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| **Botany Downs Secondary College**  AS91896 & 91897 - Use advanced techniques and processes to develop a digital technologies outcome (Computer Program)- 12 credits   |  | | --- | | **Student Declaration:**  I Nikhil declare that this assessment is my own work, except where acknowledged appropriately (e.g., use of referencing). I declare that I composed the writing and/or translations in this assessment independently, using the tools and resources defined for use in this assessment. I am aware that any breach of this statement or identified academic misconduct will be followed up and may result in disciplinary action.  Signed: Nikhil  Date: 5/5/22 | |  | |

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| **Date** | **Log** |
| **5/05/22** | **I started off my project by writing why I am making this program and who my target audience are. I also Set up my Trello.** |
| **6/05/22** | **I listed down the program requirements for my program** |
| **10/05/22** | **I finished making a basic flowchart of what my program will be like.** |
| **13/05/22** | **I decomposed my components which made it easier for me to write code, I decomposed my program into 5 different components** |
| **17/05/22** | **I wrote down all the relevant implication in my project and described and explained them** |
| **23/05/22** | **I finished writing the code for my first component** |
| **25/05/22** | **I finished testing and trialling my first component** |
| **26/05/22** | **I started coding my second component** |
| **1/6/22** | **I finished the code for my second component** |
| **2/06/22** | **I finished testing and trialling my second component** |
| **3/06/22** | **I started writing code for my third component** |
| **7/06/22** | **I finished writing the code for my third component** |
| **11/06/22** | **Finished tests for component 3** |
| **11/06/22** | **I started component 4** |
| **15/06/22** | **I finished code for component 4** |
| **16/06/22** | **I finished testing component 4** |
| **16/06/22** | **Started testing whole program, in the test log** |
| **18/06/22** | **I finished addressing relevant implications** |
| **20/06/22** | **Fixed python conventions and minor adjustments** |
| **22/06/22** | **Minor adjustments** |
| **23/06/22** |  |

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| **1. Getting started** |

I will be making a **unit converter**; the purpose of this program will be to convert different units for example feet to cm or millimetres to centimetres. The target users of this program can be anyone, it can help people measure when cooking, it can help builders who want to convert units to a bigger/smaller scale, and it can be helpful to anyone from time to time who would want to convert units for any reason.

I have chosen to make this because the convertor on google doesn’t work properly, for example if we put in 180cm to feet and inches we get 5’9 but actually 180cm converts to 5’10.97 even though there are websites which convert correctly they are hard to find. There are probably many other errors on google so I thought I would make a convertor which converts correctly and in detail.

**What are the program requirements?** (For example, name of the program you will write the code in, variables, functions, libraries etc)

**Software requirements:**

**Visual Studio to develop python program**

* I will use a word document to document my progress and processes.
* I will use other tool such as GitHub and Trello to help me track my progress and remember the processes.

Program Requirements:

* I will need knowledge in python
* I will use functions, so I will not have to rewrite unnecessary code
* I will use tkinter to make a GUI program
* I will have to use variables to store values with correct datatypes
* I will have to use correct python conventions such as correct indentations
* I will use lists and dictionaries to hold information
* I will use correct syntax which included indentation etc.

**Updated Trello screenshot**

**Graphical user interface, application

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**What project management and version control tools will you be using?**

(link to Gantt chart and link to Trello)

**LINK TO GITHUB,TRELLO AND GANTT CHART:**

**Github:** [**https://github.com/NikhilKamath2006/AS-91896-97**](https://github.com/NikhilKamath2006/AS-91896-97)

**Trello:** [**https://trello.com/invite/b/geWbk7PM/fc4697ebf06acfdfa05c6d34d4b79bd4/as91896-91897**](https://trello.com/invite/b/geWbk7PM/fc4697ebf06acfdfa05c6d34d4b79bd4/as91896-91897)

**Gantt Chart :** [Programming Gantt Chart.xlsx](https://mybdscschool-my.sharepoint.com/:x:/g/personal/nikhil_kamath_my_bdsc_school_nz/EULXjZi3lqRHs8OBJTMmMuEBtsIpr448zLFY3X9fmktMBg?e=kPVZW3)

**What relevant implications will you consider? and how do you plan to address them? (How you have addressed these can be in another table after you develop the outcome)**

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| **Relevant Implication** | **Describe** | **Explain** |
| **Functionality** | This implication means that my program must work properly with minimal errors, it should function properly without any problems | I plan to address this implication by using testing tables to test my code and by breaking down my code into components so I can refine each part of my code thoroughly |
| **Usability** | This implication means that the user needs to be able to use the program without any issues and they will need to be able to use the program with ease | I will address this issue by making the buttons bug which will be easy to click. And also I will not add to many colours and keep the colour scheme simple this will ensure that the program will be easy to navigate through. |
| **Acessibility** | This implication will require me to consider all people with disabilities. This would mean that the program must not have a lot of user requirements. | I plan to address this implication by not adding too many things for the user to do. I plan to address this by using dropdowns the user can click instead of typing what they want. |
| **Aesthetics** | This implication is about how my program will look, It will need to look good and will cause the users to have a better overall experience | I will address this implication my aiming for a clean and simplistic look on my program. If I add too many colours it might cause problems for users and make it hard for them to navigate but by using a simplistic colour scheme I will be able to make my program look good. |
| **Sustainability and Futureproofing** | This implication will require me to ensure that my program can be used in the future without any mistakes and if things change I will need to update the information. | I believe I will not need to futureproof this program this is because my program revolves around math concepts that have been used for a lot of years. The math concepts are very unlikely to change therefore my program will already be futureproof. |
| **Intellectual Property** | This implication will require me to ensure the fact that the work is mine and not copied | I will ensure that I am not copying anyone’s work by changing the values and names of variables and modify the code so it is no longer copied. |
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**Graphical user interface, application

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**Initial flowchart of program:**

**Diagram

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**Decompose list of the components of your project:**

(This might be a photo of a mind-map, a typed list, etc)

Graphical user interface

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Here is an initial look of what I want my program to look like, there will be three dropdowns, one to select type of conversion and 2 to select unit to conversion E.g., mm to m

My first component will be a feature which will allow the user to actually see the program this will be done by making a GUI program.

One of my components will be a feature which will allow the user to choose the units the want to convert for example the user will be able to choose length, millimetre to centimetre.My third component will be a place where I can store all my data, I will do this my making either a list, dictionary or any other function which stores data. And my fourth component will be a feature where the user will be able to enter a number they want to convert, and then submit the number which then will be converted.

Updated trello

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| **2. Developing for each component:**  These steps will be repeated for each component of your outcome. **Copy and paste the table below** as many times as you need (3 to 6 times would be suitable).  Reminder: you must keep evidence of your trialling and testing, either in a separate document or in this document, under each component table. Evidence could include notes of user feedback, before and after screenshots, testing tables with annotated screenshots and/or screencastify videos. |

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| **Component 1** | |
| What do I want to achieve? | I want to create a feature which will show my program to the user |
| Do I plan to trial alternative design or techniques? What are they? | I plan on making a window and altering it by changing its size and colour |
| How did the trialling go? Which design or technique did I choose to use and why? | I tested trialled with different colours and changing the size of the window. In the end I chose to make the screen size unadjustable to the user this is because I want the program to look minimalistic. I also went with plain colours which made the program look clean |
| How did the testing go? Were there any issues in the code? What was the feedback from users? | There were no issues in the code. And my users agreed on the fact that the plain colours make the program look better. |
| **Trail 1 : Adjustable window with black background**    Image of black background with normal size    Image of program with adjusted screen size.  Trail 2:  Image of program with plain background and unadjustable screen size. | |

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| **Component 2** | |
| What do I want to achieve? | I want to create a feature which will allow the user to choose the type of units they want to convert. For example, if the user wants to convert distance units there will be a feature which will allow them to do so. |
| Do I plan to trial alternative design or techniques? What are they? | I plan to change the design of the design by changing the size and testing how it will look.  I can think of many alternative designs, such as radio buttons and dropdowns |
| How did the trialling go? Which design or technique did I choose to use and why? | I chose to use the dropdowns instead of the user input and radio button. The radio button wasn’t a good choice because I would have had to make a lot of buttons which would have complicated my code. I chose to implement the dropdown feature into my program this is because this feature allows the user to choose the unit of choice without any mistakes. |
| How did the testing go? Were there any issues in the code? What was the feedback from users? | I tested both radio buttons and dropdowns, I had problems with none of them. I asked some of my friends to test the buttons and dropdowns and they didn’t have problems either. I have posted screenshots below. I want to create 3 dropdowns in my program |
| **Trial 1: Radio button:**  Graphical user interface  Description automatically generated with medium confidenceAs we see here the radio buttons can be seen and clicked.  Code for radio buttons:  I used this code here to make the radio buttons.  **Trial 2: Dropdowns:**  This shows me testing the dropdown, my cursor was on liquid therefore it has been highlighted.  Code for dropdowns:  Here is the code I used to make my dropdowns  Flowchart for thiscomponent | |
| **Update of my project management tool at this point (screenshot)** | |
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| **Component 3** | |
| What do I want to achieve? | I want to create a place where I can store my information. |
| Do I plan to trial alternative design or techniques? What are they? | I plan to use dictionaries and lists to store all my information. I can also try to put my data in an external file and import it into my main file, doing that will make my code look cleaner. |
| How did the trialling go? Which design or technique did I choose to use and why? | I made an external file which would hold all my conversions, and then I have imported them into my main file. I have done this because the code looks cleaner, and it will be easier for me to edit things in the future. |
| How did the testing go? Were there any issues in the code? What was the feedback from users? | There wasn’t really much testing required for this, this is because all I did was move code to a different file. |
| **Trail 1: Information on same file**  This is a dictionary of the conversion rates of the units, in my main file  Trail 2: Information on different file  This is a dictionary of the conversion rates of units, in a different file. | |

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| **Component 4** | |
| What do I want to achieve? | I want to create a feature which will allow the user to enter a number and submit it in order for their chosen units to be converted |
| Do I plan to trial alternative design or techniques? What are they? | I can use drop downs to let the user choose between pre-set numbers, or I can create a user input box which will allow the user to enter numbers of their choice. And to submit the number I plan to create a button and once clicked the units will be converted |
| How did the trialling go? Which design or technique did I choose to use and why? | I chose to make an user input box, this is because making dropdowns would severely narrow down the options the user has. By making a user input box the user is able to easily enter any number of their choice. |
| How did the testing go? Were there any issues in the code? What was the feedback from users? | I have tested the code in the testing table. The overall testing went well. |
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| |  |  | | --- | --- | | **Testing the component3** | | | **What was tested** | **I have tested the user input box** | | **Expected** | I tested 1 kilometre to metres so the expected value was 1000    This code worked.    I will test another conversion to ensure that there is no error.  I will test 1 gram which will be 0.001 kilograms.    This worked. | | **Boundary** | It works | | **Invalid** | I will do a square metre to square mile conversion and I will enter abcdefg.    I got a value error, but the code didn’t end and I was able to do another conversion without problems  Another invalid is negative numbers    It works but the answer would be incorrect | | **Next Steps** | My expected boundary and some of my invalid values worked. I only had one problem which was with negative numbers, I could try to improve my code by making it not accept negative numbers. |   Flowchart for this component    Updated trello |

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| **3. Finishing up** |

**Final test data:** *this is done when the entire program is completed*

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| **Sample Inputs** | **Expected Outputs** | ✔️ |
| Testing if centimetre to inch works, I have input 20 | Expected output was 7.8 | ✔️ |
| Testing if centimetre to metre works |  | ✔️ |
| Testing if centimetre to millimetre works have entered 20. |  | ✔️ |
| Testing if centimetre to kilometre works I have entered 20 |  | ✔️ |
| Testing if centimetre to |  |  |
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*Add extra rows as needed.*

*Attach screenshots or videos that show your program works with the sample inputs above.*

**Relevant implications:** If you haven’t already explained these as you worked on each component, explain them here, and state how they are addressed in your outcome.

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| Implication | How was this addressed? |
| Functionality | I have used a testing table and I have tested various possible conversions in my program, by testing my program I was able to find bugs and errors in my code and fix them. By doing this I was able to make my program more functional |
| Usability | My program is usable because I have used features such as buttons and dropdowns which make it easier for the user to navigate and use the program. With the addition of these features my program is more usable |
| Accessibility | The user will not need any prior knowledge of the program to use it, they will only need to be able to read. Also, there is no price to use this program, and anyone can use this program |
| Aesthetics | I have kept the design of my program minimalistic by not letting the user change the size of the program and my colours scheme is clean, it only consists of light colours and isn’t too flashy. |
| Sustainability and Future proofing | I did not have to address this implication this is because the conversion rates have been the same and are very unlikely to change. |
| Intellectual Property | I have addressed this implication by changing any code I might have taken from someone. I have used parts of code as a reference but I have changed and modified the code which means that the code no longer is copied and it allows me to use that code. |

**How did planning assist in the development of a high-quality outcome?**

By planning out my code I was able to achieve a better outcome, this is because the flowcharts guided me to write my code, without the flowcharts I would not have been able to code in a organised way. Using the flowcharts, I was able to write my code in chronological order which made it easier to code. I also listed program requirements before starting my code, this helped me understand the resources I would need to code this program, if I hadn’t done this I might have run into problems when I was writing my code. I also used Trello to plan how I was going to manage my time. Trello greatly helped me stay on track and not waste time, by doing this I was able to efficiently code and I had a lot of time later to fix errors. So by properly planning out my project I was able to maximise my efficiency therefore I was able to achieve a better outcome.

Here are screenshots of me using Trello, Gantt chart and specifying my program requirements:

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A screenshot of a computer

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Graphical user interface, text, application, email

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**How did testing and trialling assist in the development of a high-quality outcome?**

Testing and trialling helped me refine and develop my program so it would achieve great heights. I tested and trialled my program by suing testing tables, using different iterations in components and trialling different techniques and comparing them. For 3 of my components, I trialled different techniques and then compared them and made a decision after comparing which one was better.

An example of how testing and trialling improved my program was when I trialled my component 2, I had the option of either making radio buttons or dropdowns, I chose to make dropdowns this was because it would have been more efficient if I hadn’t tested and trialled this component it would not have been at its optimal standard. Screenshots of me testing and trialling:

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Text

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I also tested and trialled my program by using testing logs, and testing tables, by using these I was able tot ensure that there were minimal errors in my program and that it would work

and follow all the program requirements. The testing logs and tables also helped me debug errors in my code. My using these I was able to refine my code which overall boosted the quality of my code. Screenshot of my testing table.

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| **4. Final checklist: page 6 of the assessment booklet** |