Welcome

In this lecture, we explore verification.

How can we verify something is correct and of good form.

We will:

- Study the various geometrics available and compare their outputs
- Discuss how our platform delivers live web applications with integrity
- Discuss the problems facing this project and many industries

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Cylinder and Sphere is a Capsule

On our platform, its possible to combine multiple types to produce a single type. For instance the capsule is useful as it combines both a cylinder with a sphere.

Outputs are uniform thus we have that consistency which makes everyone comfortable with everything

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Capsule	Radius	Height	Unit	Volume
tube_with_ends	5 mm	250 mm	mm^3	20158.552861

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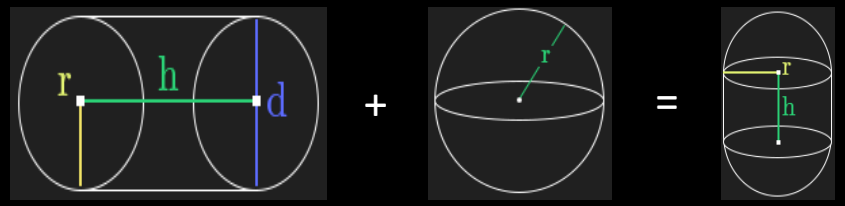
Cylinder	Diameter	Length	Unit	Volume
tube	10 mm	250 mm	mm^3	19634.954085

Sphere	Radius	Unit	Volume
ends	5 mm	mm^3	523.598776

We can test this:

Given a diameter of 5 mm and a length of 250 mm. The sphere is halved and with one half placed on each end of the cylinder resulting in a capsule. The outputs need be be uniform as we need repeatability…

Combine multiple types into a singular type



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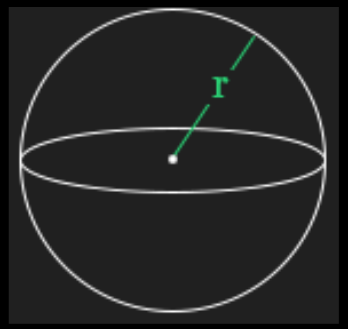
Sphere and Spherical Cap

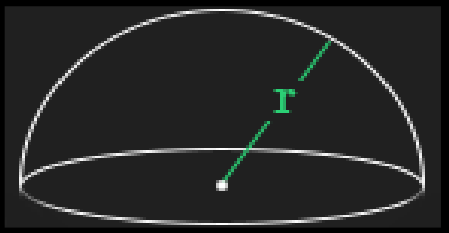


Original Sphere

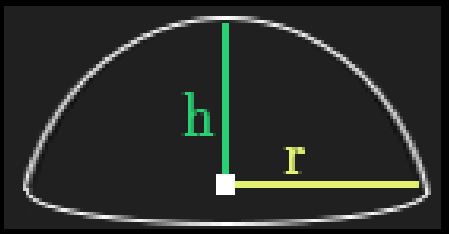
One halving of a sphere should equate to a spherical cap which shares the same radius

Given a radius of 20 cm, we reduce the scale of the sphere to 0.5 (one half). Both types evidently emit a spatial complexity of 16755.16 cc

The spherical cap handles the occasions when the original radius for a sphere was unknown albeit the object of interest results from a cut sphere because their respective shapes are indeed similar to each other



½ of a sphere should equate to a spherical cap



Sphere	Radius	Unit	Volume
sphere [0.5x]	20 cm	cm^3	16755.160819

Spherical Cap	Cap Radius	Sphere Radius	Cap Height	Unit	Volume
sphere_half	20 cm	20 cm	20 cm	cm^3	16755.160819

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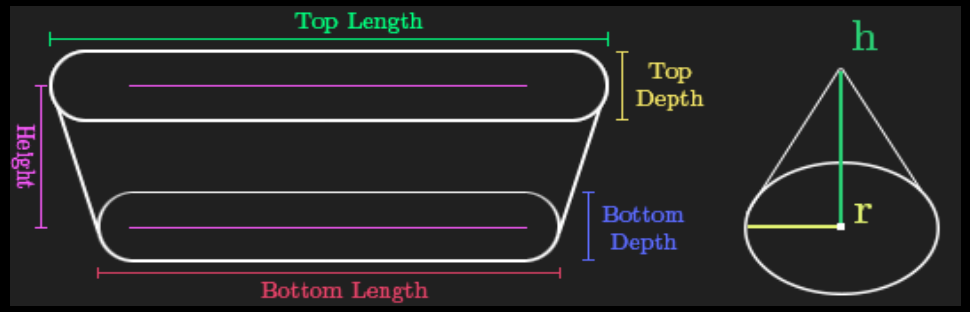
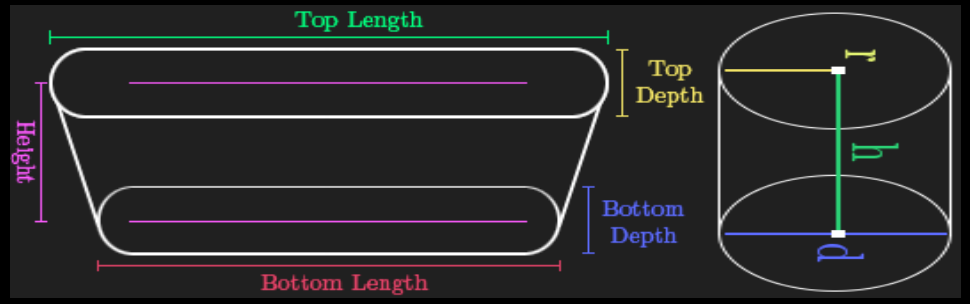
Stadium Frustum



Cone	Radius	Height	Slant	Unit	Volume
unit_1	5 cm	10 cm	11.1803 cm	cm^3	261.79938779914943

Stadium	High Length	High Width	Low Length	Low Width	Height	Unit	Volume
unit_2	10 cm	10 cm	1e-16 cm	1e-16 cm	10 cm	cm^3	261.79938779914943

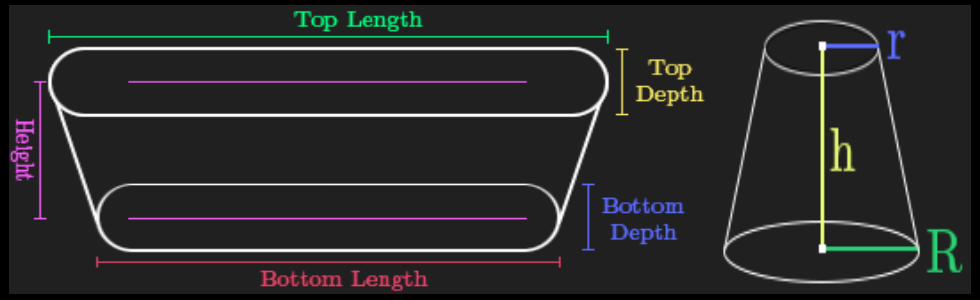
1) if the lower side were to act as a tip akin to the top of a cone with a deep enough resolution and the cone's radius is equal to one halving of the stadium's higher side diameter then the volumes should be equal. In this case, the volume outputs are equal to 261.79 cc



Cylinder	Diameter	Length	Unit	Volume
unit_1	10 cm	10 cm	cm^3	785.3981633974483

Stadium	High Length	High Width	Low Length	Low Width	Height	Unit	Volume
unit_2	10 cm	10 cm	10 cm	10 cm	10 cm	cm^3	785.3981633974483

2) if both sides of a stadium have an equal length and width, it should mimic a perfect cylinder. In this case, the volume outputs are equal to 785.39 cc



Conical Frustum	Top Radius	Bottom Radius	Height	Unit	Volume
unit_1	4 cm	8 cm	10 cm	cm^3	1172.8612573401895

Stadium	High Length	High Width	Low Length	Low Width	Height	Unit	Volume
unit_2	8 cm	8 cm	16 cm	16 cm	10 cm	cm^3	1172.8612573401895

3) the conical frustum (cut cone) can also be used to verify the integrity of the stadium frustum given a matching set of parameters. Outputs 1172.86 cc

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Delivery of Web Applications

Our web applications are delivered to web clients only after a series of safety checks have passed. Our platform utilises hash digest checking before script delivery arrives to a web user. These behind the scene digest checks are made in real time and are compared to copies stored in active databases and flat file caches.

Should any chain digest not match, delivery of the web application will safely terminate. A message will state that the web application is not available. This ensures any instance of our web application that does arrive into client space is legitimate and no man in the middle attack was possible prior to its delivery.

For each hash digest check that we add, the security increases exponentially and digest copies are stored on distinct server instances which themselves are physically separated.

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Problems Facing Industry

The biggest problem in many industries is the lack of solid tool chains. Volume.cc serves a single purpose. It allows anyone to calculate a complex volume and to do it easily. It has been engineered to a high standard and follows a user friendly design pattern where even those with minimal experience can utilise this service.

Our platform allows engineers to calculate and manipulate volume data for complicated objects. Volume subtractives and ratios are certainly not feasible in any spreadsheet most of us have seen nor any other existence software for that matter. Our platform can within seconds distribute a volumetric dataset from one engineer to other.

Our service has practically eliminated the transfer of an engineering sheet by email. It has minimised the chance of error to the best extent possible. It is a service which comes with a large amount of documentation and illustrative diagram. It allows private and public industries to interface with each other using a data protocol to verify to what extent is and should the quality standard be for particular products and certain industries.

Further more, it gives people the chance to talk about volume and witness what is possible when we all have a solid tool chain which actually works how it was intended to work.

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Conclusion

This is the final slide of the Volume.cc Series 1 lectures. Writing these slides and documenting some of the concepts envisioned and necessary to utilise the services on this platform was enjoyable. It’s a relatively simple web application we have albeit its incredibly powerful.

Over time, our services will grow but now its time for a new iteration before series 2…