**Task**

You have been tasked with solving a series of challenges on picoCTF. You will use your learning outputs as evidence to guide the marker to what you have learned and at what level and to highlight/market your learning to non-technical third parties.

You should treat this assignment as Assignment Item 3 (Evidence Guide) and Assignment Item 4 (Innovation Showcase).

At a minimum, you must complete CTF activities covering web exploitation, cryptography, reverse engineering, and forensics. Furthermore, it is recommended that you complete the following CTFs

* Web Exploitation: don't-use-client-side and picobrowser
* Cryptography: la cifra de and john pollard
* Reverse Engineering: vault-door3 and vault-door 4
* Forensics: so meta and extensions

Note you may need to do other activities to learn or refresh the skills to complete these tasks.

A second note: You may choose to complete other (or more) tasks at your discretion.

**Each must include the following at a minimum**

* Evidence of your project/work over the term
  + A writeup/explanation of each problem solved
  + A bibliography of any supporting documentation that you used (if in doubt, use APA 5th)
  + Video evidence of your solution in its most complete format.
* A series of short journals responding to different unit goals/descriptors/etc.
* An Evidence Guide (PowerPoint)
* Innovation Showcase Poster and Presentation (Poster + video(s))

# Tool of learning

The best learning happens when we stop and think about what we've done, what worked, what didn't, and what we would do next time.

With this in mind, the lion's share of marks will focus on what you've learned in the project process, with the project itself being the journey and not the destination.

## Submission Guide

#### Journal responses

The journal responses will be asking questions similar to the questions below. They are used to prepare to look at your work and produce your Evidence Guide and Innovation Showcases.

#### Evidence Guide and Innovation Showcase

The Evidence Guide and the Innovation Showcase rely on you responding to some questions. The questions are the same for both sections, but you will answer them differently. These questions will be heavily based on the goals and content of the unit. In this case, we are using the Unit Goals from Digital Technologies: Structured Project

1. What is it you did this term, and what did you learn?
2. How may your learning impact your understanding of Network Administration and Security?
3. What is Web Exploitation, and why is it essential for Network Administrators to understand?
4. What is Cryptography, and why is it beneficial for Technology professionals to understand?
5. What is Reverse Engineering, and why is it essential for Technology Professionals to understand?
6. What is Digital Forensics, and how is it used in Network Administration?
7. What skills, tools, or processes have you developed to use or support you in solving complex network/systems problems?
8. What management strategies did you use to keep yourself, or put yourself back on, track? How/why did this impact you?

##### Evidence Guide

Evidence Guides are a personal response to the questions above. However, they focus on reporting to a technical expert (me) on what you've done this semester.

In this case, the Evidence Guide must be completed in a PowerPoint format (or similar analog). You must answer **four** questions, but only **two** are mandatory: "What is it that you did this term, and what did you learn" and "How may your learning impact your understanding of Network Administration and Security?". You may select which of the other two questions you want to respond to in a technical format. The remaining two questions must be answered in your showcase.

Each question can contain no more than three slides. On top of the style guide requirements (found below the rubric), you may include a short passage in the author's notes to extrapolate the idea further. However, each question can have no more than 250 words in total.

##### Innovation Showcase

Innovation Showcases are focused on informing people with a diverse understanding of technology. It must be helpful for someone in year ten coming to an open night but informative for your peers to understand the cool things you've done.

Unlike the evidence guide, you do not need to respond to all the questions above. You must answer **four** questions, but only **two** can be repeated: "What is it that you did this term and what did you learn" and "How may your learning impact your understanding of Network Administration and Security?". The other two questions must be ones you haven't addressed from the list above.

Innovation Showcases will consist of 1 or more connected posters based on the provided template. You are not required to design your own template and must align with the broad design template given to you.

Additionally, you must submit a series of short presentations focused on each question for 6 minutes.

## Task 1: Evidence Guide

## Rubric

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Knowledge, Comprehension & Application** |  |  |  |  |  |
| **CRITERIA** | **EXPECTATIONS** | **POSS** | **STUDENT** | **GIVEN** | **MULTI** | **TOTAL** |
| **PicoCTF**  (individual) | You have submitted **evidence of your picoCTF** solutionsduring Term 4. This work is expected to be indicative and highlights the learning journey's significant outputs.   * A writeup/explanation of each problem solved * A bibliography of any supporting documentation that you used (APA 5th) * Short video evidence of your solutions in its most complete form | 2  2  2 | \_\_/2  \_\_/2  \_\_/2 | \_\_/2  \_\_/2  \_\_/2 | A x2  T x1 | A \_\_/ 12 T \_\_/ 6 |
| **Journal Responses**  (individual) | You will have submitted **journal responses** during Term 4. You will receive three journal topics to respond. Each topic is linked to some significant parts of the evidence guide questions. | 2  2  2 | \_\_/2  \_\_/2  \_\_/2 | \_\_/2  \_\_/2  \_\_/2 | - | \_\_/ 6 |
| **Evidence Guide**  (individual) | You have **submitted an evidence guide** for review. The evidence guide is **in PowerPoint** and appears to be a **substantive effort** that **addresses all required questions.** | 2 | \_\_/2 | \_\_/2 | A x2  T x1 | A \_\_/ 4 T \_\_/ 2 |
|  | **Analysis, Synthesis & Evaluation** |  | | **SUBTOTAL** | | **A \_ / 22**  **T \_ / 14** |
| **What is it you did this term, and what did you learn?** | Your evidence guide **communicates** your work on picoCTF **coherently** using **appropriate evidence** and **technical literacy**. The evidence highlights your **project details** appropriately and shows evidence of using **proper techniques and approaches**. | 4 | \_\_/4 | \_\_/4 | - | \_\_/ 4 |
| **How may your learning impact your understanding of Network Administration and Security?** | Your evidence guide **communicates your evaluation** of your learning in **contrast to what you understand** of the industry. This evidence is **presented coherently** and uses **appropriate evidence** **and technical language**. | 4 | \_\_/4 | \_\_/4 | - | \_\_/ 4 |
| **Question 3: student selected** | The evidence guide addresses **a third student-selected question** from the range provided. This evidence is **presented coherently** and uses **appropriate evidence and language** to frame it. | 4 | \_\_/4 | \_\_/4 | - | \_\_/ 4 |
| **Question 4: student selected** | The evidence guide addresses **a fourth student-selected question** from the range provided. This evidence is **presented coherently** and uses **appropriate evidence and language** to frame it. | 4 | \_\_/4 | \_\_/4 | - | \_\_/ 4 |
|  | **Submission Guidelines** |  | | **SUBTOTAL** | | **\_\_ / 16** |
| **Submitability** | **Assessment submission is ordered** and has a definite pattern to its construction. **The reader is not confused about the content in any given section and can follow the submission flow** easily. | 4 | \_\_/4 | \_\_/4 | x2 | \_\_ / 8 |
| **Formatting** | **Students have** **followed the formatting instructions,** including any provided templates and guides **or have created their own** legible formatting guide **and applied it constantly**. | 2 | \_\_/2 | \_\_/2 | - | \_\_ / 2 |
|  |  |  | | **SUBTOTAL** | | **\_\_ /10** |
|  | DAYS LATE \_\_\_/7 = \_\_\_% |  |  | **FINAL** | | **A \_\_/48 T \_\_/40** |

## Task 2: Innovation Showcase

## Rubric

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Knowledge, Comprehension & Application** |  |  |  |  |  |
| **CRITERIA** | **EXPECTATIONS** | **POSS** | **STUDENT** | **GIVEN** | **MULTI** | **TOTAL** |
| **Knowledge Item**  (individual |group) | Task description  Evidence for knowledge, comprehension, and application may include:   * **Knowledge**: Your evidence highlights that you recall and list relevant terms in your learning. It may tell a story to the reader (the teacher) or state the conditions of your learning. * **Comprehension**: Your evidence highlights that you can identify critical aspects of your learning or explain what you've done to the author. * **Application**: It is clear from your evidence that you constructed a complete submission | 2 | \_\_/2 | \_\_/2 | A x2  T x1 | A \_\_/ XX T \_\_/ XX |
| **Knowledge Item**  (individual |group) | Task description  Evidence for knowledge, comprehension, and application may include:   * **Knowledge**: Your evidence highlights that you recall and list relevant terms in your learning. It may tell a story to the reader (the teacher) or state the conditions of your learning. * **Comprehension**: Your evidence highlights that you can identify critical aspects of your learning or explain what you've done to the author. * **Application**: It is clear from your evidence that you constructed a complete submission   Note: the assessor may use their discretion to source other evidence from this assessment to judge the activity if required. | 2 | \_\_/2 | \_\_/2 | - | \_\_/X |
|  | **Analysis, Synthesis & Evaluation** |  | | **SUBTOTAL** | | **A \_ / 30**  **T \_ / 20** |
| **Mastery Activity** | **Statement | Evidence**: Description of what you are after.  Details  Justification  What you are assessing  Each of your questions will be marked against the following aspects of your ability to:   * express your understanding of technology concepts and principles * your ability to communicate ideas appropriately in the selected medium   Evidence for higher-order learning may include:   * **Analysis**: Your evidence shows a reasoned understanding of what you did and why. For example, you may have explained how you did X, Y, and Z, but you continue to explain why you did them the way you did. * **Evaluative**: your evidence makes a judgement of something or between multiple things. This judgement may be the value of one thing over another or highlighting the significant differences between two things. * **Transferal**: your evidence highlights when you apply information, strategies, or skills that you have learnt to a new situation or context.   Note: the assessor may use their discretion to source other evidence from this assessment to judge the activity if required. | 4  4 | \_\_/4 \_\_/4 | \_\_/4 \_\_/4 | A x1  T x 2 | A \_\_/ 8  T \_\_/16 |
|  | **Submission Guidelines** |  | | **SUBTOTAL** | | **A \_\_/24**  **T \_\_/48** |
| **Suitability** | **Assessment submission is ordered** and has a definite pattern to its construction. **The reader is not confused about the content in any given section and can follow the submission flow** easily. | 4 | \_\_/4 | \_\_/4 | x2 | \_\_ / 8 |
| **Formatting** | **Students have** **followed the formatting instructions,** including any provided templates and guides **or have created their own** legible formatting guide **and applied it constantly**. | 2 | \_\_/2 | \_\_/2 | - | \_\_ / 2 |
|  |  |  | | **SUBTOTAL** | | **\_\_ /10** |
|  | DAYS LATE \_\_\_/7 = \_\_\_% |  |  | **FINAL** | | **A \_\_/XX T \_\_/XX** |

## Rubric sections

##### Section 1: Knowledge Comprehension and Application

This section of the rubric consists of the required elements of the assignment. Students should take special care to include ALL these elements as they are often extended in the following sections

##### Section 2: Analysis, Synthesis, and Evaluation.

This section will evaluate your ability to include critical thinking and justification elements into your work. Often the requirements for extension are not explicitly given, so it will be up to you to decide how best to demonstrate what you have learned beyond the required unit goals and curriculum. Items such as 3D models, pictures, drawings, diagrammatic responses, notes, evidence of problem-solving, advanced programming concepts, elegant responses, media, etc., are all available options.

##### Section 3: Submission Guidelines

Students are expected to provide a submission that fulfils the requirements listed in style guides while also submitting at an appropriate quality. Be aware that points in this section could be 2- or 4-point items. Treat them accordingly.

## Submission

All submission items should be stored in an appropriate format. For example, code must be stored in a programmatical format so it can be evaluated (**images of code or code copied and pasted into a document may not be marked**)

Evidence of working material must be recorded where appropriate. For example, to show how your robot meets a requirement, you must submit a recording of it completing that requirement. Similarly, if you need to show how your program can download a file from the internet and crack a password, you must submit a recording of it doing that.

Ask the teacher if you are unsure if an element needs to be recorded**.**

All materials must be submitted to Google Classroom.

Students are responsible for keeping backups/master copies.

## **Scoring Notes**

Formatting for all typed/written assessments should be as follows:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Google Doc** | 11-12 Pt | 1.15-1.5 Line Spacing | 1 Space between paragraphs | Spelling and Grammar “Soft Limit” | In-Text Citations with footnotes | Title Page/Slide:   * Name * Date * Class * Aim * Assessment title |
| **Slides** | 10-12 pt. font text  14-24 pt. font titles | 1.0 1.15 Line Spacing | Bullet Points Preferred | Word Count per slide >100-110 “Soft Limit.” | Approved Templates and Themes |
| **Python** | We apply the following style guide to Python files. However, in general, most programs follow this overall layout.    [PEP 8: The Style Guide for Python Code](https://pep8.org/) | | | | | |
| **Arduino**  **C/C++** | We apply the following style guide to C/C++ files. However, in general most programs follow this broad layout.    I accept both K&R and K&R alternative bracing format. As long as it is consistent in your file.  [Arduino Style Guide for Creating Libraries | Arduino Documentation | Arduino Documentation](https://docs.arduino.cc/learn/contributions/arduino-library-style-guide) | | | | | |
| **Markdown** | We apply the following style guide to markdown documents. However, in general, most documents follow some variation of the following layout:    <https://github.com/google/styleguide/blob/gh-pages/docguide/style.md> | | | | | |

“Soft Limits” are not rigidly defined limits and will be assessed on a case-by-case basis. Ask for clarification on specific tasks

## Possible Scoring Groups are out of 2 or 4 Points.

##### 2-Point Criteria - Knowledge and Understanding

Criteria assessed as 2-Points are classified as Knowledge and Understanding criteria. These will examine and evaluate a student’s ability to effectively state facts and define terms and concepts. Analysis and synthesis of the information will not be assessed through these criteria.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **0 Points** | **1 Point** | **2 Points** |
| **2 Point Criteria** | **Not present** or **not able to be assessed** as the required criteria | Item is presented but **does not meet expectations** for quality, rigour, or detail. | Item is presented and **does meet expectations** for quality, rigour, or detail |

##### 4-Point Criteria - Analysis and Synthesis and Expert Review

To show true mastery of your developing skills, students must show that they can go beyond simple repetition of the given tasks or an explanation of processes. Students will demonstrate their ability to show higher-order thinking through analysis, evaluation, or linking multiple fields of learning to solve problems in novel ways.

## Analysis and Synthesis

Analysis and Synthesis components evaluate a student’s ability to effectively review data and understandings and develop these into a coherent and relevant statement. Analysis refers to the generating of thoughts from interpreting the data. In contrast, synthesis combines experience from one area with other pertinent knowledge to develop an original and compelling solution.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **0 Points** | **1 Point** | **2 Points** | **3 Points** | **4 Points** |
| **4 Point Criteria** | **Not present** or **not able to be assessed** as the required criteria | Evidence is presented and explained. However, it **does not show appropriate evidence of higher-order thinking** such as analysis, evaluation, or synthesis. | Evidence is presented and **shows appropriate evidence of higher-order thinking** such as analysis, evaluation, or synthesis. | Evidence is presented and **exceeds expectations for evidence of higher-order thinking** such as analysis, evaluation, or synthesis.  **-or-**  Item is presented and shows appropriate evidence of higher-order thinking such as analysis, evaluation, or synthesis and **exceeds expectations for quality or rigour** of understanding of the selected mastery. | Evidence is presented and **exceeds expectations for evidence of higher-order thinking** such as analysis, evaluation, or synthesis. **Additionally, this item exceeds expectations for quality or rigour** of understanding of the selected mastery. |

##### Expert Review

Expert Reviews evaluate a student’s ability to build solutions using the skills taught during the semester. Criteria assessed as 4-Points are classified as Analysis and Synthesis criteria. These will examine and evaluate a student’s ability to effectively review data and understandings and develop these into a coherent and relevant statement. Analysis refers to the generating of thoughts from interpreting the data. In contrast, synthesis combines experience from one area with other pertinent knowledge to develop an original and compelling solution.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **0 Points** | **1 Point** | **2 Points** | **3 Points** | **4 Points** |
| **4 Point Criteria** | **Not present** or **not able to be assessed** as the required criteria | Evidence is presented and broadly solves the problem. However**, the evidence does not show appropriate mastery** upon review. | Evidence is presented and broadly solves the problem. On review, it **does show appropriate evidence** of mastery. | Evidence is presented and solves the specific problem. On review, the evidence **shows understanding beyond expected mastery**.  **-or-**  Item is presented and broadly solves the problem. On review, it does show appropriate evidence of mastery and is **done so in a well-constructed or design method** that clearly shows higher levels of understanding**.** | Evidence is presented and solves the specific problem. On review, **the evidence shows understanding well beyond expected mastery** and is **done so in a well-constructed or designed method** that clearly indicates higher levels of understanding. |

##### Multiplier

Criteria will be combined with a **Multiplier**. While each criterion will be scored on the 0-1-2-4 scale, the multiplier will attach relevant worth to each criterion. Be aware of these multipliers and dedicate appropriate time to ensure you achieve your best result.

## Achievement Standards:

## Evidence of higher-order learning:

What is it that I mean by “higher-order thinking”?

It means I want you to go beyond replicating what we do in class. I want you to dig into your brain and understand why you did something, what about it was great, and what could be improved.

Why is this important? Reflective thinkers can go beyond what they are taught and can customise their learning to ben

