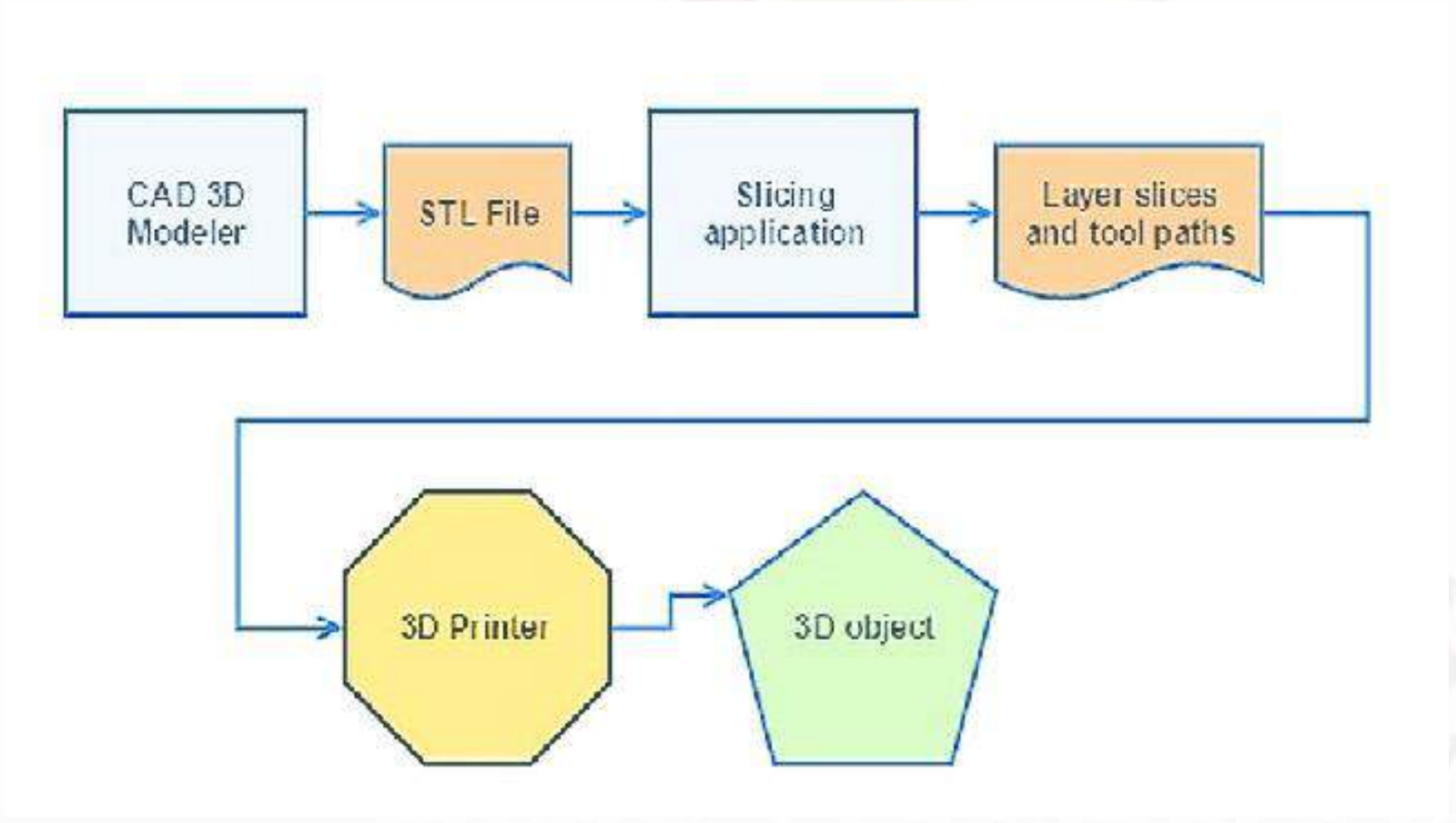
Unit-5
Preparing SOLIDWORKS Models for 3D Printing

Prerequisite/Recapitulations

- Mathematics
- Drawing, Sketching
- Solid Modelling
- Principles of 3 D Printing

From CAD Model to Prototype – Preparing your model for 3D Printing

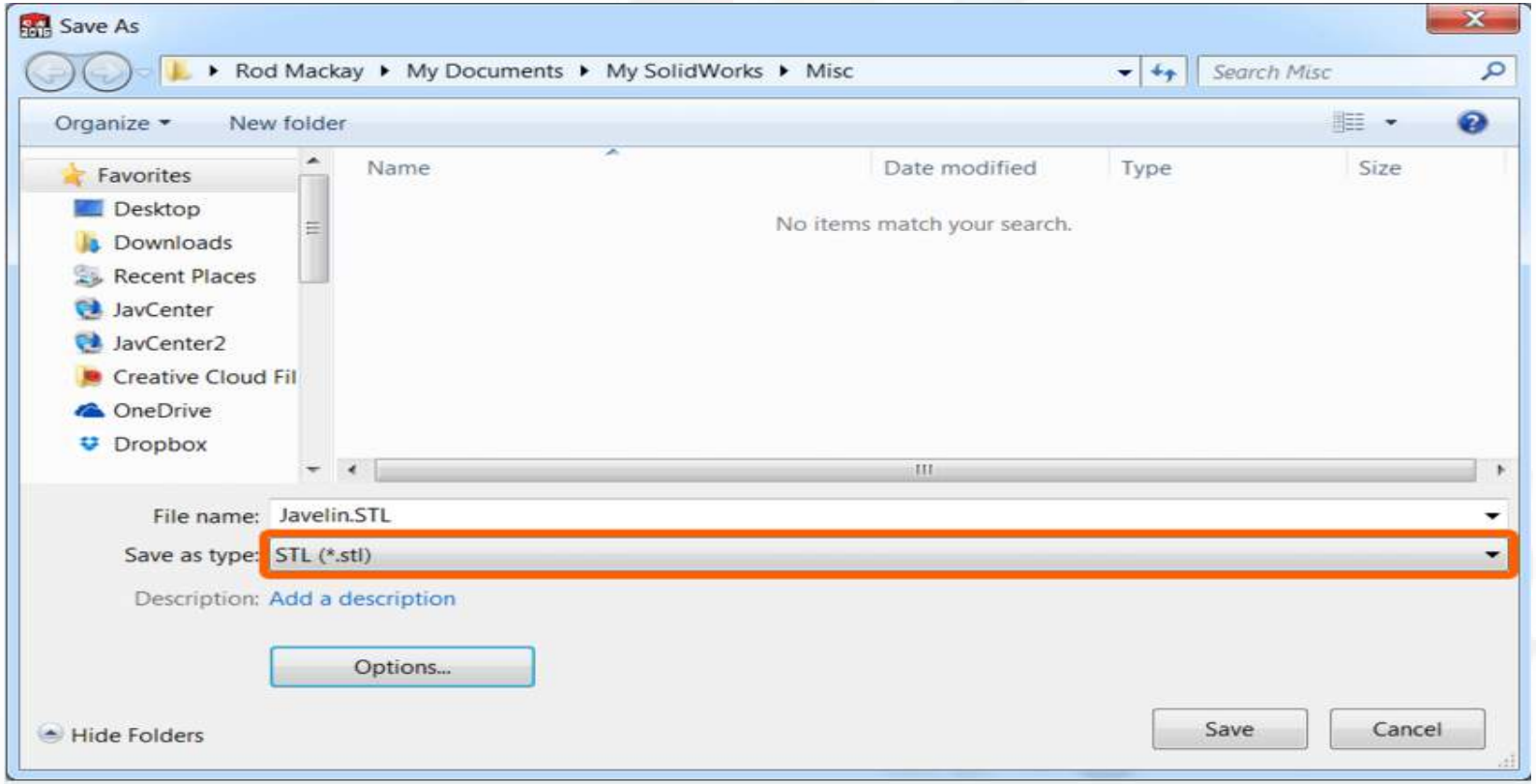


How to create an STL file in SOLIDWORKS

❖STL is the standard file type used by most 3D printing systems

❖STL or Standard tessellation/triangulation language is a 3D file format which uses a series or triangles to describe the outer surfaces of a 3D model

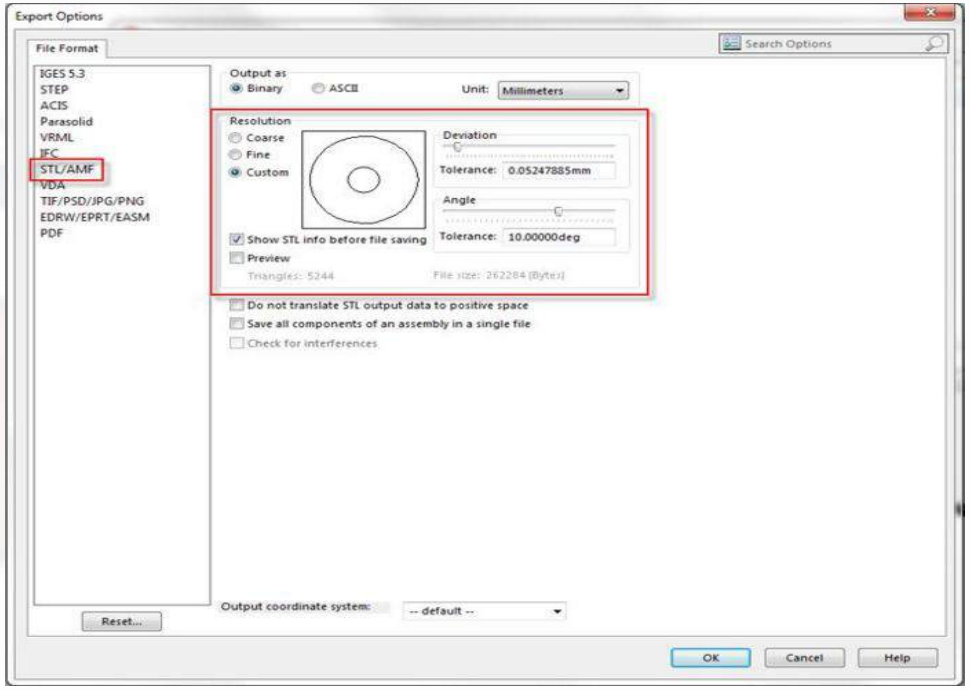
❖To save a SOLIDWORKS part file as an STL file simply select **File** > **Save As** and choose STL from the list of file types:

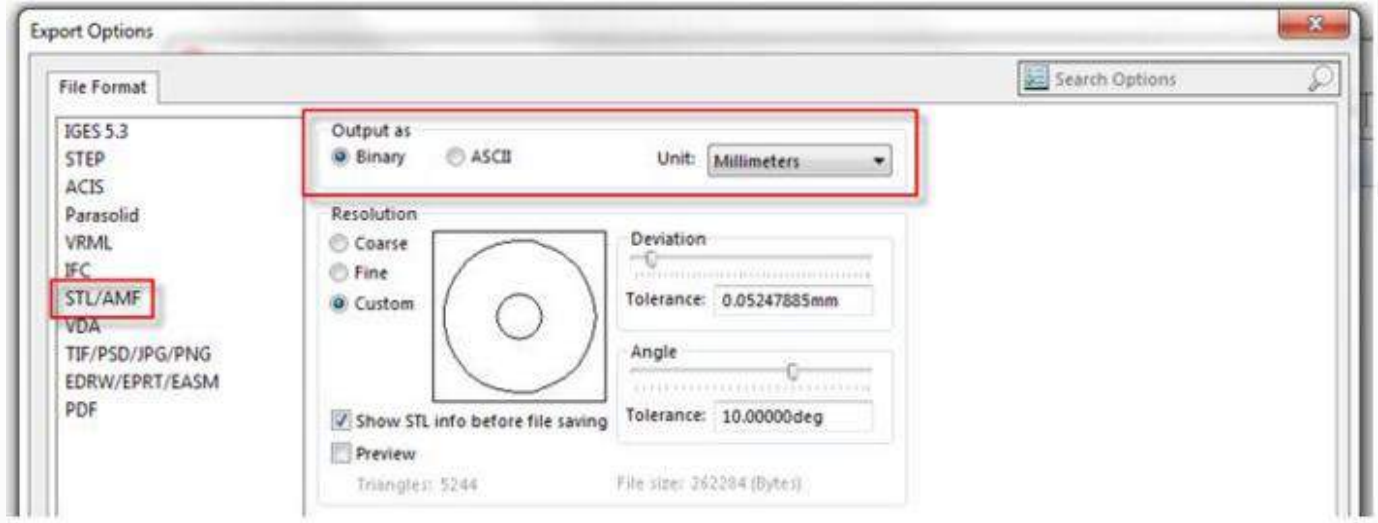


Save As STL File

STL file options and Resolution

- STL files convert your SOLIDWORKS part geometry into triangles which means faceting of the geometry.
- Depending on the number of facets and the accuracy of your 3D printer will determine the smoothness of your final 3D printed model.
- When outputting the model from SOLIDWORKS you pick the **Options** button and then to decide on the resolution of the model will be.
- First as a default you should pick **Binary** as the output type, this generates a smaller file size. With ASCII the file will be larger because you will be able to read the STL file code, but you likely won't need to, and your 3D printing software will recognize the binary file.





STL file options and Resolution

Coarse Resolution:

•Smaller file size as larger triangles are used to represent the geometry

•Shorter build time as there is less geometry to print

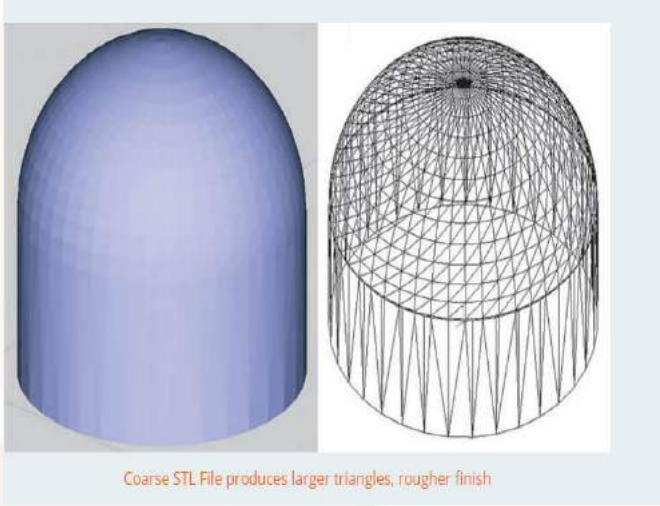
•But the model with have a rougher surface finish.

Fine Resolution:

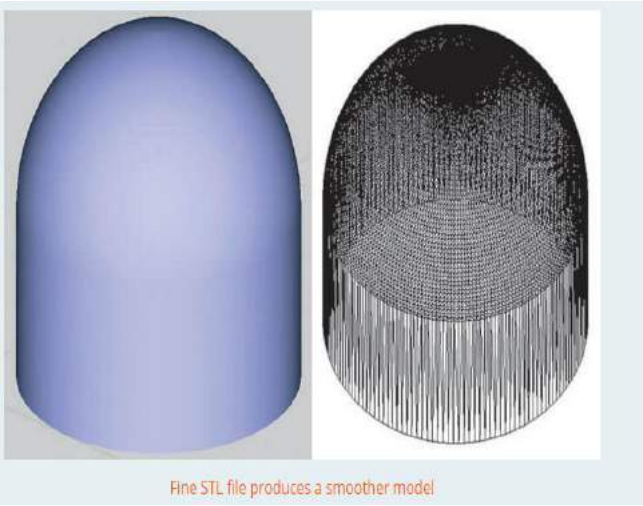
•Larger file size as there are more triangles used to represent the geometry

•Larger build time as there is more geometry to print

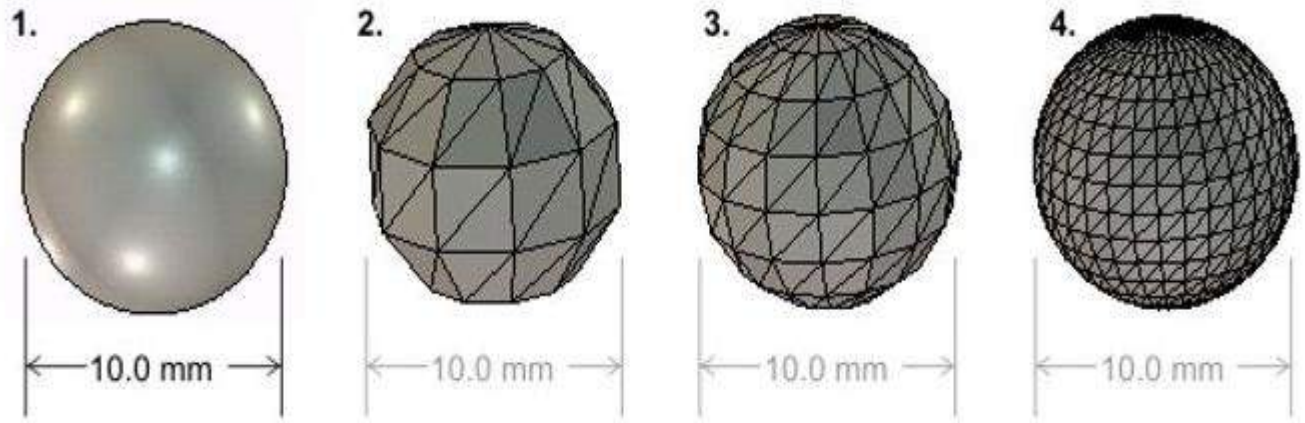
•But the model with have a smoother surface finish



Coarse STL File produces larger triangles, rougher finish



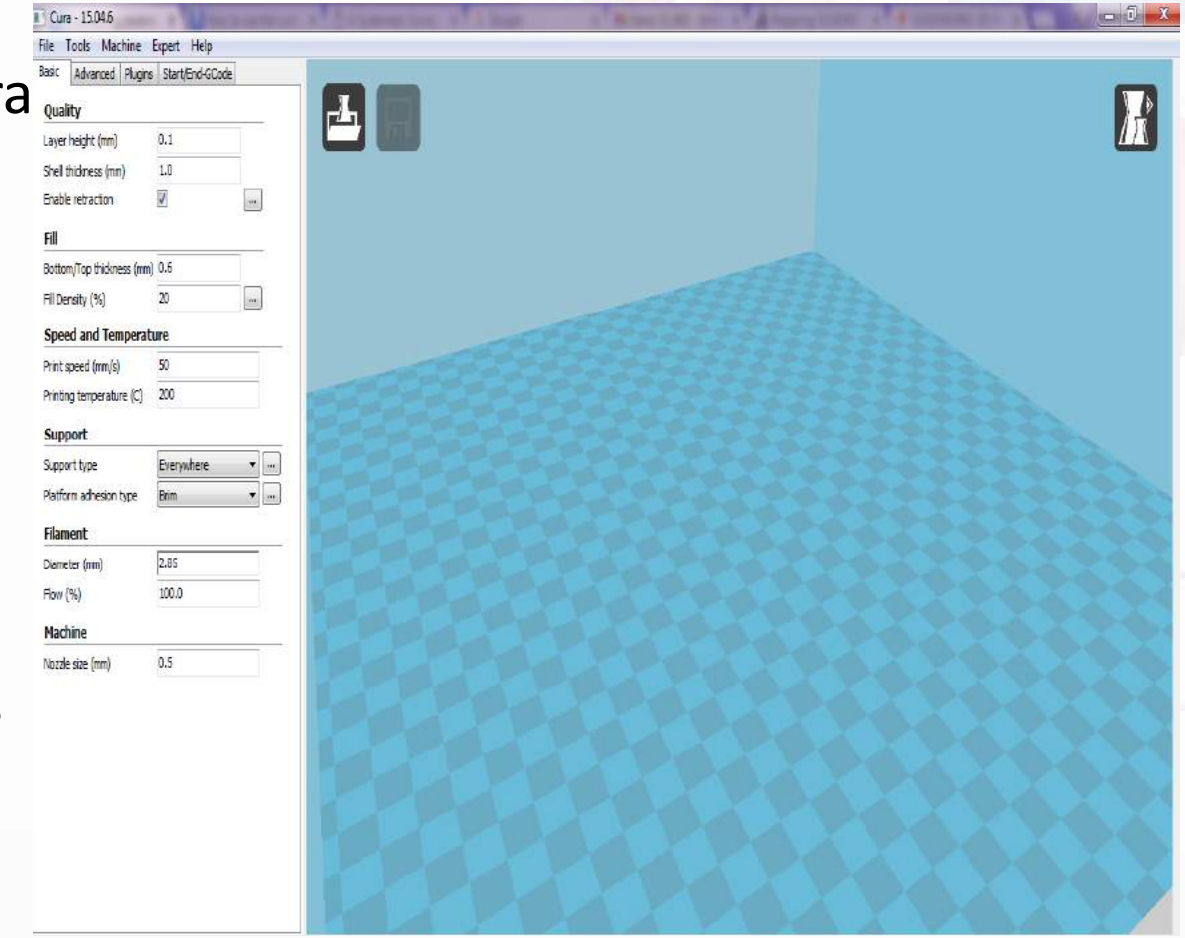
Fine STL file produces a smoother model

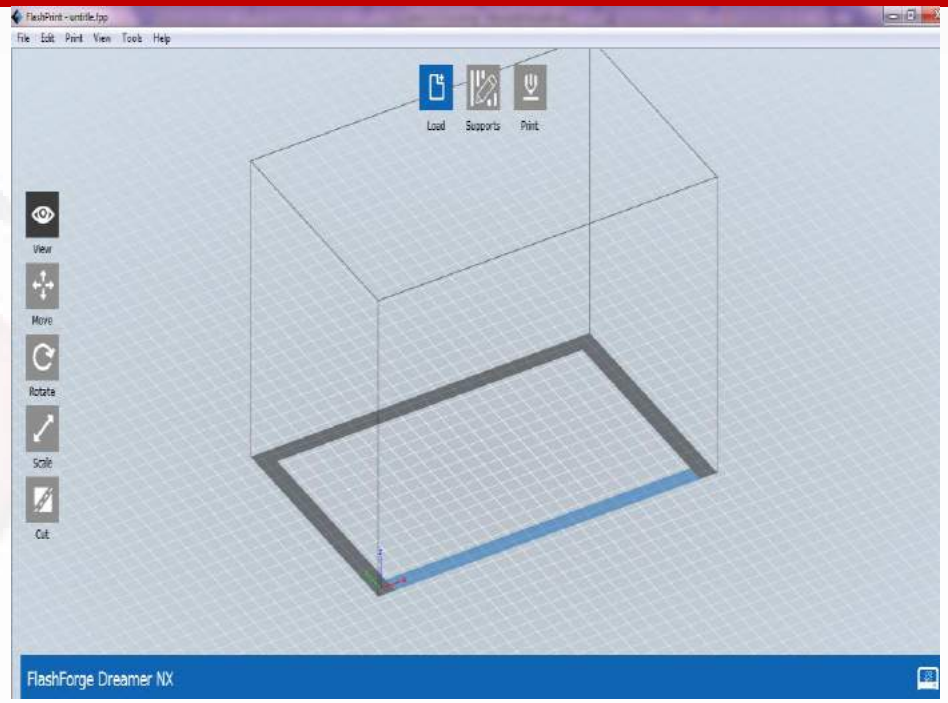


Settings of 3 D Printing Parameters

Slicers & 3D Printer Hosts

- Uimaker Cura
- Flashprint
- Simplify3D
- Slic3r
- Repetier
- KISSlicer
- ideaMaker
- OctoPrint
- 3DPrinterOS





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Settings of 3 D Printing Parameters

Summary

- You cannot build the model any better or smoother than the STL file produced from SOLIDWORKS, so if the STL is coarse and faceted, that is what you can expect in the final model. Typically you should use the ‘fine’ option with models from SOLIDWORKS, but 3D printing a few benchmark SOLIDWORKS models with different STL settings will determine the best settings for your machine.

- Resolution settings in Solidworks depend on the resolution of the printer you’re using

Questions

- How do you explain slicing
- List the softwares used for 3 D Modelling in 3 D Printing
- Identify the role of layer height in printing quality

References

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- https://community.ultimaker.com/topic/15191-cura-setting-parameters/
- Chee Kai Chua, Kah Fai Leong(2016), 3D Printing And Additive Manufacturing: Principles And Applications, WSPC
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Thank You