INFO1111: Computing 1A Professionalism

2024 Semester 1

Skills: Team Project Report

Submission number: ?? Add your details

Github link: ?? Add your details

Team Members:

Name	Student ID	Target * Foundation	Target * Advanced	Selected Major
FAMNAME1, givenName1	01234567	A	NA	Computer Science
KARTHIK, Nikhil	540493607	A	NA	Data Science
FAMNAME3, givenName3	01234567	A	NA	SW Development
FAMNAME4, givenName4	01234567	A	NA	Cyber Security

* Use the following codes:

- NA = Not attempting in this submission
- A = Attempting (not previously attempting)
- AW = Attempting (achieved weak in a previous submission)
- AG = Attempting (achieved good in a previous submission)
- S = Already achieved strong in a previous submission

Contents

Instructions

Important: This section should be removed prior to submission.

You should use this LaTeX template to generate your team project report. Keep in mind the following key points:

- **Selecting a major**: Each team member must select one of the computing degree majors (a different one for each student) - i.e. Computer Science; Data Science; Software Development; Cyber Security. If there are more than four members in your team then your tutor will suggest a fifth alternative. The choice for each student should be included in the table on the cover page.

- **Teamwork**: Whilst the team project is just that – a team project – it has been designed to also allow different members of the team to achieve different outcomes. We do expect you to work together as a team – i.e. your team can only submit a single report. There will be some sections that need to be worked on as a team, and some sections that are done individually. This means that your team will need to collaborate to combine your individual components for each submission. This collaborative aspect is a requirement for both the foundation and advanced tasks (since the two tasks are submitted using this one template). The only exception to this is where a member of the team has already achieved the level they are targeting (e.g. OK for the Foundation task) in a previous submission and has decided to not attempt higher levels, and so is not contributing anything further (this should be obvious because no target is indicated for that student on the cover page).

- **Team problems**: If you do come across problems working together then the first step should be to discuss this with your tutor. You should do this as soon as possible, and not wait until it is too late for your tutor to address any problems.

- **Choosing Levels**: Whilst the report is compiled as a team, for each submission each team member can individually attempt the foundation task, advanced task or neither, (though you need to achieve a "STRONG" on the foundation task before being eligible to attempt the advanced task). Each team member will then be individually assessed for the levels they have attempted.
  For example, in the first submission, one team member attempted only the foundation task and the other three all attempted both the foundation task and the advanced task. For the one who attempted only the foundation task, they were not successful in achieving an "OK" (a pass) or a "STRONG" (opportunity to proceed to advanced task). In the second submission, they then reattempted the foundation task (successful – "STRONG"). For the third and final submission they could attempt the advanced task, or even just choose to not submit anything further and remain at the foundation "STRONG" rating.

- **Minimum requirement**: Remember that in order to pass the unit, you must achieve at least foundation – "OK" rating by the end of the third submission.

- **Assessment**: In order to attempt the advanced – "OK" or "STRONG" you must first have achieved foundation – "STRONG". This means that we will not assess any attempts made on the advanced task until the "STRONG" rating has been achieved on the foundation task.

- **Using this template**: When completing each section, you should remove the explanation text and replace it with your material. For each submission, each individual must complete their subsections and then collectively compile and submit the report.

- **Referencing**: You should also ensure that any resources you use are suitably referenced, and references are included into the reference list at the end of this document. You should use the IEEE reference style [1] (the reference included here shows you how this can be easily achieved).

1. Task 1 (Foundation): Core Skills

Throughout your Computing degree we will help you learn a range of new skills. Once you graduate however you will need to continue to learn new languages, new tools, new applications, etc. Task 1 focuses on core technical skills (related to LaTeX and Git) and the key technical skills used in different computing jobs. Each member of the team should individually complete their subsection below. You should begin by allocating to each team member a different major to focus on (i.e. one of: Computer Science; Data Science; Software Development; Cyber Security). If you have a fifth member, then your tutor will suggest a fifth topic to cover. This allocation should be specified above (see lines 37-56 in the LaTeX file).

For this section each member of your team needs to select one of the majors provided and identify 3 key technical skills that you would need to be able to work in the industry of your allocated major. You should then put these in order from most required to least required, and for each one explain why it is a key skill required for the industry of your major. You must use the skills framework for the information age "SFIA" to identify at least 2 out of the 3 key tech skills. (Target = ∼100 words per skill = ∼300 words total, per student).

Begin by looking at the list of skills identified within SFIA (Skills Framework for the Information Age) [2]. Then select two skills from the complete list. The skills you select should be skills you believe are the most required key technical skills relevant to the major you have selected. You should explain why each skill is a key technical skill and necessary for that major.

You will need to integrate your information into the shared collaborative LaTeX document and compile the result.

OVERALL REQUIREMENTS:

To achieve an "OK" rating for this task you must individually accomplish the following:

- Each member of your team **has been** allocated a different major (Computer Science, Data Science, Software Development, Cyber Security).
- Each member of your team **has identified** 3 key technical skills that you would need to be able to work in the industry of your allocated major.
  - These must be in order from most required to least required.
  - Each skill must have an explanation on why it is a key skill required for the industry of the major (∼100 words per skill).
  - At least 2 out of the 3 key tech skills must be identified from the skills framework for the information age SFIA.
- Github, LaTeX & LaTeX
  - Your team has created a team repository on Github for the project and put a copy of the LaTeX template, bib file, and image file into the team repository (only needs to be done by one member of your team).
  - The information for 'Task 1' has been compiled into the shared collaborative LaTeX document using the template provided on Canvas with your team members sections - you have edited the LaTeX template to include your chosen major and the 3 key tech skills for the major.
  - You have cloned the team repository to your local machine.

  - Provide evidence that you can compile from the command line (provide screenshots of the command entered and output).
  - Provide evidence that you can commit to your local repo (provide screenshots of the steps taken to commit to their local repo).

- Referencing
  - You have provided in-text references (IEEE) to support your claims or where they gathered the information from.
  - You have a reference list following the IEEE referencing guidelines.
  - Some common things to look for to see whether your have correctly followed the referencing guide are:
    * Sources are listed in alphabetical order
    * The sources you have listed are only the sources that are present in-text.
    * All sources seen in-text are included in the reference list.
    * You followed the correct convention for references that don't have author's details or multiple sources have the same author and year of publication
    * You have included the required information for the source type as outlined in the guide.
    * Sources are not a list (i.e. dotpoints)

To achieve a "STRONG" rating, you must individually accomplish all of the above in addition to the following:
Demonstrated the following to your tutor during the tutorial:

- You are able to retrieve your team's shared repo
- You are able to make changes, recompile, commit changes, and push back to repo.
- Note: you should also provide screen-shots of relevant actions taken to make changes, recompile etc. does not require you to provide evidence of detailing conflicts.

1.1. Skills for Computer Science: FAMNAME1, givenName1

Your text goes here

1.2. Skills for Data Science: KARTHIK, Nikhil

Machine Learning Machine learning is a crucial skill for Data Scientists, as the algorithms constructed are able to quickly process raw data and produce statistical models and outputs, much faster than any human. In an era where the sheer volume of data is unfathomable, sorting through it all via trial and error is simply impossible. Hence, being proficient in using ML algorithms allows for a Data Scientist to automate filtering through, analyzing and producing outputs to Big Data, potentially even discovering trends that the human eye might miss, especially since the ML algorithm improves as it analyzes more and more data [3]. Relying purely on traditional statistical methods only results in greater inaccuracy, as they only consider a discrete and unchanging sample set, whereas data is constantly fed to ML algorithms, allowing for it to adapt its model to produce more accurate readings [4].

Programming As a Data Scientist analyzes vast volumes of data, having some background in programming is crucial. Firstly, being adept at programming helps with collecting data through web scraping, for which you can develop programs to extract key data from a number of websites. Secondly, there might be instances where you need to develop your own programs in order to iterate through large quantities of data to clean it up. Furthermore, having strong programming skills in languages like Python, Julia or R allow Data Scientists to even construct their own ML algorithms to sort through data to produce a desired output [5]. While Data Scientists don't require extreme knowledge in a large number of languages, having a background in a few key ones optimizes processes that would otherwise be extremely challenging and complex to handle manually.

Data Visualization Data Scientists work with large quantities of unprocessed data, so it is imperative that they are able to filter through the data and form visualizations that make it easier to understand and draw conclusions from [6]. For a Data Scientist, being able to accurately present their findings is important in order to minimize miscommunication to a key stakeholder. Data visualization also eliminates any extraneous noise from data, tidying it up and presenting the key trends on an appropriate figure. It also allows for Data Scientists to ensure that their algorithms are functioning as intended when producing outputs, as visualizations can be interpreted far more easily than pure numbers. [7]

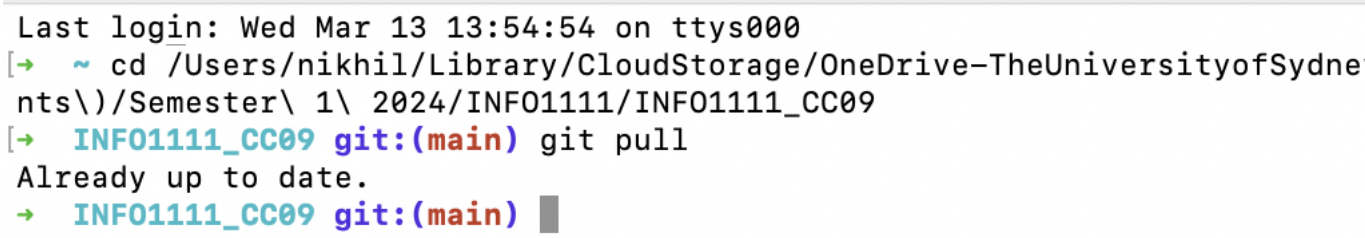

Figure 1: Evidence of accessing and pulling repo

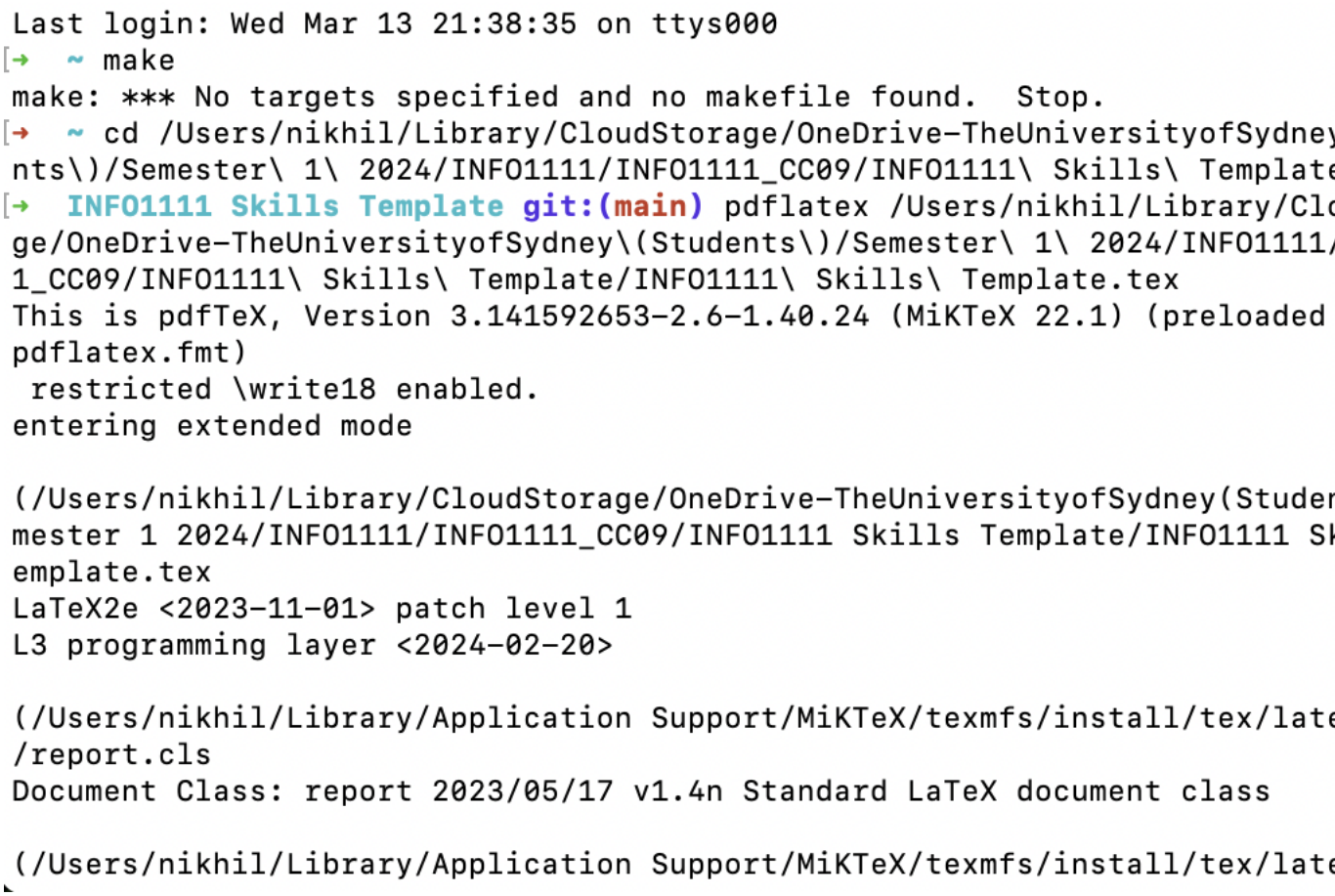

Figure 2: Evidence of Compilation- pdflatex

```
Transcript written on "INFO1111 Skills Template.log".
➜  INFO1111 Skills Template git:(main) ✗ bibtex /Users/nikhil/Library/Cl
ge/OneDrive-TheUniversityofSydney\(Students\)/Semester\ 1\ 2024/INFO1111
1_CC09/INFO1111\ Skills\ Template/INFO1111\ Skills\ Template
This is BibTeX, Version 0.99d (MiKTeX 22.1)
The top-level auxiliary file: /Users/nikhil/Library/CloudStorage/OneDriv
versityofSydney(Students)/Semester 1 2024/INFO1111/INFO1111_CC09/INFO111
 Template/INFO1111 Skills Template.aux
The style file: IEEEtran.bst
Database file #1: main.bib
-- IEEEtran.bst version 1.14 (2015/08/26) by Michael Shell.
-- http://www.michaelshell.org/tex/ieeetran/bibtex/
-- See the "IEEEtran_bst_HOWTO.pdf" manual for usage information.
Warning--empty journal in datasci1
Warning--empty year in datasci1
Warning--empty journal in datasci2
Warning--empty journal in datasci3
Warning--empty journal in datasci4
Warning--empty year in datasci4
Warning--empty journal in datasci5

Done.
(There were 7 warnings)
➜  INFO1111 Skills Template git:(main) ✗
```

Figure 3: Evidence of Compilation- bibtex

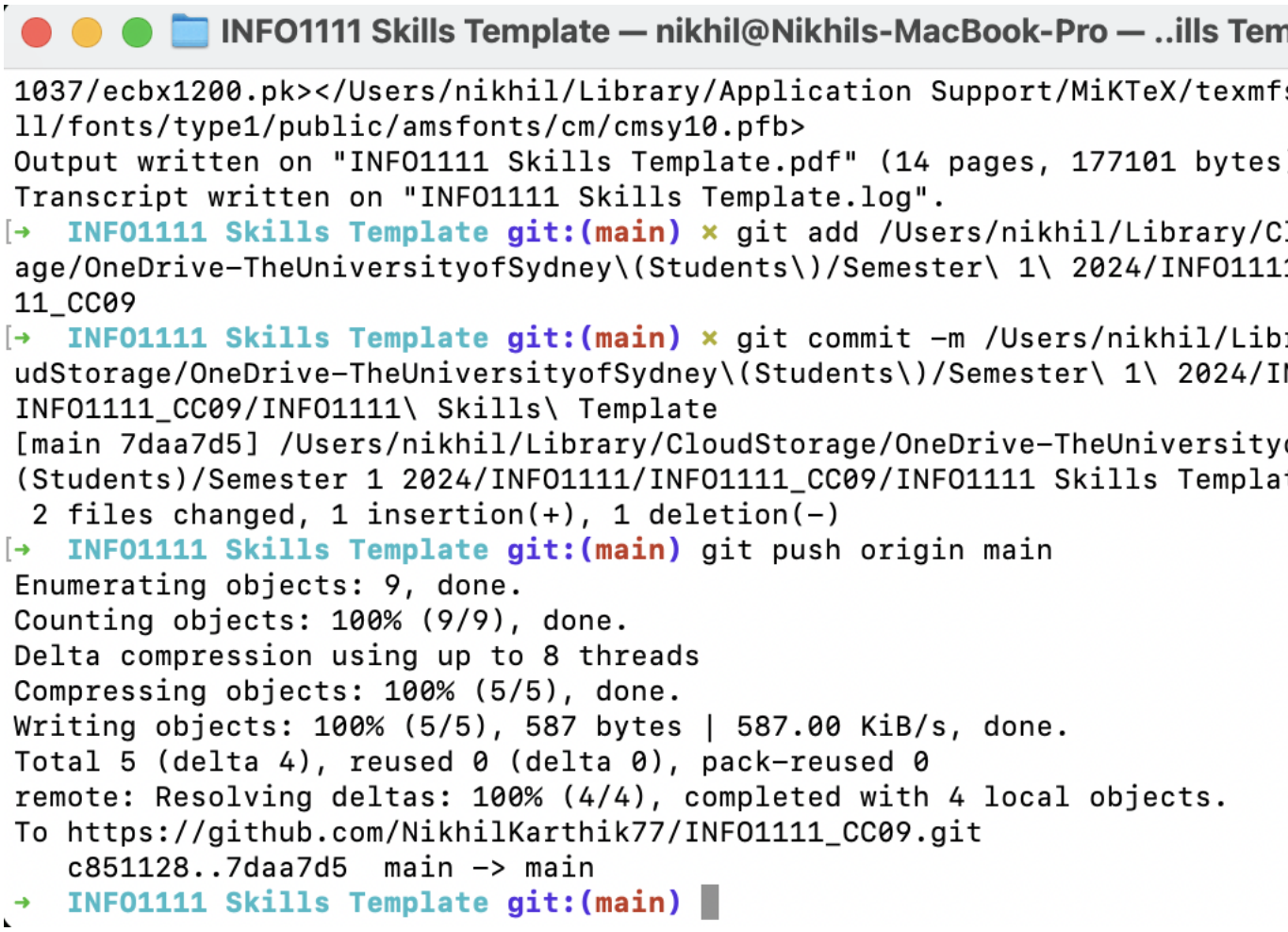

Figure 4: Evidence of Git Commands

2. Task 2 (Advanced): Advanced Skills

Task 2 contains two components (both required).

Component 1: Exploration of Tech Tools

The first component focuses on exploration of relevant tech tools used within professional computing employment. All companies make use of a range of technologies and tools (often as part of a tech stack). These tools might be implementation languages; design tools; data analysis tools; collaboration technologies, etc. Each student should identify two tools that are widely used in industry, and which relate to the major you are focusing on for this project. You should then describe:

1. What are the two tools you have identified for your chosen major
2. The main functionality of those tools;
3. The ways in which those tools are used in the industry of your chosen major;
4. Any weaknesses or limitations of those tools.

This task consists of two parts:

1. **Part A**: Generate a set of questions that you can put to ChatGPT in order to obtain answers to each of the above four questions. Using ChatGPT, then generate the answers for each of the two tools. You must include in the report below both the questions that you posed to ChatGPT, and the answers that it provided. (100–250 words each).
2. **Part B**: For each of the four answers from Part A, assess the answer that ChatGPT provided and explain to us why you agree or disagree with the answer (100 words for each question above).

As examples of the tools which might be selected (which you shouldn't now use):

- Computer Science: Eclipse.
- Software Development: GitHub.
- Cyber Security: Wireshark.
- Data Science: Hadoop.

Note also that no two students in the same tutorial should choose the same tools, so your tutor will maintain a list of those that have already been selected. You should therefore check this list with your tutor and then confirm your choice with your tutor prior to researching your proposed tools and spending time writing about them. (Target = ∼200-400 words per tool).

Component 2: Advanced LaTeX and Git Skills

The second component of Task 2 focuses on more advanced technical skills in LaTeX and Git. The following is a list of advanced Git and LaTeX skills/features. Each student in your team that is attempting the Advanced task should select a different pair of items from each list (e.g. you might choose "Resetting and Tags" from the git list, and "Cross-referencing and Custom commands" from the LaTeX list). You then need to demonstrate

actual use of each item (either through activity in Git, or through including items in this report). (Target = ∼100-200 words per student for each feature).

1. Git
   (a) Rebasing and Ignoring files
   (b) Forking and Special files
   (c) Resetting and Tags
   (d) Reverting and Automated merges
   (e) Hooks and Tags
2. LaTeX
   (a) Cross-referencing and Custom commands
   (b) Footnotes/margin notes and creating new environments
   (c) Floating figures and editing style sheets
   (d) Graphics and advanced mathematical equations
   (e) Macros and hyperlinks

OVERALL REQUIREMENTS:
To achieve an "OK" rating for this task you must individually accomplish the following:

- **Component 1 - Exploration of Tech Tools**
  - Identified two tools that are widely used in industry, and which relate to the major chosen for this project.
    - The two tools selected are not the same as the tools selected by other students in the tutorial.
    - The two tools selected are relevant to the major chosen.
  - Answer the following questions as instructed in 'Part A' & 'Part B':
    - What are the two tools you have identified for your chosen major
    - 3 main functionality of each of the identified tools
    - The ways in which those tools are used in the industry of your chosen major;
    - 2 weaknesses or limitations of each of the tools
  - **Part A**: Generate a set of questions (minimum 5 questions) that can be put to ChatGPT in order to obtain answers to each of the above four questions. Using ChatGPT, then generate the answers for each of the two tools. You must include in the report below both the questions that you posed to ChatGPT, and the answers that it provided. (100 - 250 words for each question)
  - **Part B**: For each of the four answers from Part A, assess the answer that ChatGPT provided and explain to us why they agree or disagree with the answer (100 words for each question above).
- **Component 2 - Advanced LaTex & Git Skills**

- Each member of the team has selected one pair of items from each list below and demonstrate actual use of each item (i.e. a Git item and a LaTeX item).
- **Git**
  - Rebasing and Ignoring files
  - Forking and Special files
  - Resetting and Tags
  - Reverting and Automated merges
  - Hooks and Tags
- **LATEX**
  - Cross-referencing and Custom commands
  - Footnotes/margin notes and creating new environments
  - Floating figures and editing style sheets
  - Graphics and advanced mathematical equations
  - Macros and hyperlinks
- This means no two members of the team have not chosen the same item from either of the lists above.
- You have demonstrated the use of your selected items either through activity in Git, or through including items in this report.
- This means for Git items:
  - You have added your tutor to your git repository and when they view it they are able to see your activity that demonstrates the use of your selected items (e.g. forks, hooks, tags, merges etc.).
  - You have included screenshots and annotations (where necessary) in your report and provided an explanation of ∼100 words of your use of advanced Git features.
- and for LaTeX items:
  - You have included items you have chosen in your LaTeX report document submission and the tutor is able to clearly see it (e.g. the pdf document written in LaTeX has hyperlinks, macros, cross referencing etc. included in it).
  - You have included screenshots and annotations (where necessary) in your report and provided an explanation of ∼100 words of your use of advanced LaTeX features.

- Referencing
  - You have provided in-text references (IEEE) to support your claims or where they gathered the information from.
  - You have a reference list following the IEEE referencing guidelines.
    - Some common things to look for to see whether your have correctly followed the referencing guide are:
    - Sources are listed in alphabetical order
    - The sources you have listed are only the sources that are present in-text.
    - All sources seen in-text are included in the reference list.

    - You followed the correct convention for references that don't have author's details or multiple sources have the same author and year of publication
    - You have included the required information for the source type as outlined in the guide.
    - Sources are not a list (i.e. dotpoints)

To achieve a "STRONG" rating you must accomplish all of the above in addition to the following:

- The answers provided to the 4 questions (component 1b) use ChatGPT and independent research and analysis is excellent, showing a deep understanding of industry.
- You have used advanced Git features such as branching when demonstrating the items you selected (component 2a).

2.1. Tools and Skills for Computer Science: FAMNAME1, givenName1

Part A: Exploration of tech tools

Machine Learning

Part B: Analysis

Your text goes here

Technical Skills (LaTeX and Git)

Your text goes here

2.2. Tools and Skills for Data Science: KARTHIK, Nikhil

Part A: Exploration of tech tools

Your text goes here

Part B: Analysis

Your text goes here

Technical Skills (LaTeX and Git)

Your text goes here

2.3. Tools and Skills for SW Development: FAMNAME3, givenName3

Part A: Exploration of tech tools

Your text goes here

Part B: Analysis

Your text goes here

Technical Skills (LaTeX and Git)

Your text goes here

2.4. Tools and Skills for Cyber Security: FAMNAME4, givenName4

Part A: Exploration of tech tools

Your text goes here

Part B: Analysis

Your text goes here

Technical Skills (LaTeX and Git)

Your text goes here

3. Submission contribution overview

For each submission, outline the approach taken to your teamwork, how you combined the various contributions, and whether there were any significant variations in the levels of involvement. (Target = ∼100-300 words).

3.1. Submission 1 contribution overview

As above, for submission 1

3.2. Submission 2 contribution overview

As above, for submission 2

3.3. Submission 3 contribution overview

As above, for submission 3

Bibliography

[1] The University of Sydney, "Referencing and citation styles: IEEE," 2022, see https://libguides.library.usyd.edu.au/c.php?g=508212.

[2] SFIA, "The global skills and competency framework for the digital world," 2022, see https://sfia-online.org/en/sfia-8/all-skills-a-z.

[3] T. I. B. M. Corporation, "What is machine learning (ml)?" [Online]. Available: https://www.ibm.com/topics/machine-learning

[4] T. I. of Machine Learning for Data Scientists Simon Tavasoli, "The importance of machine learning for data scientists," 2023. [Online]. Available: https://www.simplilearn.com/importance-of-machine-learning-for-data-scientists-article

[5] A. Ashraf, "The role of programming in data science," 2023. [Online]. Available: https://1stepgrow.com/data-science/the-role-of-programming-in-data-science/

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[7] E. B. Kate Brush, "data visualisation," 2022. [Online]. Available: https://www.techtarget.com/searchbusinessanalytics/definition/data-visualization