ME 225 Project

GUI Based Software to Calculate Cutting Parameters

This is a project made by Pranav Garg and Vikash Nirwan, both second year Mechanical engineering students, that calculates cutting parameters for the process of turning and milling. The code for the project has been written in python language and the IDE used is Spyder. For the purpose of deployment, Streamlit has been used. The source code file and the relevant images have been attached in the submission folder. The link to the GUI based software is: link and to the GitHub repo is: Github. The demonstration of the software has been done in the PowerPoint presentation attached in the folder.

Below is some information about turning and milling:

Turning is a machining process in which a cutting tool, typically a non-rotary tool bit, describes a helix toolpath by moving more or less linearly while the workpiece rotates.

Usually the term "turning" is reserved for the generation of external surfaces by this cutting action, whereas this same essential cutting action when applied to internal surfaces (holes, of one kind or another) is called "boring". Thus the phrase "turning and boring" categorizes the larger family of processes known as lathing. The cutting of faces on the workpiece, whether with a turning or boring tool, is called "facing", and may be lumped into either category as a subset.

Turning can be done manually, in a traditional form of lathe, which frequently requires continuous supervision by the operator, or by using an automated lathe which does not. Today the most common type of such automation is computer numerical control, better known as CNC. (CNC is also commonly used with many other types of machining besides turning.)

Milling is the process of machining using rotary cutters to remove material[1] by advancing a cutter into a workpiece. This may be done varying direction[2] on one or several axes, cutter head speed, and pressure.[3] Milling covers a wide variety of different operations and machines, on scales from small individual parts to large, heavy-duty gang milling operations. It is one of the most commonly used processes for machining custom parts to precise tolerances.

Milling can be done with a wide range of machine tools. The original class of machine tools for milling was the milling machine (often called a mill). After the advent of computer numerical control (CNC) in the 1960s, milling machines evolved into machining centers: milling machines augmented by automatic tool changers, tool magazines or carousels, CNC capability, coolant systems, and enclosures. Milling centers are generally classified as vertical machining centers (VMCs) or horizontal machining centers (HMCs).

Contribution in the project:

Both partners worked together in doing appropriate research, writing code and making the GUI based software, designing and making the PowerPoint presentation and this final document and had equal efforts and contribution in the project. It was a learning experience for both of us and we are glad that the project has been successfully completed on time.

Thank You!

Pranav Garg (190103067)

Vikash Nirwan (190103121)