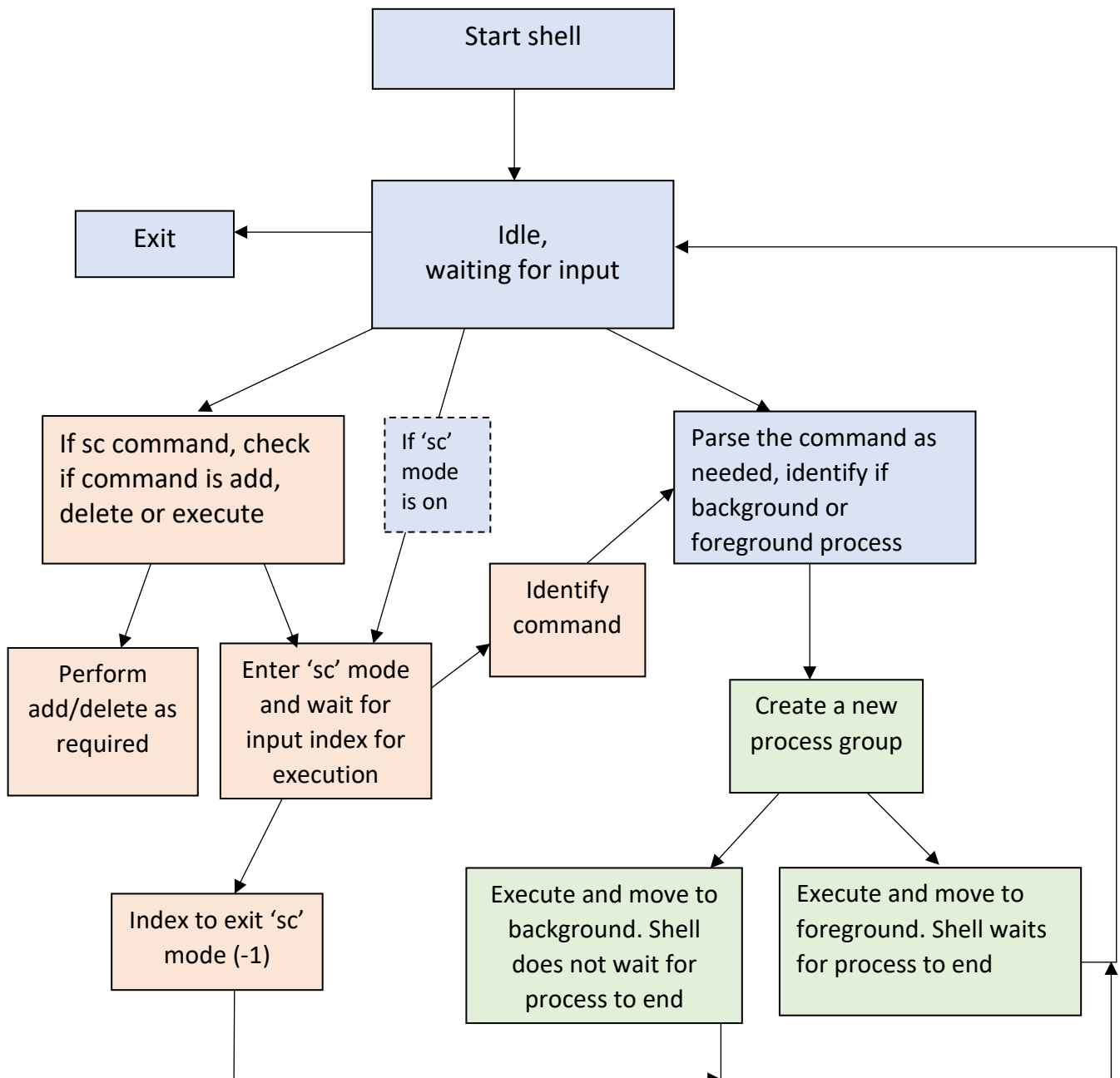


BASIC DESIGN:

The shell essentially consists of 3 parts: input handler, execution handler, 'sc' handler. The basic flow of execution can be better described by the following flowchart.



For each command, a new process group is created and depending on the command it is either pushed to the background or foreground. Then the command is executed and for foreground processes all signals are received by the process group itself. The shell waits for all the foreground processes to finish executing and then makes its own group the foreground process again.

The sc mode is activated when the user delivers the SIGINT signal to the shell, then the user can enter any valid index number to execute the commands stored there. Entering -1 will exit the sc mode and return to regular shell execution mode.

For pipes and redirections, relevant file descriptors are manipulated to ensure input and output is delivered to the correct places, to ensure this, we used a recursive strategy where each subcommand is only responsible for it and its next subcommand, i.e., each subcommand handles its output and the next command's input. This also ensures process sync in the command.