SUVAT Equation Calculator Report

11SEN3a

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$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$

$$s = \frac{v+u}{2}t$$

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Project outline

The goal of this project that I intend to do is to make a SUVAT equation. The reason for making a SUVAT equation is for the people who do Physics to have their own calculator on Kinematics. Making this calculator, I must outline the main properties of the SUVAT equation. The equation is also in SI units(**International System of Units**), for any confusion.

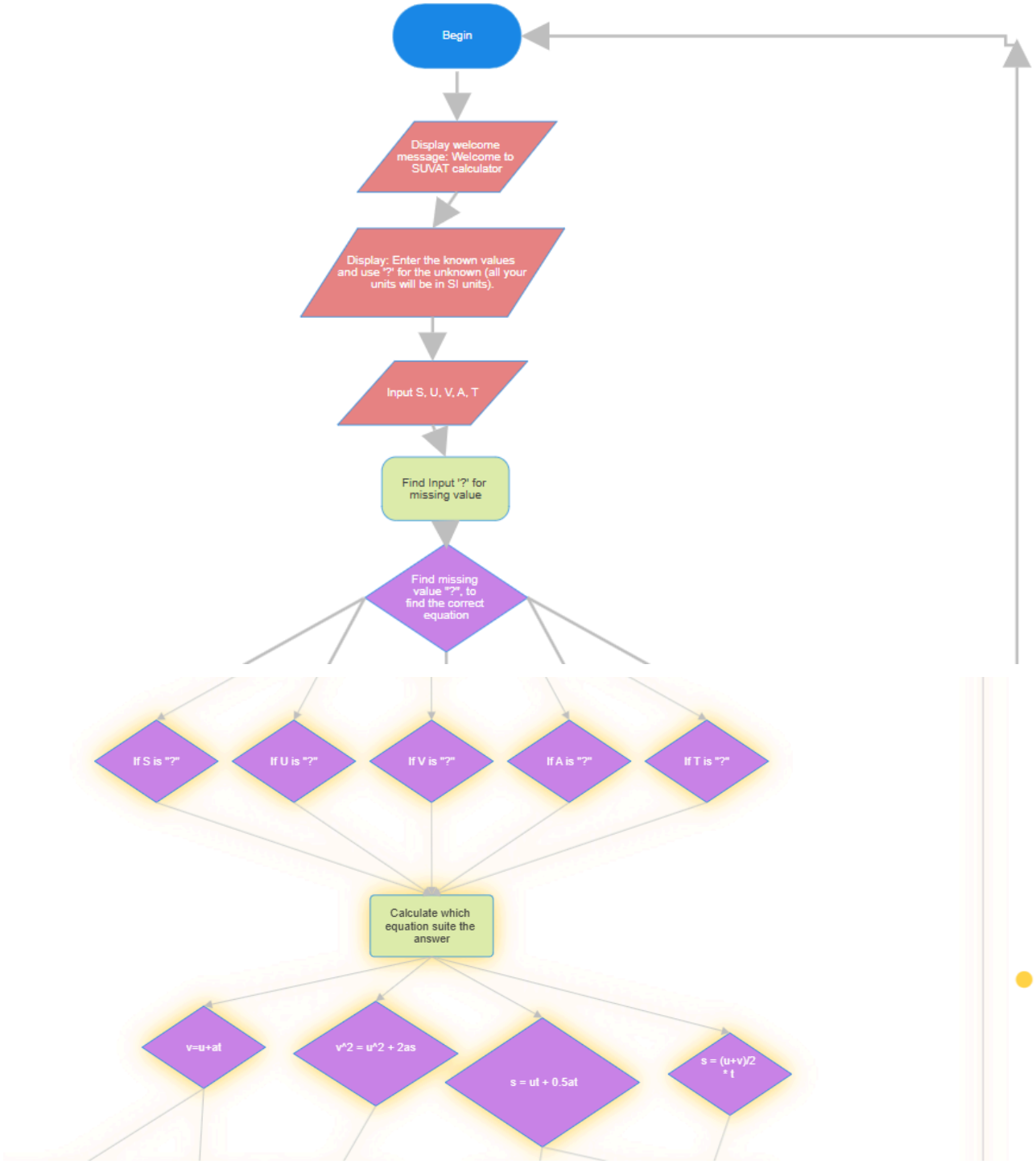
The meaning of SUVAT equations has its unique symbol, ***S*** = **Displacement**, (not speed) most people can get that confused when they first see this, ***U*** = **Initial Velocity** (starting speed), ***V*** = **Final Velocity** (the final speed), ***A*** = **acceleration** (how quick it moves fast), ***T*** = **time** (everyone should at least remember it), this is recorded in **seconds**, while the (***S***) **Displacement** is recorded in **metres**, **u**, ***a*** and ***v*** is recorded in **m/s.**

Why is this important and meaningful to me and others? This project is a core fundamental for Physics nerds, like me who are obsessed with data statistics of object movement.

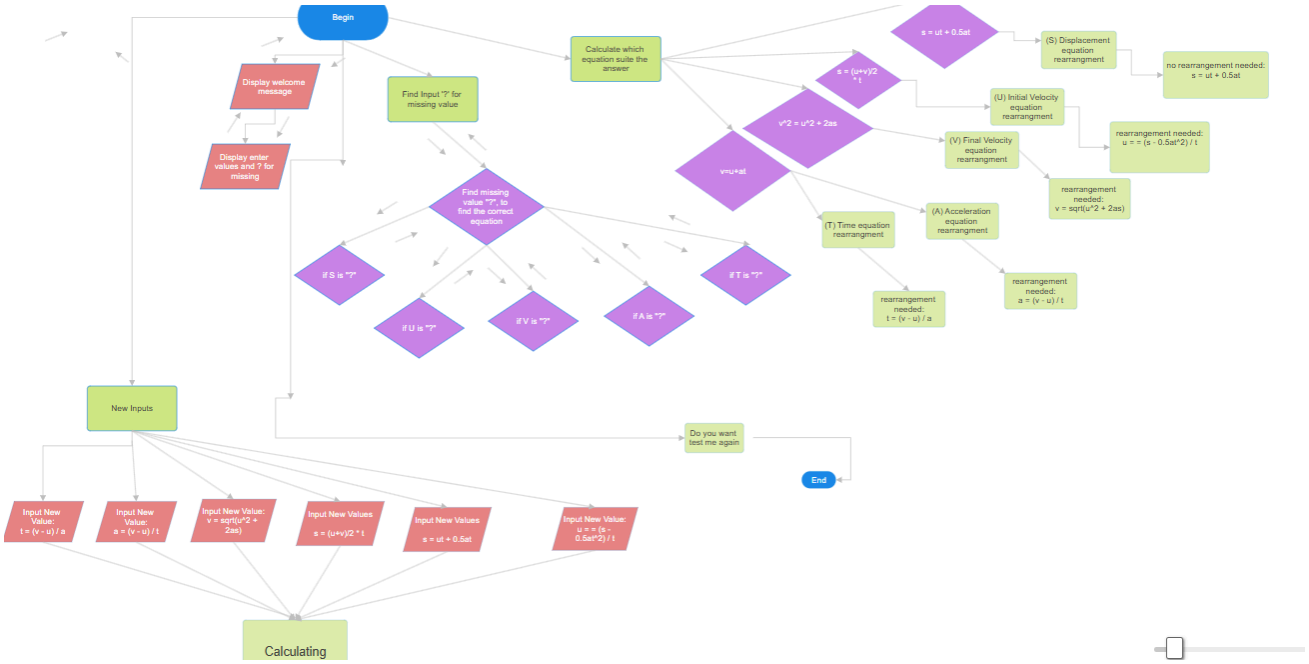
Algorithm design and desk checks

Algorithm: **FINAL DESIGN**

NOTE: There is been an error exporting the Smart Draw Canva where the size would not comply with fitting the screen and would just pixelate, so I could only screenshot it, if you can't read this or find this weird to look at, remember it was some glitch I could not solve.


Begin
Display welcome message: Welcome to SUVAT calculator
Display: Enter the known values and use '?' for the unknown (all your units will be in SI units).
Input S, U, V, A, T
Find Input '?' for missing value
Find missing value "?", to find the correct equation
If S is "?"
If U is "?"
If V is "?"
If A is "?"
If T is "?"
Calculate which equation suite the answer
v=u+at
v^2 = u^2 + 2as
s = ut + 0.5at
s = (u+v)/2 * t

Structure chart



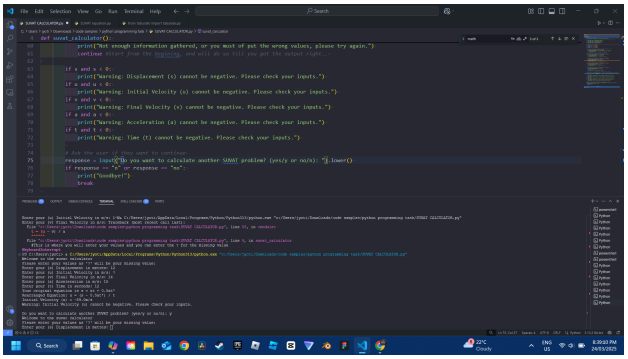
Data requirements

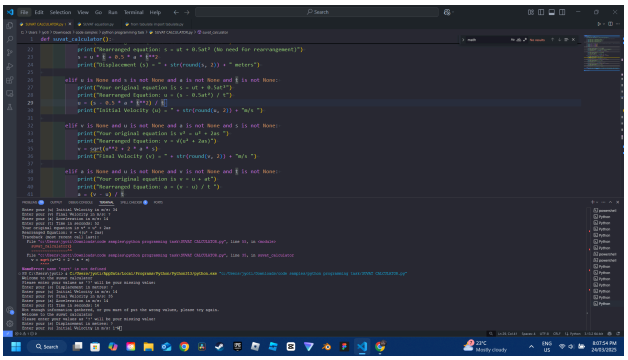
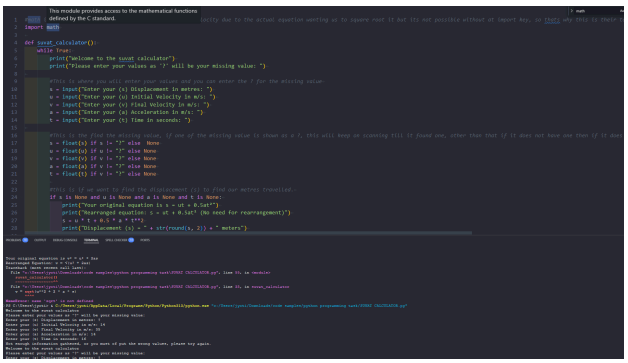
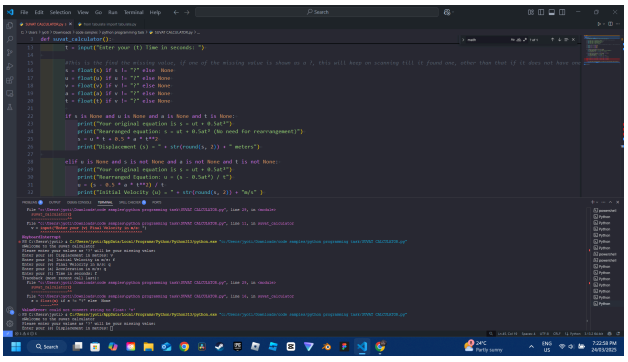
Data dictionaries

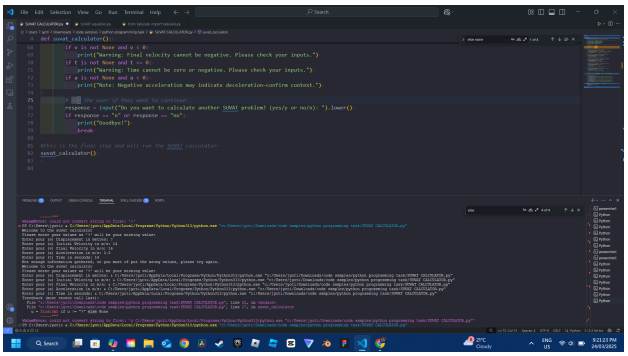
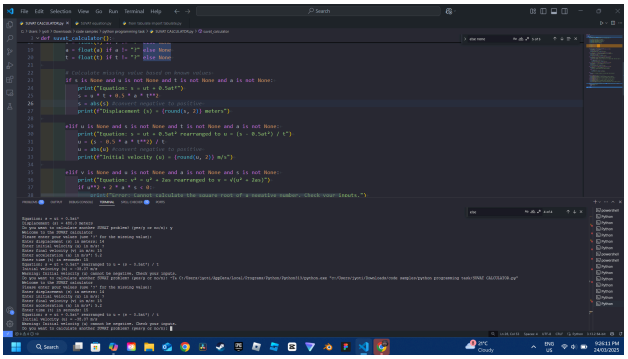
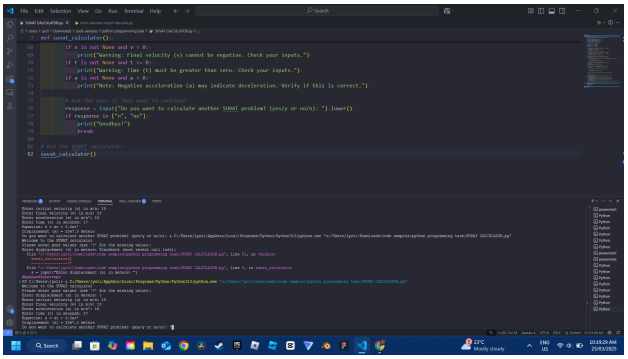
Variable / Asset name	Key properties	Use in project
s	This is a name to define the displacement	Store the displacement value as well to calculate it in the final equation.
u	This is a name to define the initial velocity	Store the initial velocity value as well to calculate it in the final equation.
v	This is a name to define the final velocity	Store the final velocity value as well to calculate it in the final equation.
a	This is a name to define the acceleration	Store the acceleration value as well to calculate it in the final equation.
t	This is a name to define the time	Store the time value as well to calculate it in the final equation.
math	This is a built-in code module	Allows math equations to be calculated for example in my code using **sqrt**
None	This is represented as null or no	This is the find the missing value

	value	of the SUVAT equation to solve
Input	String values	This will convert my input in the string to in it will store the value till the output given.
str	String data type	This is used for my output to display answer like for example 10 (m/s) instead of just giving me just only a 10 without any representation.
True	Conform its true, boolean data	You should know it has true or false.
def	Define data, define your function	This is to define my suvat_calculator(): telling that this is what I am aiming to do.
abs (not used anymore)	To change the value from negative to positive	This is for to change my final equation to negative to positive at the final equation. This did not make sense nor did it work.
float	Entering your number a from a string to a float	The float in my equation will represent in a decimal so it can be precise as possible when you input the value and the output displaying as well.
Round	Convert your final value to be rounded	Round the final SUVAT equation by two decimal places

Developing solutions

	**The intention of the test?** To fix the answer from negative to positive **Did it work?** Kinda **Result of the test?** Depends, the answer is given but still gives out a negative value

	**The intention of the test?** To check if the calculator works **Did it work?** No **Result of the test?** No their was been errors saying that it needed to find the values when the values been sent
	**The intention of the test?** Import math to check if it works, while working it for the sqrt **Did it work?** yes **Result of the test?** The results can now be given and it works both the answer and the sqrt calculation, the slight problem it just display in
	**The intention of the test?** Calculating the equation for the answer **Did it work?** no **Result of the test?** It works slightly but still getting negative values but also the sqrt does not work answering my equation.
	**The intention of the test?** Checking if the calculator works **Did it work?** No **Result of the test?** Final velocity was not working as it was giving me glitches saying the input values are incorrect.

	The intention of the test? Testing the calculator Did it work? no Result of the test? The float value was giving me the errors that I did not intentionally wanted to give.
	The intention of the test? Calculation of the SUVAT equation Did it work? Yes but still giving negative Result of the test? The equation now display the correct output, but the problem is that I still face that problem unsolved.
	The intention of the test? Calculation of the SUVAT equation final attempt Did it work? Yes Result of the test? The output now display in a positive manner on what I intent to do it so and now that it works the equation is now completed

Description	#	Intention of Test	Did it work?	Result of the Test	Notes
Barrel Sprite Sheet Editor	1	The cutting up of the Barrel sprite sheet for the	No	The sprites were cut out overflowing each other, which caused them to bleed into each other when animating.	For them to not bleed into each other, I need to separate them further apart.
Barrel Sprite Sheet Editor	2	The cutting up of the barrel sprite sheet without the sprites bleeding into each other.	Yes	When animating, none of the Barrel Sprites had bled into each other.	When drawing sprite sheets later, I need to keep enough room apart to avoid bleeding.
Play button on the Start menu	1	When clicked, it should load the first level	No	The button does not respond when clicked to change scenes to the first level or become highlighted when the curser is above the button.	The z axis location may possibly need to be changed.

Bibliography

Smartdraw.com. (2025). *SmartDraw is a Unified Visual Collaboration App | Diagramming, Whiteboarding, and Data Visualization*. [online] Available at: https://www.smartdraw.com/?srsltid=AfmBOopcDBpEPWJRuG9ICCRu1vkO8QQs4tmS6GvCoEX7ID2S3msiZQsa [Accessed 23 Mar. 2025].

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