All groups of size less than 60 are soluble

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A non–identity group G is said to be **soluble** if there exists a sequence of subgroups

$$\{1\} = H_1, \ldots, H_k = G$$

such that $H_{j-1} \triangleleft H_j$ and H_j/H_{j-1} is abelian for $j = 2, \ldots, k$.

The goal of this project is to prove that all groups of size than 60 are soluble.

A starting point of this honours' project will be an understanding of a class of finite soluble groups called nilpotent groups, which are just the direct product of Sylow p-groups.

A solid background in abstract algebra is needed; in particular, the candidate would have mastered WTW 381. The candidate will also be expected to learn how to use the computer algebra package, GAP, whilst working on this project.