**Case Study: Ankylosing Spondylitis (AS)**

Ankylosing spondylitis (AS) is a chronic form of arthritis which limits the motion of the spine and muscles. A study was carried out at the Royal National Hospital for Rheumatic Diseases in Bath to see if daily stretching of tissues around the hip joints would help patients with AS to get more movement in their hip joints.

Thirty-nine consecutive admitted patients with `typical' AS were allocated randomly to a control group receiving the standard treatment or to the treatment group receiving additional stretching exercises, in such a way that those patients were twice as likely to be allocated to the `stretched' group. The patients were assessed on admission and then three weeks later. For each patient several measurements were made on each hip, such as the extent of flexion, extension, abduction and rotation. This study is concerned just with flexion and lateral rotation, where all measurements are in degrees and an increase represents an improvement.

Please see the table and caption of the data below. (Also, data provided on Canvas). No more details of the data-collection method will be given here. The statistician would normally analyze the data in collaboration with a physiotherapist, but here you are expected to use your common sense.

The question as posed by the hospital researchers was: `Has the stretched group improved significantly more than the control group?'

**Your assignment:**

Complete a professional report using the class template that addresses the researcher’s question. Your report should attempt to answer this question as well as to describe any other analysis which you think is relevant (e.g. to assess assumptions). Grades will be based on clarity and organization of the report; appropriate use of figures and tables; appropriateness of the statistical analysis; interpretation of results; and discussion of any limitation/concerns.

As a reminder, code and software output should not be included in the main portion of the report, but can be placed in an appendix.

