when things do not work as expected? What do you do and how do you make changes to achieve a successful test? Finally, how do you conceive of what to write for the reflection text?

Many devices exist in the Internet of Things or IoT—start [Googling](https://www.google.ca/search?q=what+is+internet+of+things), see [IEEE](https://ieeexplore-ieee-org.libaccess.senecacollege.ca/xpl/RecentIssue.jsp?punumber=6488907).   
IoT “thing” – an object with embedded microcontrollers, sensors, actuators, *and network connectivity* that works without human interaction.

**Describe three IoT devices *that the world really needs* and why. What is the value added by its network connectivity? Invent your own or identify an existing device.** (see the notes below)

🡺 1.

🡺 2.

🡺 3.

IoT Notes:

* Although smartphones can control IoT devices, smartphones are not single purpose, autonomous IoT devices which send their sensor's data to a controlling system. Smartphones are general purpose ICT devices needing a human to work. (Humans themselves can act like IoT devices gathering data on their thought and behaviour and sending it to AI systems under the control of social media.)
* Modems, routers, switches, bridges, etc. are part of networking infrastructure that connect the Internet to Things; they are not IoT devices themselves although they are all examples of embedded devices. They do not have sensors or transmit data about their environment. Their function is to run network protocols; they are the data transmitters for other devices.
* Has IoT already jumped the shark? [IoT hairbrush](https://www.google.ca/search?q=IoT+hairbrush)
* [IoT for Smart Cities](https://ieeexplore-ieee-org.libaccess.senecacollege.ca/document/6740844), [IEEE IoT Journal](https://ieeexplore-ieee-org.libaccess.senecacollege.ca/xpl/RecentIssue.jsp?punumber=6488907), [IEEE Access](https://ieeexplore-ieee-org.libaccess.senecacollege.ca/xpl/RecentIssue.jsp?punumber=6287639), [IoT news](https://internetofthingsagenda.techtarget.com/)
* [Considerations When Developing a Connected Device](https://www.postscapes.com/iot-voices/major-considerations-when-developing-connected-products/)
* [considerations for IoT solutions](http://www.iotamy.com/IoT_Essentials) e.g. "device monitoring, firmware and software updates, diagnostics, crash analysis and reporting, physical management, and security management"
* [Bilal Javed. (2017). Internet of things (IoT) design considerations for developers and manufacturers. 2017 IEEE International Conference on Communications.](https://senecacollege-primo.hosted.exlibrisgroup.com/primo-explore/openurl?url_ver=Z39.88-2004&rfr_id=info:sid%2FIEEE.org:XPLORE&rft_id=info:doi%2F10.1109%2FICCW.2017.7962762&url_ctx_fmt=info:ofi%2Ffmt:kev:mtx:ctx&url_ctx_fmt=info:ofi%2Ffmt:kev:mtx:ctx&rft_val_fmt=info:ofi%2Ffmt:kev:mtx:journal&rft.atitle=Internet%20of%20things%20(IoT)%20design%20considerations%20for%20developers%20and%20manufacturers&rft.jtitle=2017%20IEEE%20International%20Conference%20on%20Communications%20Workshops%20(ICC%20Workshops)&rft.date=2017&rft.spage=834&rft.epage=839&rft.au=Bilal%20Javed&rft.aulast=Bilal%20Javed&vid=01SENC&institution=01SENC&url_ctx_val=&isSerivcesPage=true&lang=en_US)
* [Microsoft IoT Hub](https://docs.microsoft.com/en-us/azure/iot-hub/about-iot-hub)
* [IBM Watson IoT](https://www.ibm.com/internet-of-things/learn/what-is-iot/) [Platform](https://www.ibm.com/internet-of-things) [Canada](https://www.ibm.com/ca-en/marketplace/internet-of-things-cloud)

**Software Version**

**Research the version of a software application** you use, such as a game, photo editor, browser, or IDE. Usually, the version can be found under the Help menu, About…

🡺What is the name of the software and its current version?

🡺What do the components of the version number mean?

🡺In what way would that software be [forward compatible](https://en.wikipedia.org/wiki/Forward_compatibility)?

🡺What can you observe to indicate that the software is [backward compatible](https://en.wikipedia.org/wiki/Backward_compatibility)?

🡺Find the release notes for that software and include the URL, release date, a description of one of the latest changes.

e.g

<https://support.office.com/en-us/article/release-notes-for-office-2016-for-mac-ed2da564-6d53-4542-9954-7e3209681a41>   
Release Date: February 13, 2018   
*Excel – Precision selecting: Ever selected too many cells or the wrong ones? You can now deselect extraneous cells without having to start over.*

Your operating system probably keeps its version up to date as does your anti-virus and malware protection utility. It is a good idea to check your other software and firmware to ensure you are at the most current, i.e. *secure*, level. **Have you checked that your router’s firmware is up to date? Your router can be a firewall against intrusion from the Internet but only if its firmware has been patched to plug security holes.**