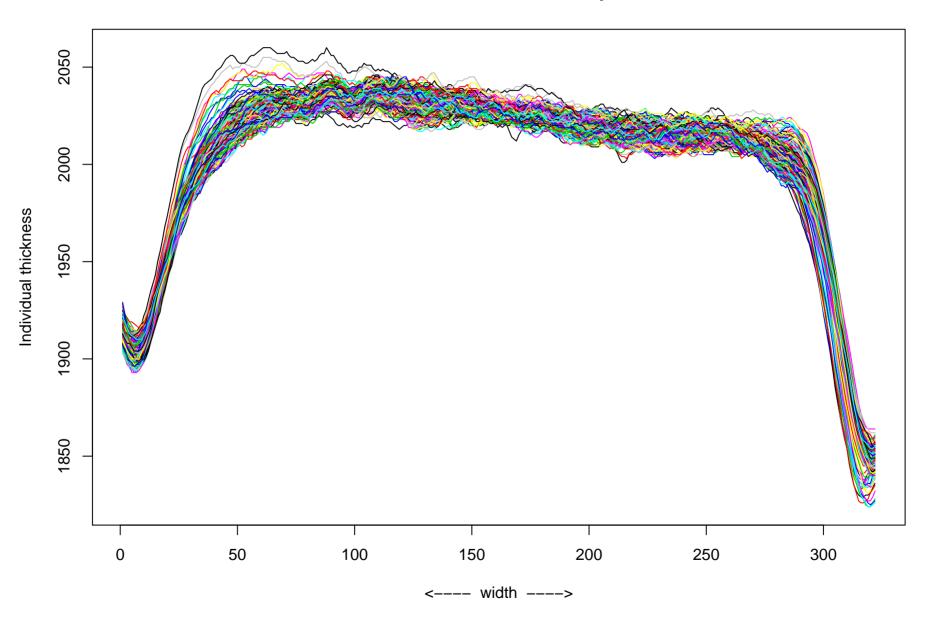
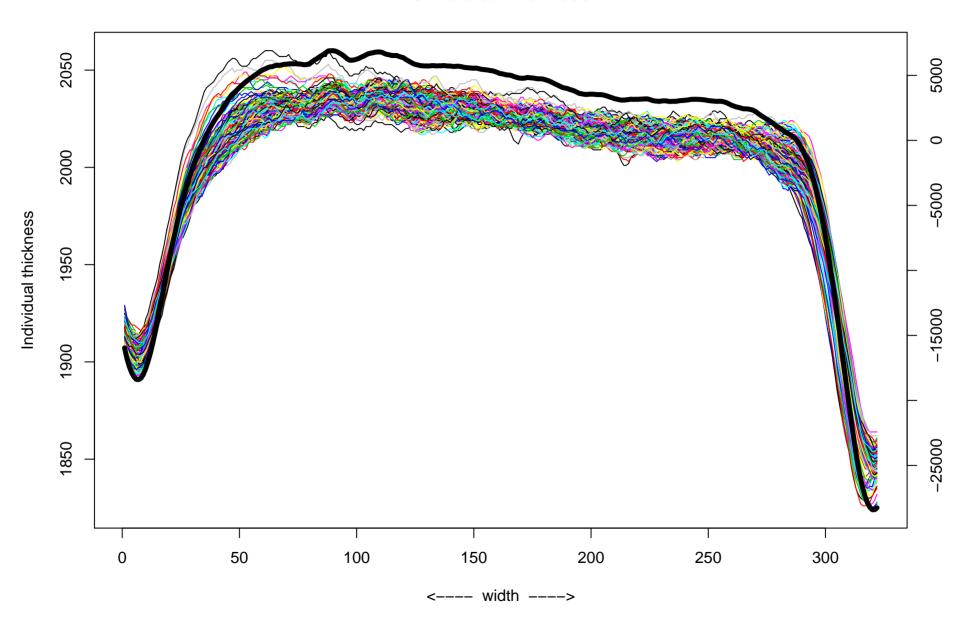
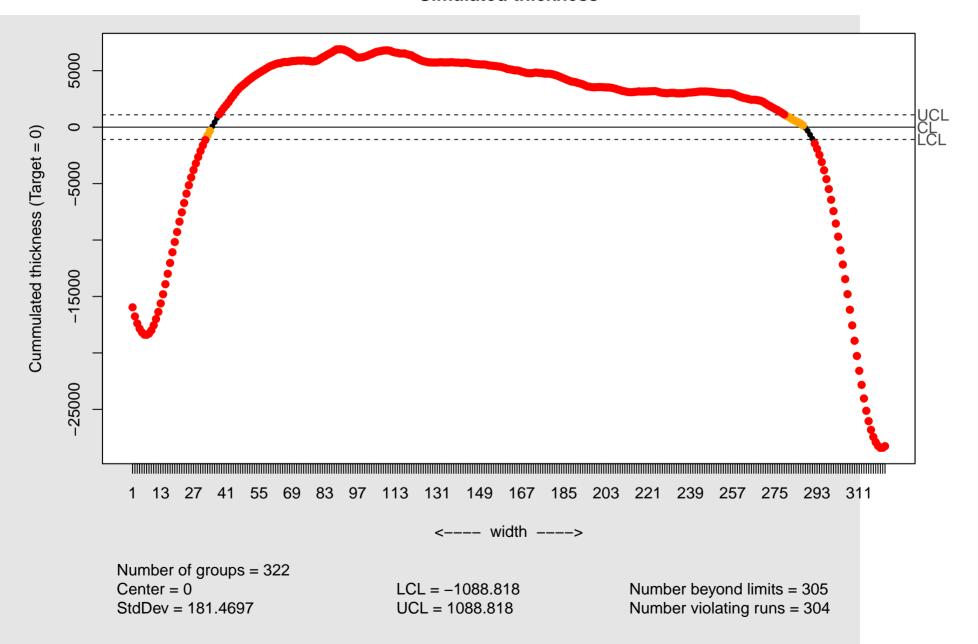
# Individual thickness only



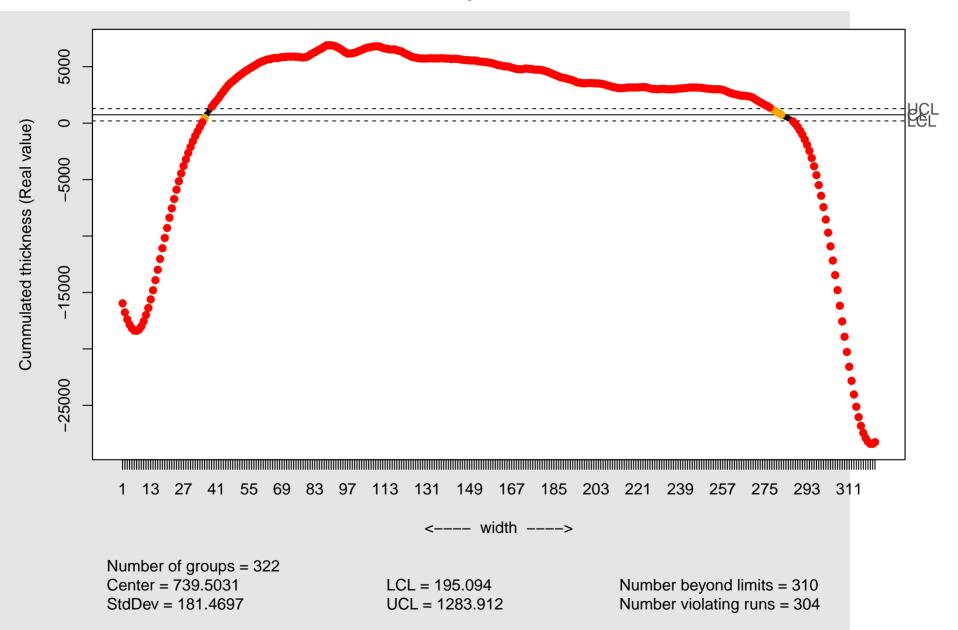
## Simulated thickness



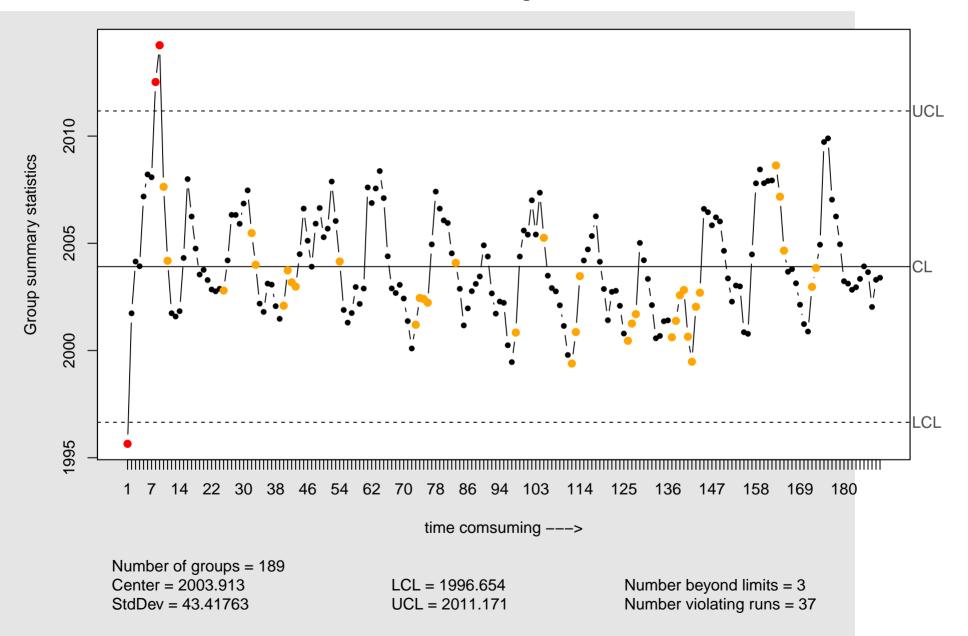
#### Simulated thickness



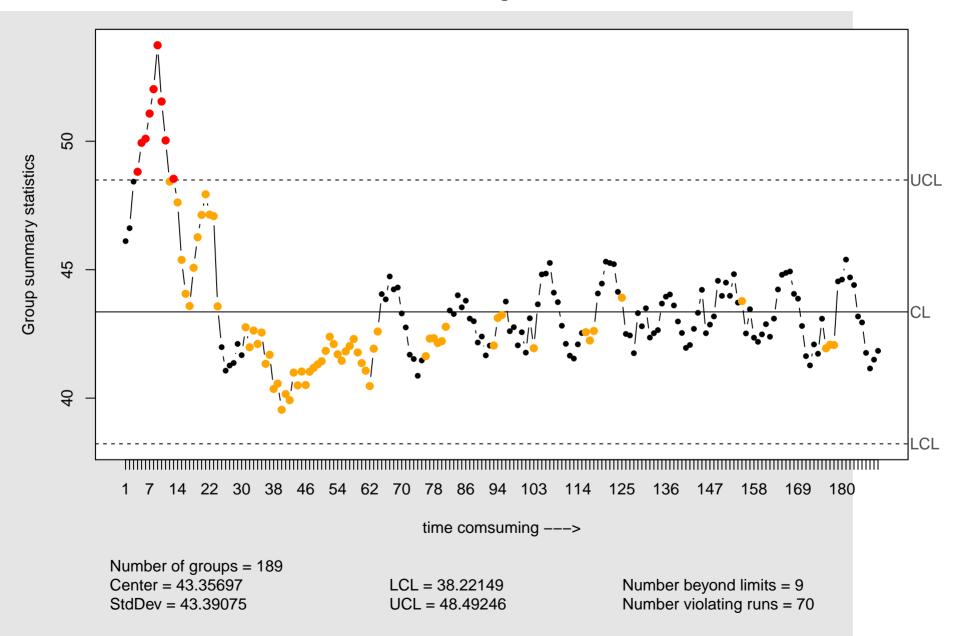
### Simulated thickness: Cpk is -0.02893 and z is -1.587.



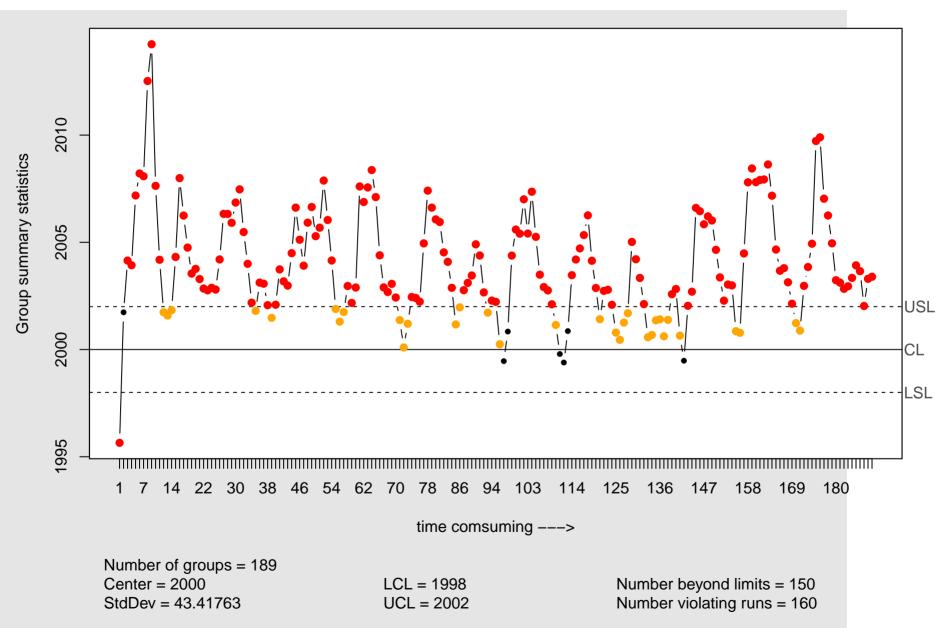
### X-bar chart for a given dataset

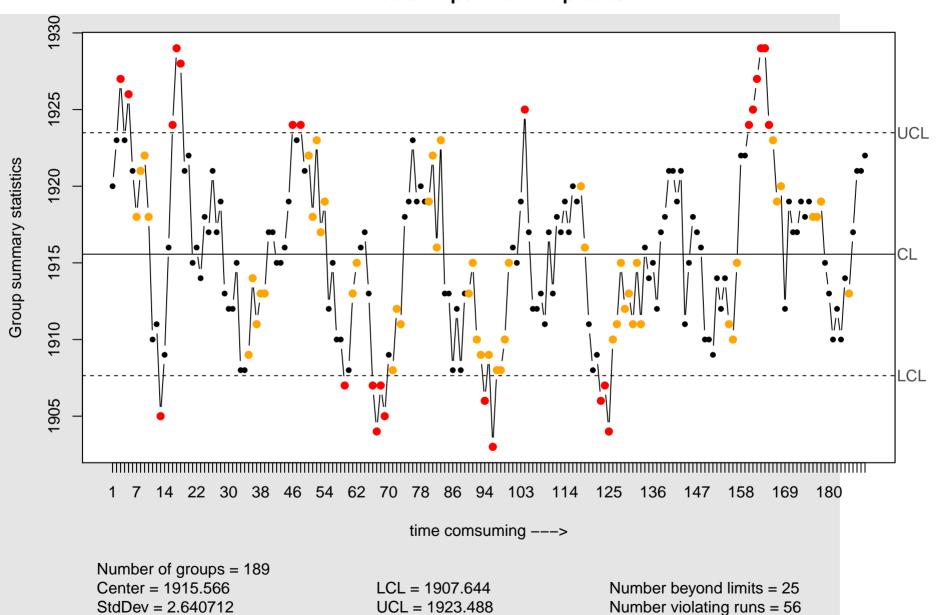


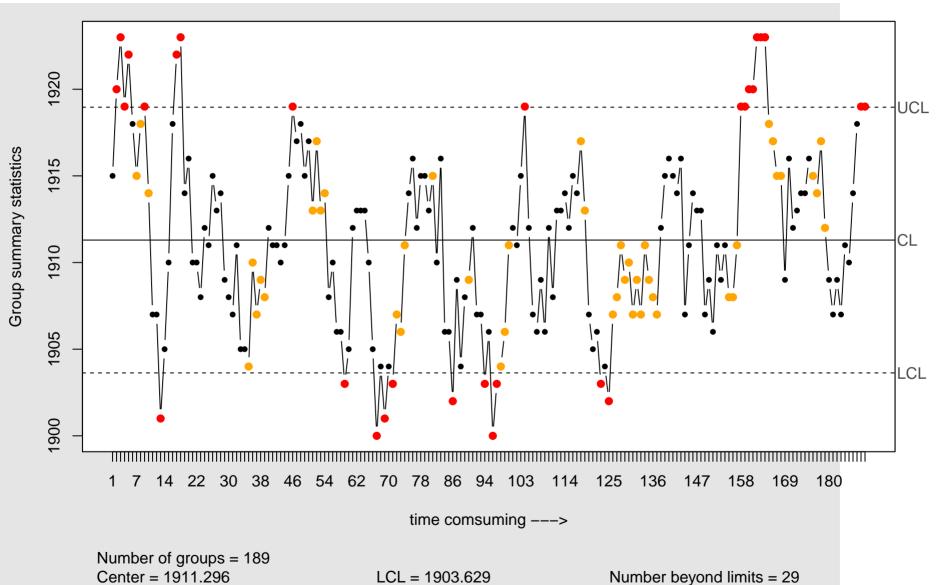
### S chart for a given dataset



### X-bar chart using USL/LSL for a given dataset



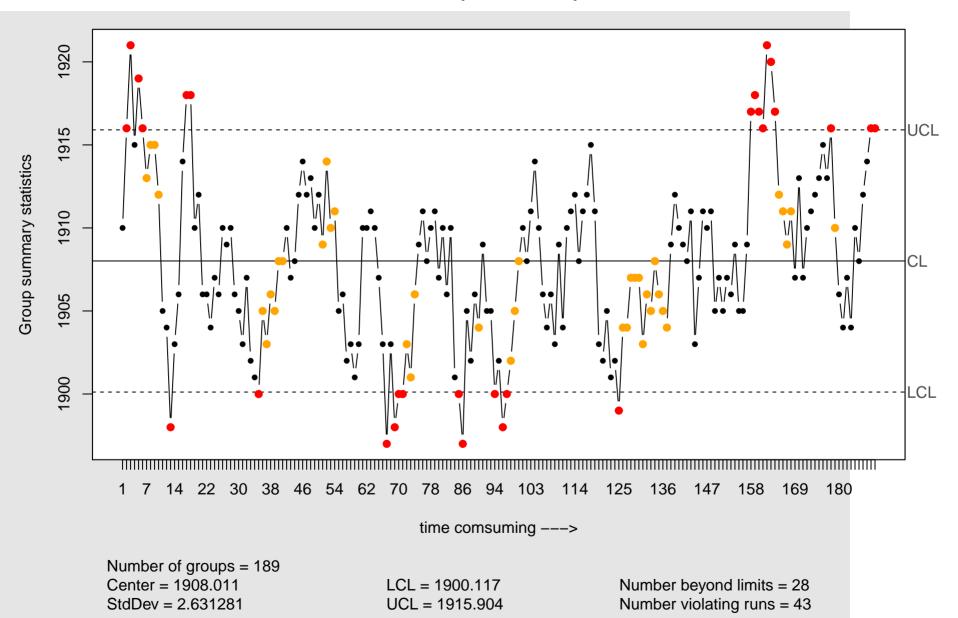


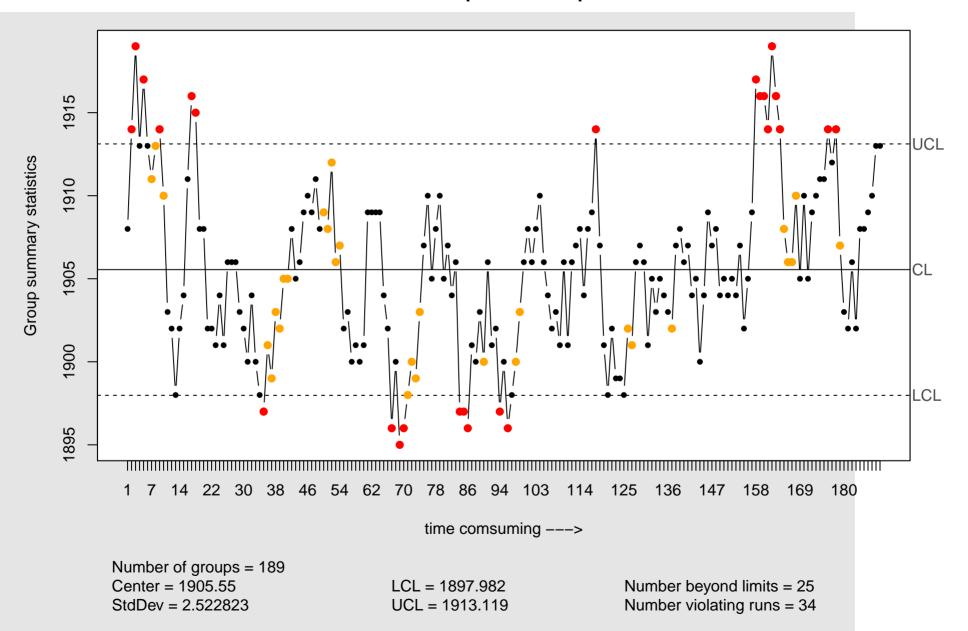


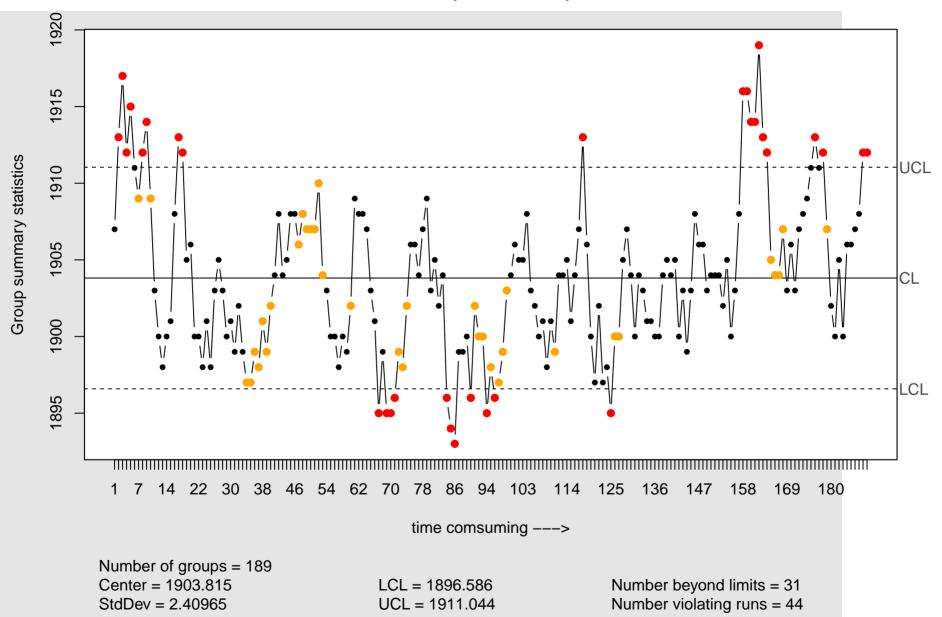
Center = 1911.296 StdDev = 2.555832

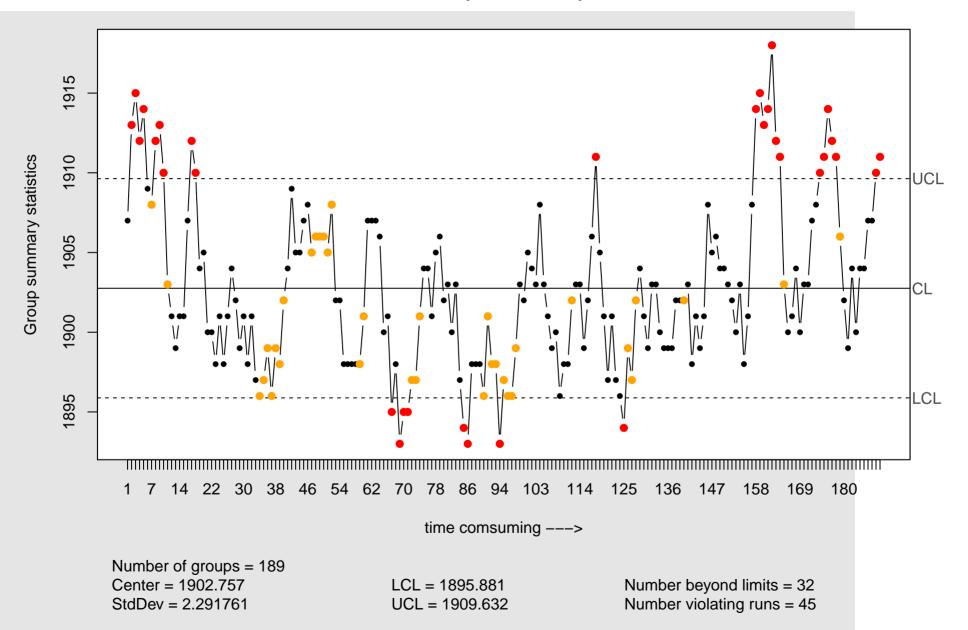
UCL = 1918.964

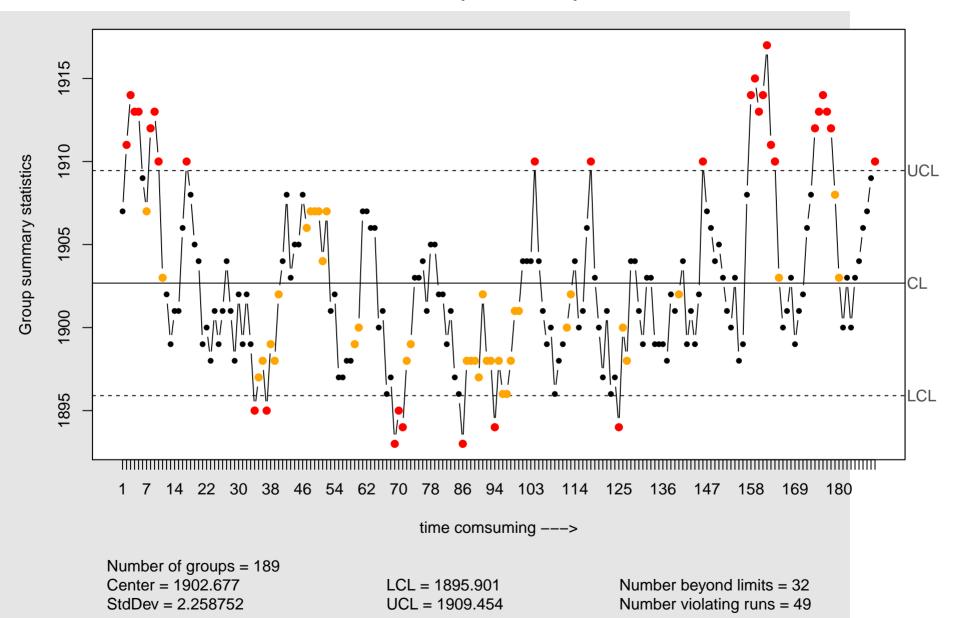
Number violating runs = 48

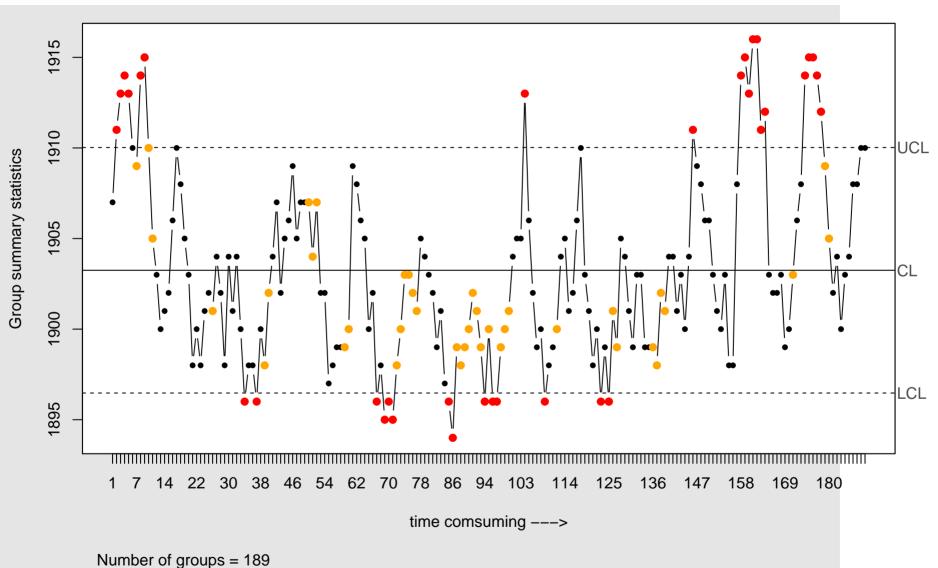






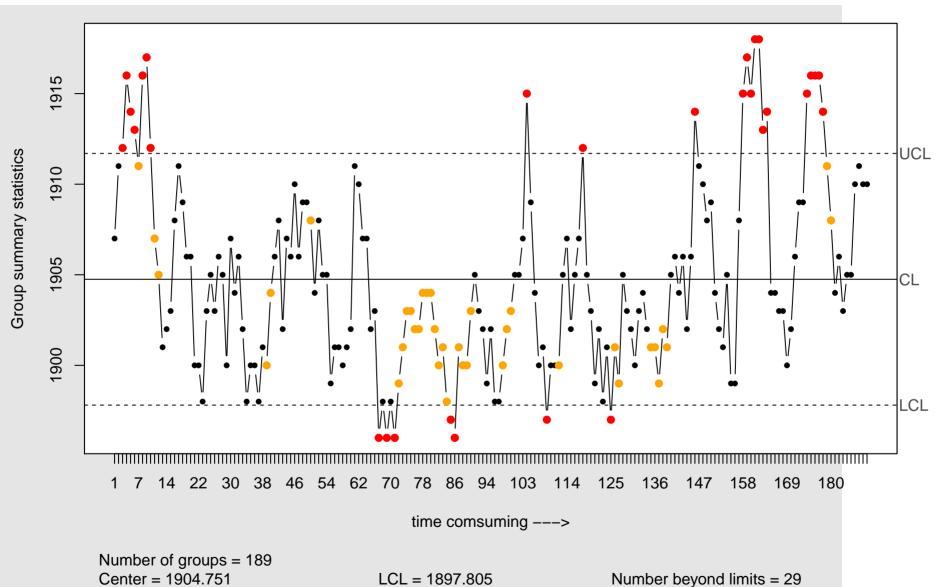






Number of groups = 189 Center = 1903.249 StdDev = 2.258752

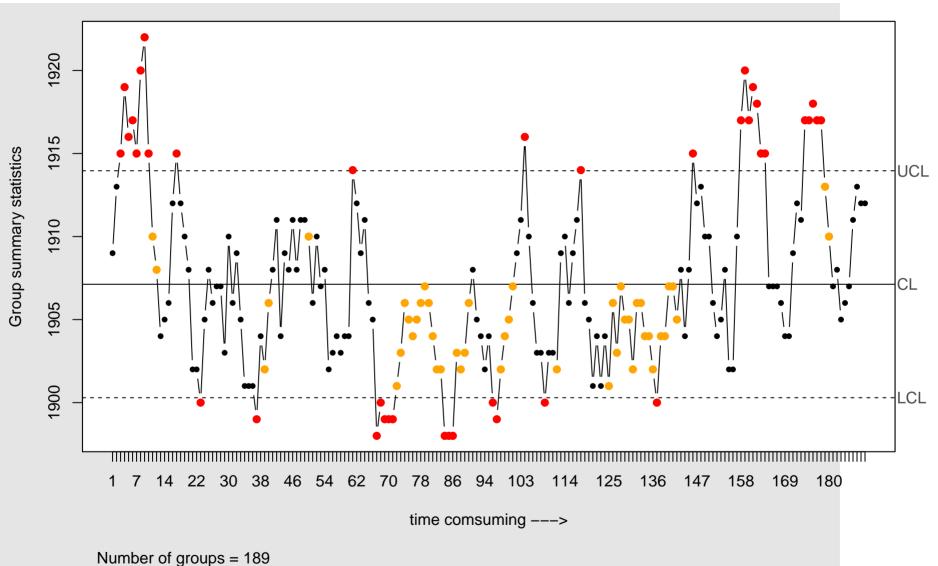
LCL = 1896.472 UCL = 1910.025 Number beyond limits = 34 Number violating runs = 49



StdDev = 2.315339

UCL = 1911.697

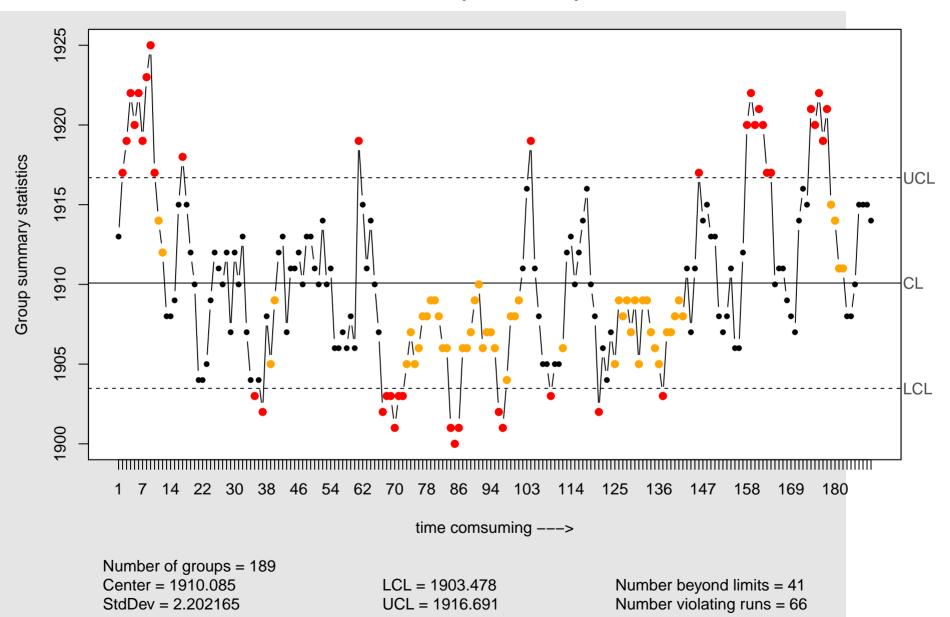
Number violating runs = 46

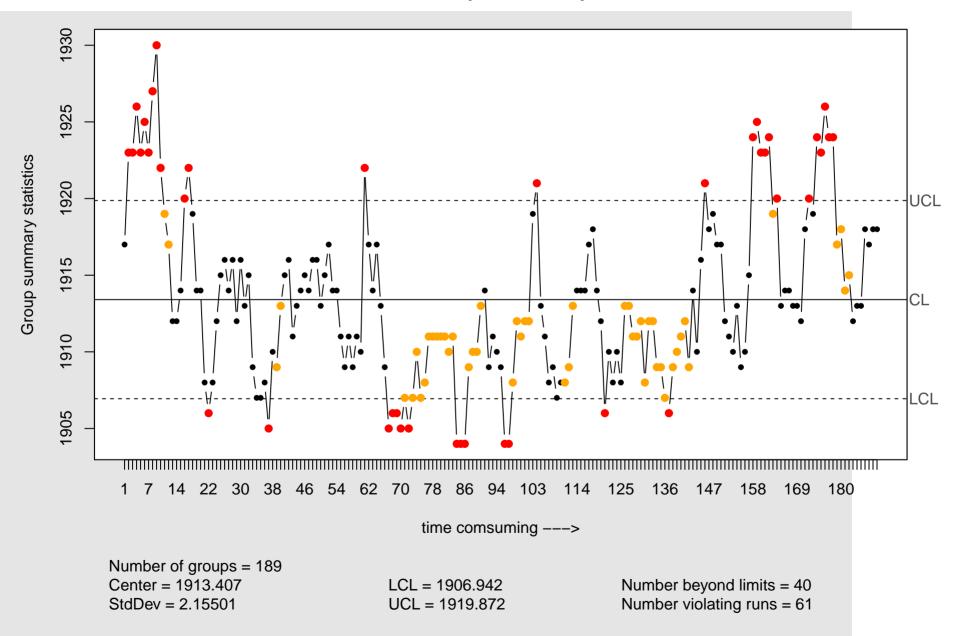


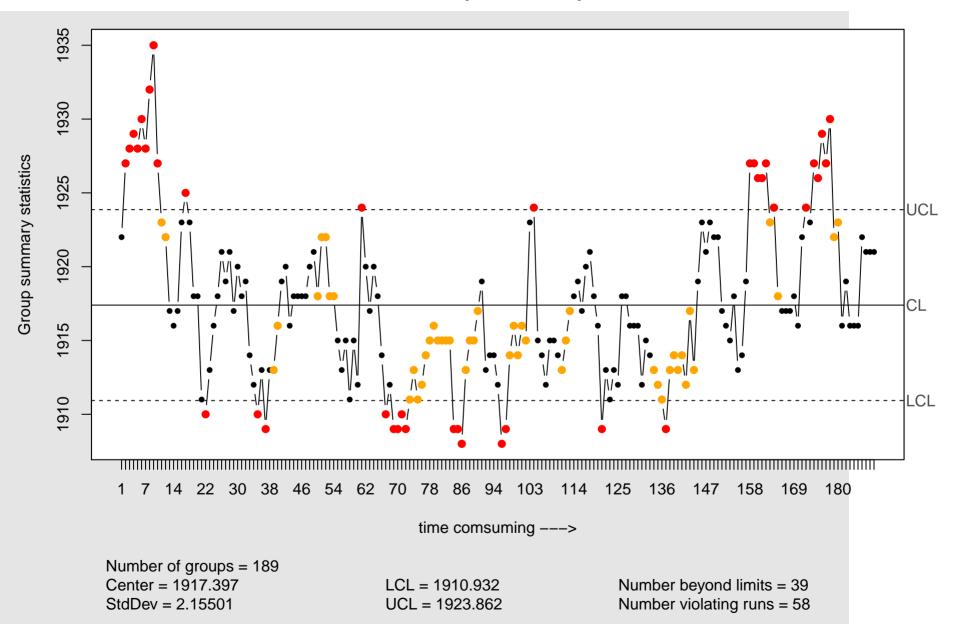
Number of groups = 189 Center = 1907.127 StdDev = 2.277614

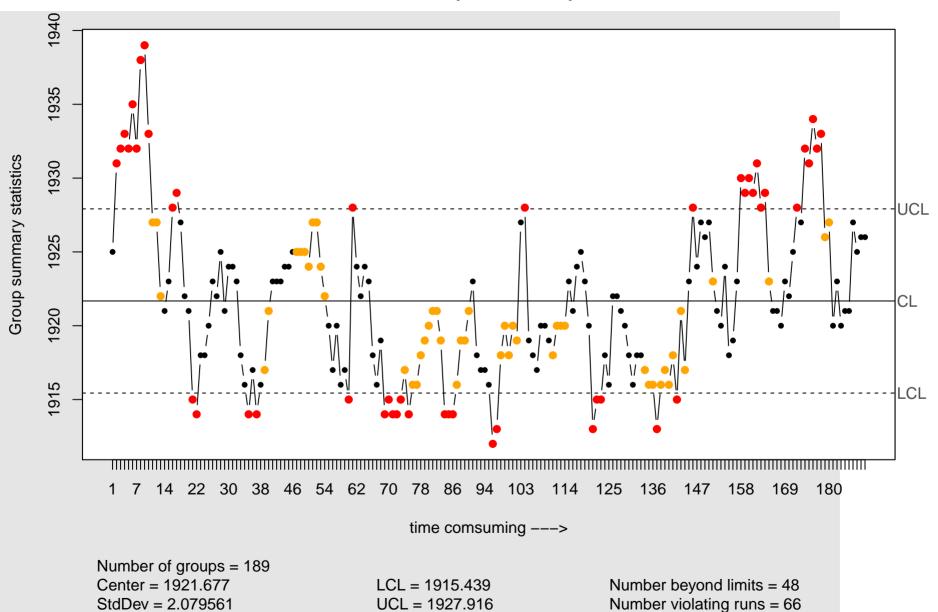
LCL = 1900.294 UCL = 1913.96

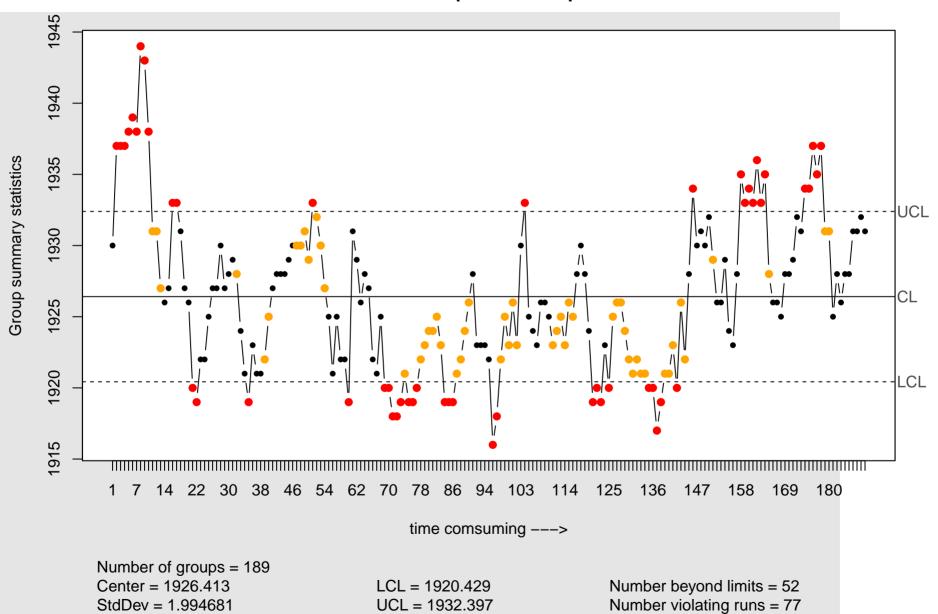
Number beyond limits = 39 Number violating runs = 58

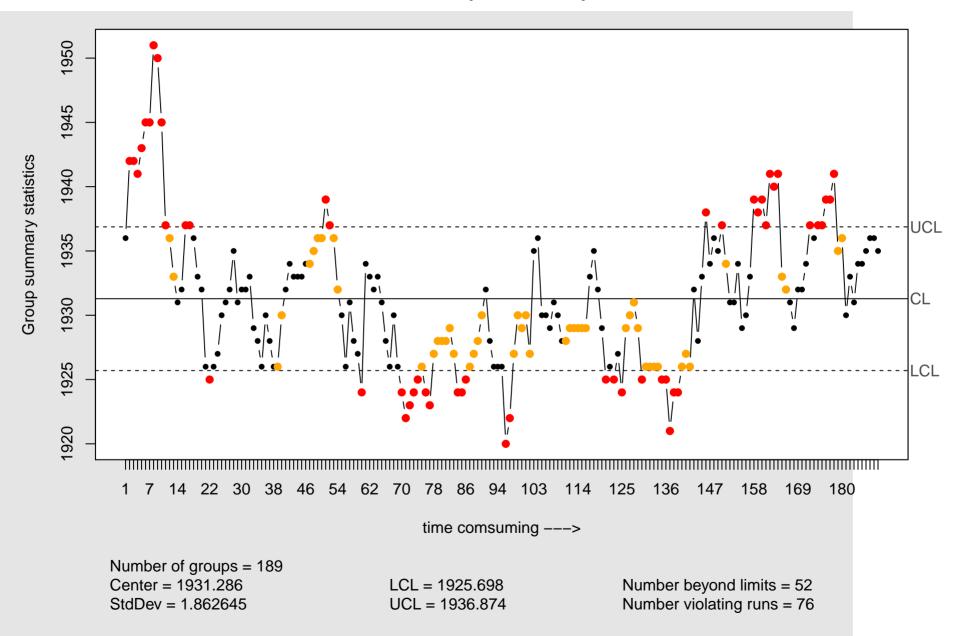


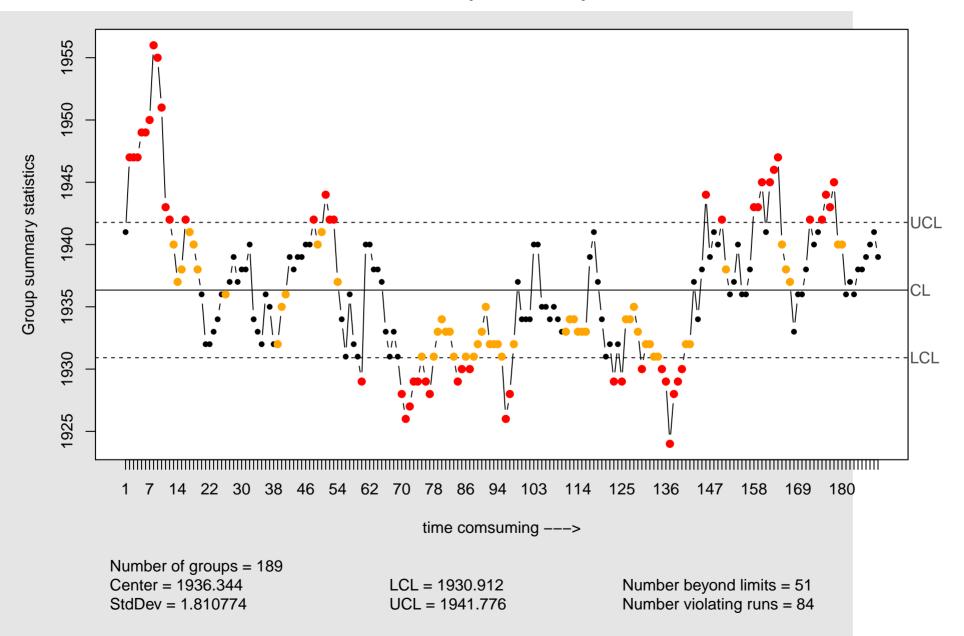


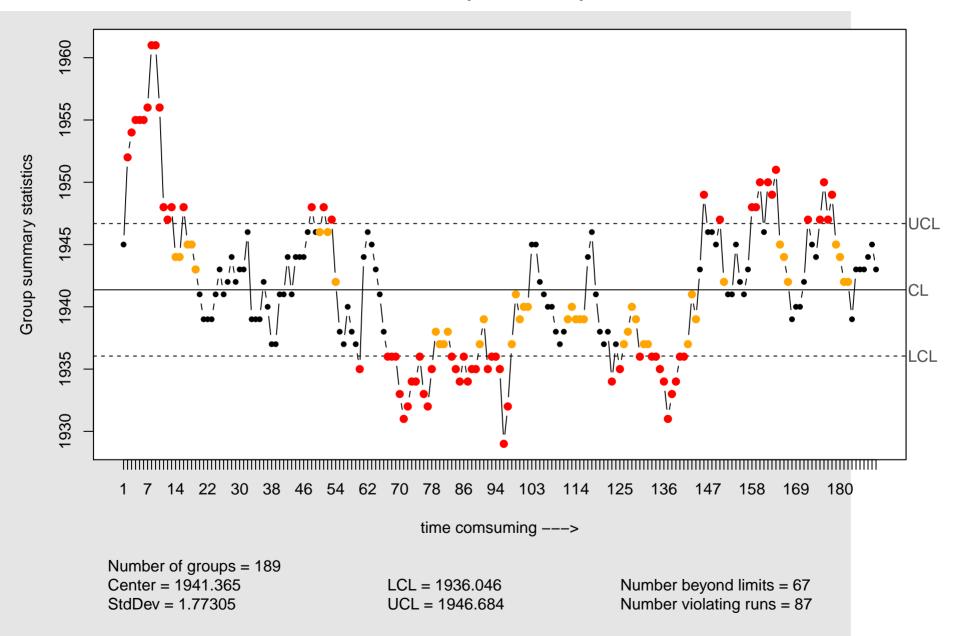


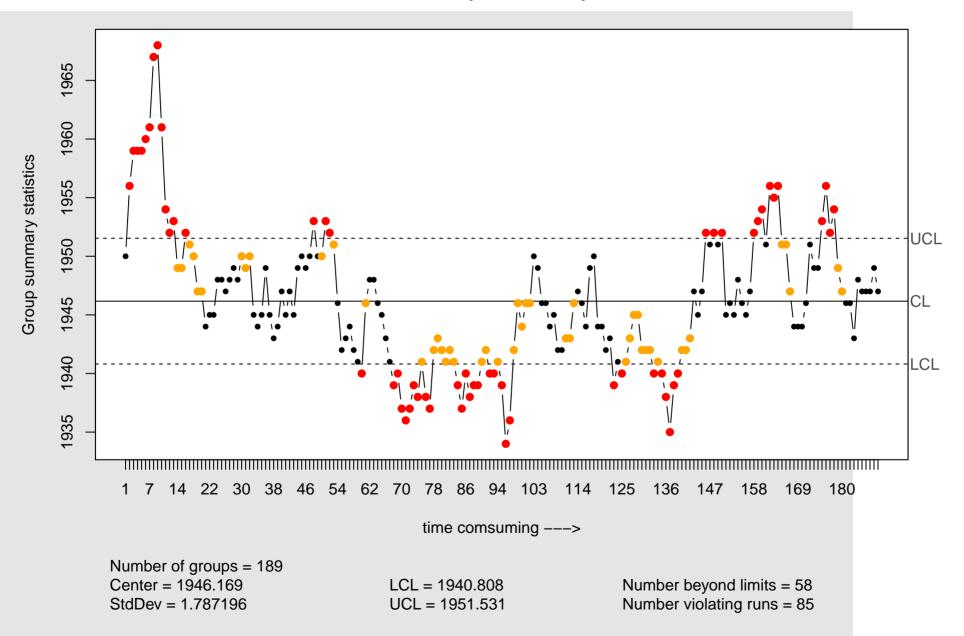


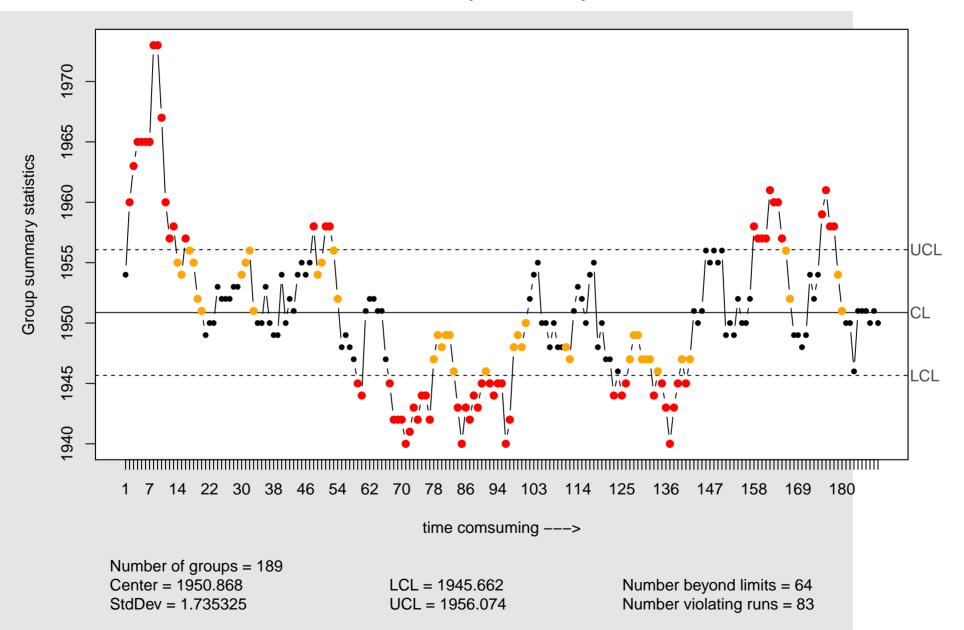


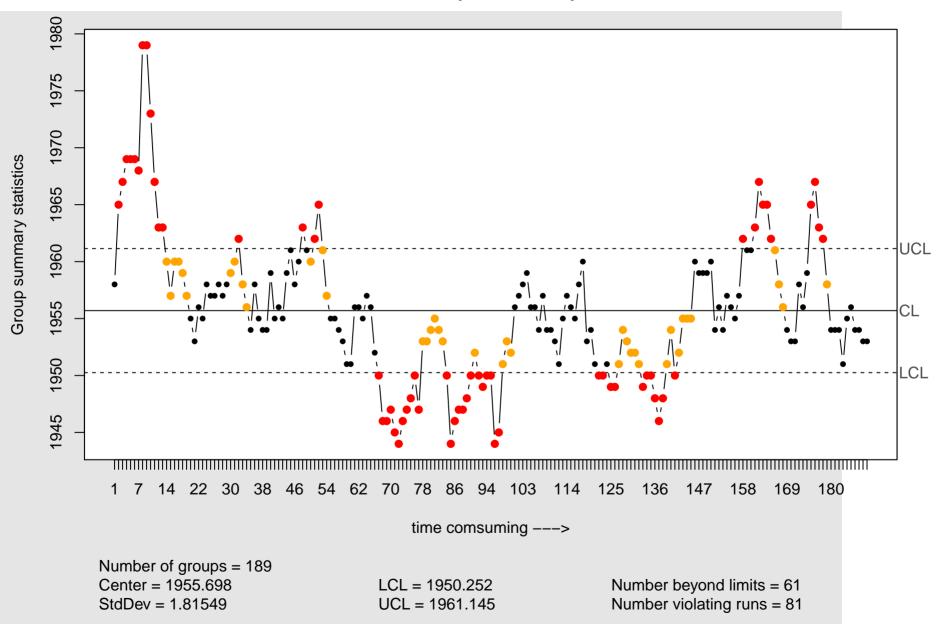


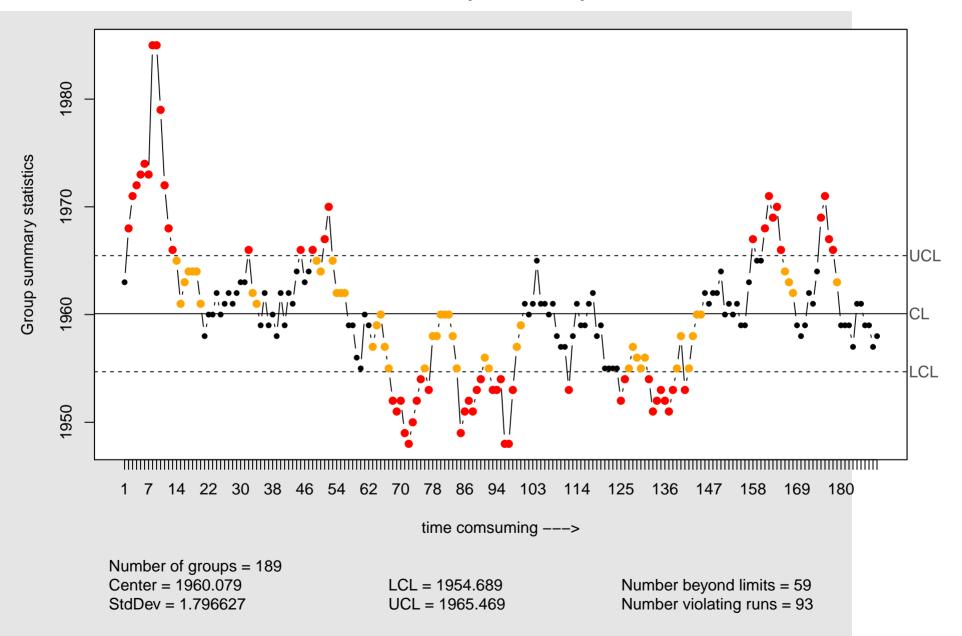


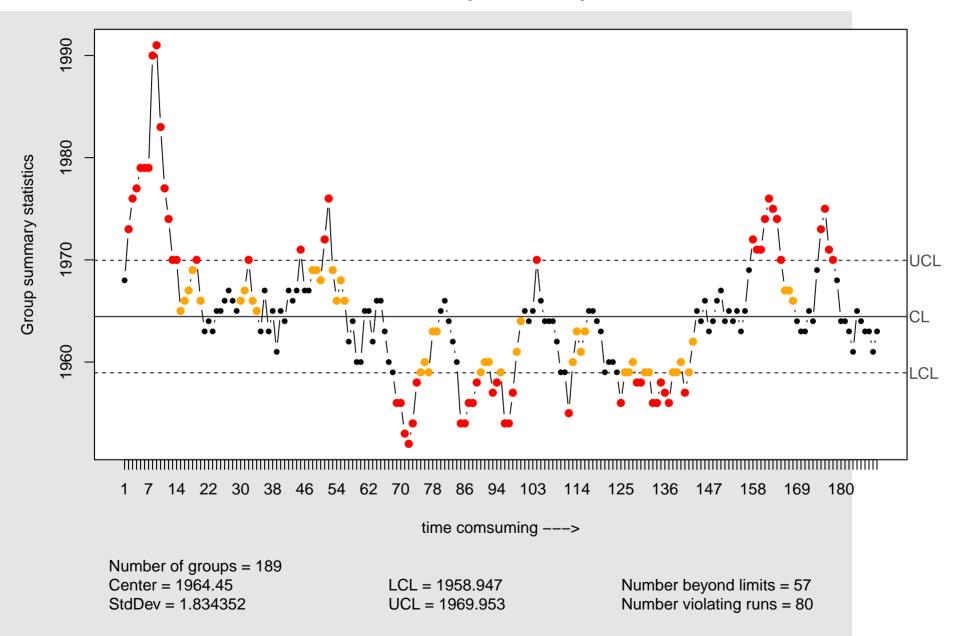


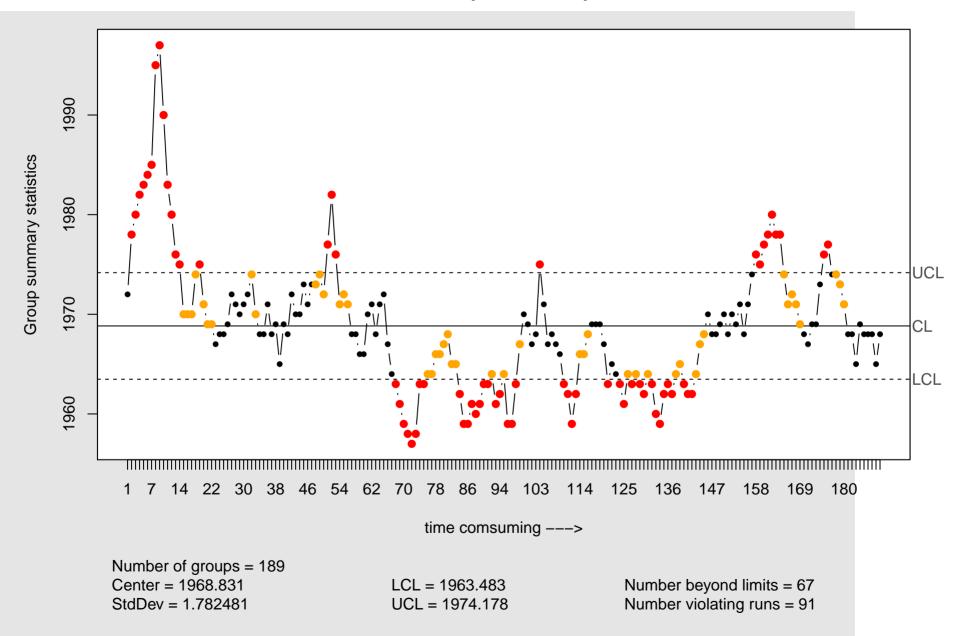


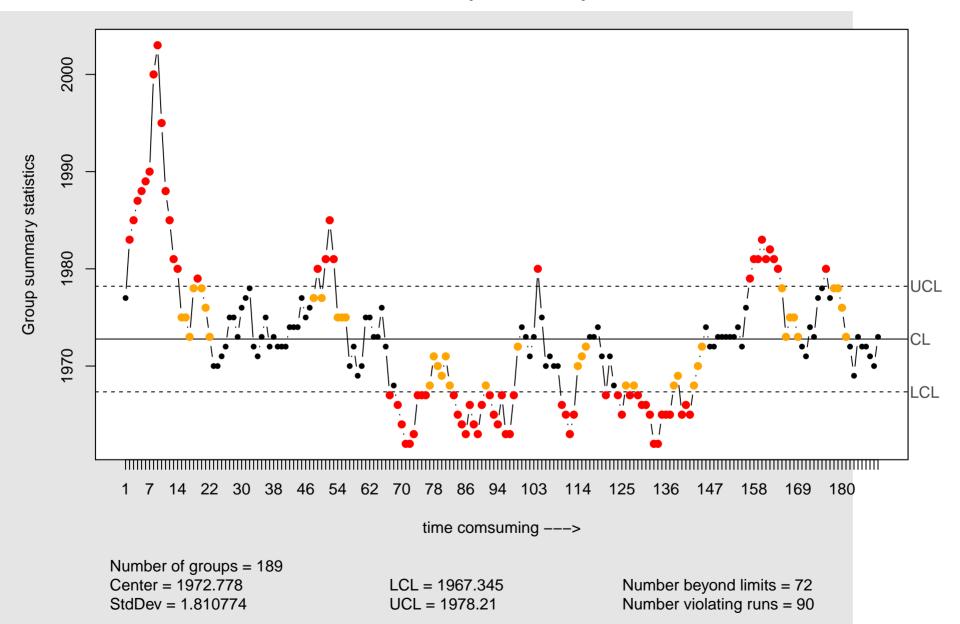


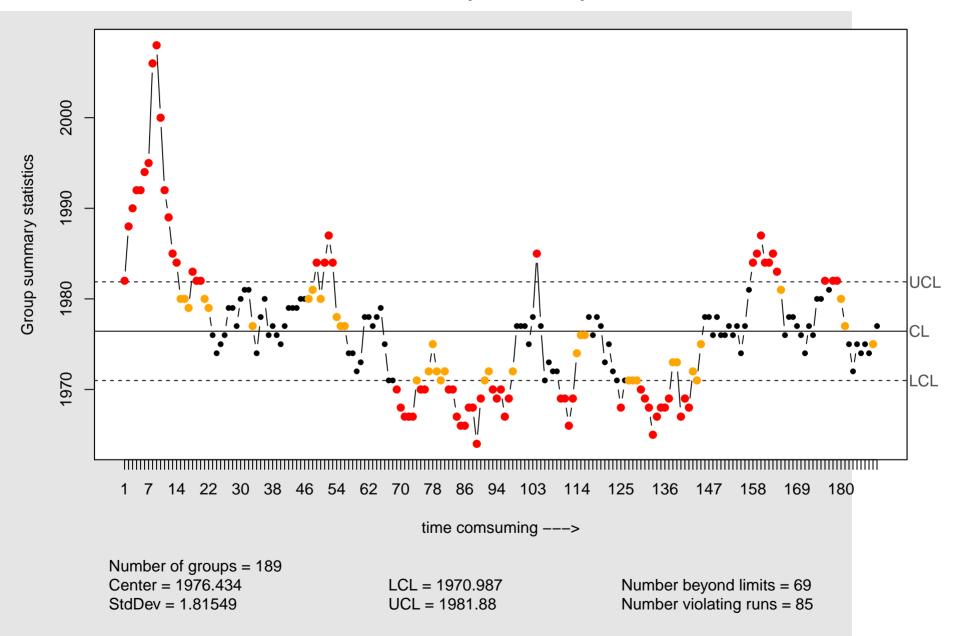


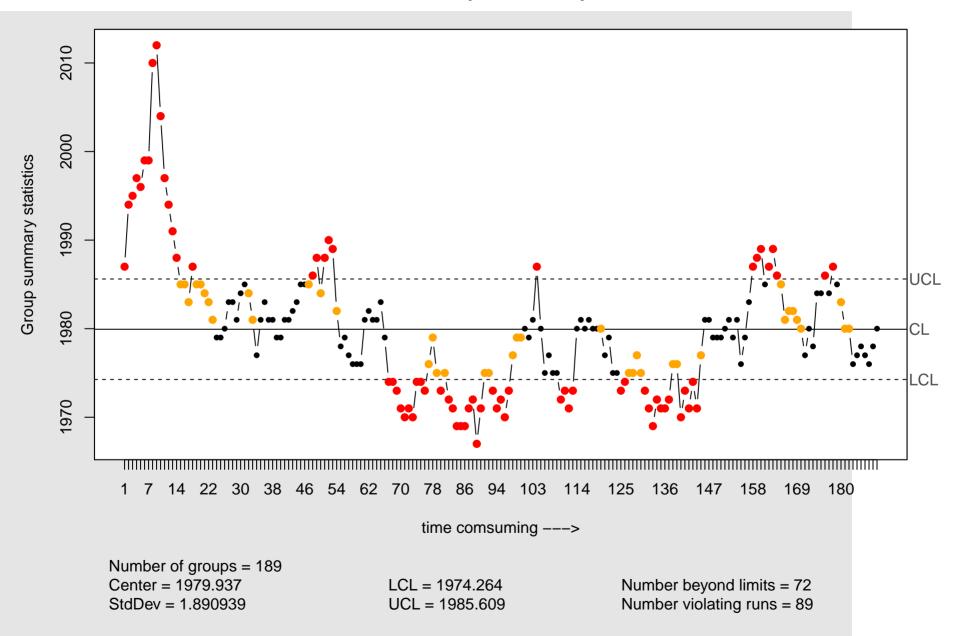


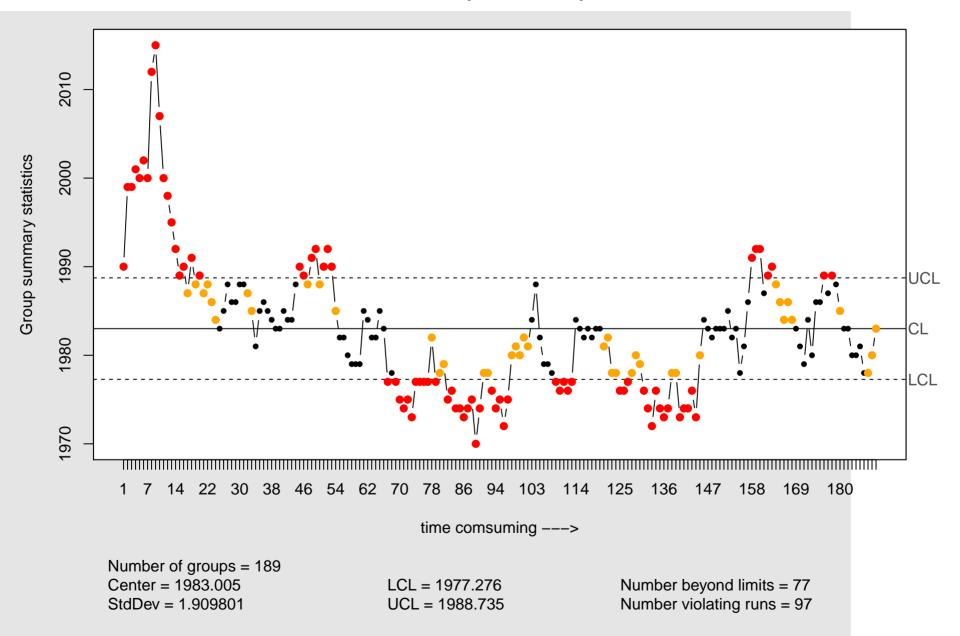


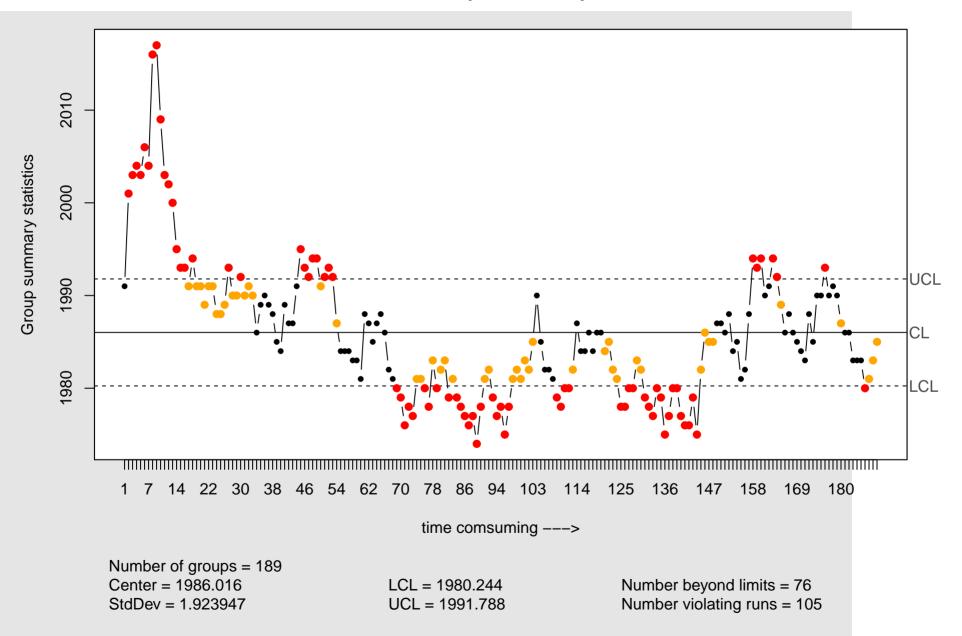


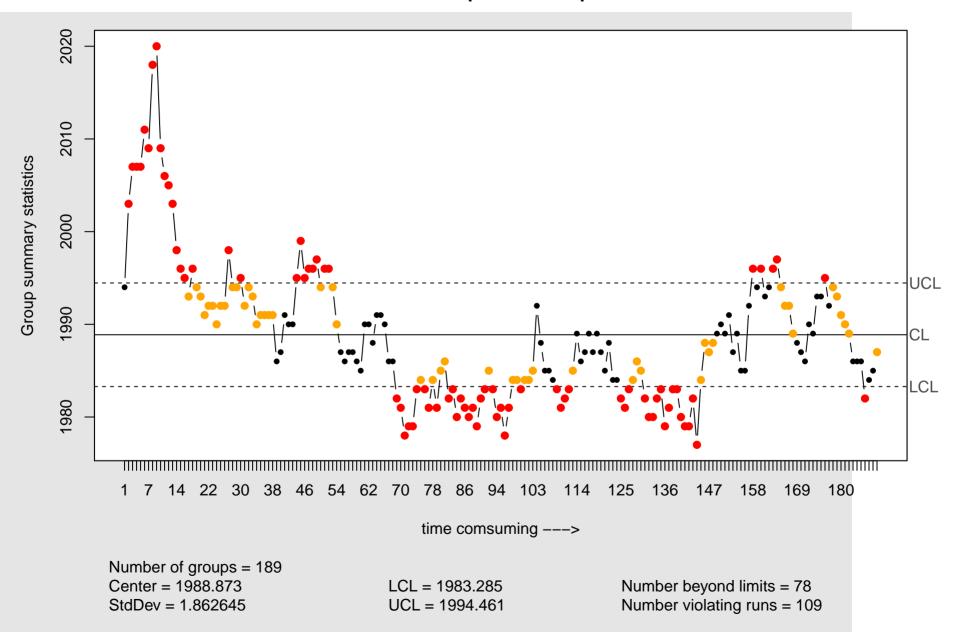


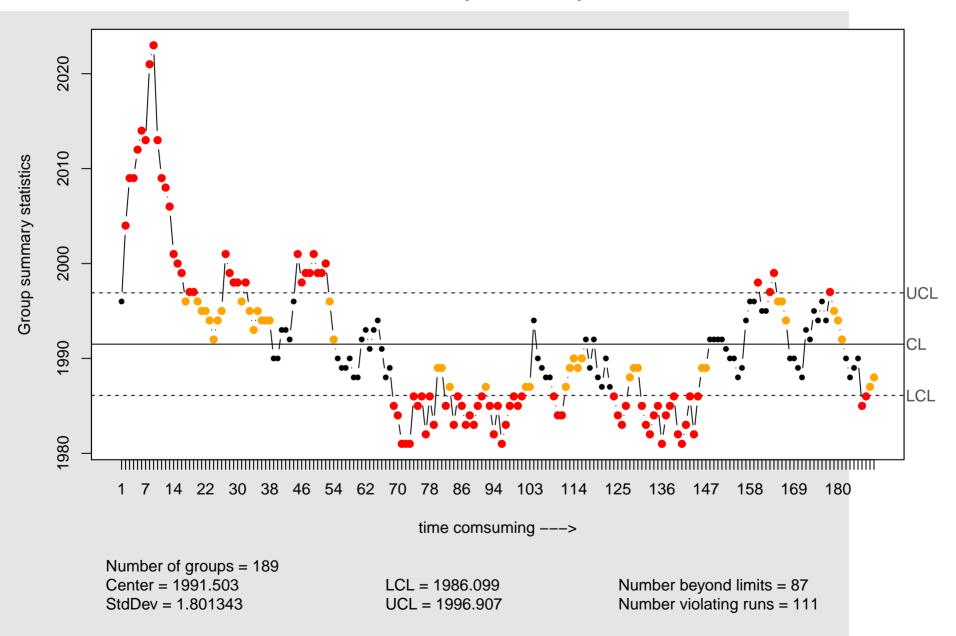


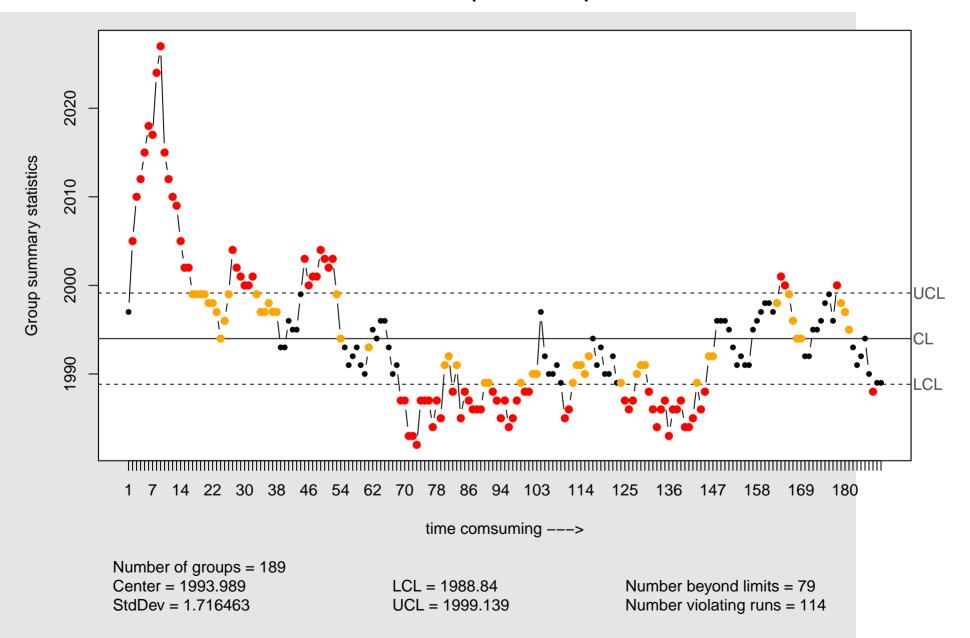


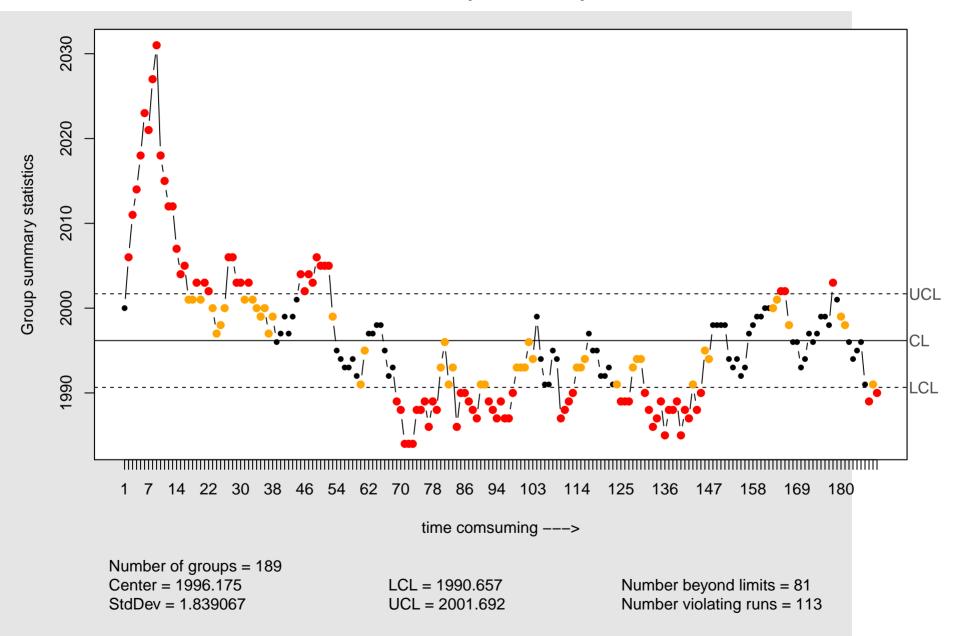


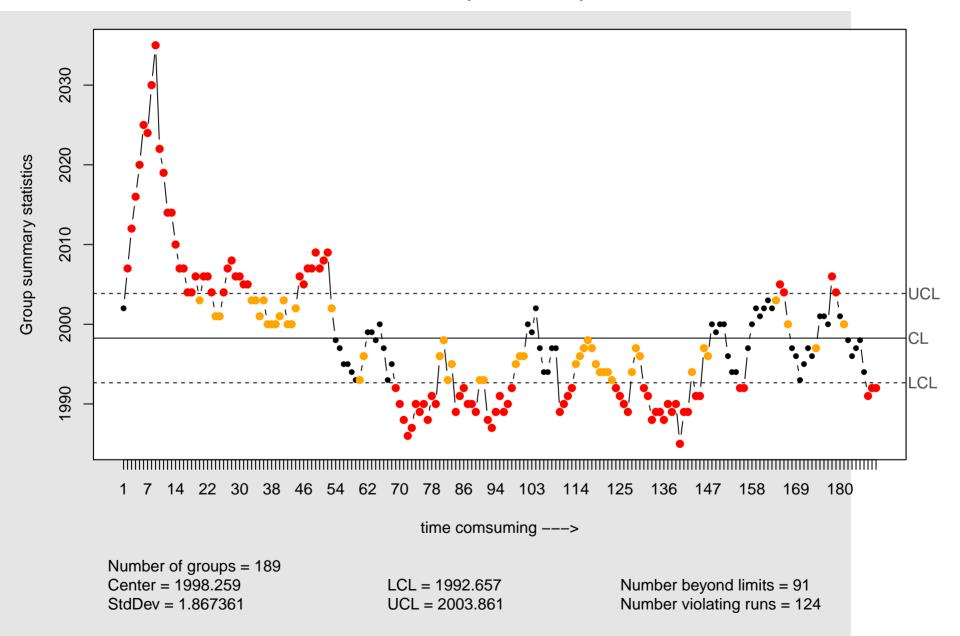


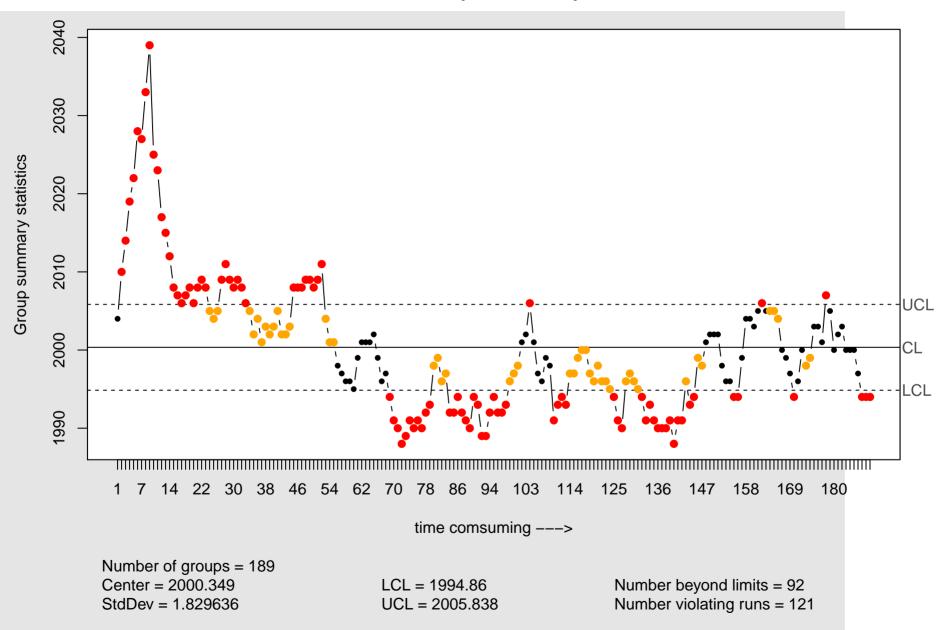


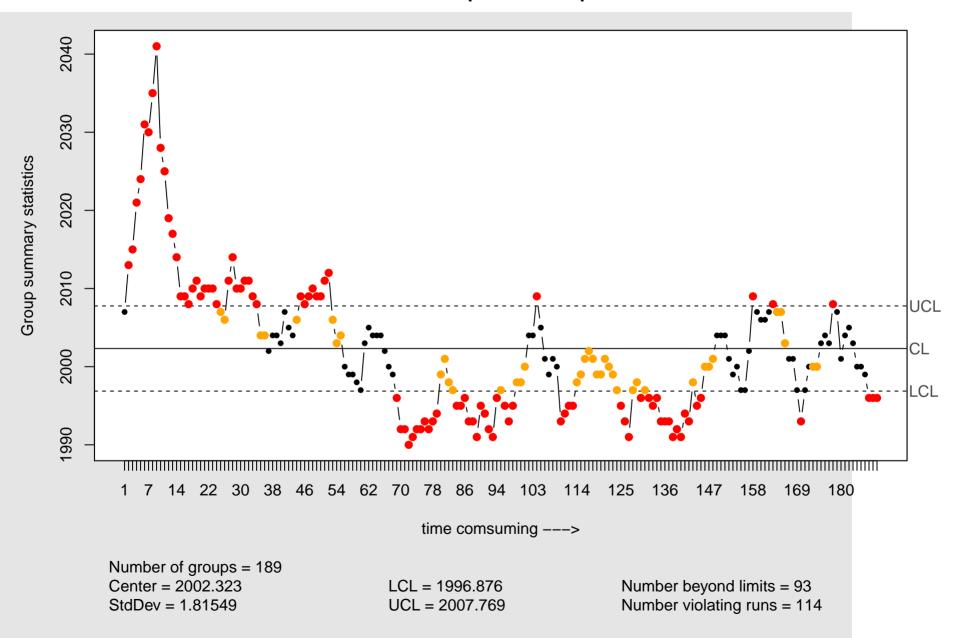


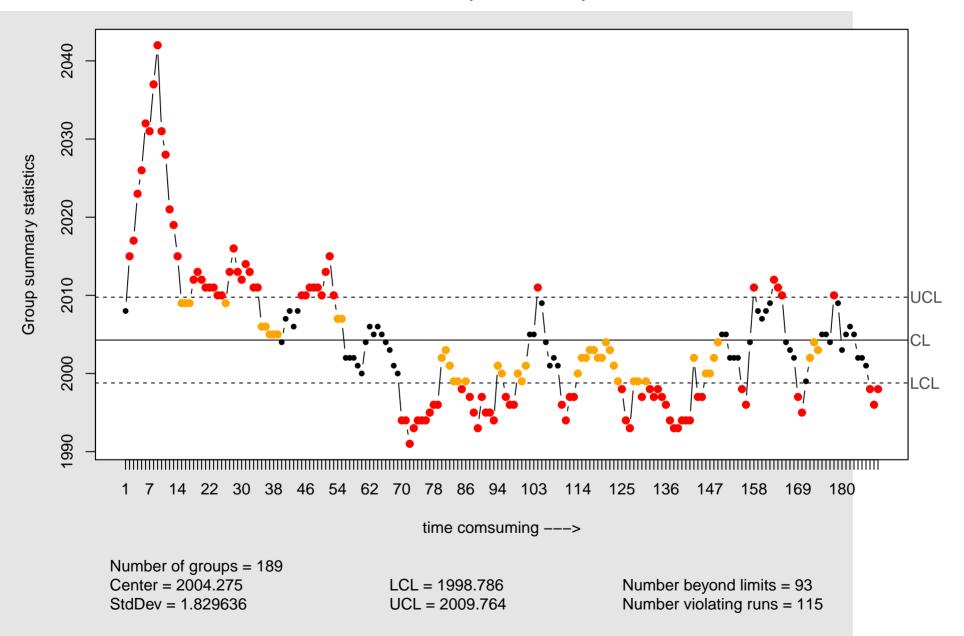


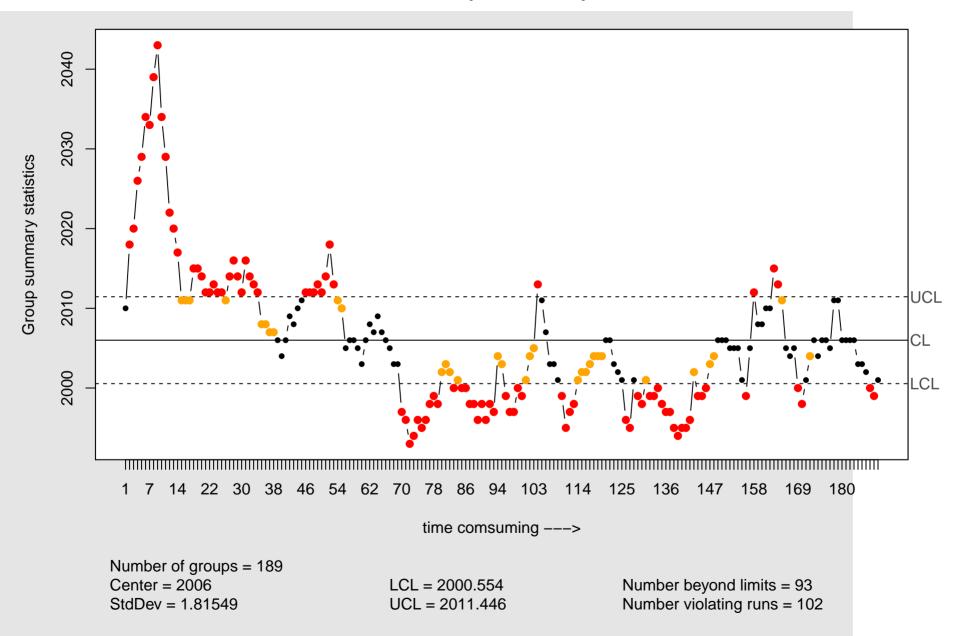


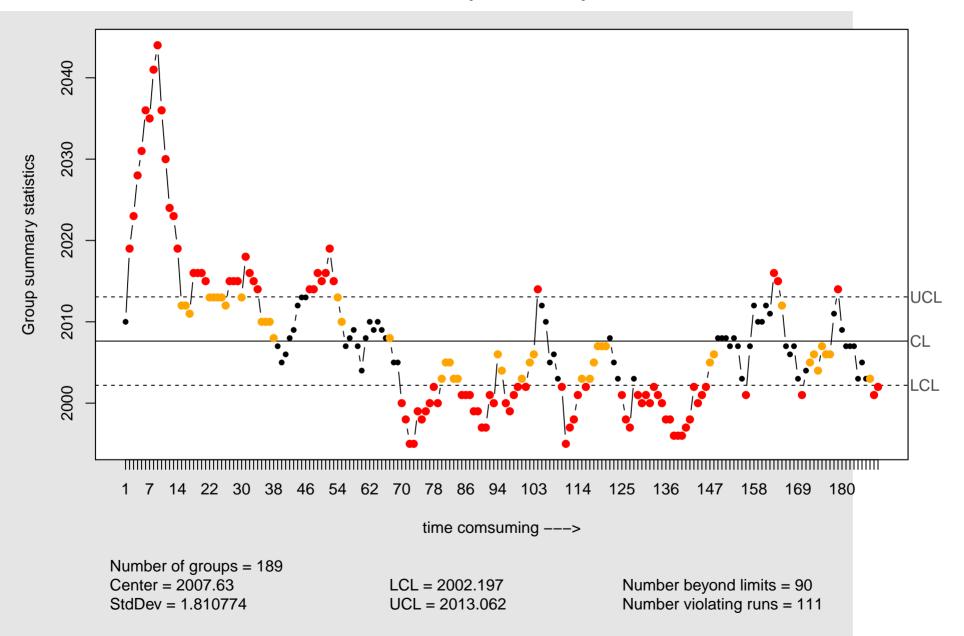


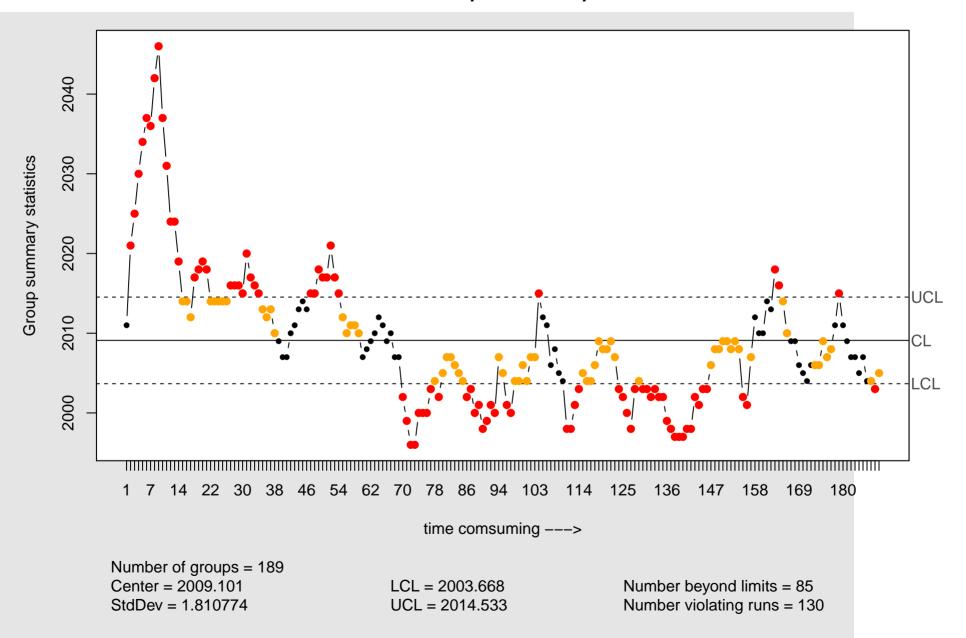


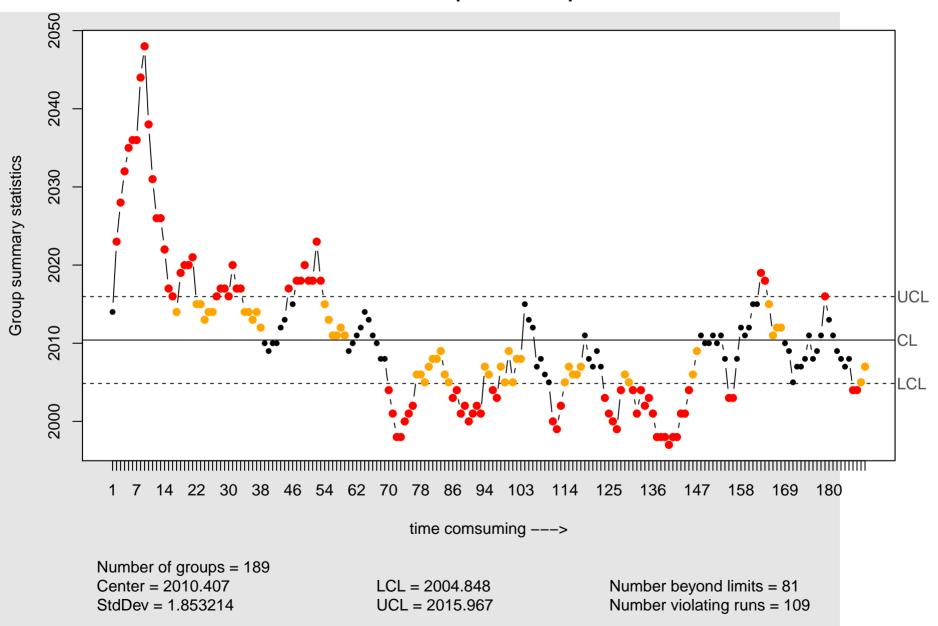


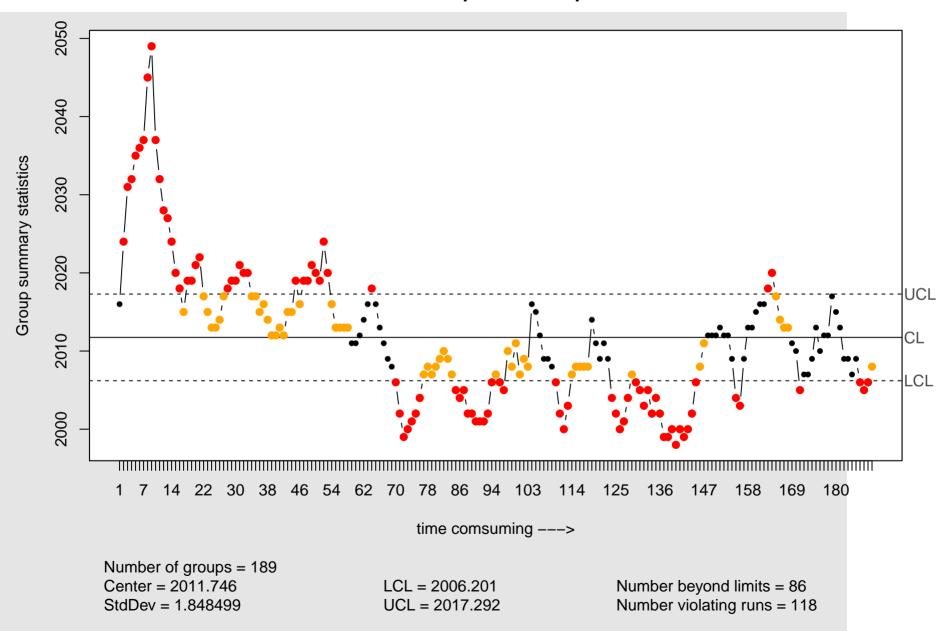


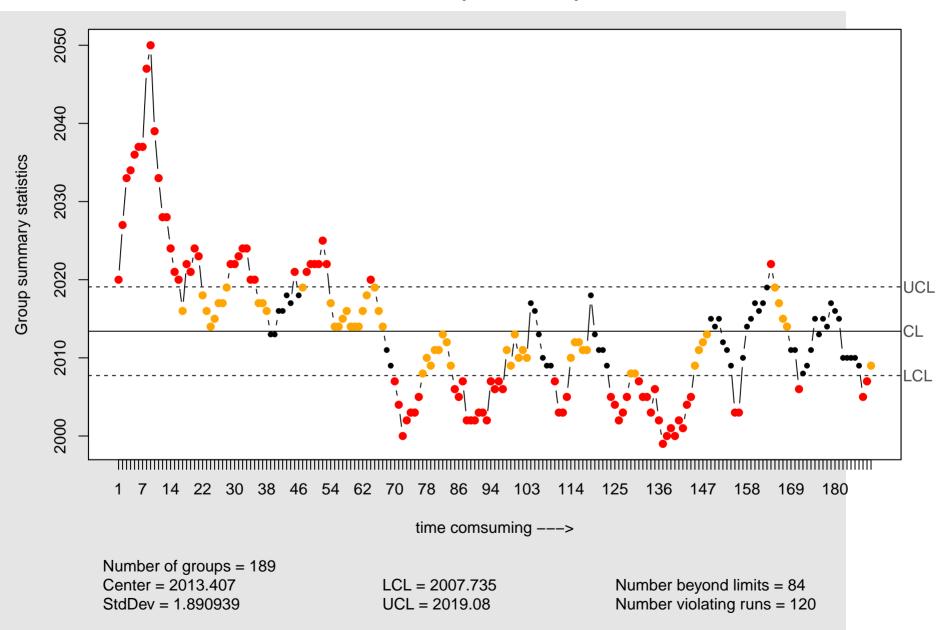


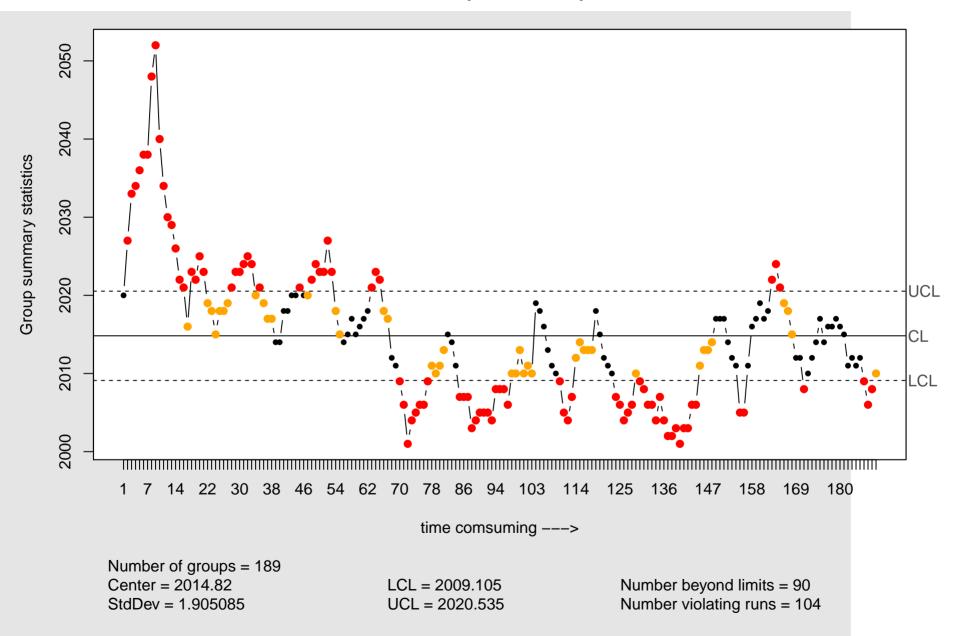


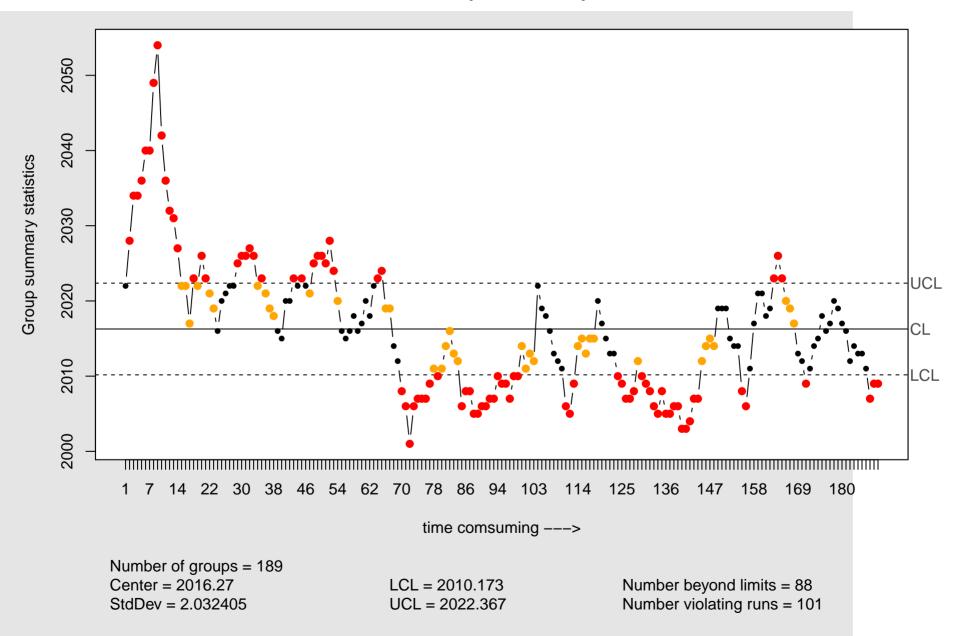


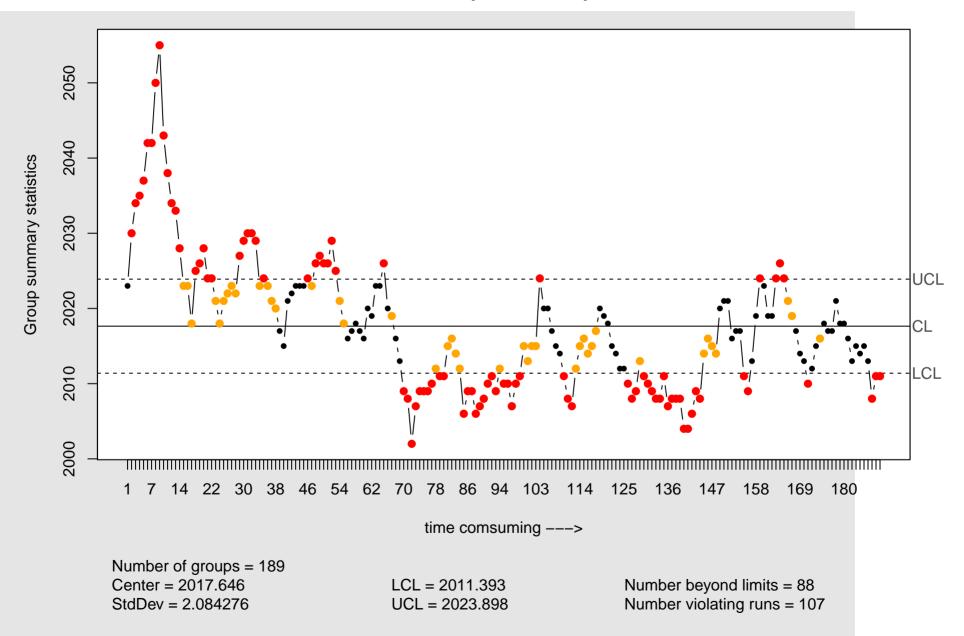


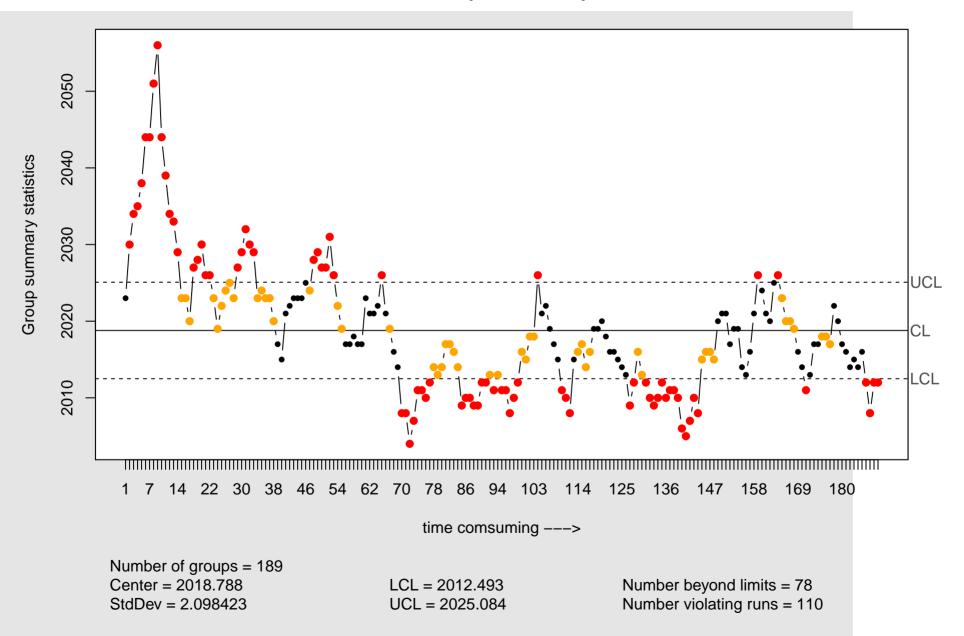


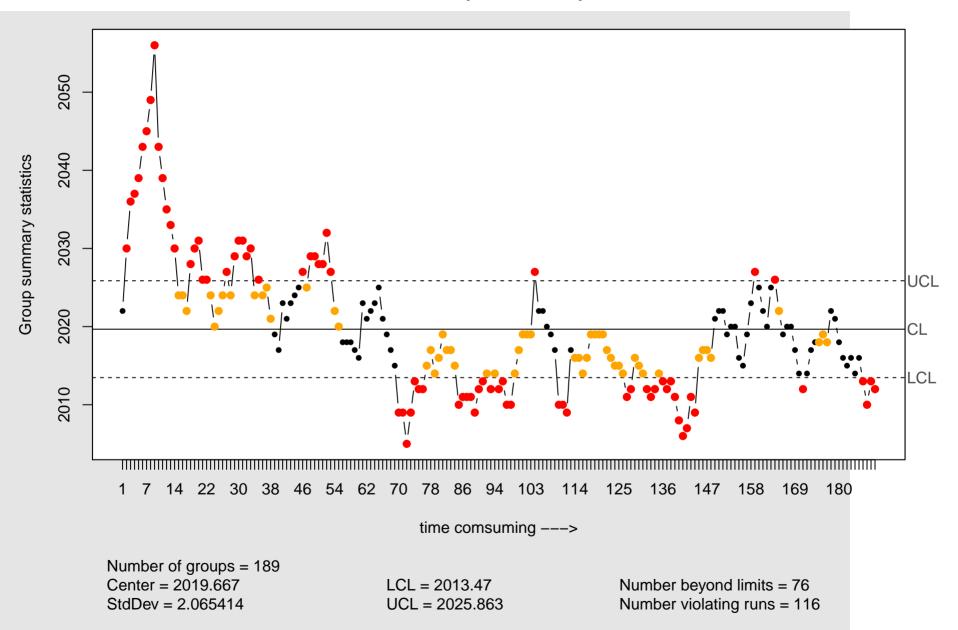


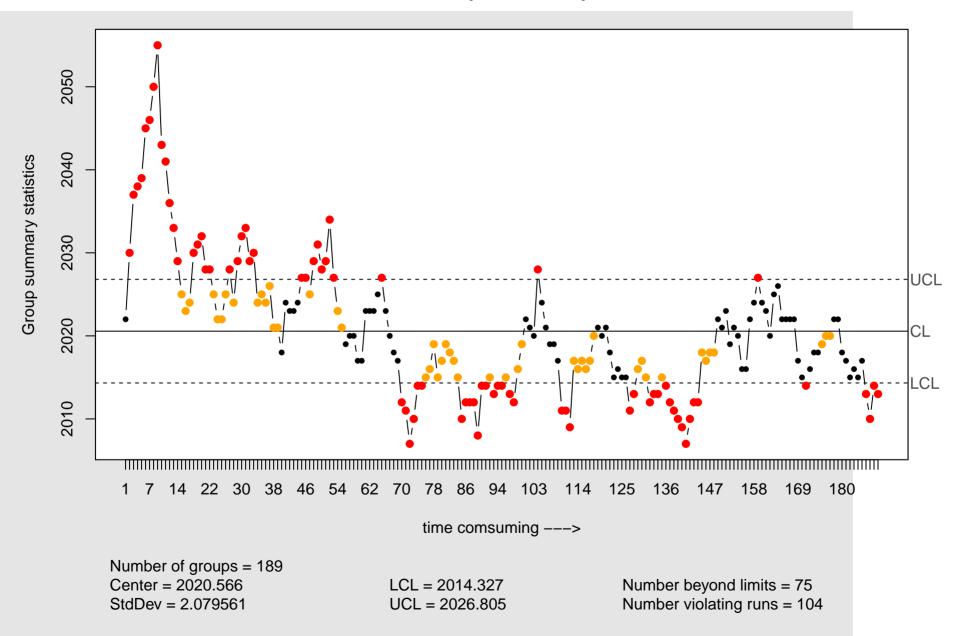


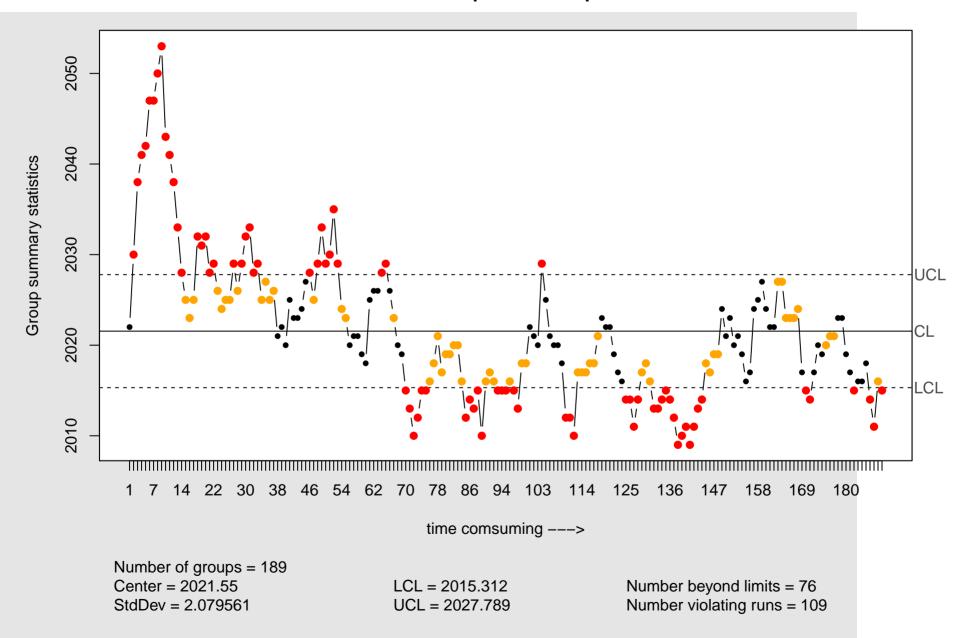


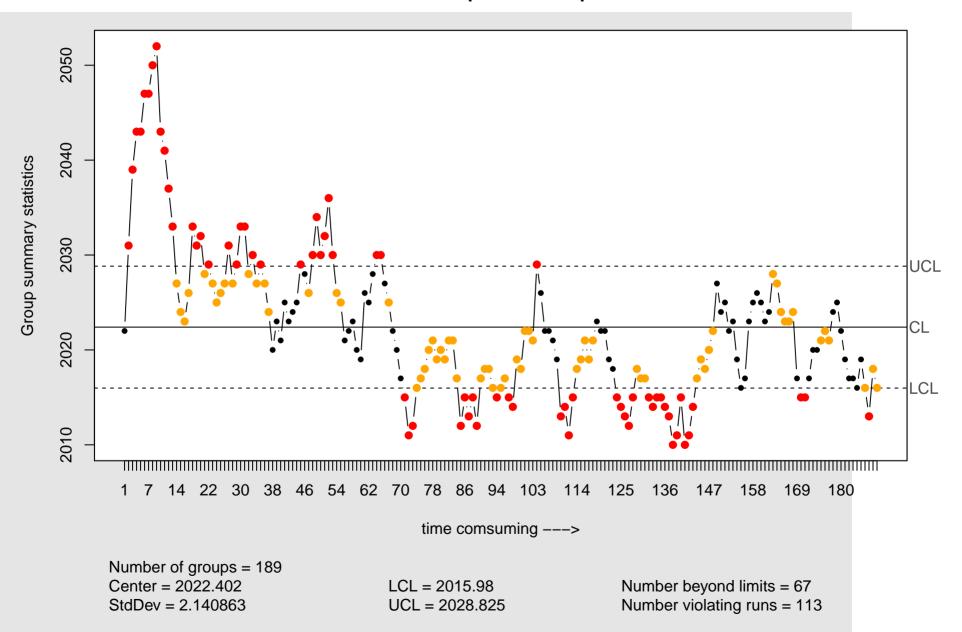


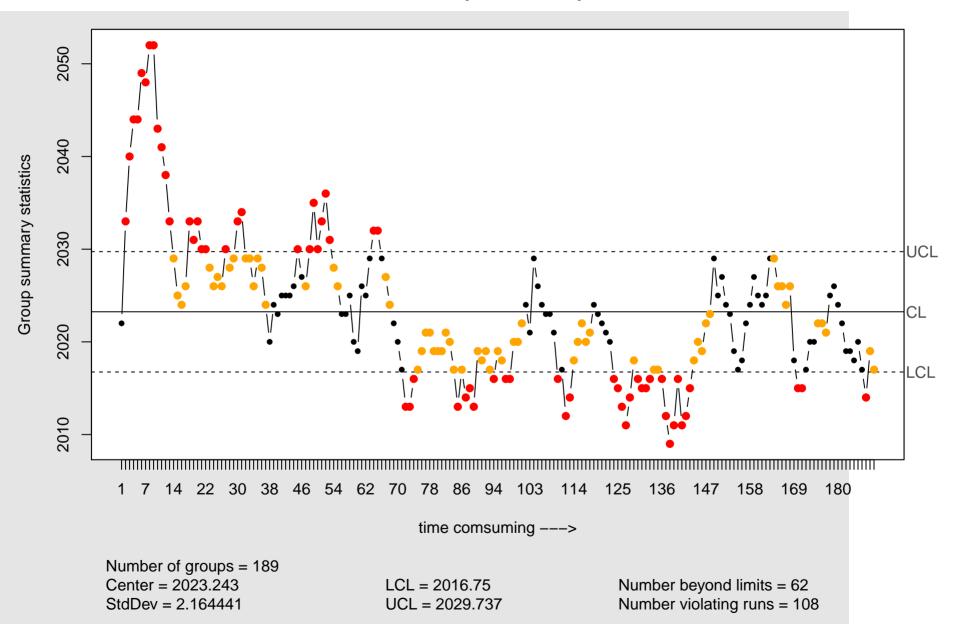


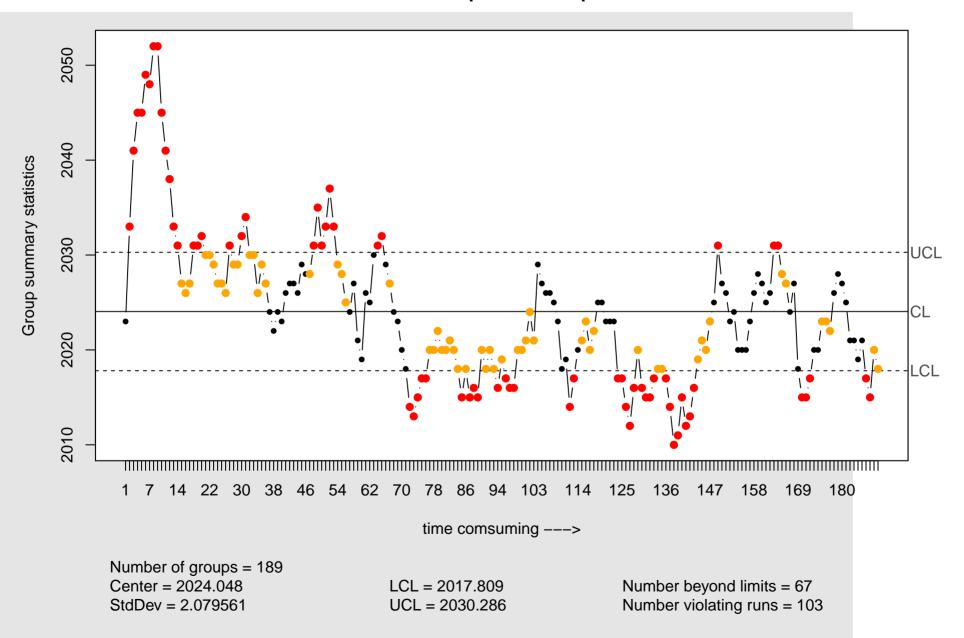


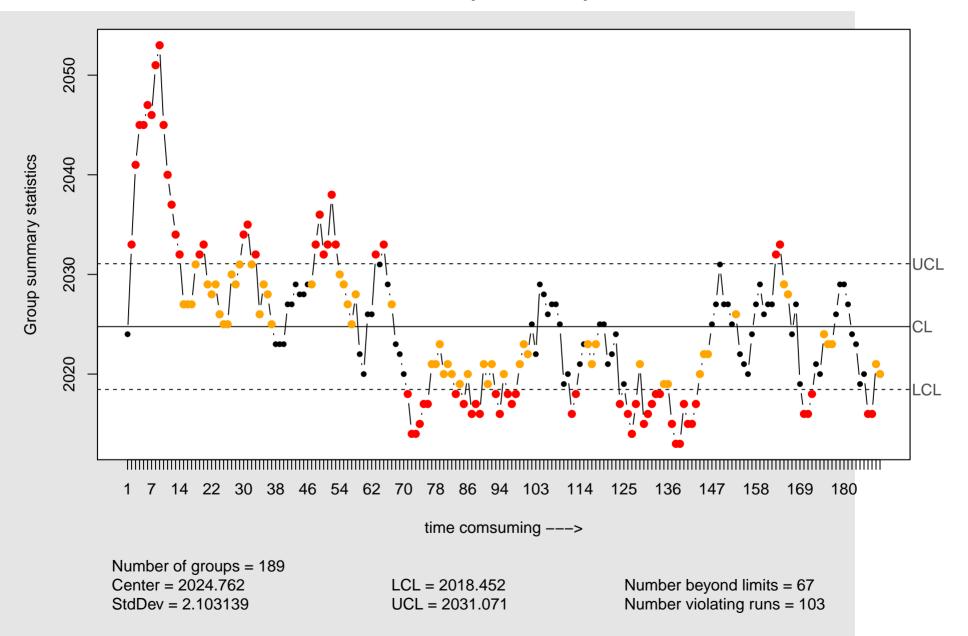


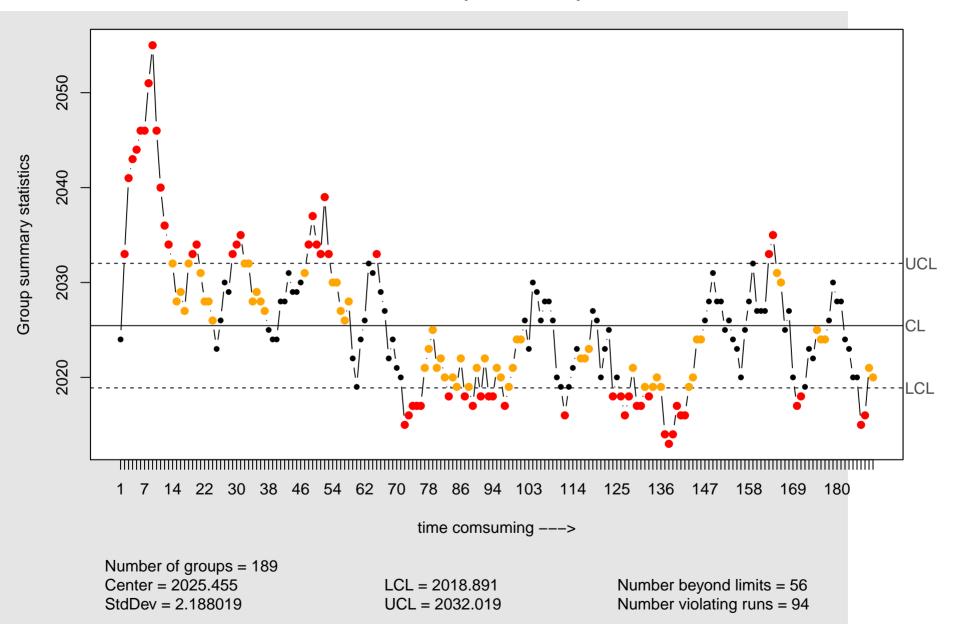


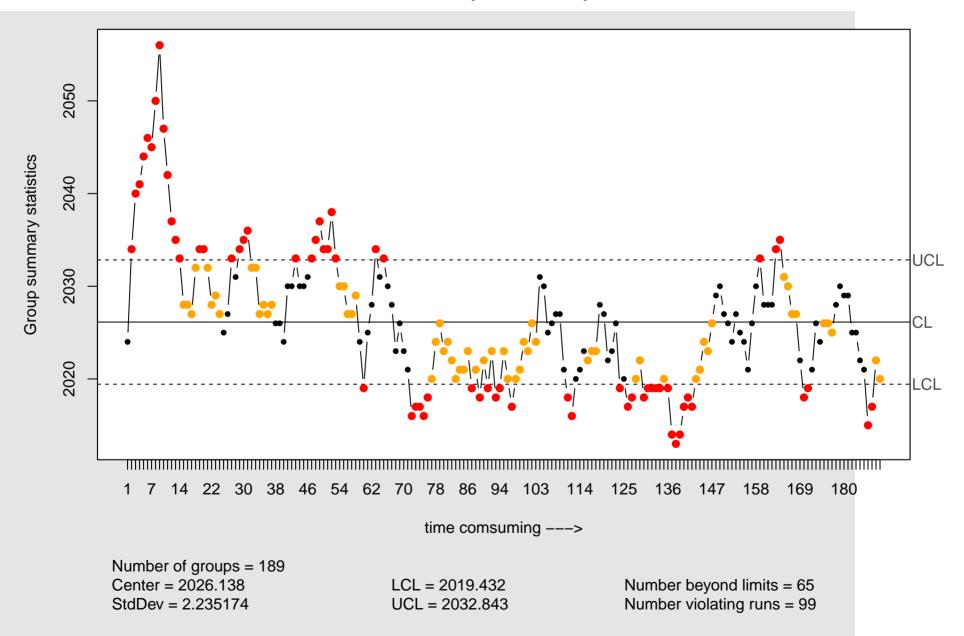


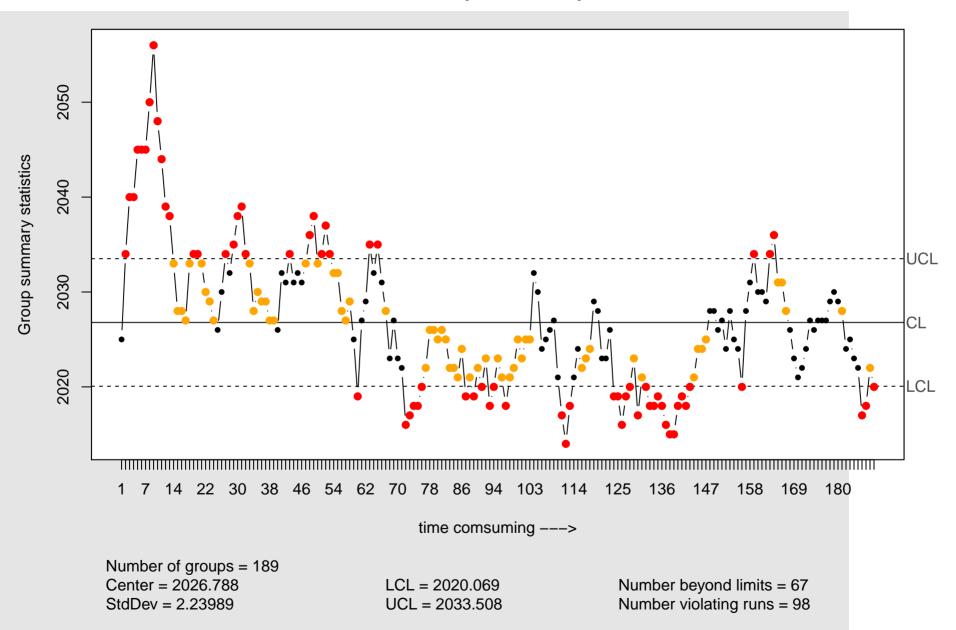


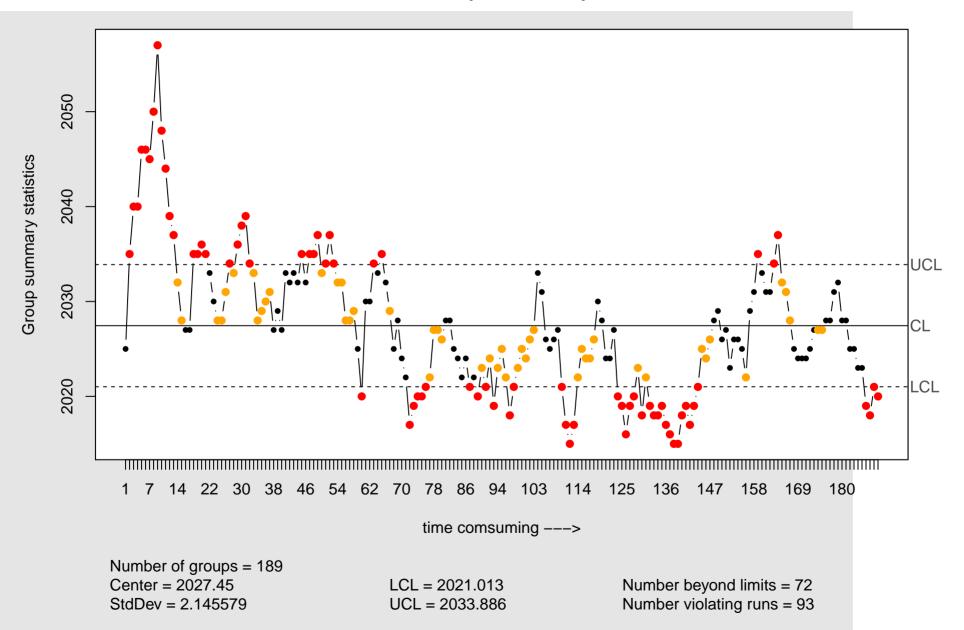


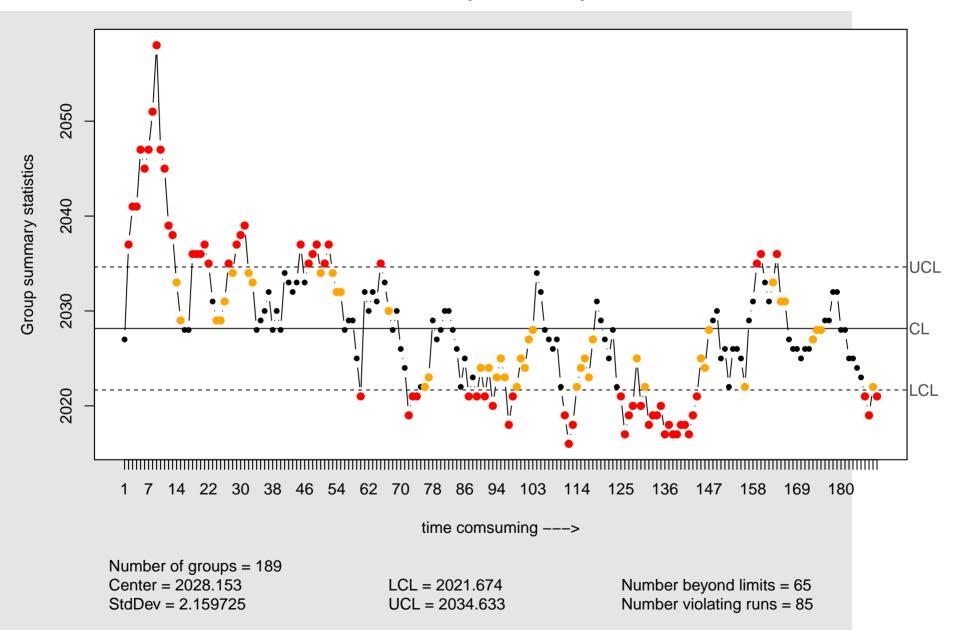


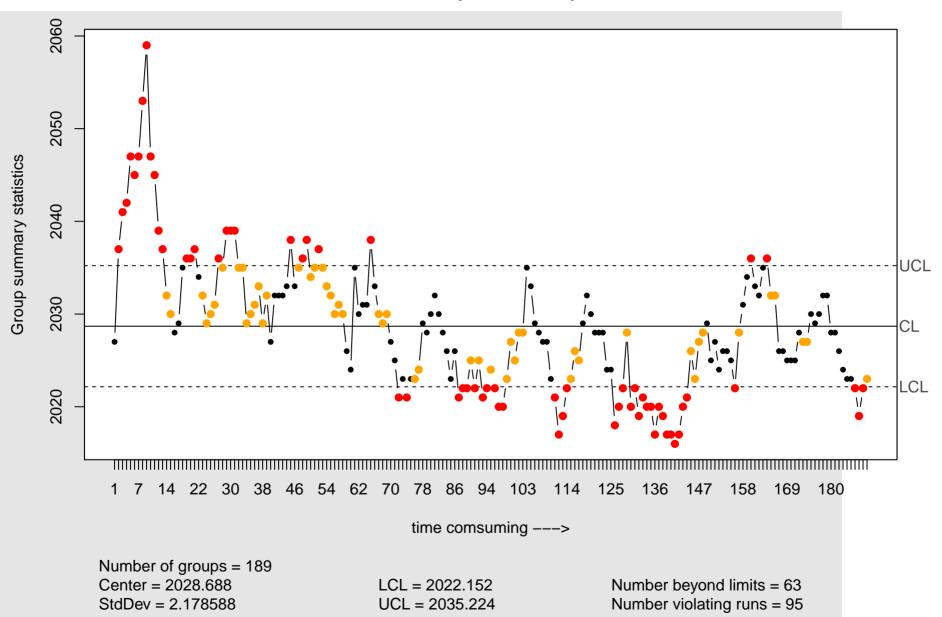


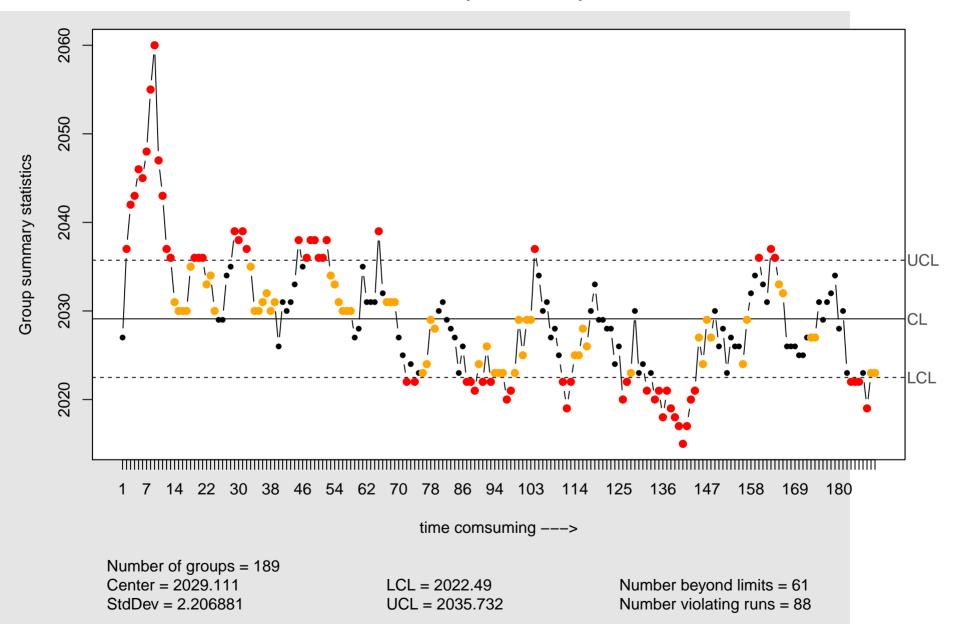


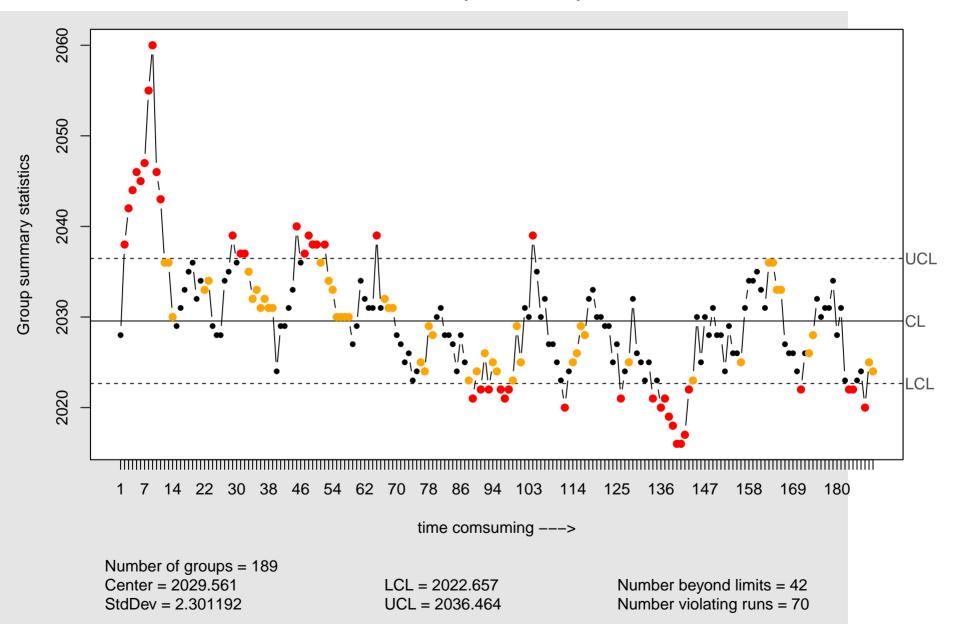


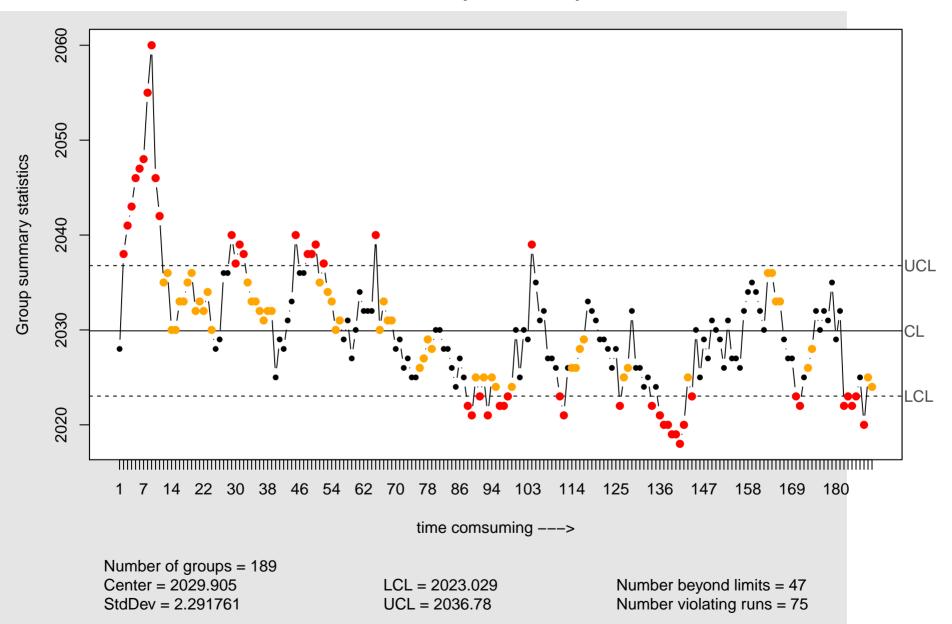


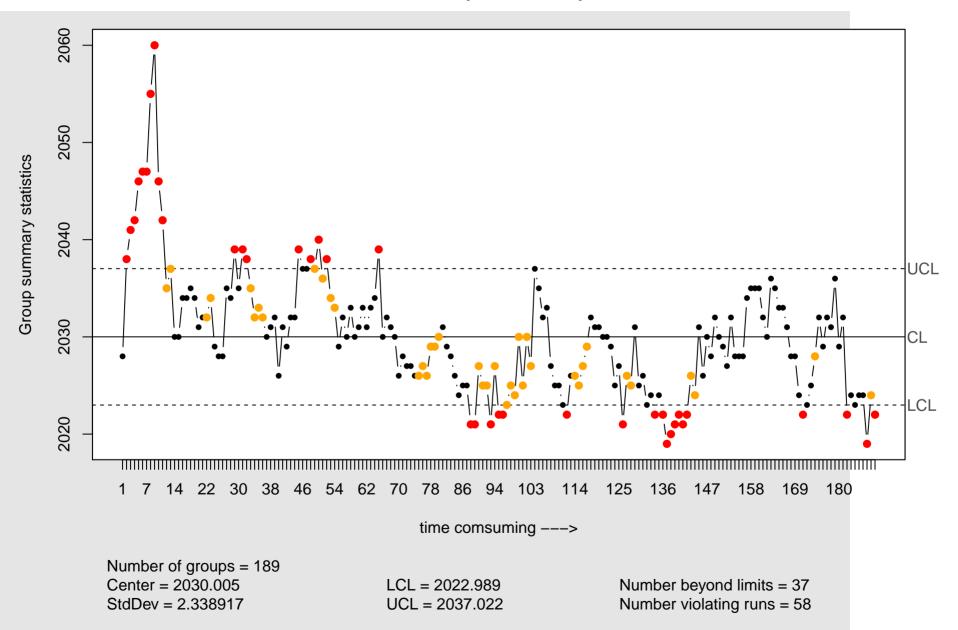


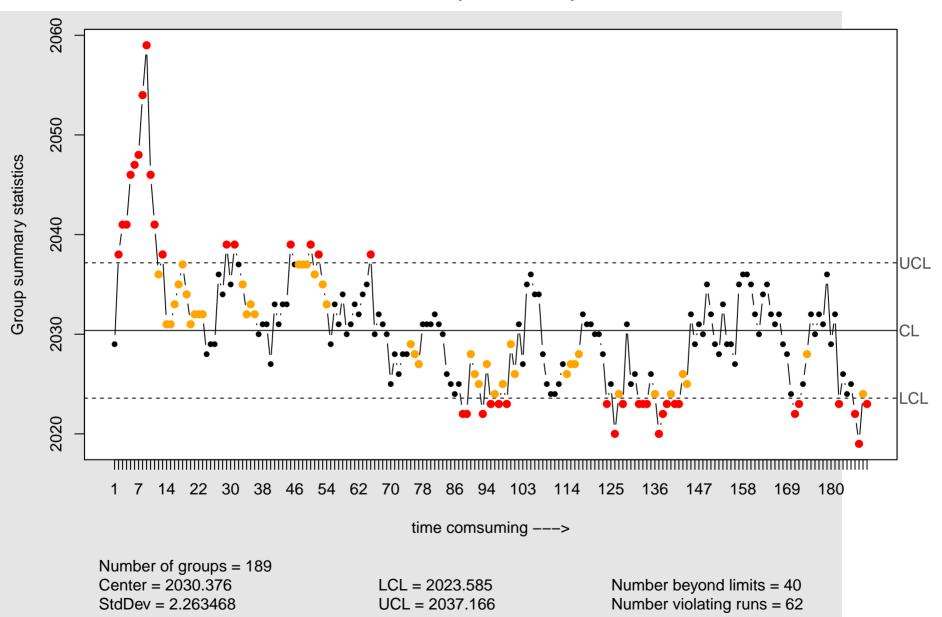


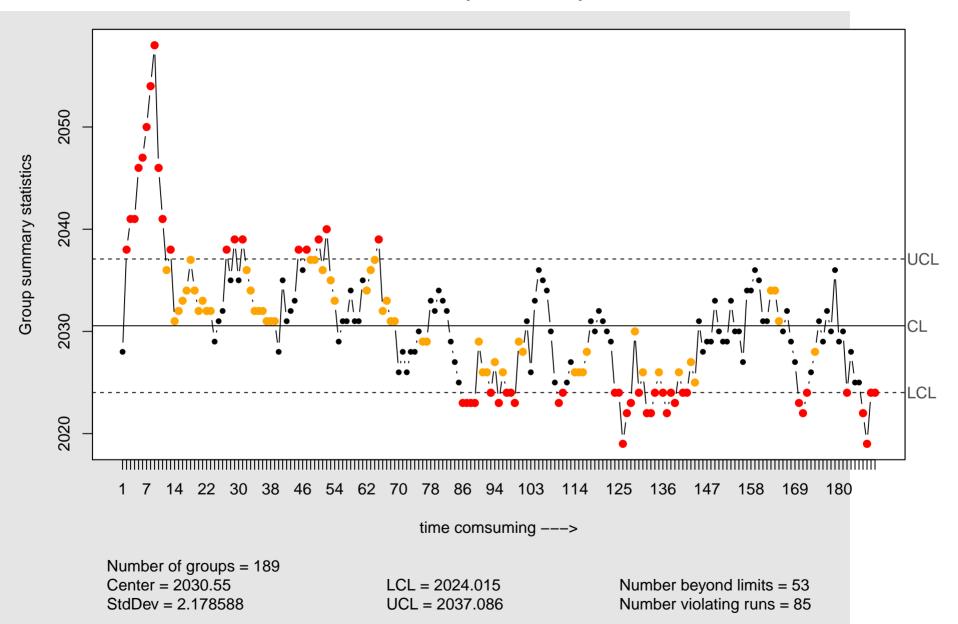


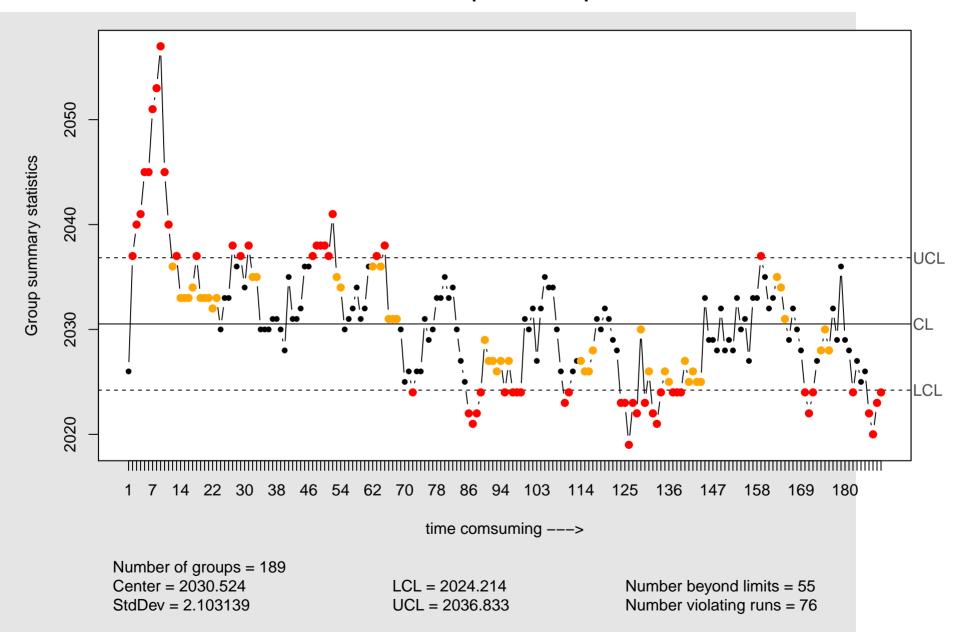


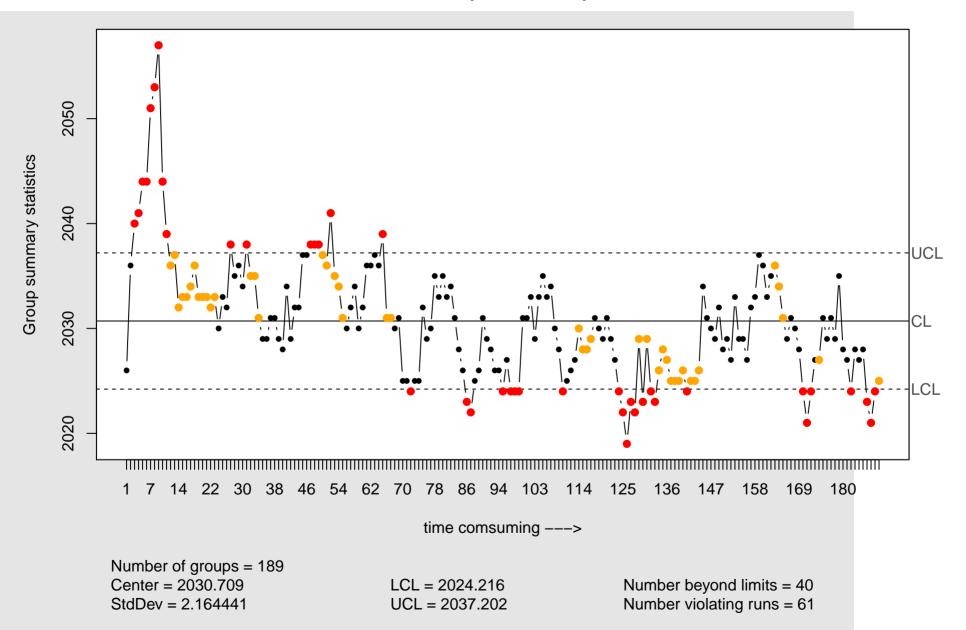


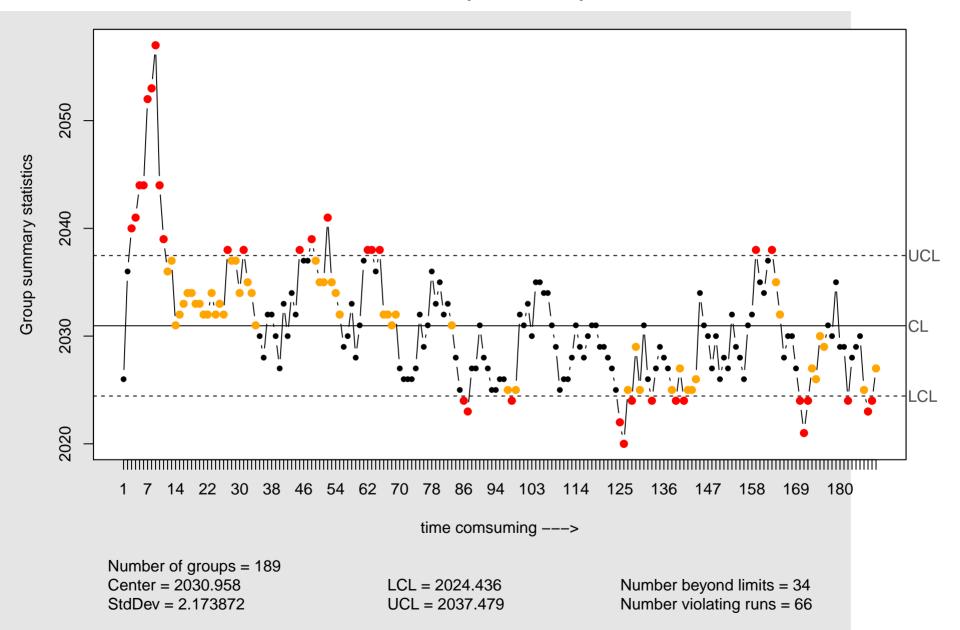


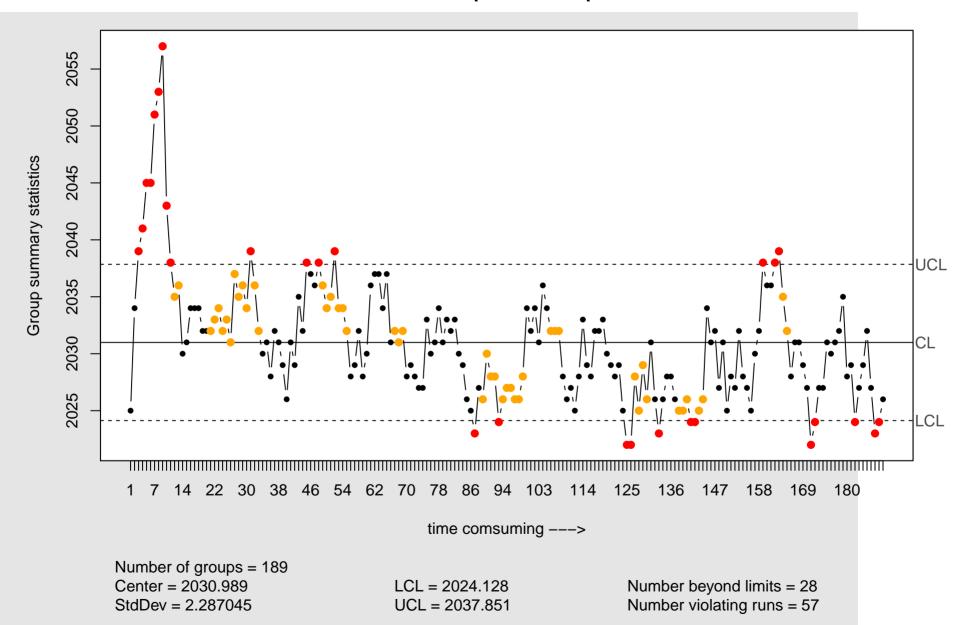


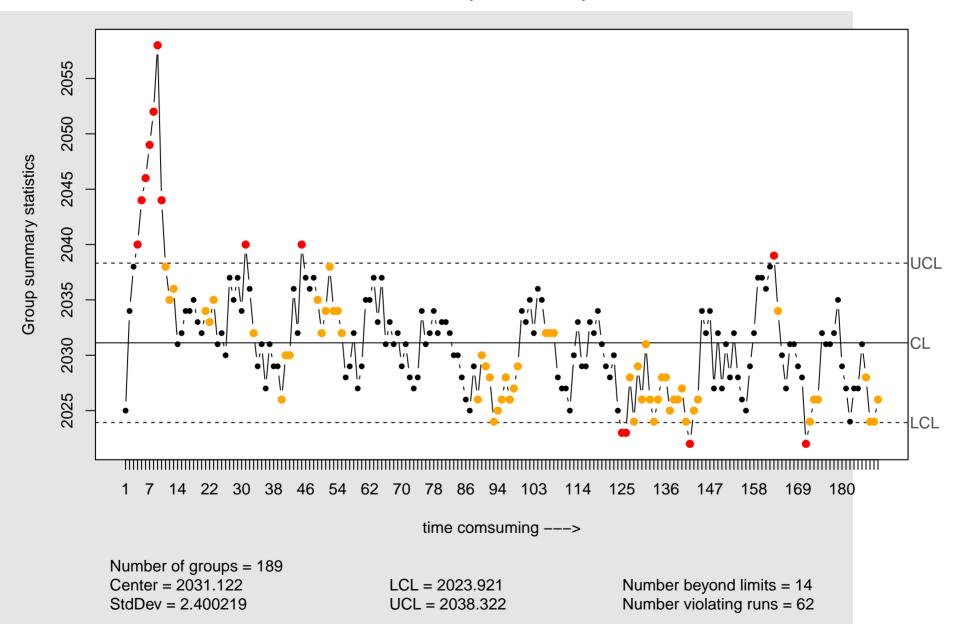


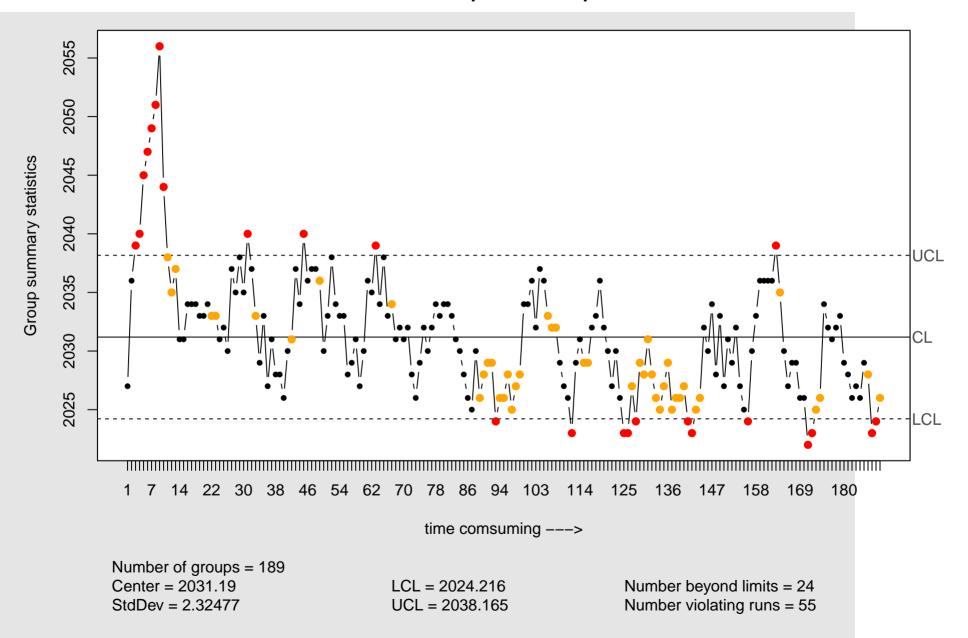


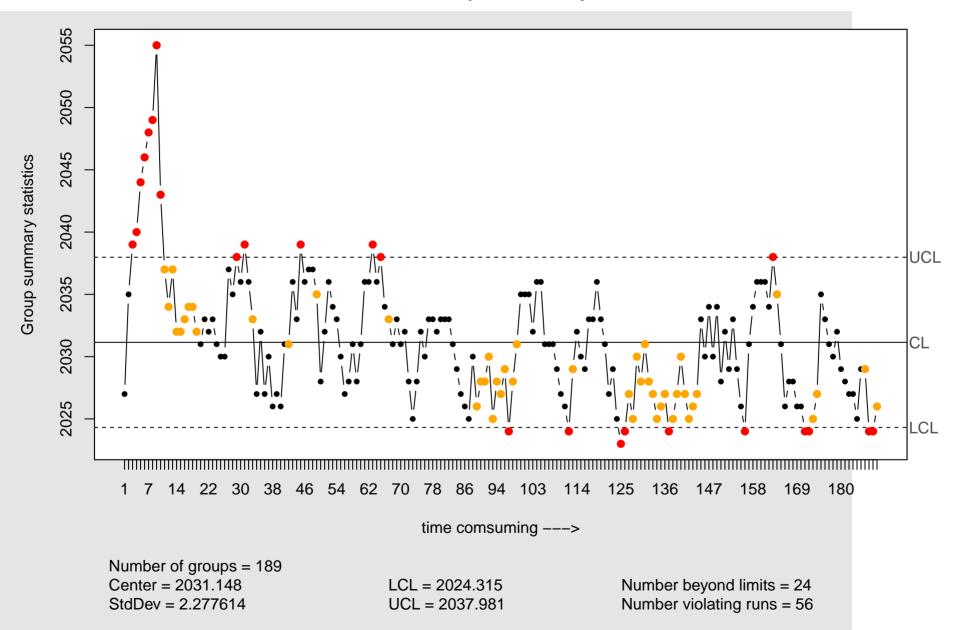


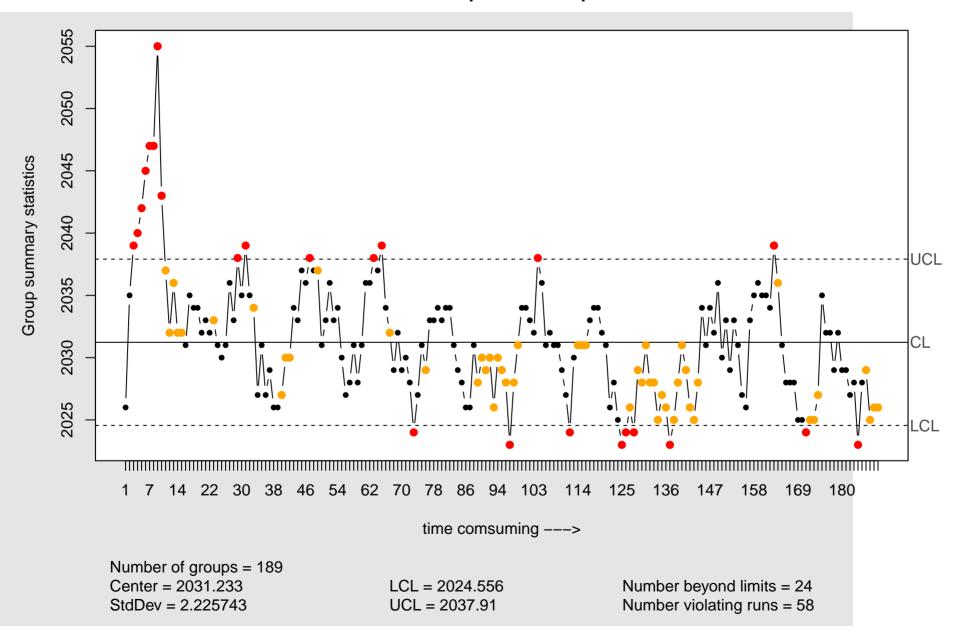


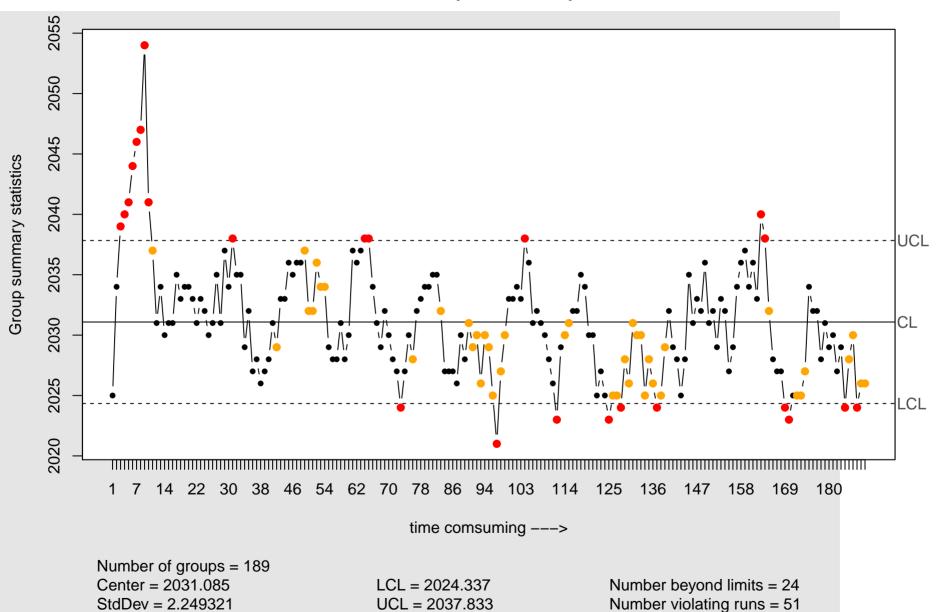


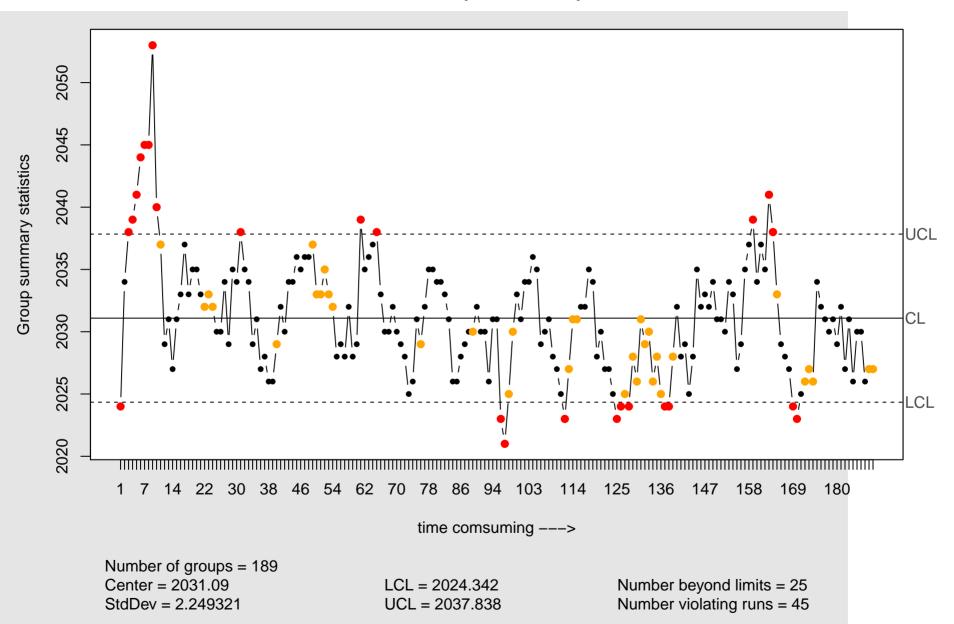


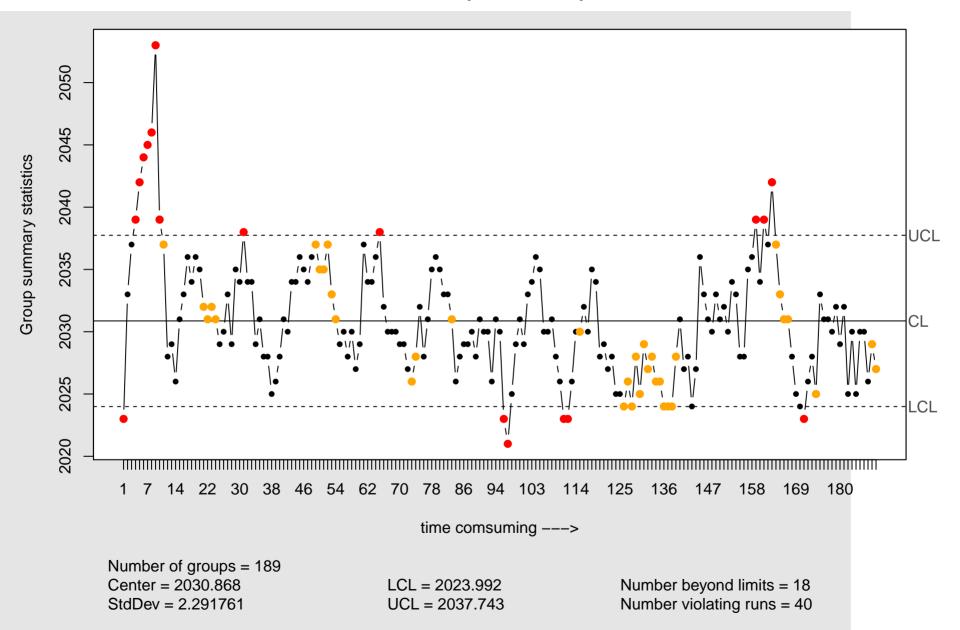


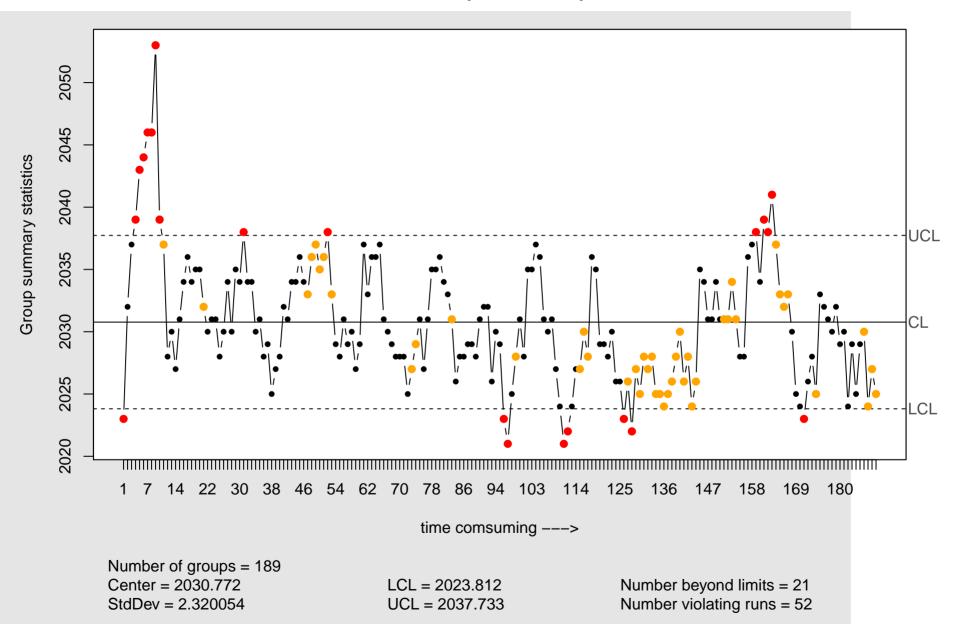


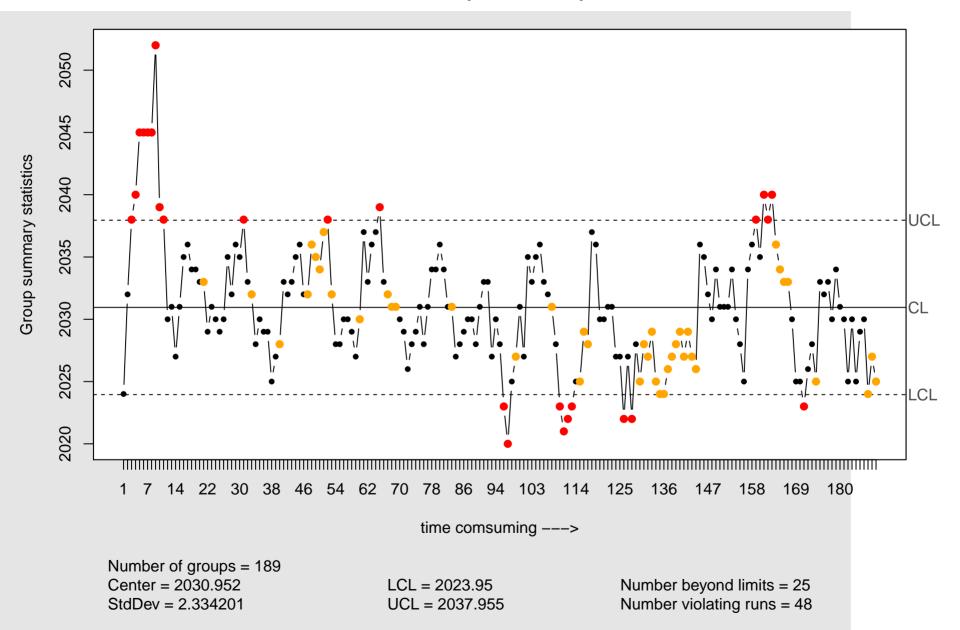


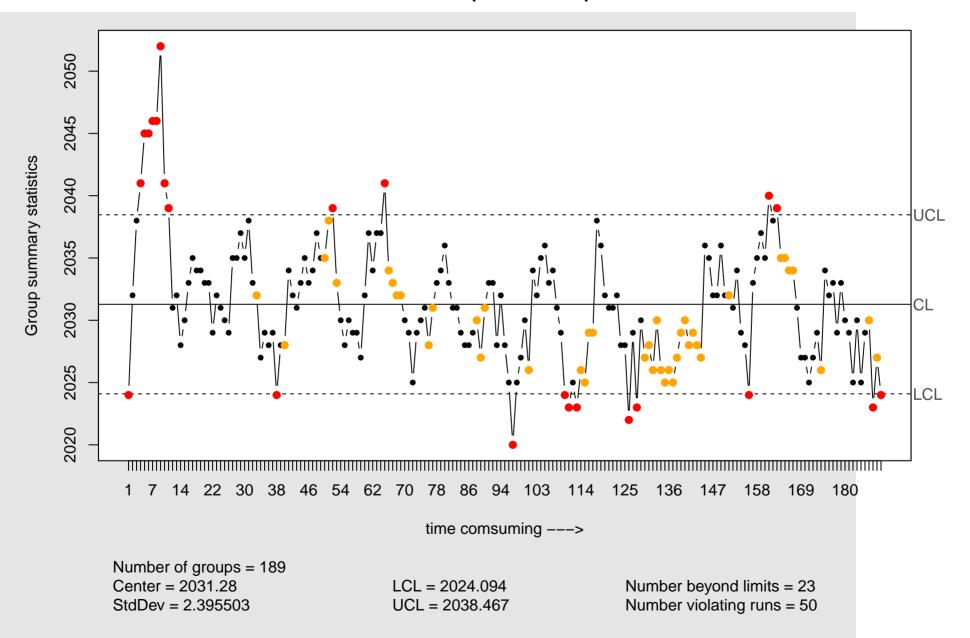


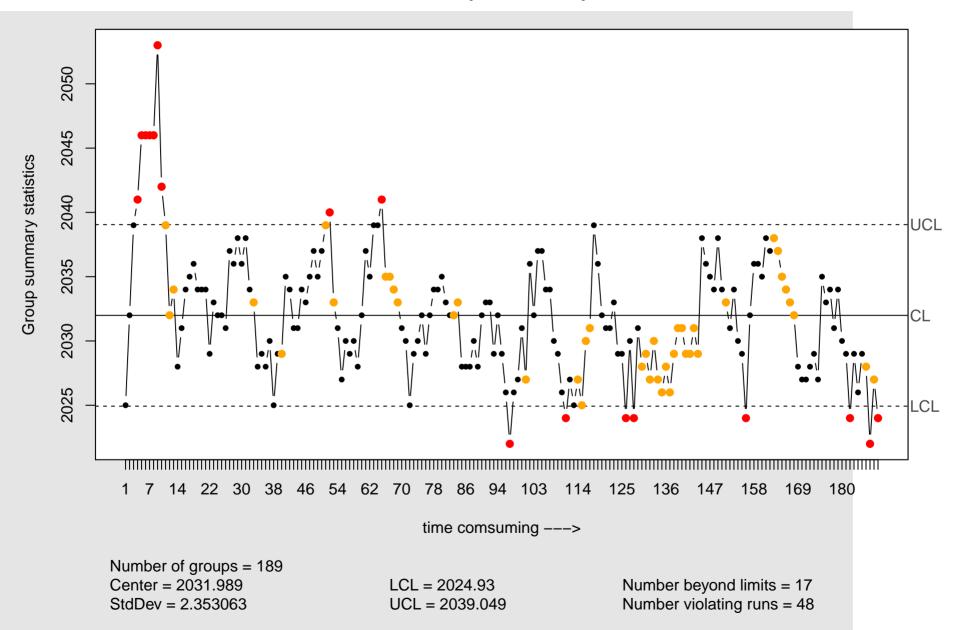


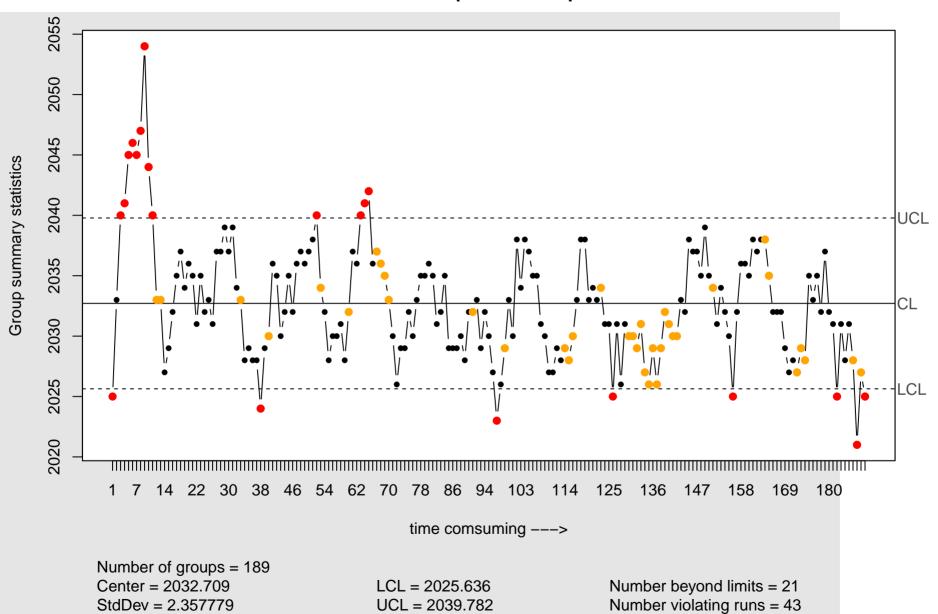


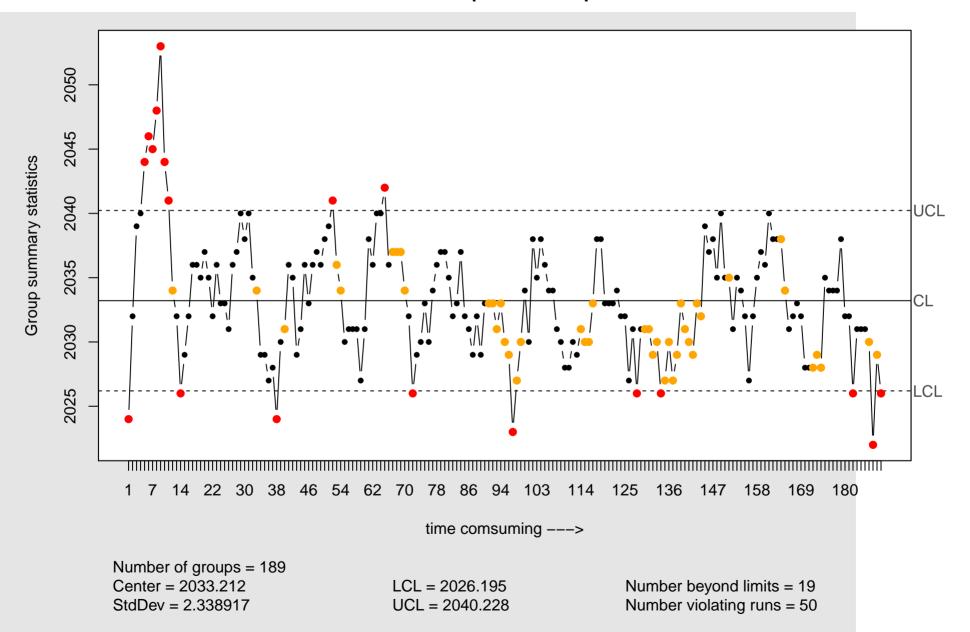


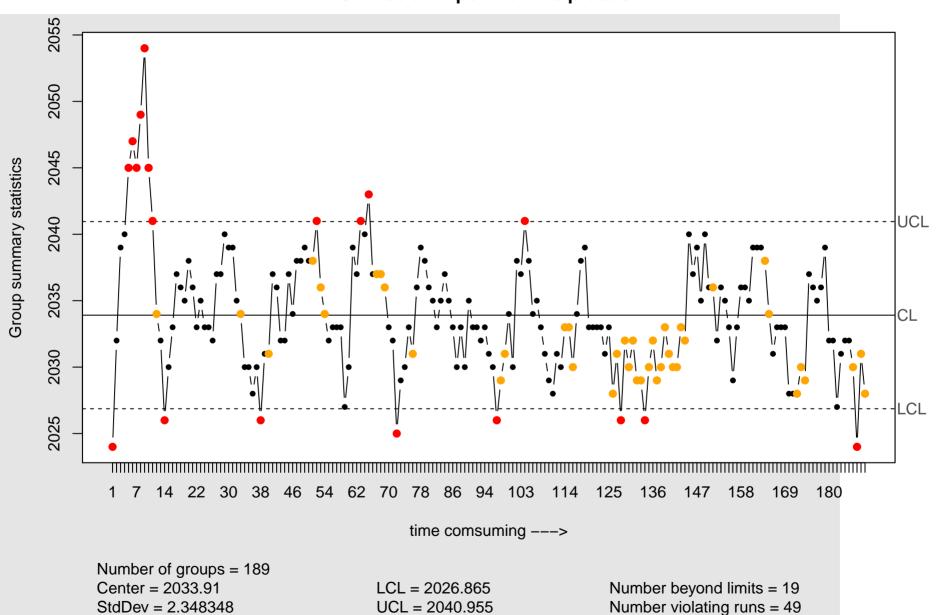


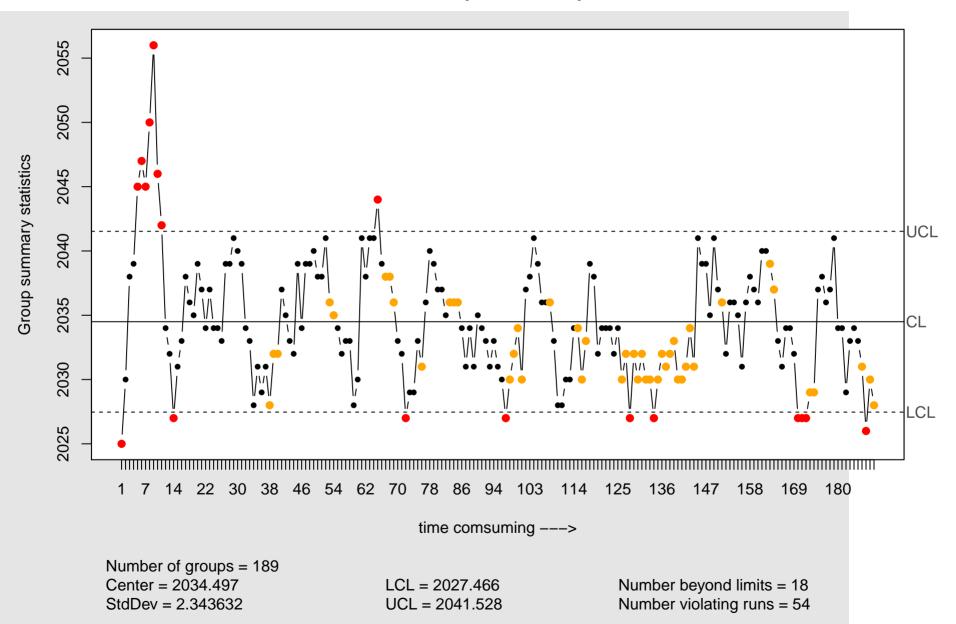


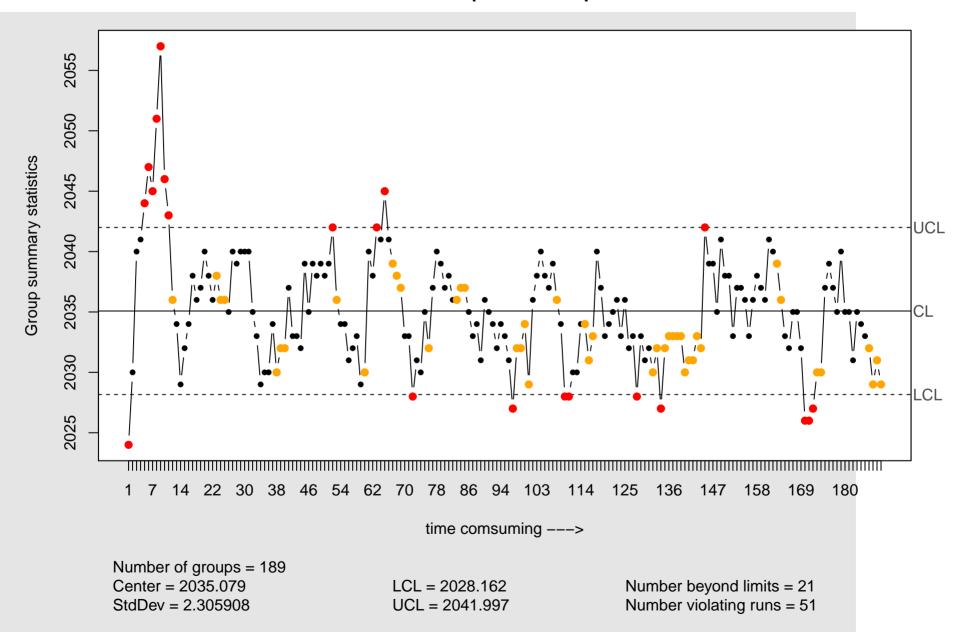


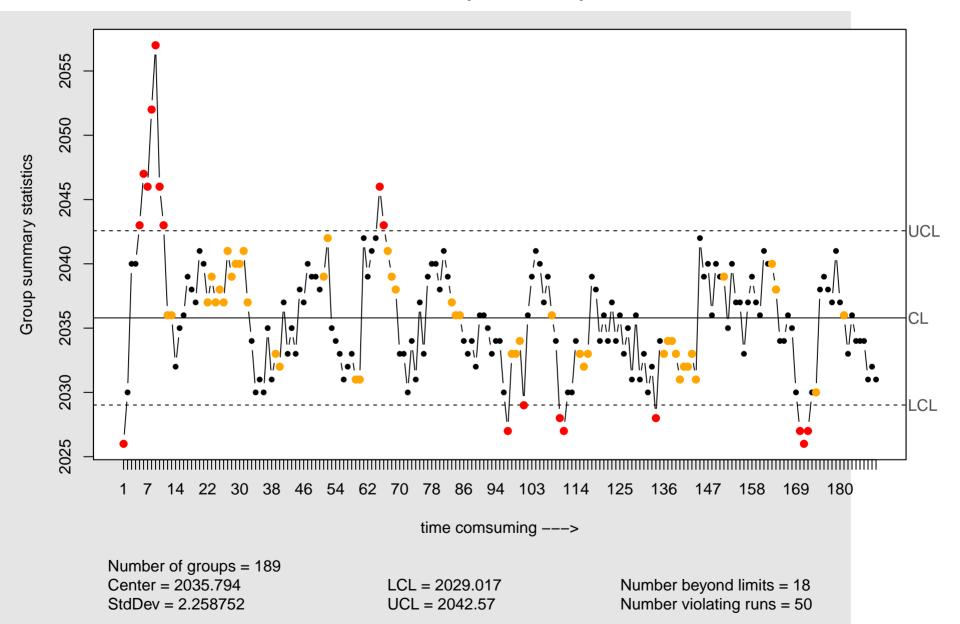


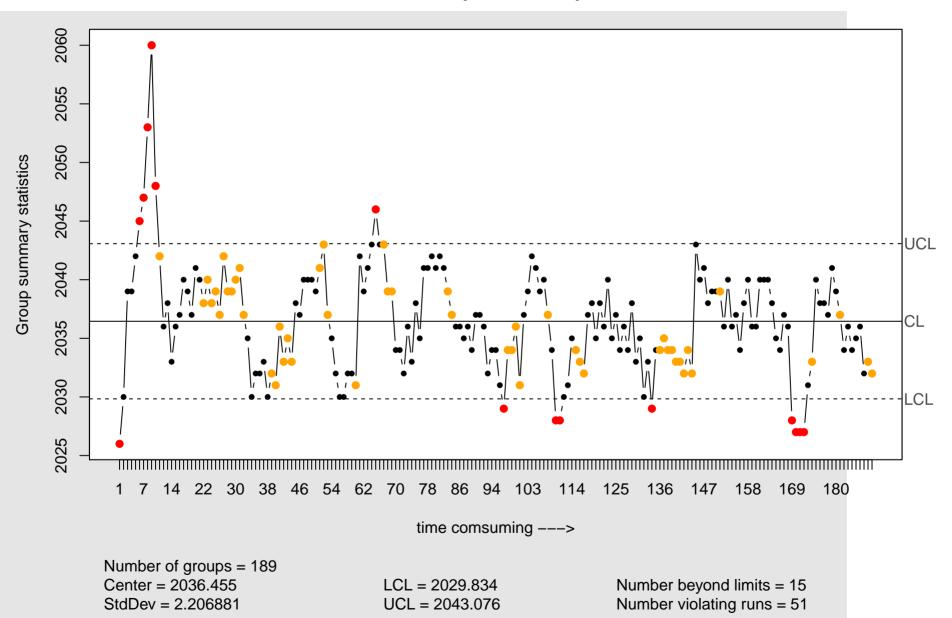


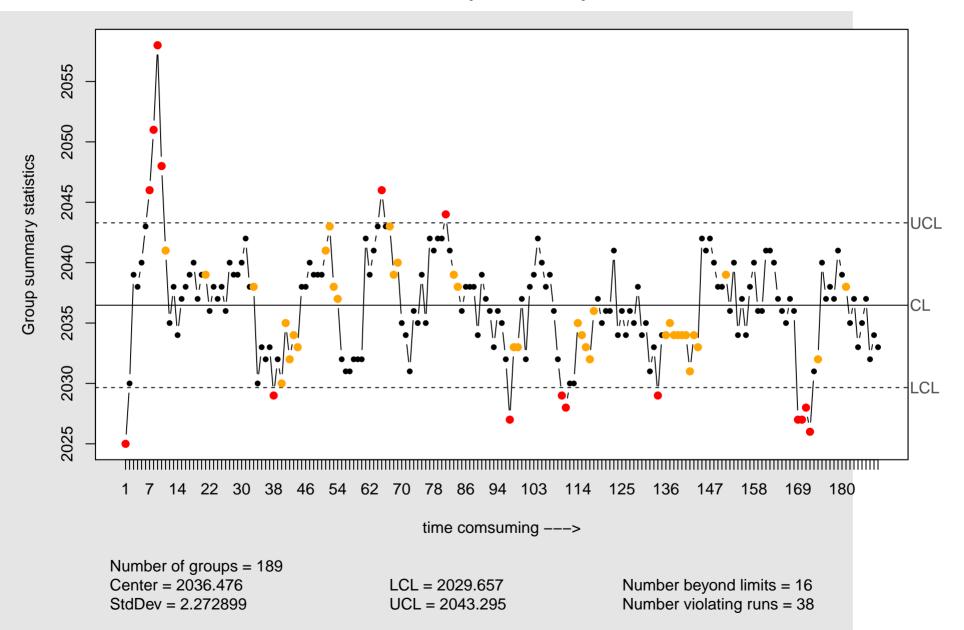


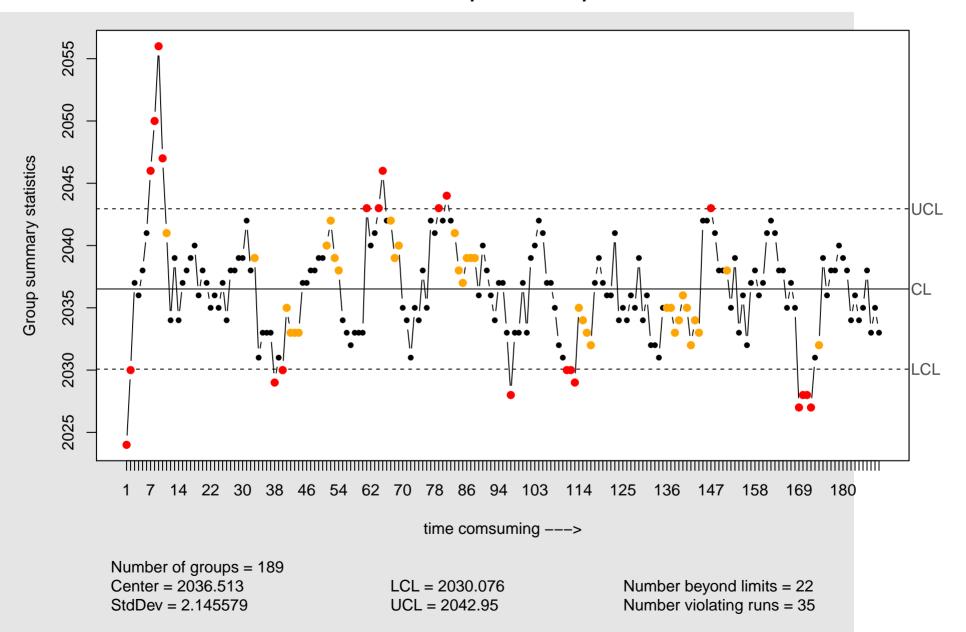


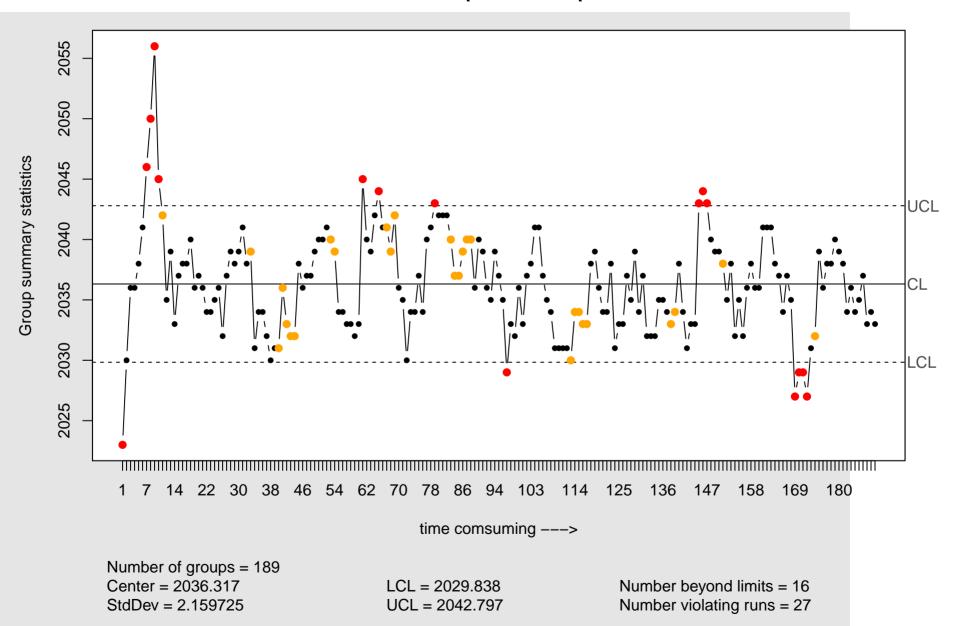


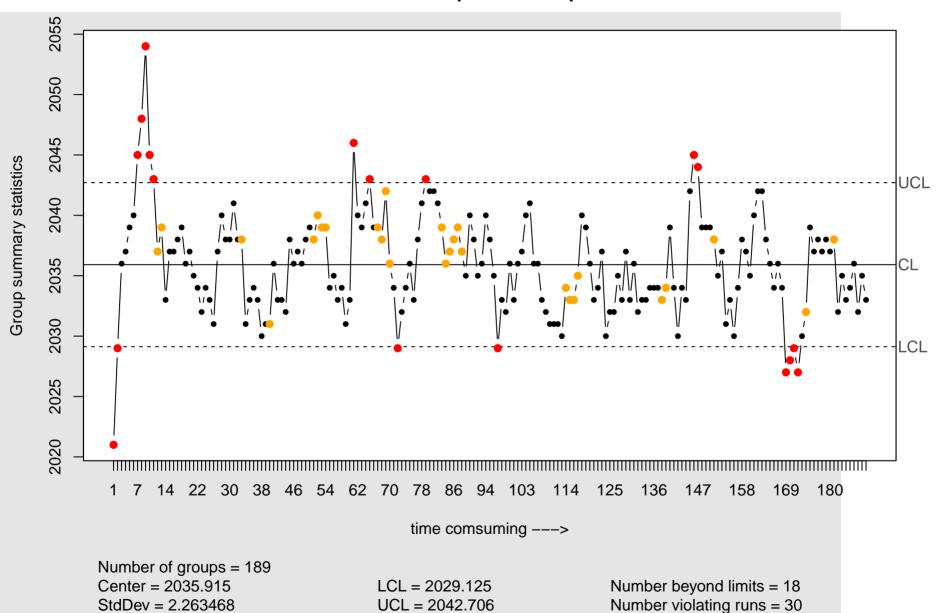


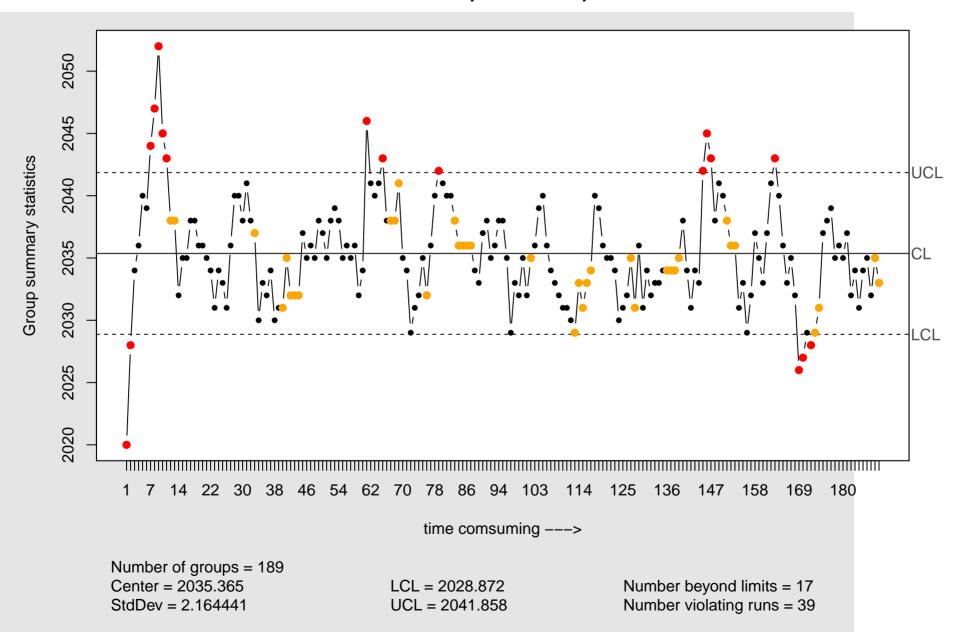


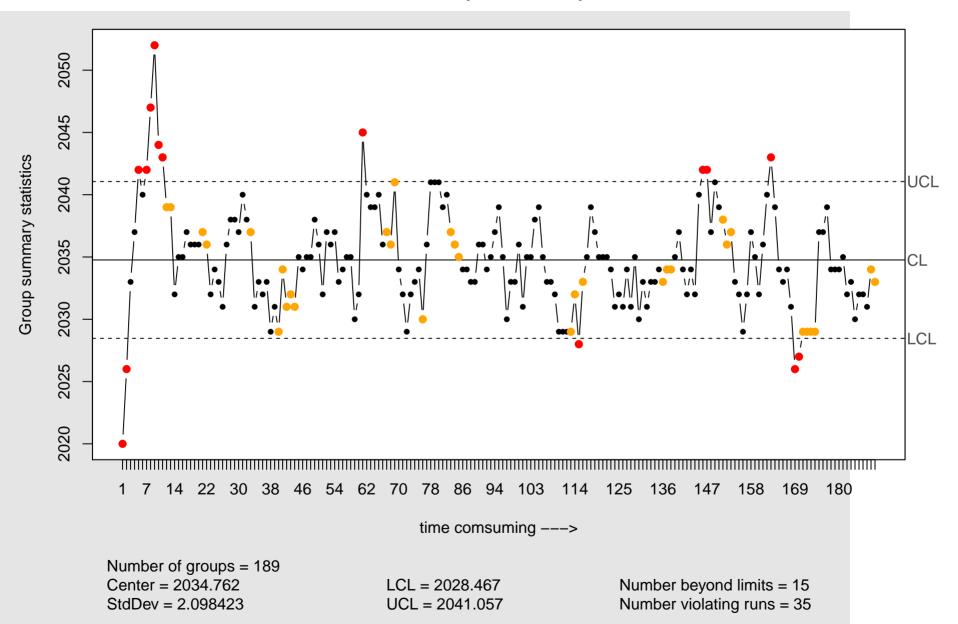


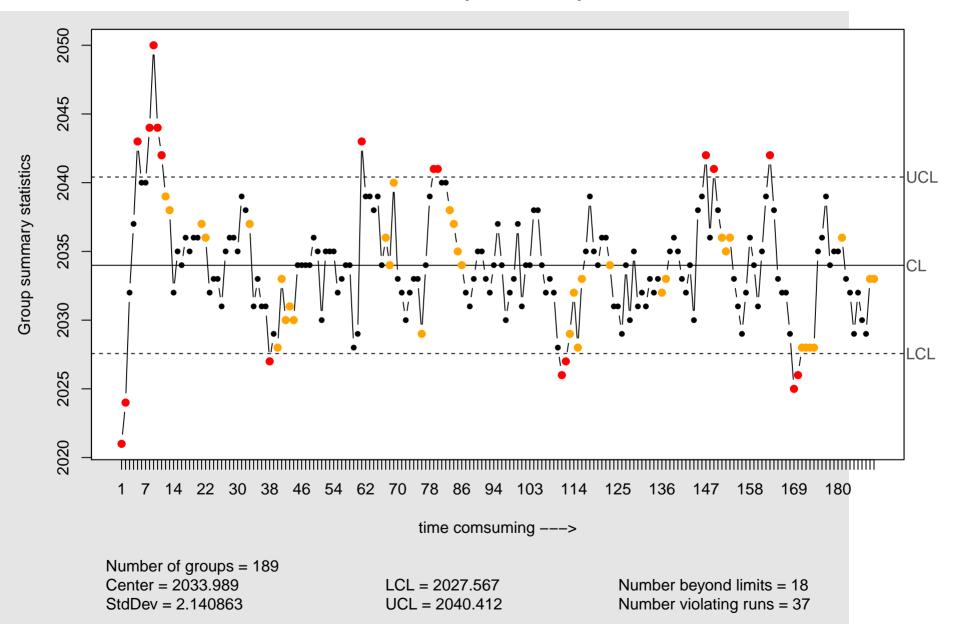


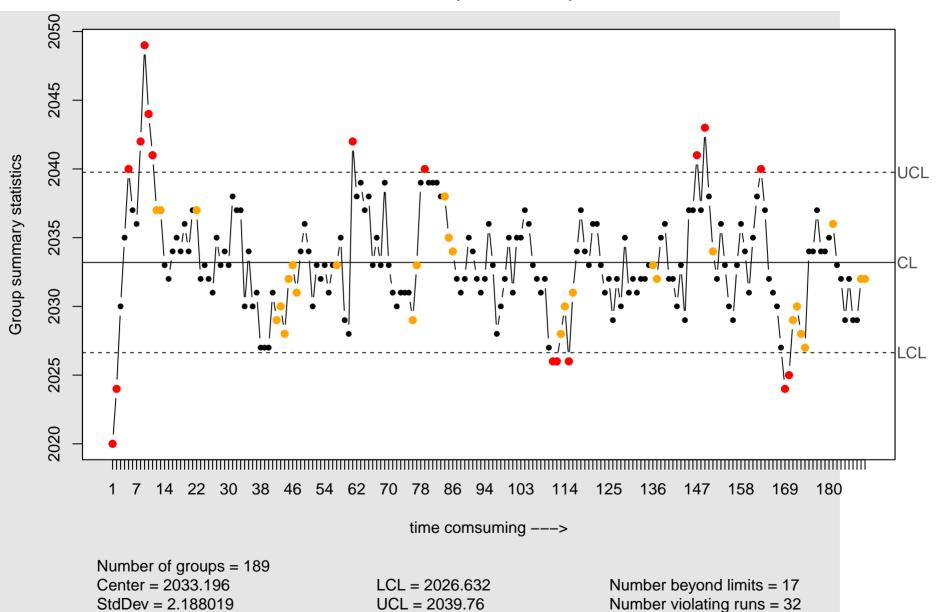


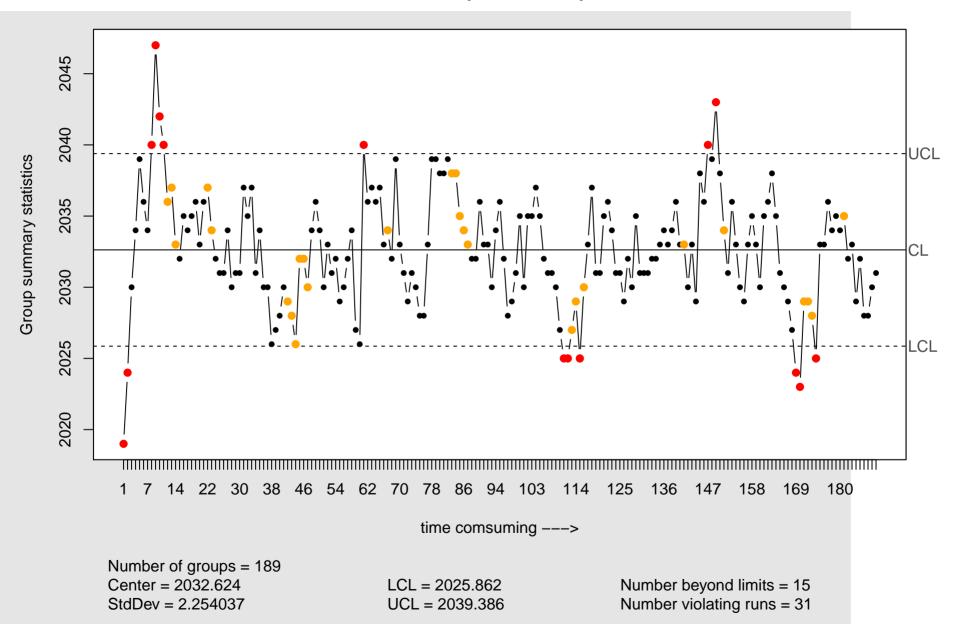


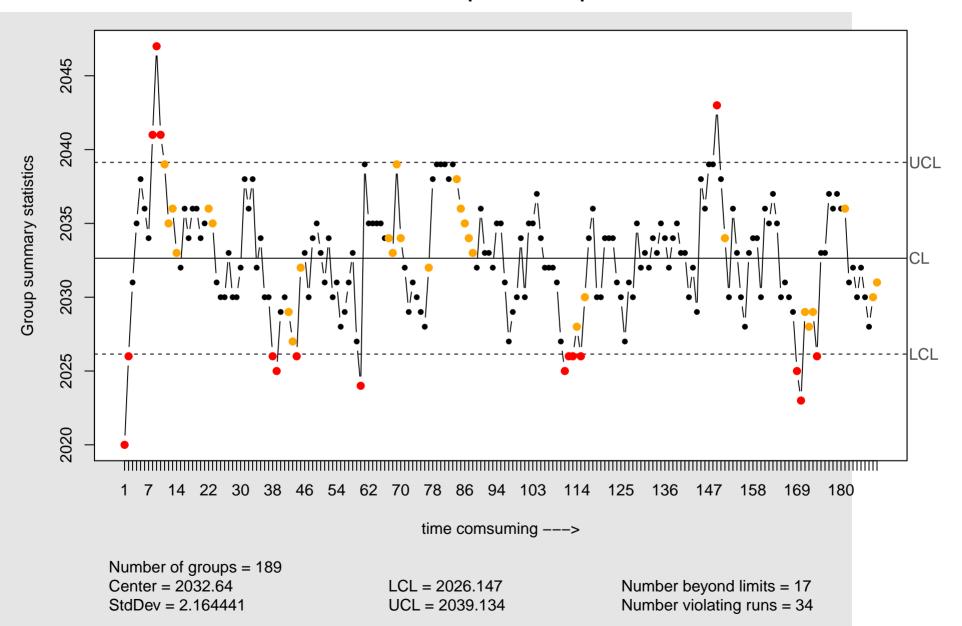


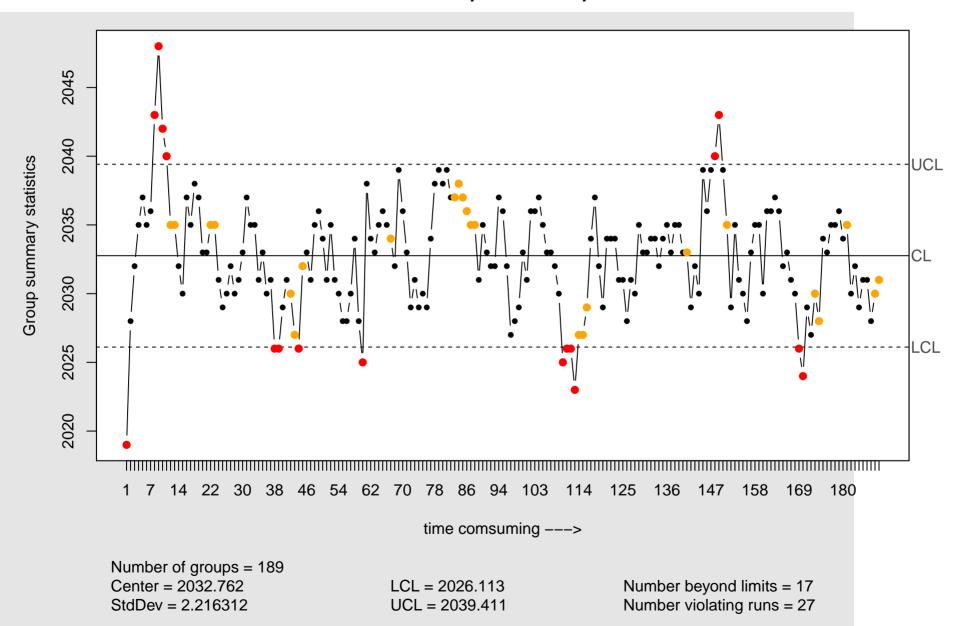


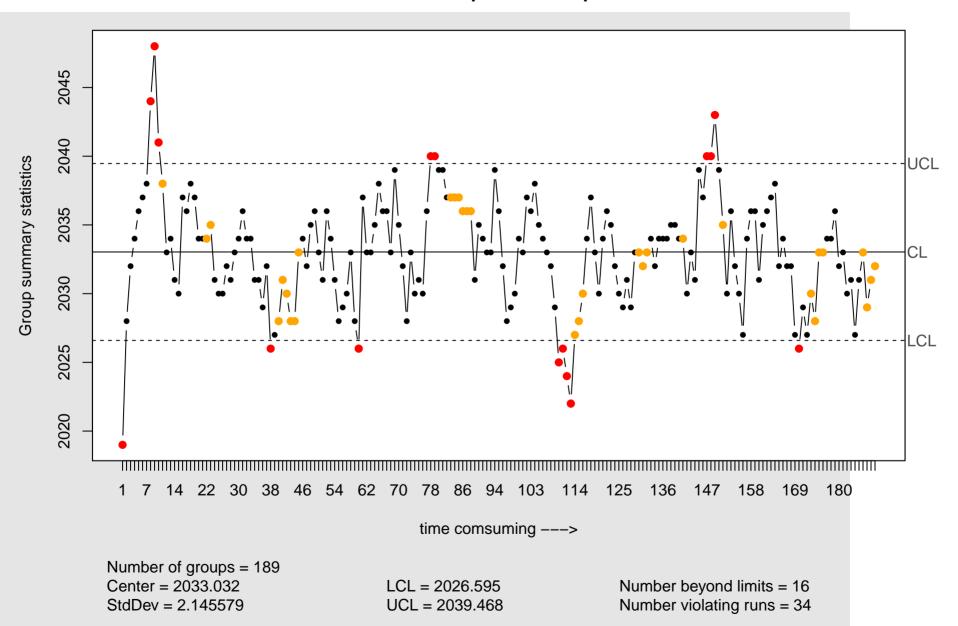


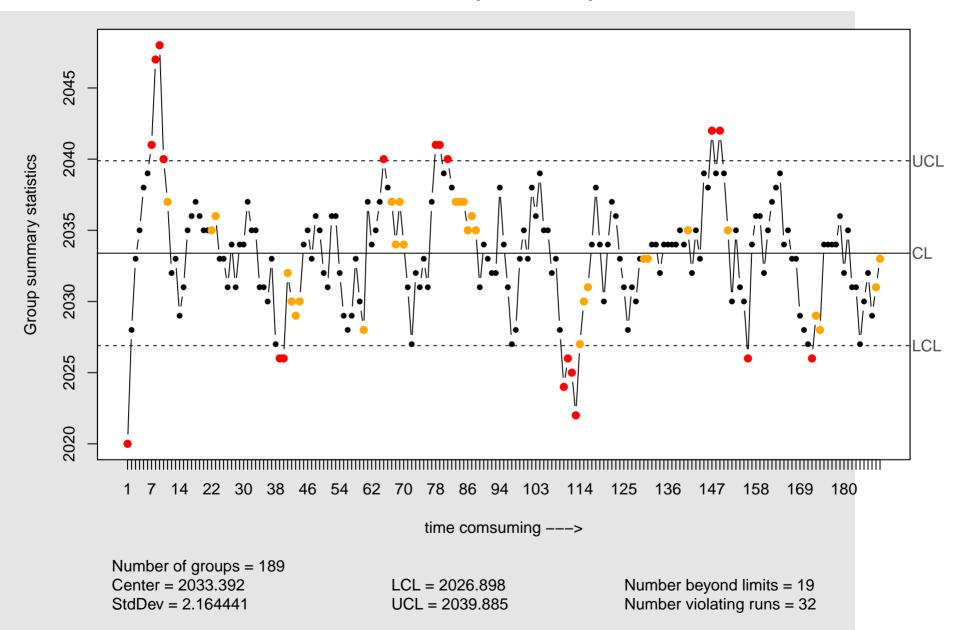


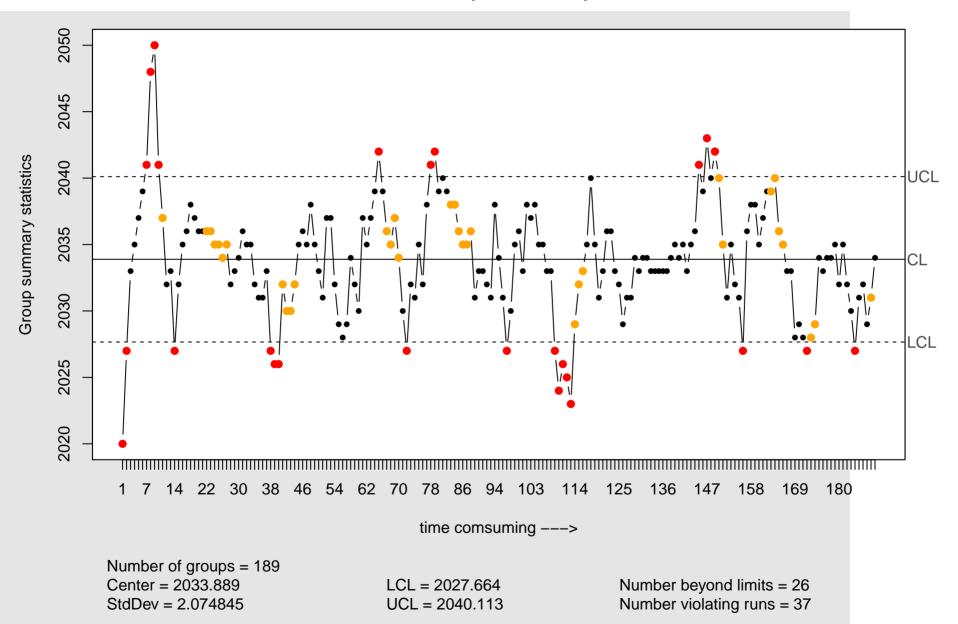


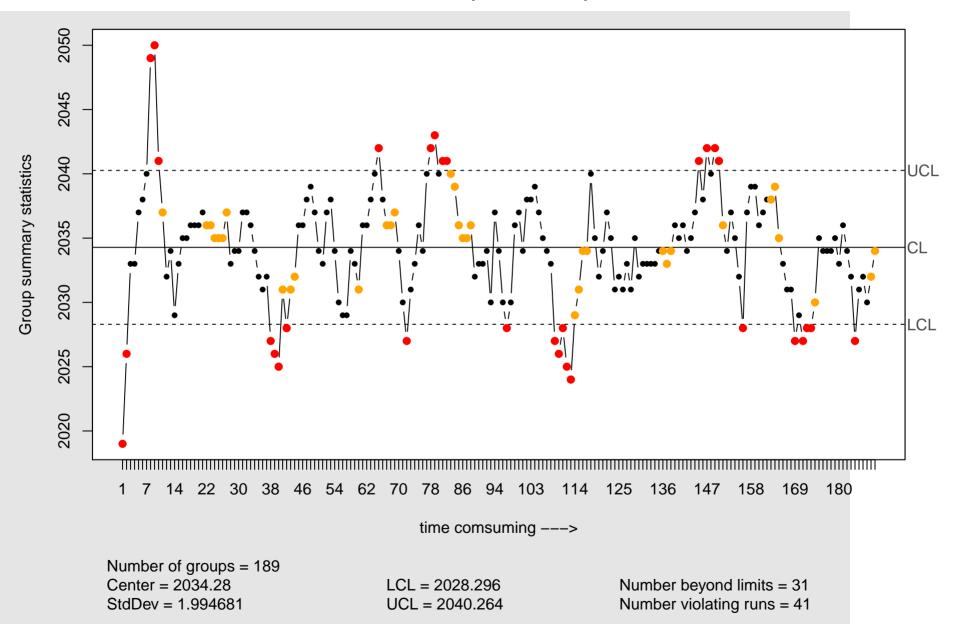


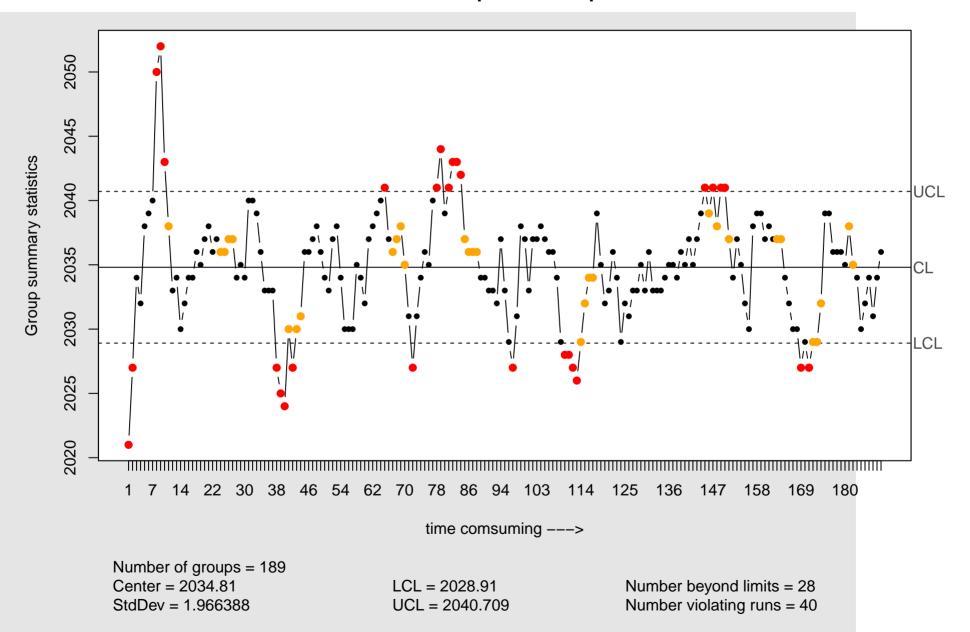


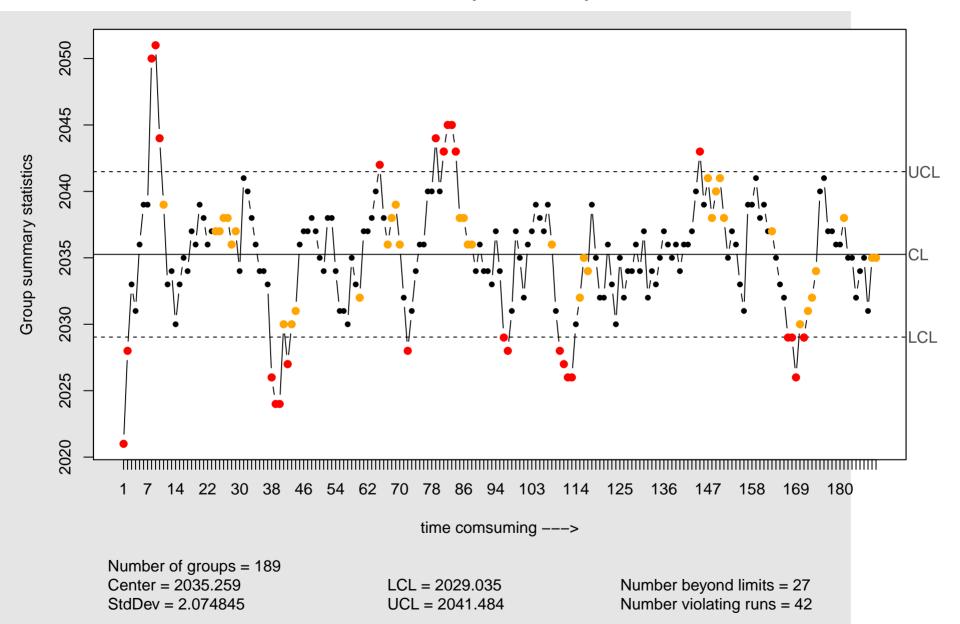


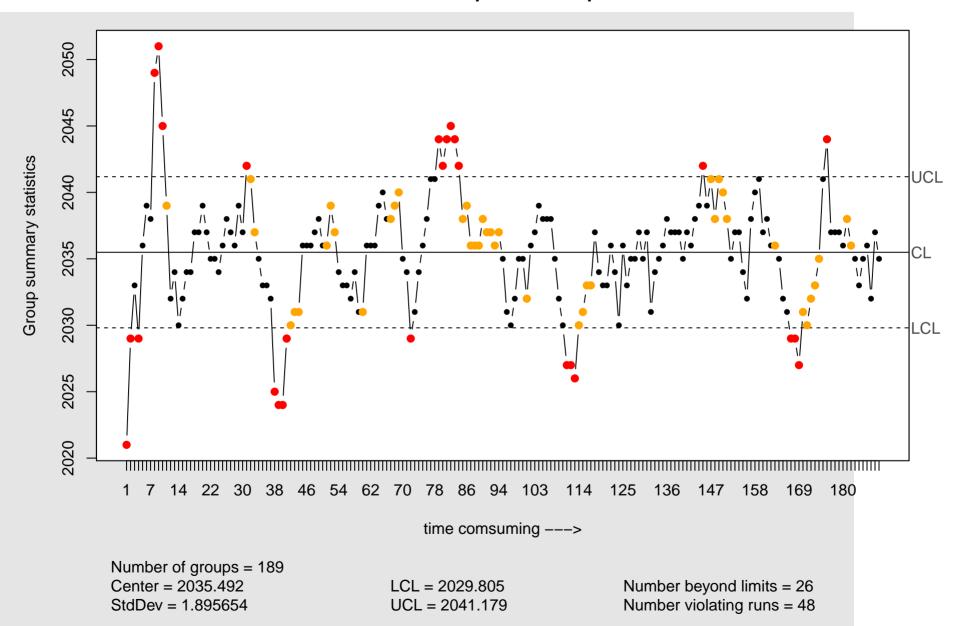


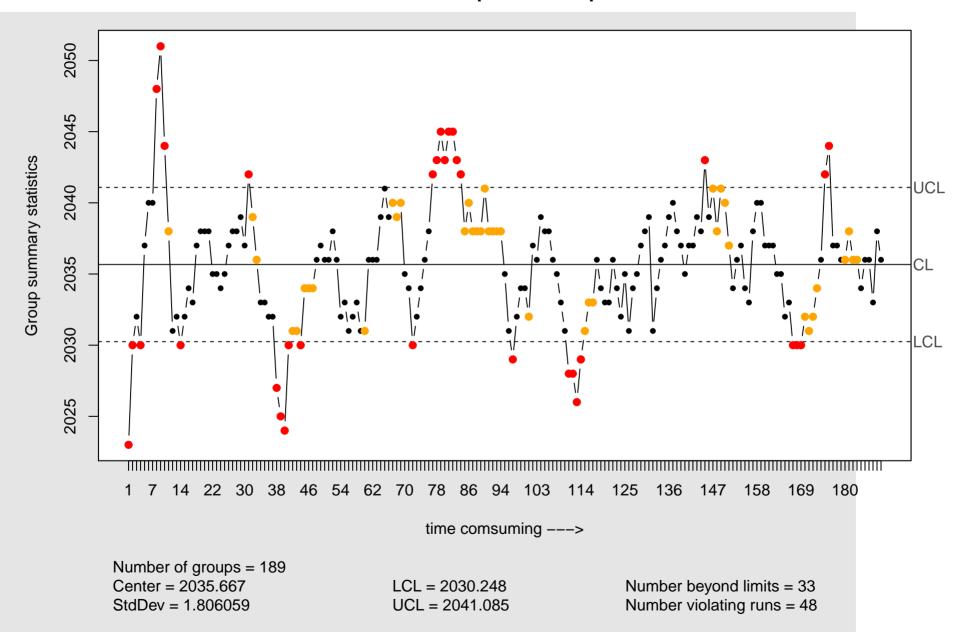


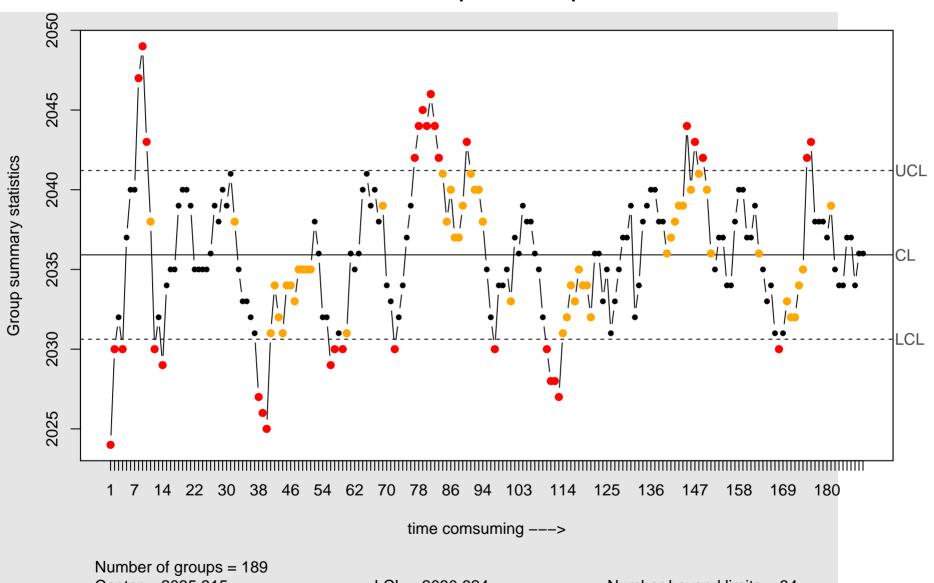






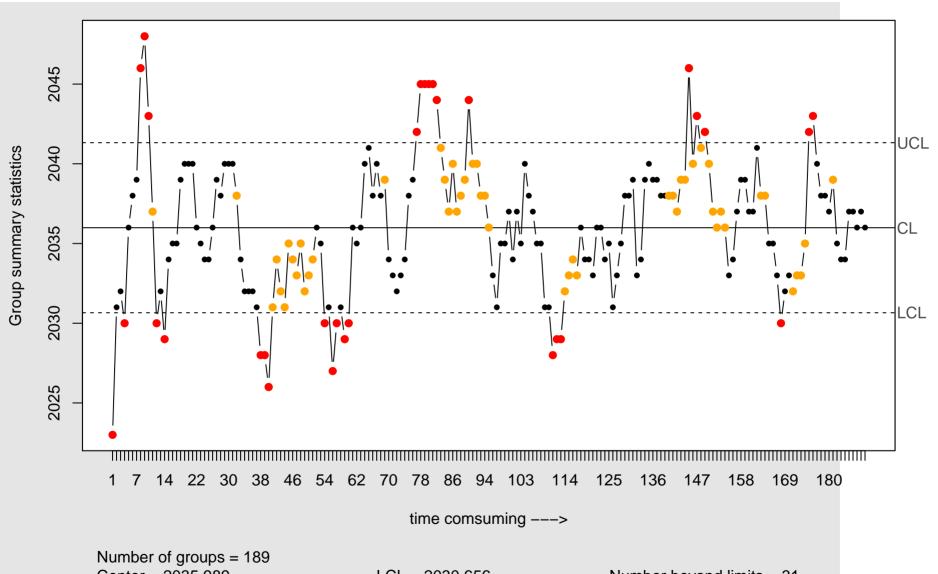






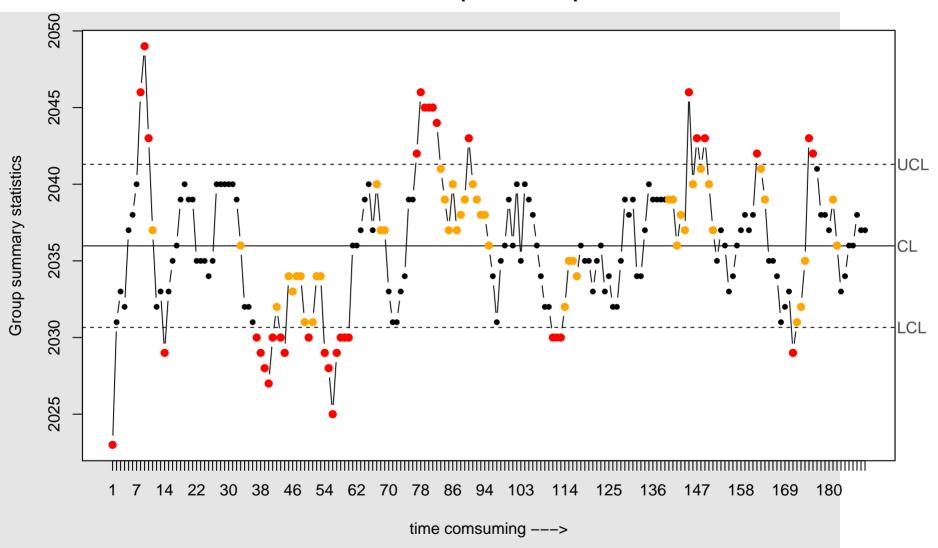
Number of groups = 189 Center = 2035.915 StdDev = 1.763619

LCL = 2030.624 UCL = 2041.206 Number beyond limits = 34 Number violating runs = 59



Number of groups = 189 Center = 2035.989 StdDev = 1.777765

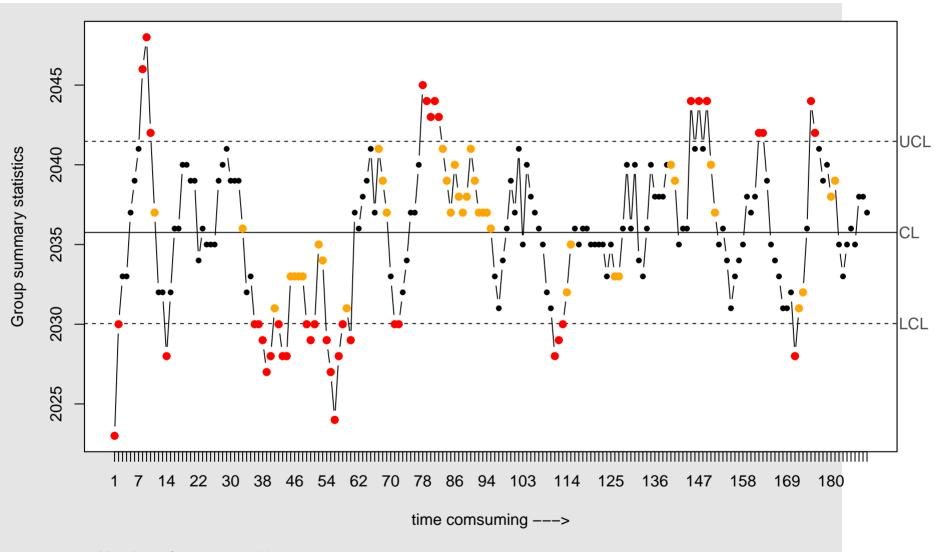
LCL = 2030.656 UCL = 2041.323 Number beyond limits = 31 Number violating runs = 60



Number of groups = 189 Center = 2035.979 StdDev = 1.77305

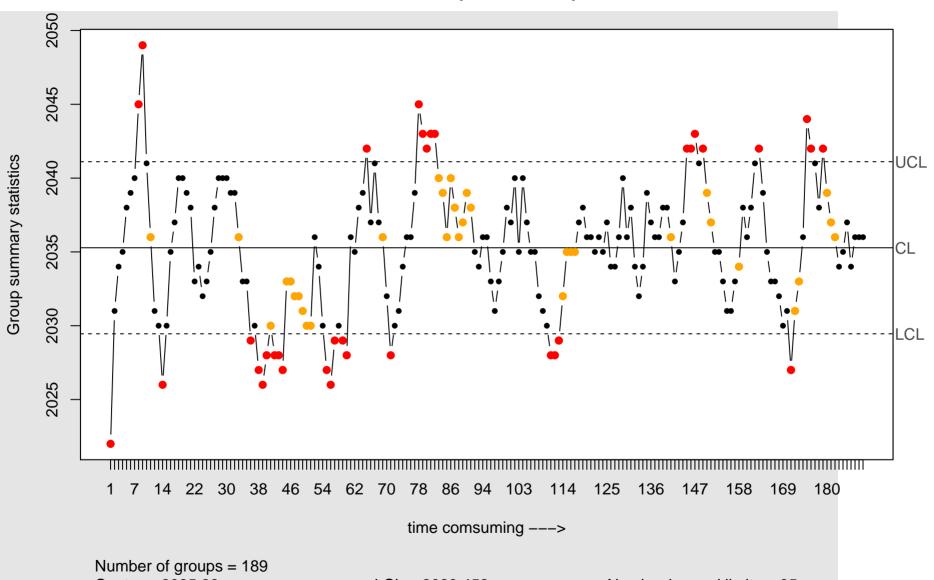
LCL = 2030.66 UCL = 2041.298

Number beyond limits = 37 Number violating runs = 65



Number of groups = 189 Center = 2035.757 StdDev = 1.905085

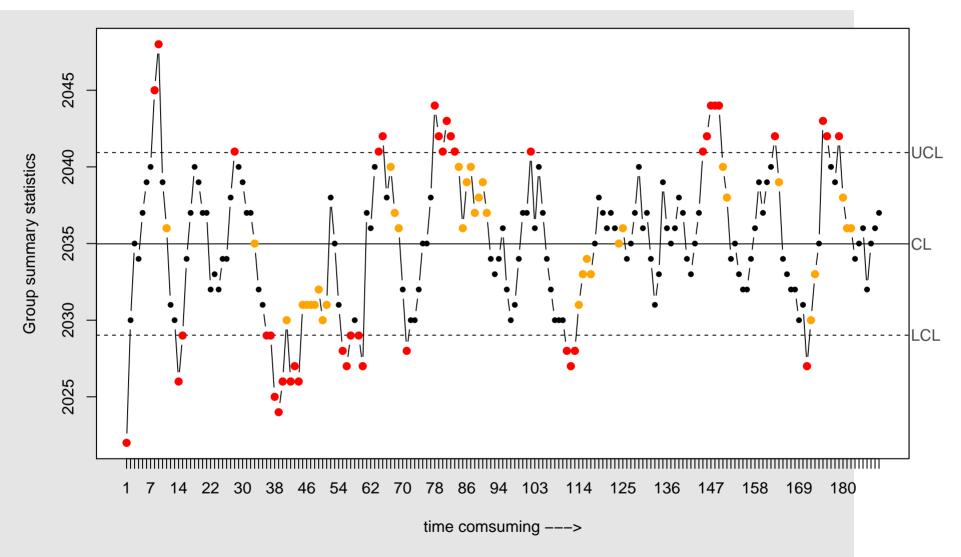
LCL = 2030.041 UCL = 2041.472 Number beyond limits = 41 Number violating runs = 55



Number of groups = 189 Center = 2035.28 StdDev = 1.94281

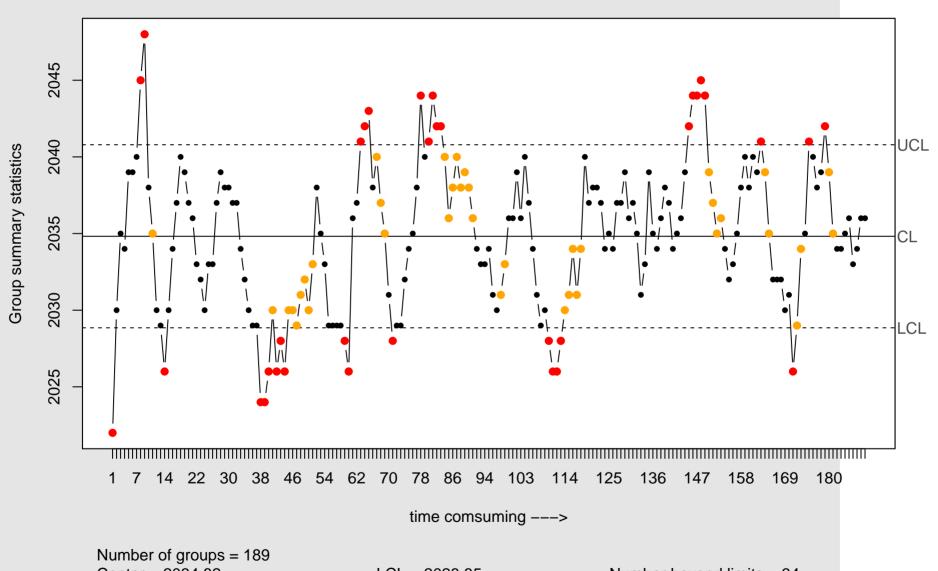
LCL = 2029.452 UCL = 2041.109

Number beyond limits = 35 Number violating runs = 44



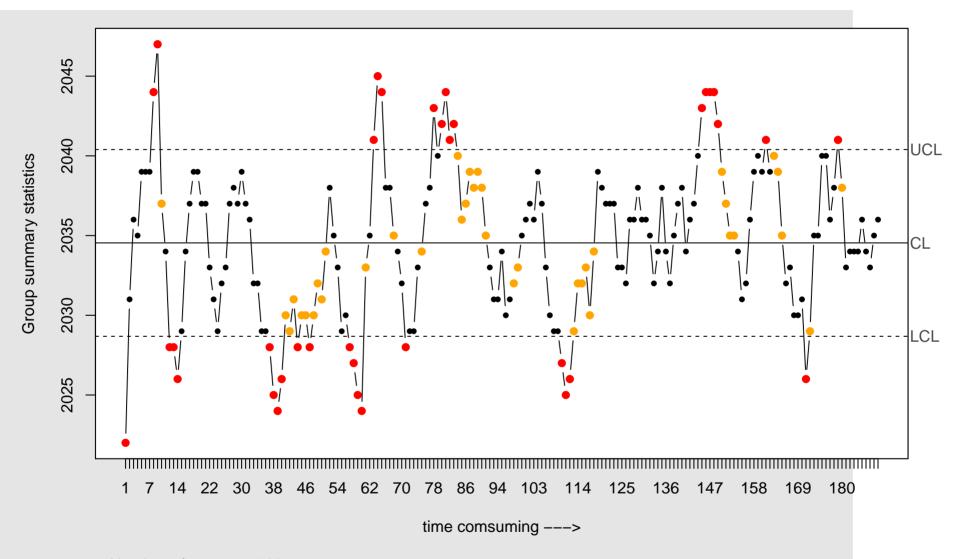
Number of groups = 189 Center = 2034.979 StdDev = 1.98525

LCL = 2029.023 UCL = 2040.935 Number beyond limits = 42 Number violating runs = 47



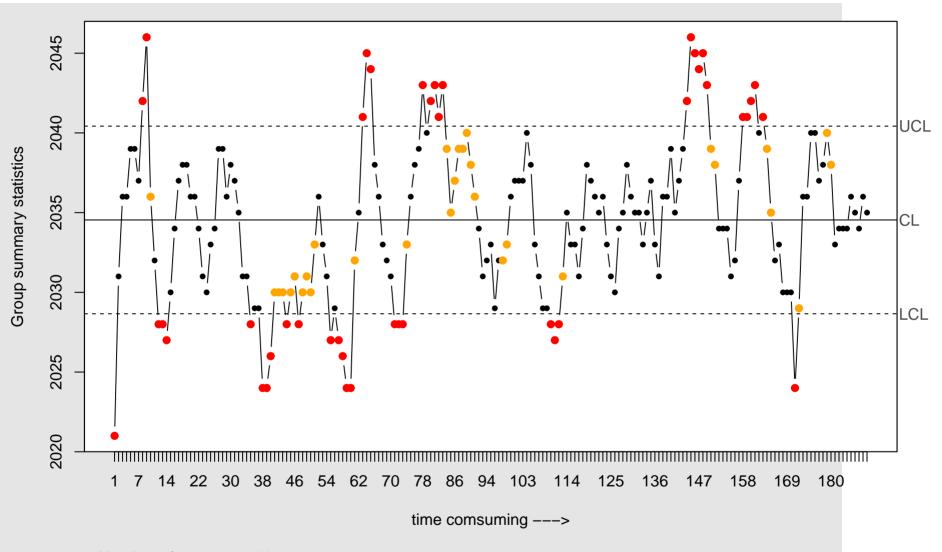
Number of groups = 189 Center = 2034.82 StdDev = 1.989965

LCL = 2028.85 UCL = 2040.79 Number beyond limits = 34 Number violating runs = 50



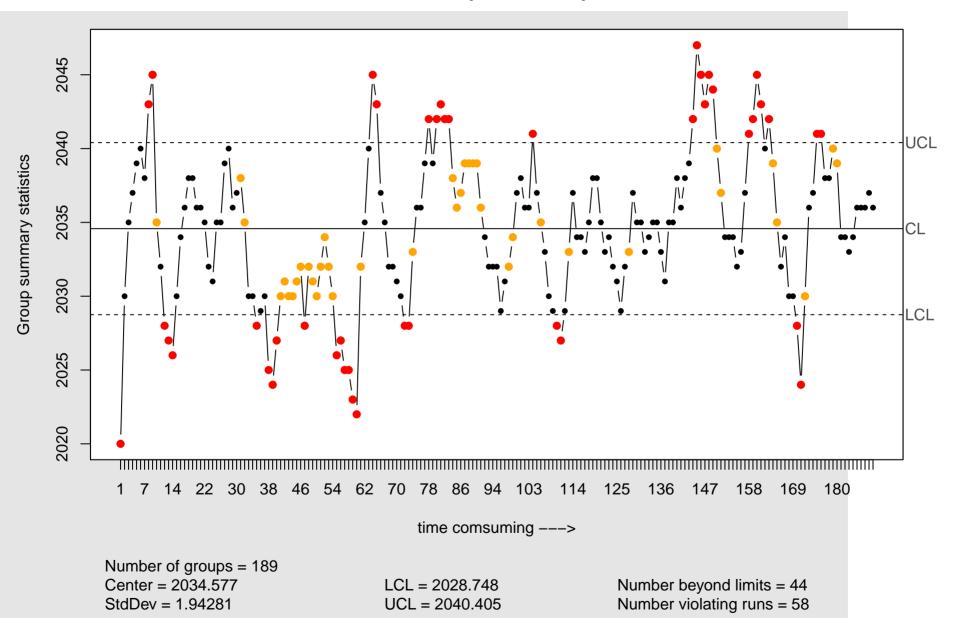
Number of groups = 189 Center = 2034.54

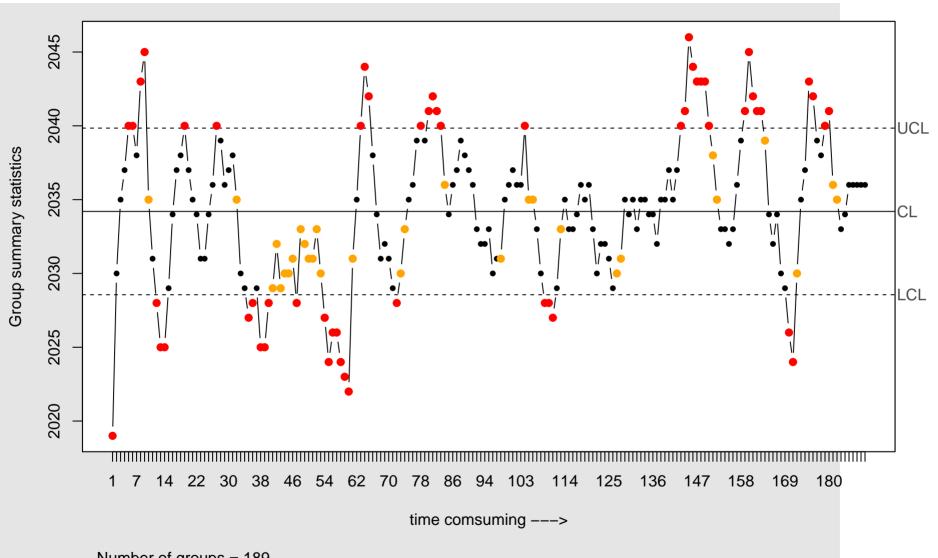
LCL = 2028.683StdDev = 1.952241 UCL = 2040.396 Number beyond limits = 36 Number violating runs = 50



Number of groups = 189 Center = 2034.54 StdDev = 1.961672

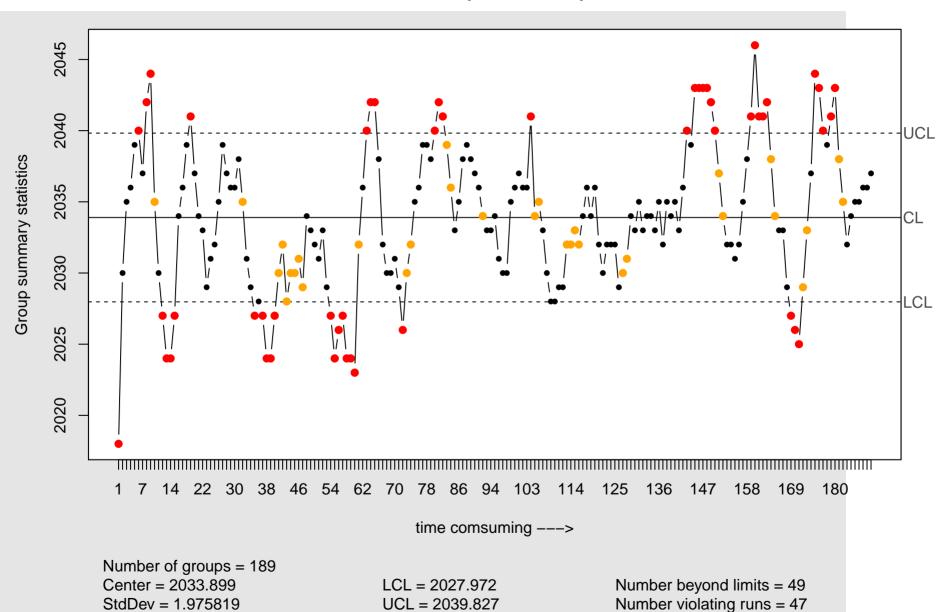
LCL = 2028.655 UCL = 2040.425 Number beyond limits = 43 Number violating runs = 48

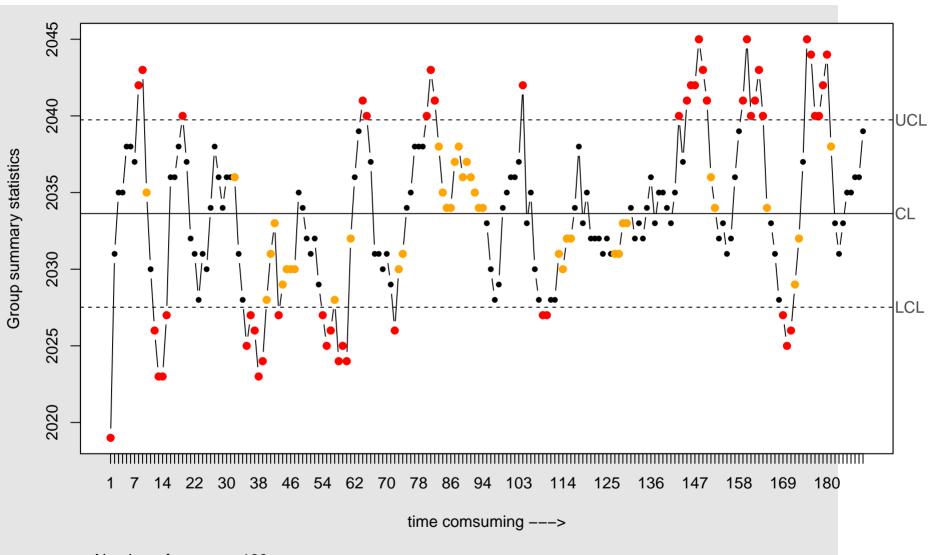




Number of groups = 189 Center = 2034.201 StdDev = 1.881507

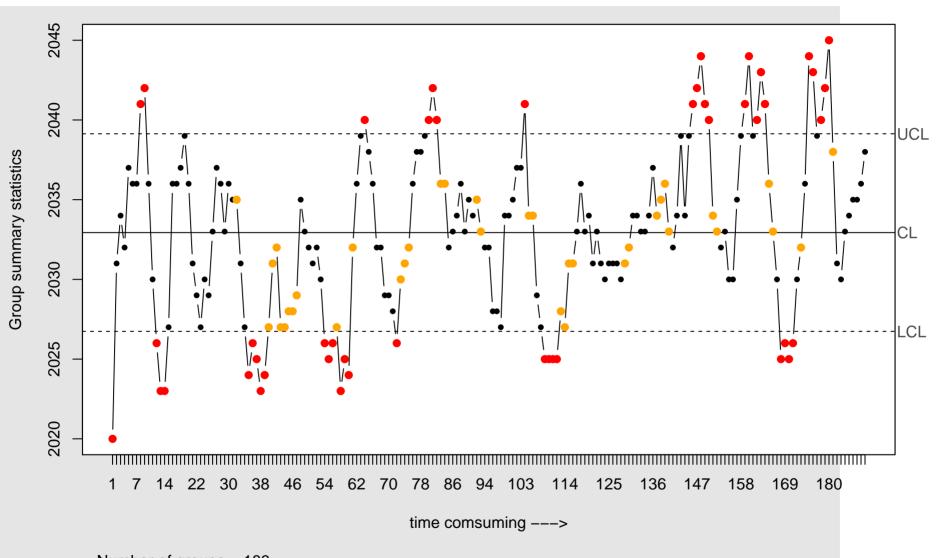
LCL = 2028.557 UCL = 2039.846 Number beyond limits = 55 Number violating runs = 55





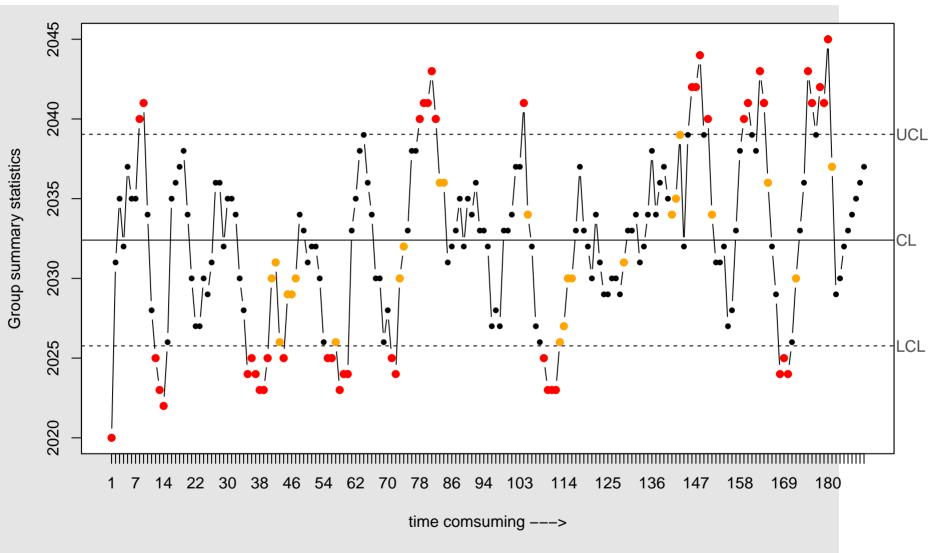
Number of groups = 189 Center = 2033.63 StdDev = 2.037121

LCL = 2027.518 UCL = 2039.741 Number beyond limits = 51 Number violating runs = 54



Number of groups = 189 Center = 2032.937 StdDev = 2.065414

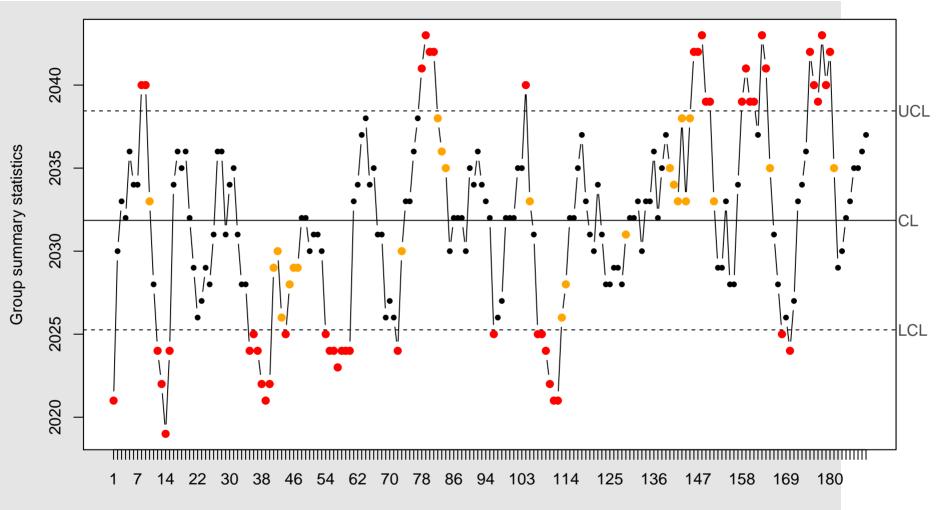
LCL = 2026.74 UCL = 2039.133 Number beyond limits = 46 Number violating runs = 48



Number of groups = 189 Center = 2032.402 StdDev = 2.211596

LCL = 2025.767 UCL = 2039.037

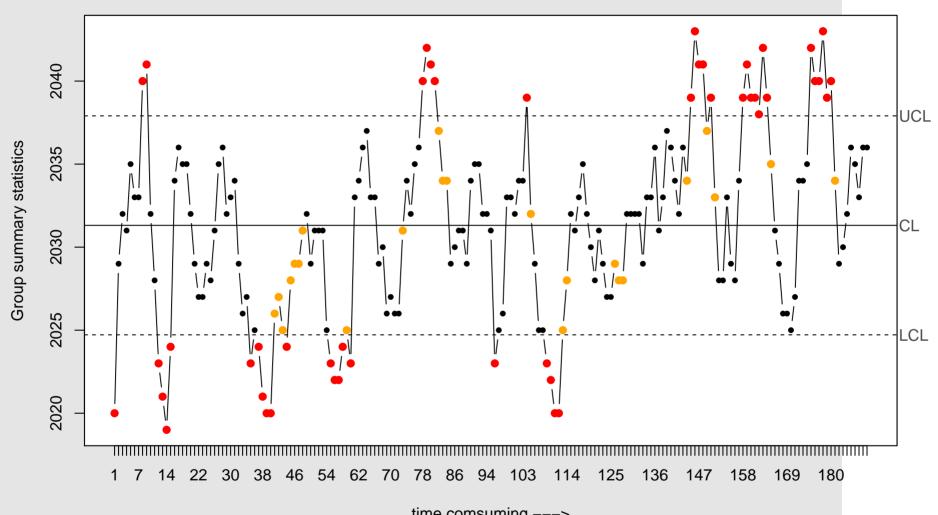
Number beyond limits = 46 Number violating runs = 38



time comsuming --->

Number of groups = 189 Center = 2031.852 StdDev = 2.19745

LCL = 2025.26 UCL = 2038.444 Number beyond limits = 53 Number violating runs = 47

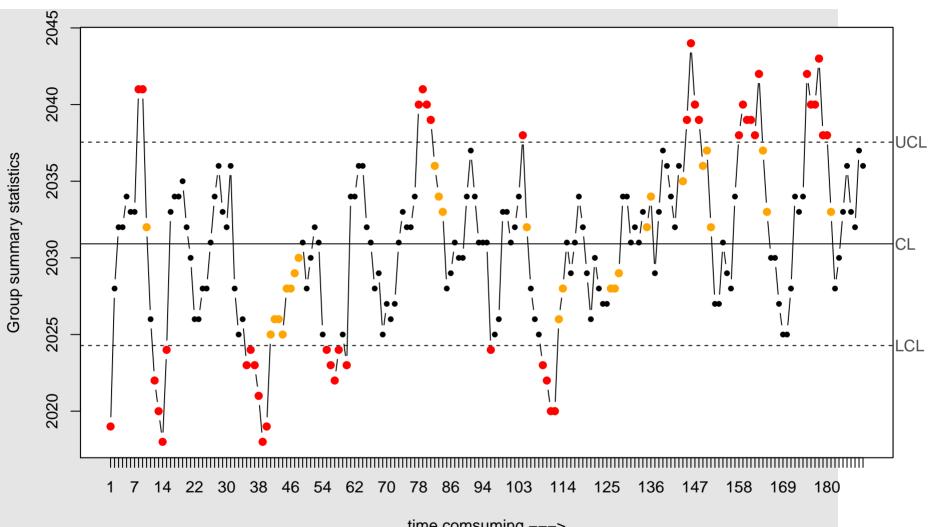


time comsuming --->

Number of groups = 189 Center = 2031.312StdDev = 2.19745

LCL = 2024.72UCL = 2037.905

Number beyond limits = 46 Number violating runs = 44

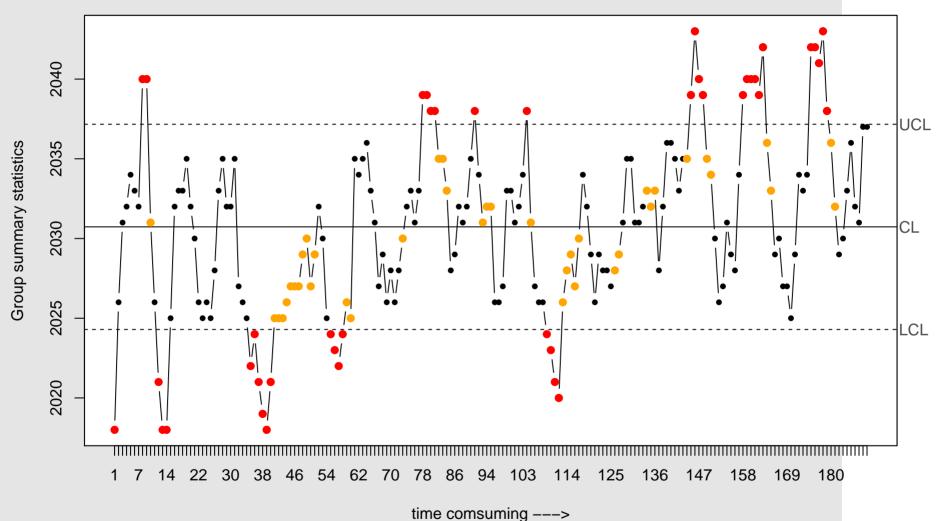


time comsuming --->

Number of groups = 189 Center = 2030.915StdDev = 2.211596

LCL = 2024.281UCL = 2037.55

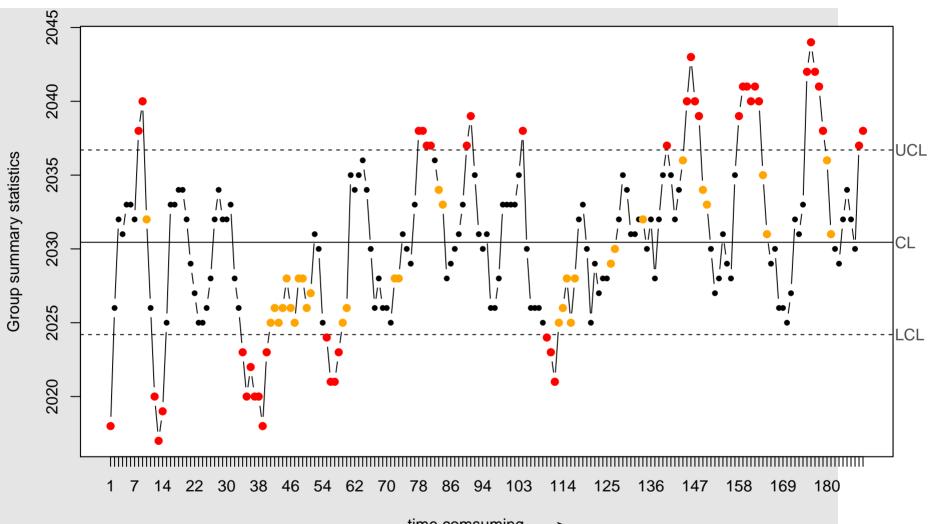
Number beyond limits = 44 Number violating runs = 44



Number of groups = 189 Center = 2030.73StdDev = 2.145579

LCL = 2024.293UCL = 2037.167

Number beyond limits = 41 Number violating runs = 53

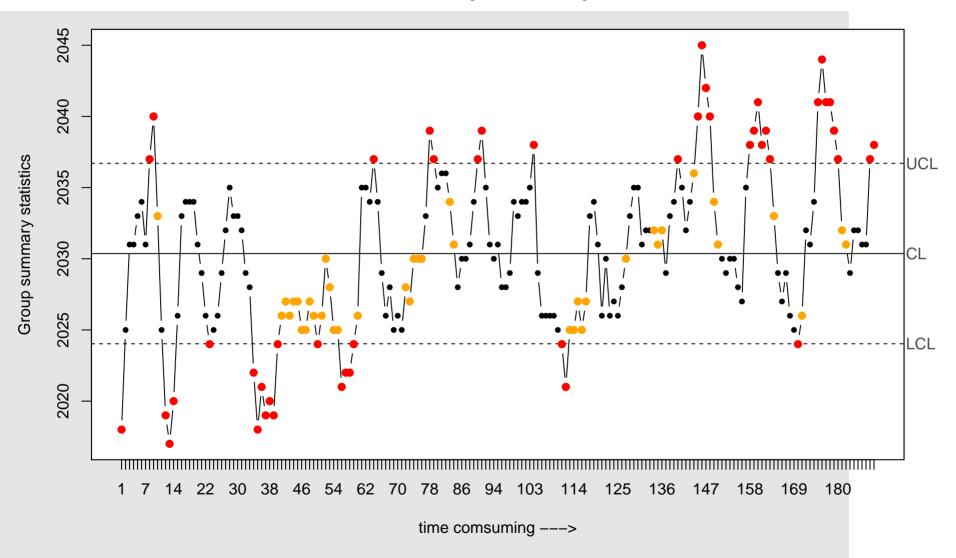


time comsuming --->

Number of groups = 189 Center = 2030.45 StdDev = 2.084276

LCL = 2024.197 UCL = 2036.703

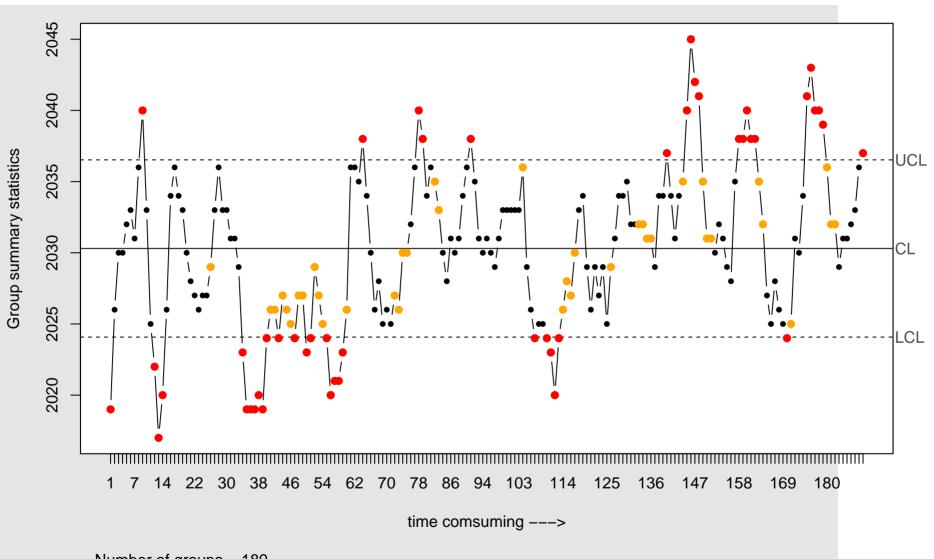
Number beyond limits = 45 Number violating runs = 46



Number of groups = 189 Center = 2030.365 StdDev = 2.11257

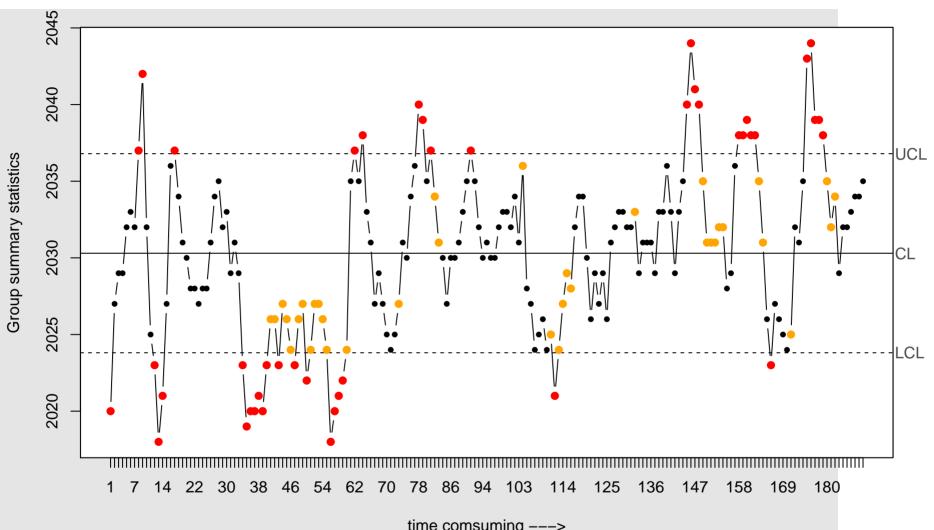
LCL = 2024.027 UCL = 2036.703

Number beyond limits = 47 Number violating runs = 58



Number of groups = 189 Center = 2030.302 StdDev = 2.074845

LCL = 2024.077 UCL = 2036.526 Number beyond limits = 47 Number violating runs = 56

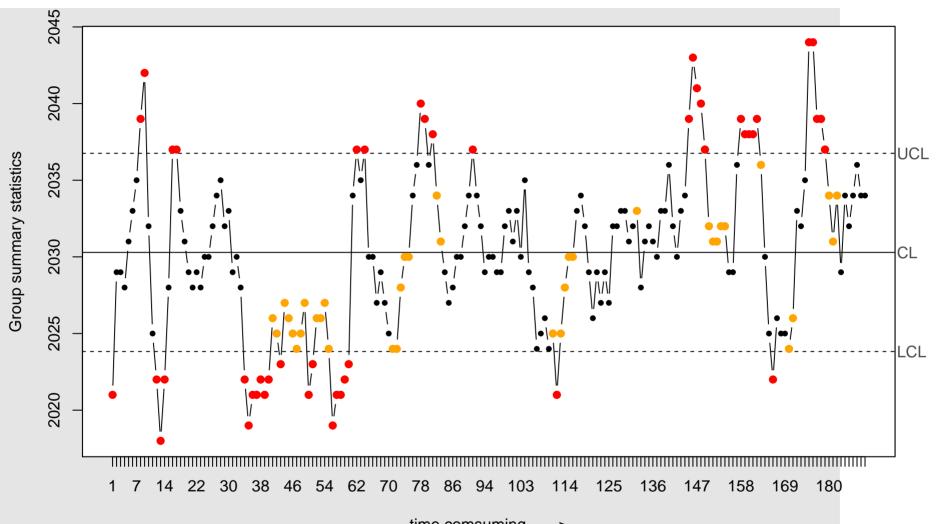


time comsuming --->

Number of groups = 189 Center = 2030.302StdDev = 2.164441

LCL = 2023.808UCL = 2036.795

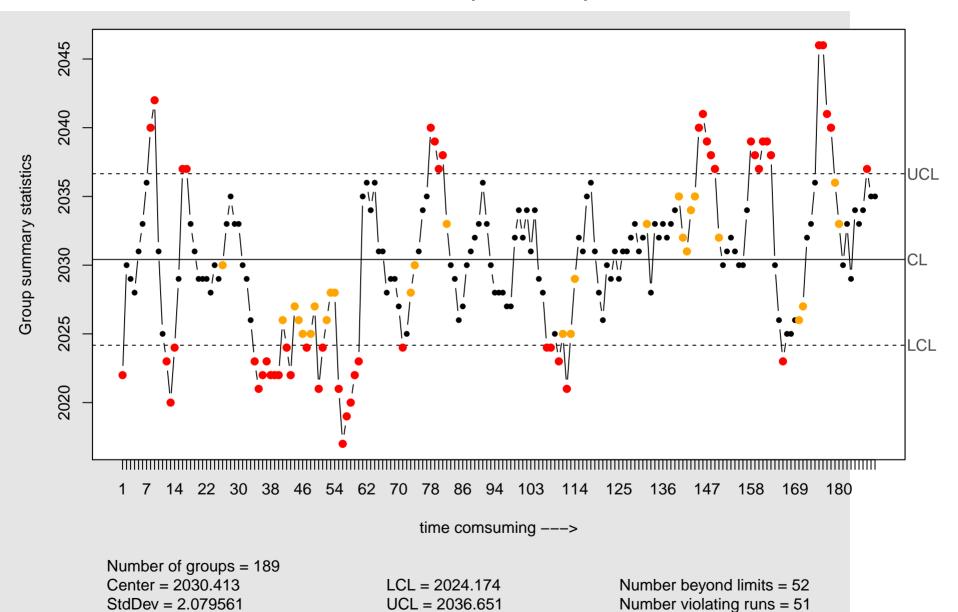
Number beyond limits = 43 Number violating runs = 47

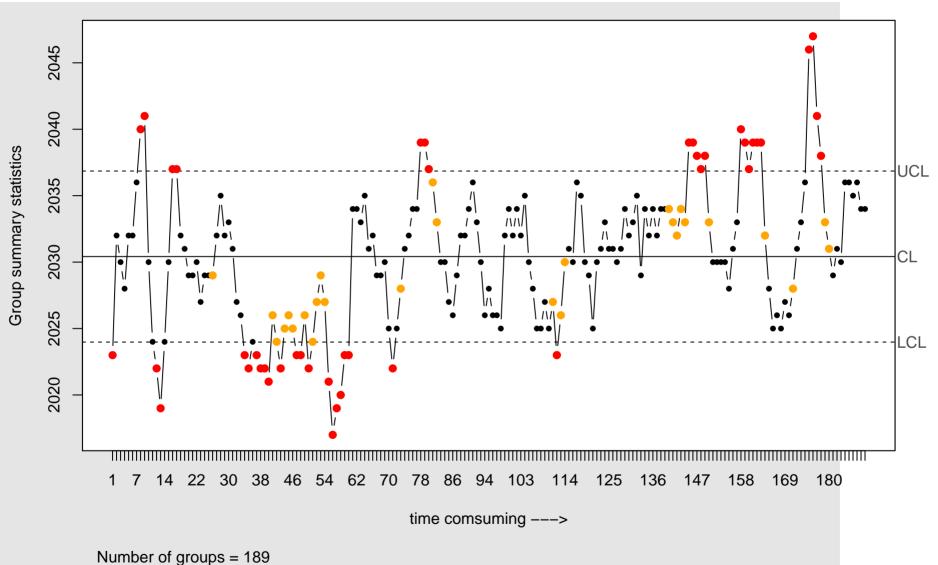


time comsuming --->

Number of groups = 189 Center = 2030.291 StdDev = 2.15501

LCL = 2023.826 UCL = 2036.756 Number beyond limits = 46 Number violating runs = 52

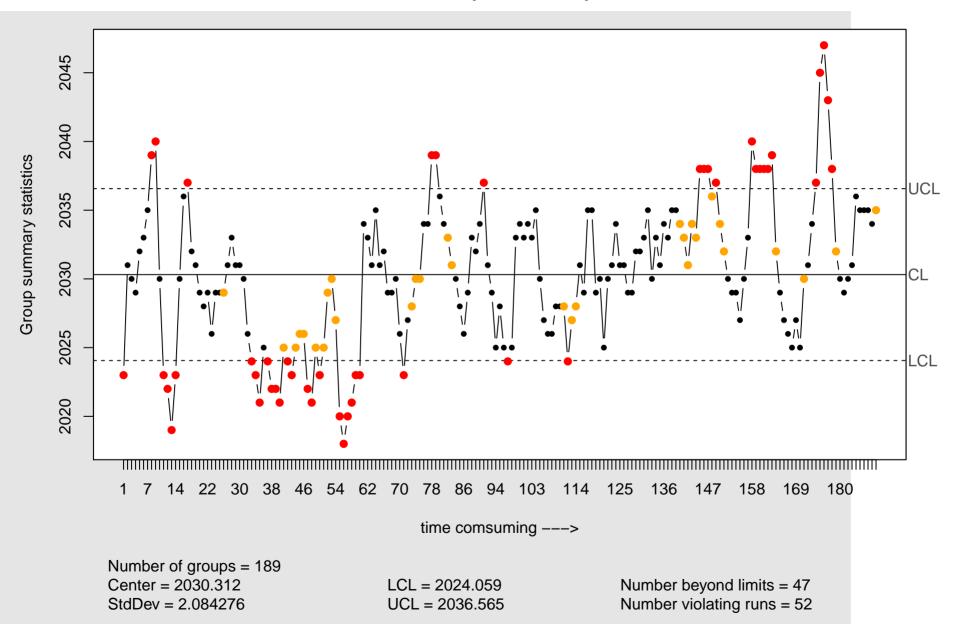


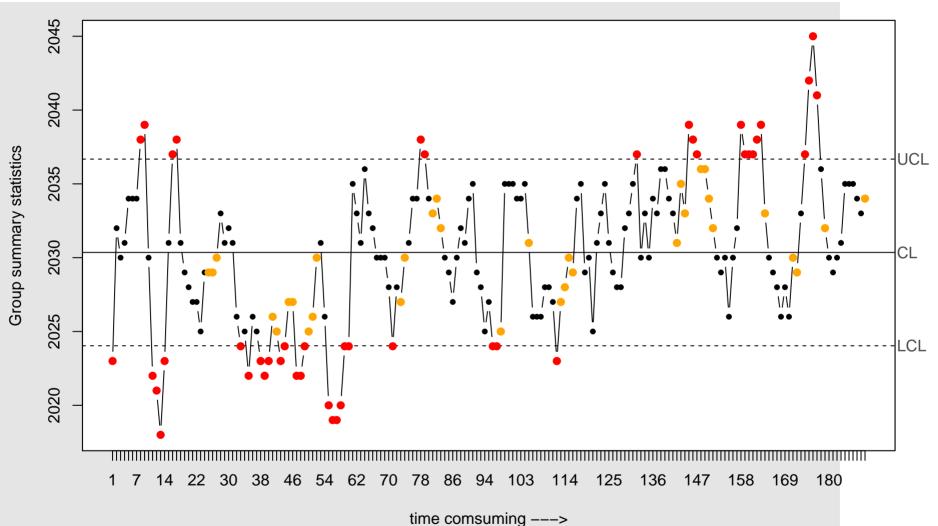


Number of groups = 189 Center = 2030.418 StdDev = 2.145579

LCL = 2023.981 UCL = 2036.855

Number beyond limits = 43 Number violating runs = 50

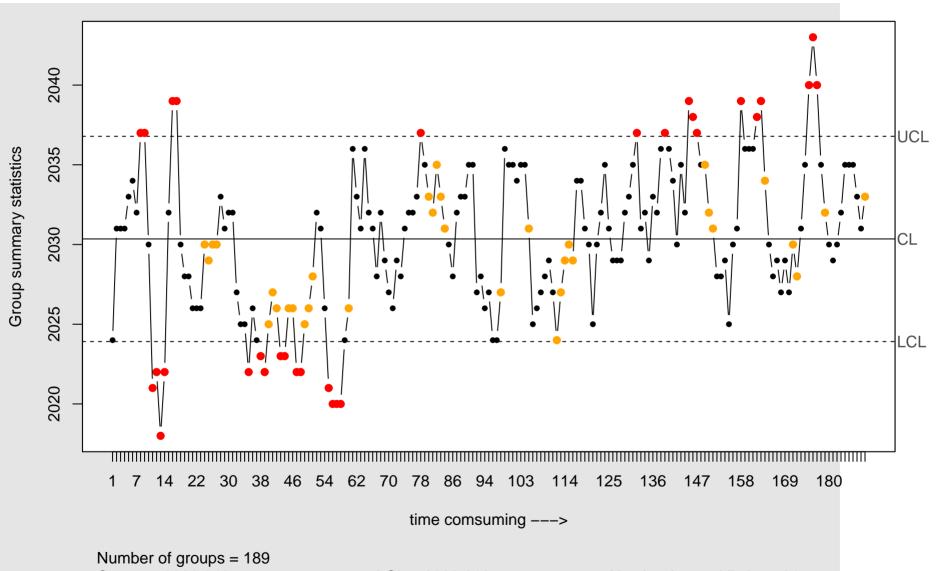




Number of groups = 189 Center = 2030.354StdDev = 2.107854

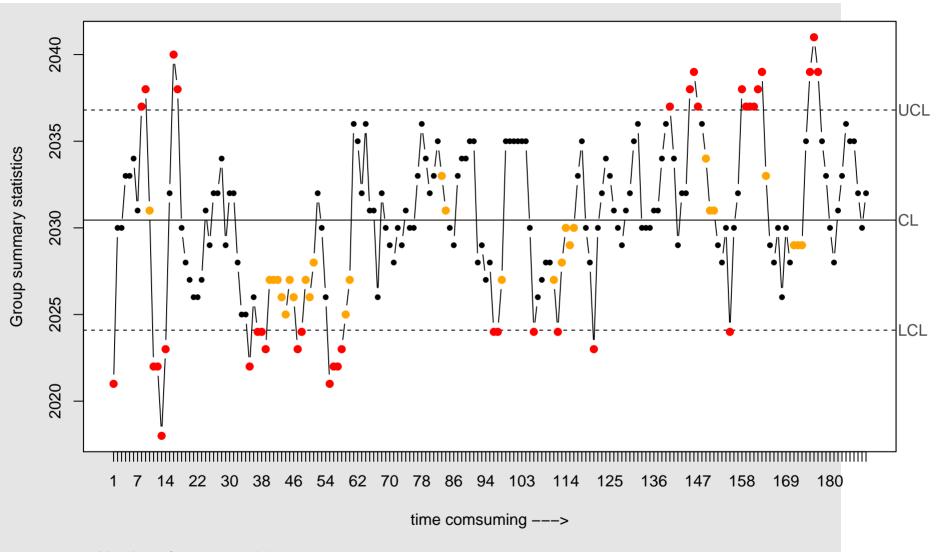
LCL = 2024.031UCL = 2036.678

Number beyond limits = 45 Number violating runs = 47



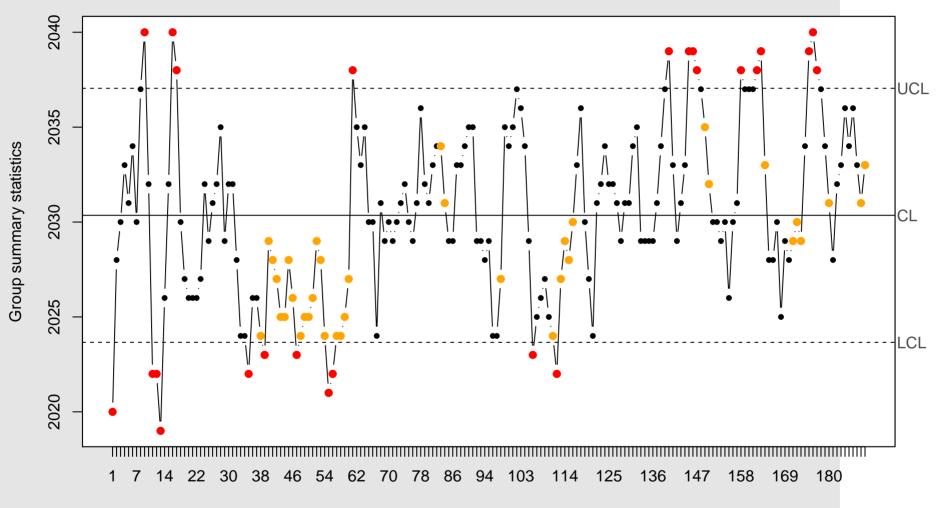
Number of groups = 189 Center = 2030.349 StdDev = 2.145579

LCL = 2023.912 UCL = 2036.786 Number beyond limits = 31 Number violating runs = 42



Number of groups = 189 Center = 2030.45 StdDev = 2.117285

LCL = 2024.098 UCL = 2036.802 Number beyond limits = 38 Number violating runs = 34

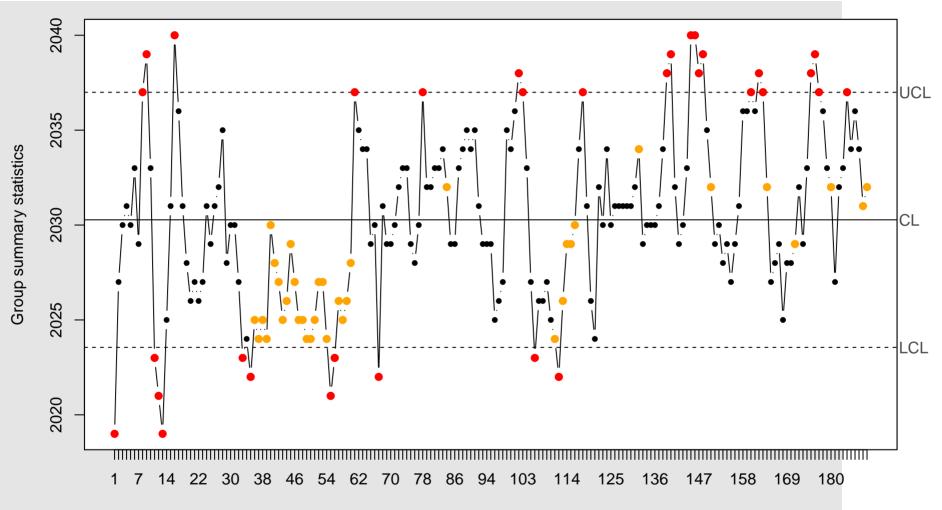


time comsuming --->

Number of groups = 189 Center = 2030.354 StdDev = 2.230459

LCL = 2023.663 UCL = 2037.046

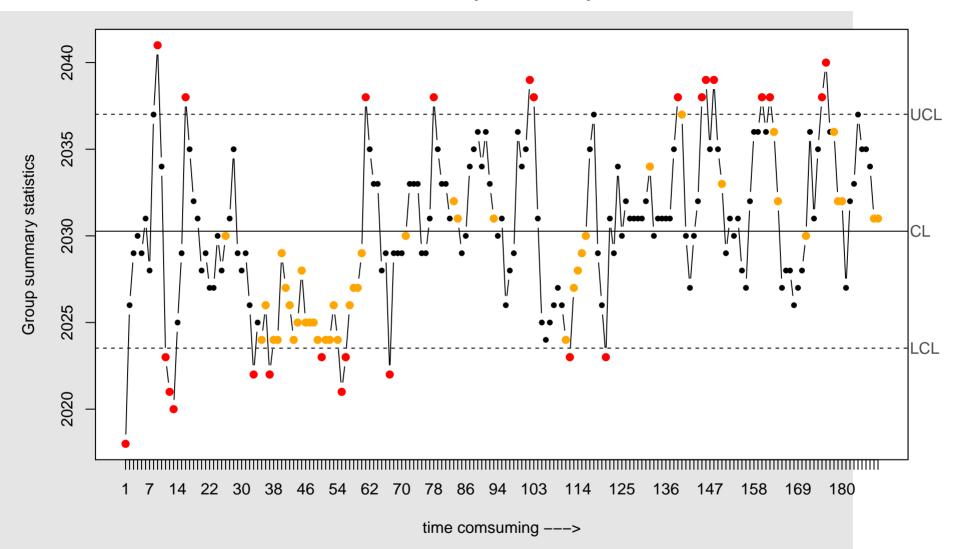
Number beyond limits = 25 Number violating runs = 42



time comsuming --->

Number of groups = 189 Center = 2030.275 StdDev = 2.23989

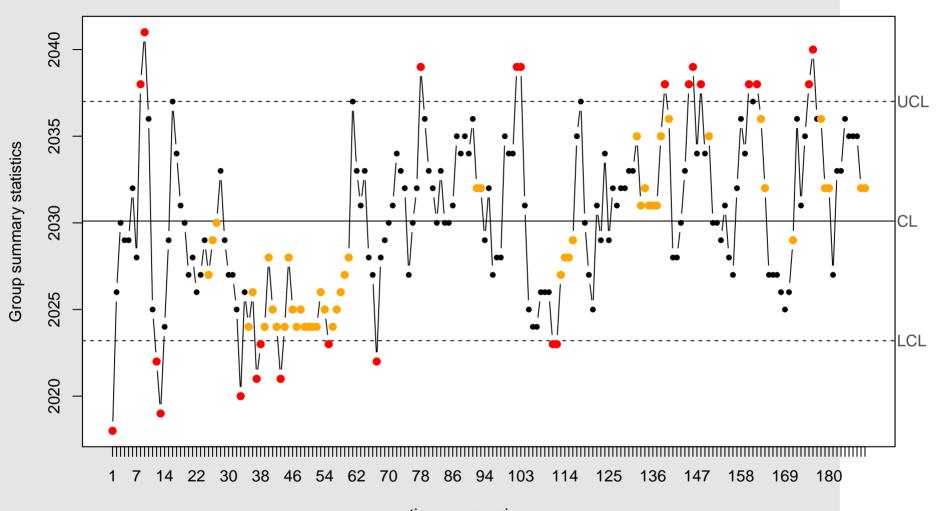
LCL = 2023.555 UCL = 2036.995 Number beyond limits = 32 Number violating runs = 41



Number of groups = 189 Center = 2030.27 StdDev = 2.249321

LCL = 2023.522 UCL = 2037.018

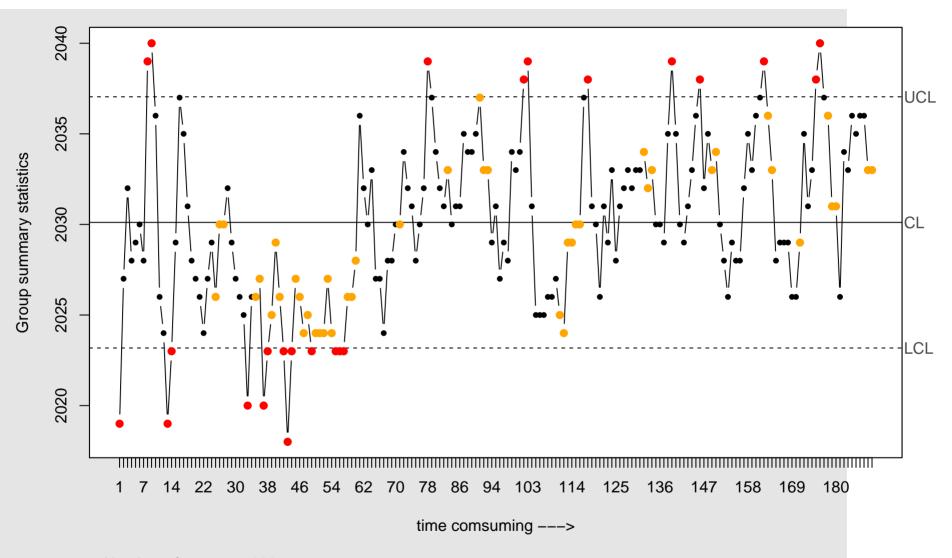
Number beyond limits = 26 Number violating runs = 48



time comsuming --->

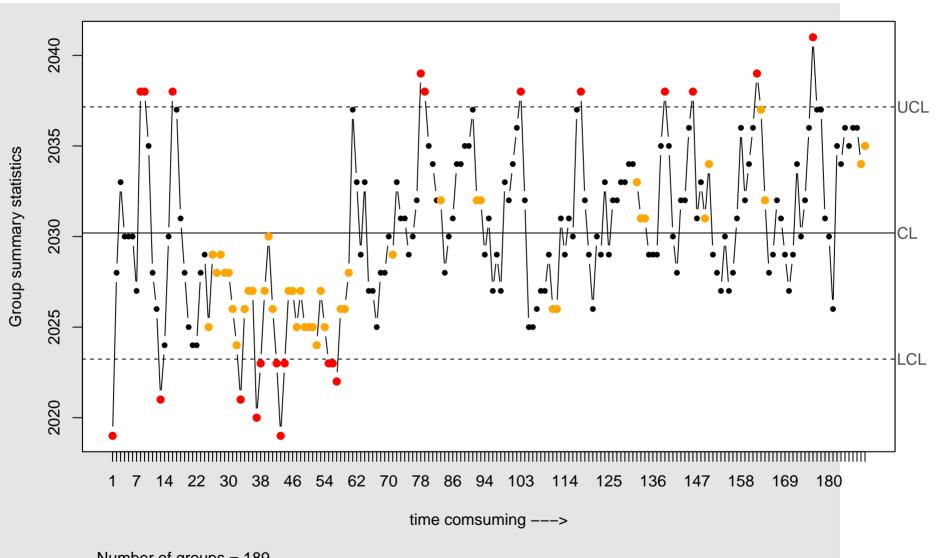
Number of groups = 189 Center = 2030.106 StdDev = 2.301192

LCL = 2023.202 UCL = 2037.009 Number beyond limits = 24 Number violating runs = 55



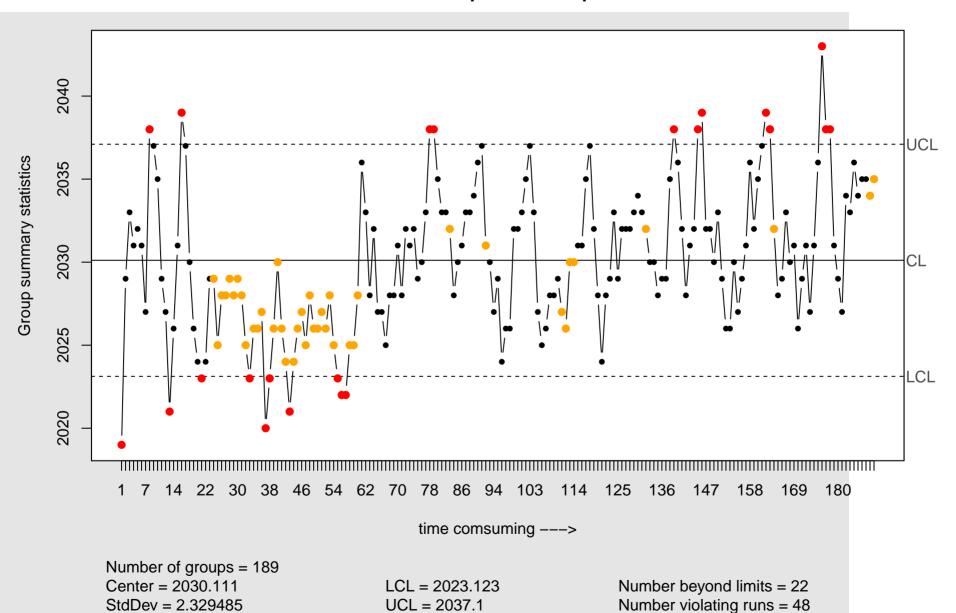
Number of groups = 189 Center = 2030.111 StdDev = 2.310623

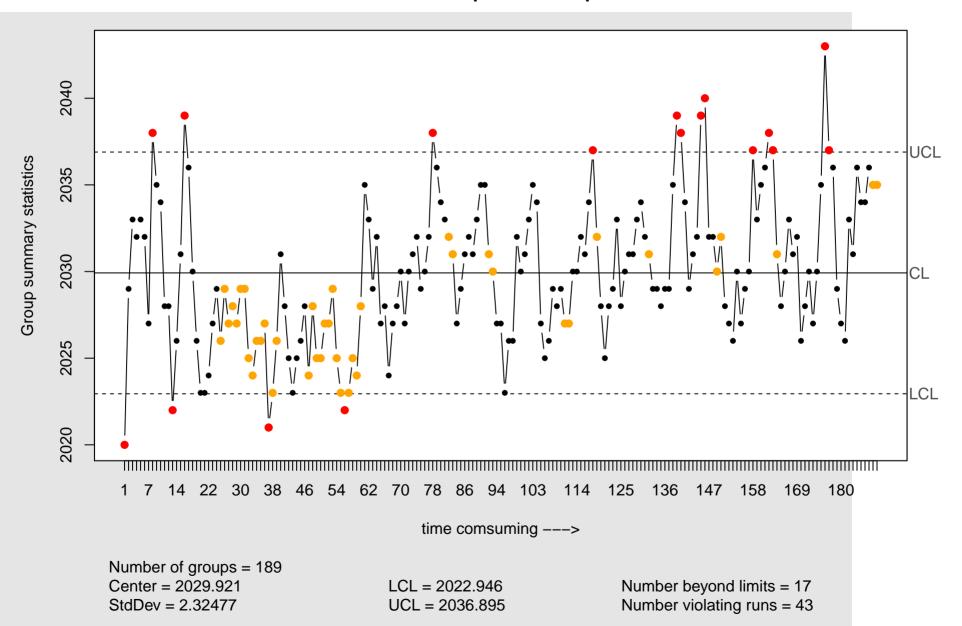
LCL = 2023.179 UCL = 2037.043 Number beyond limits = 24 Number violating runs = 53

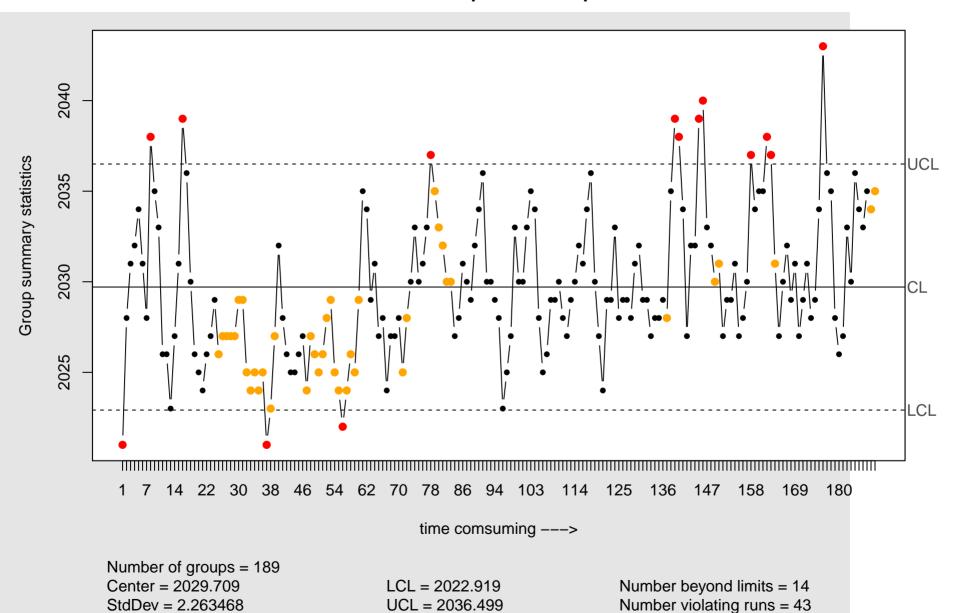


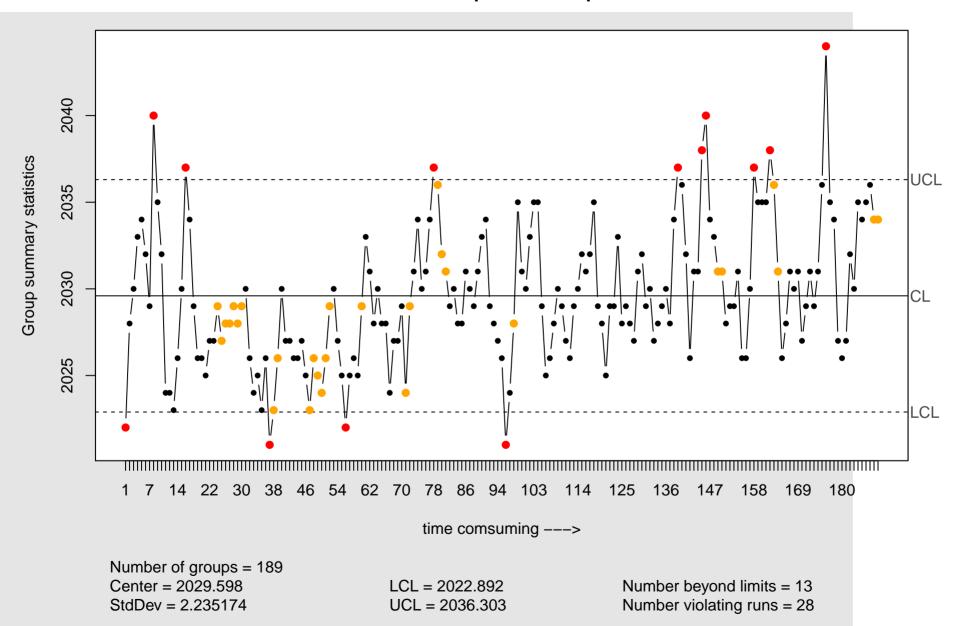
Number of groups = 189 Center = 2030.196 StdDev = 2.320054

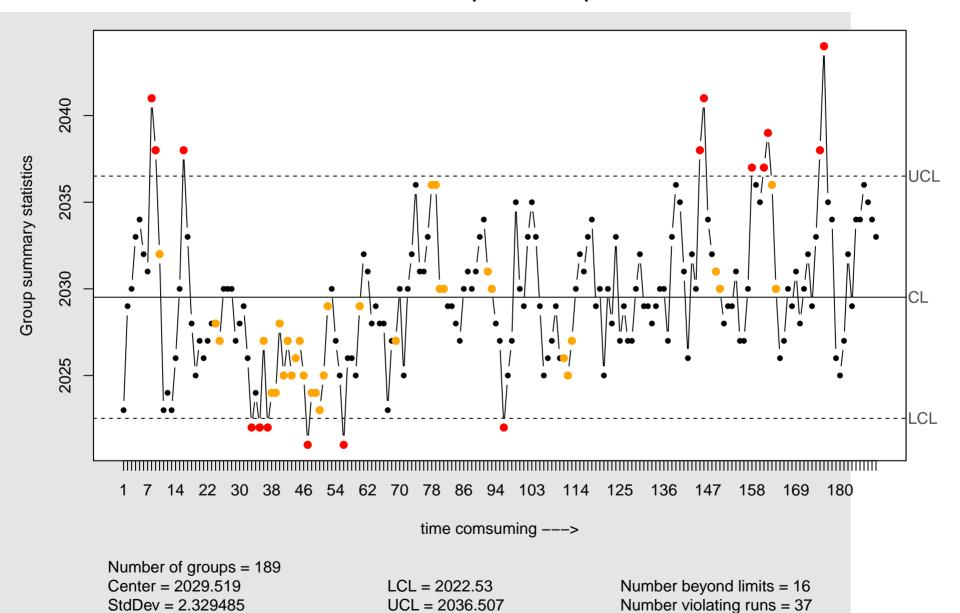
LCL = 2023.236 UCL = 2037.156 Number beyond limits = 22 Number violating runs = 51

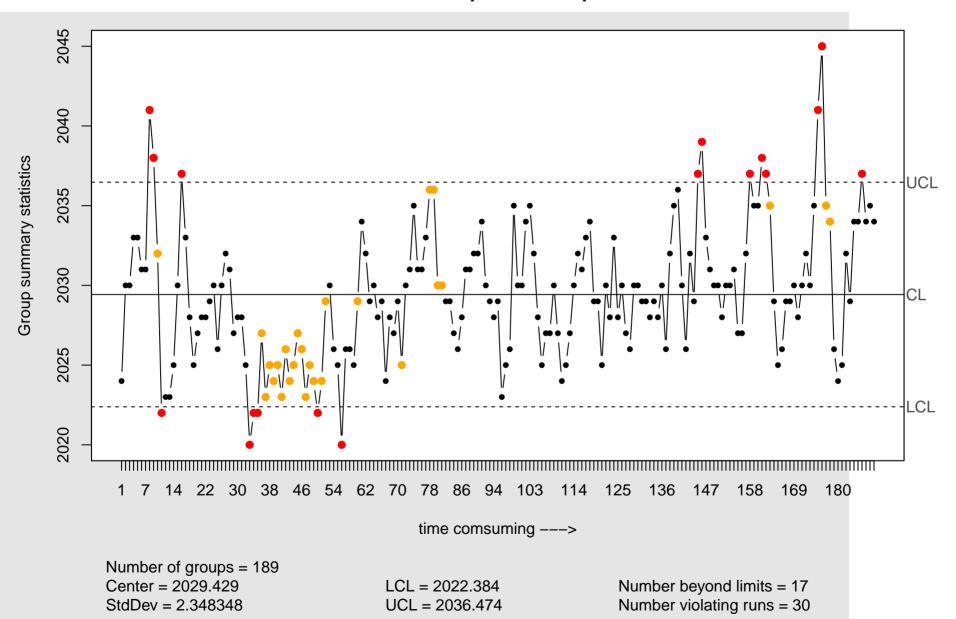


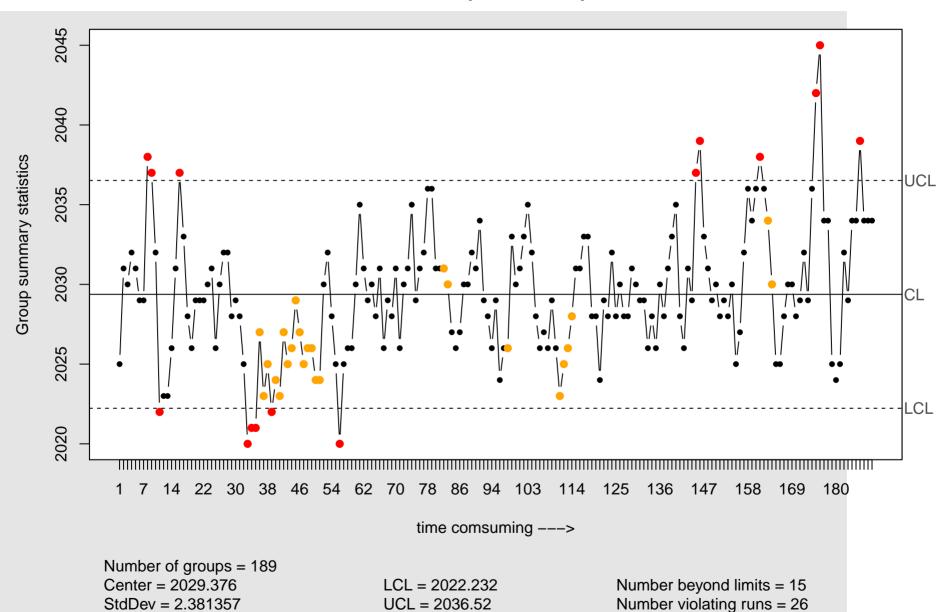


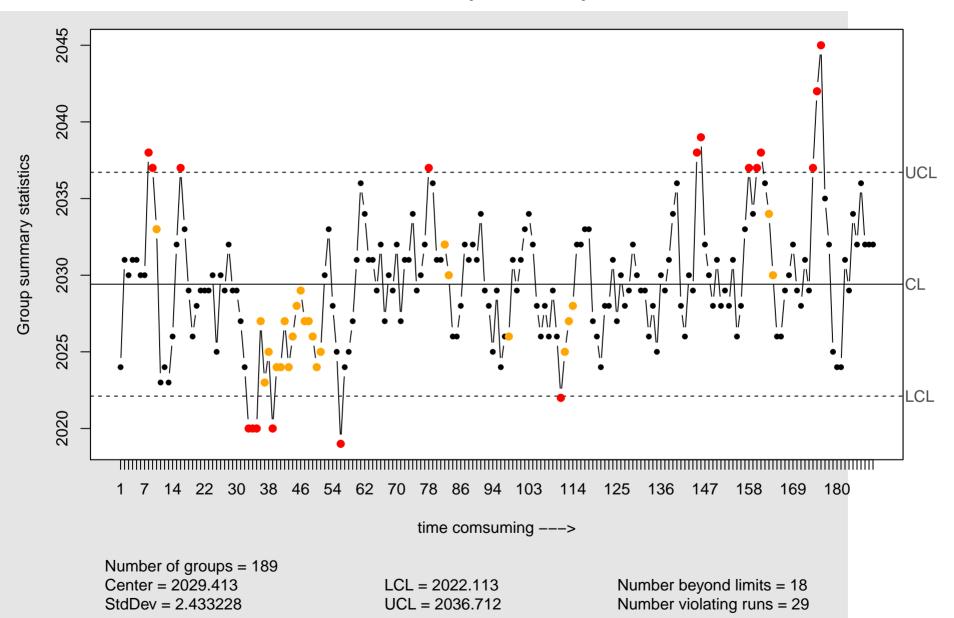


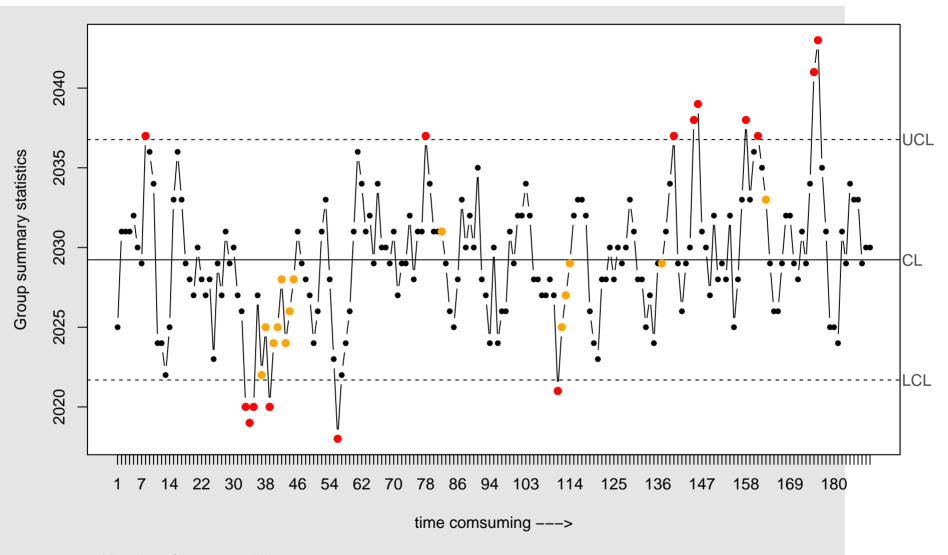






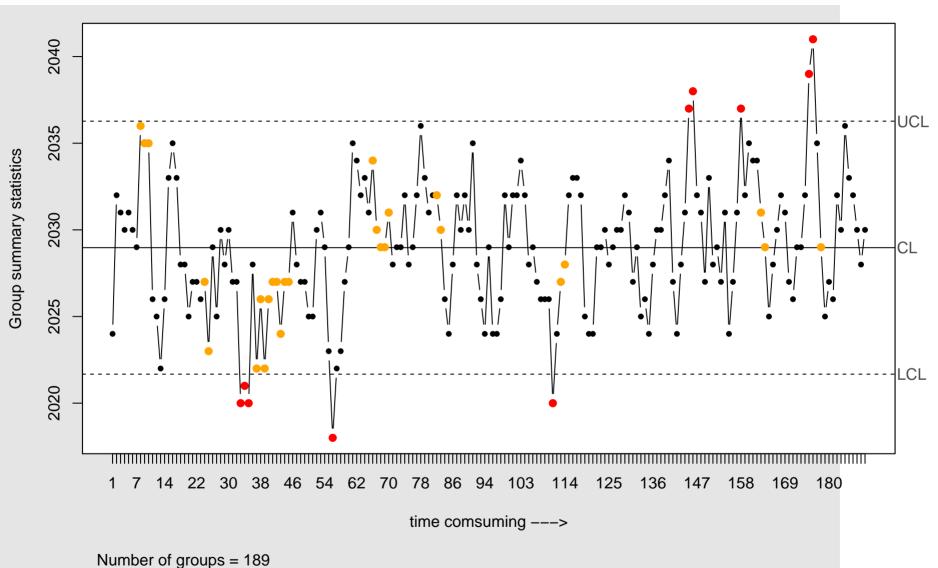






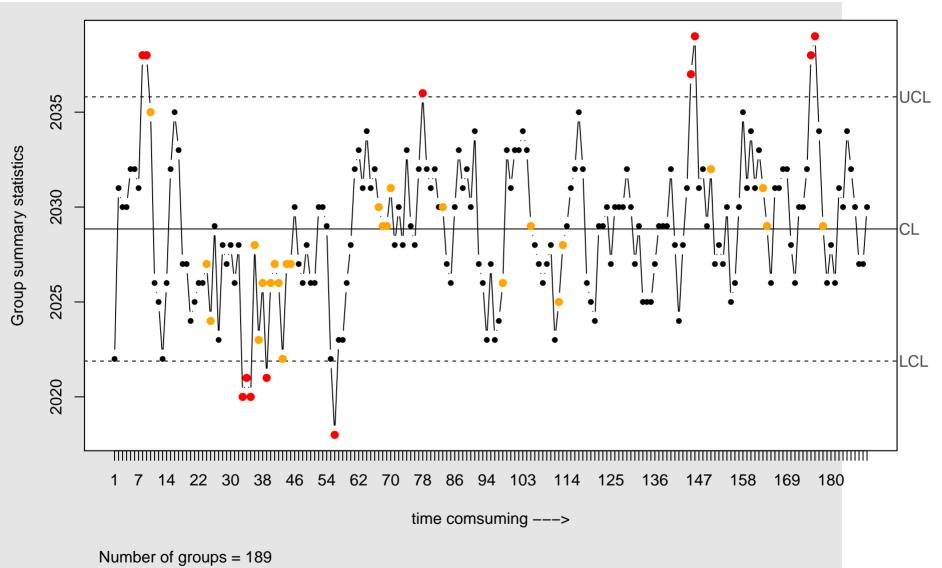
Number of groups = 189 Center = 2029.228 StdDev = 2.513392

LCL = 2021.687 UCL = 2036.768 Number beyond limits = 15 Number violating runs = 16



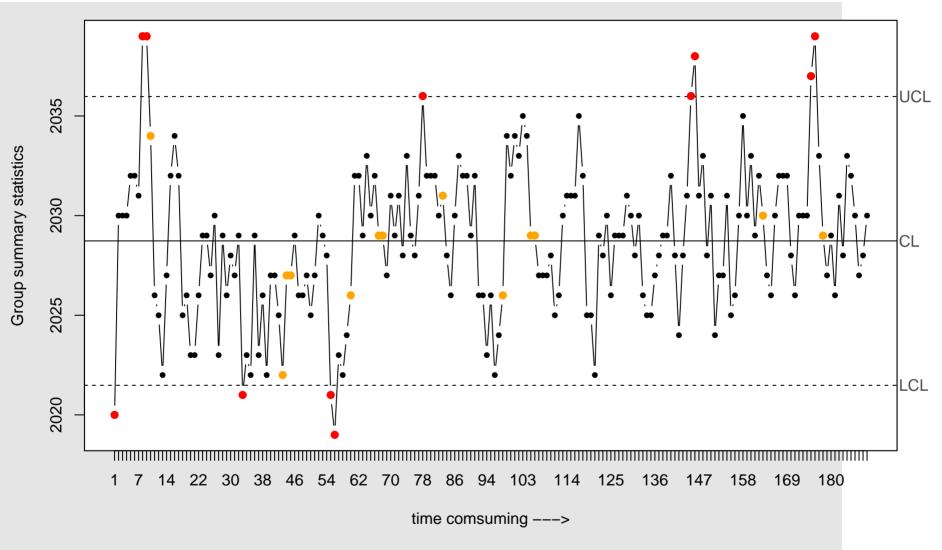
Number of groups = 189 Center = 2028.974 StdDev = 2.433228

LCL = 2021.674 UCL = 2036.273 Number beyond limits = 10 Number violating runs = 26



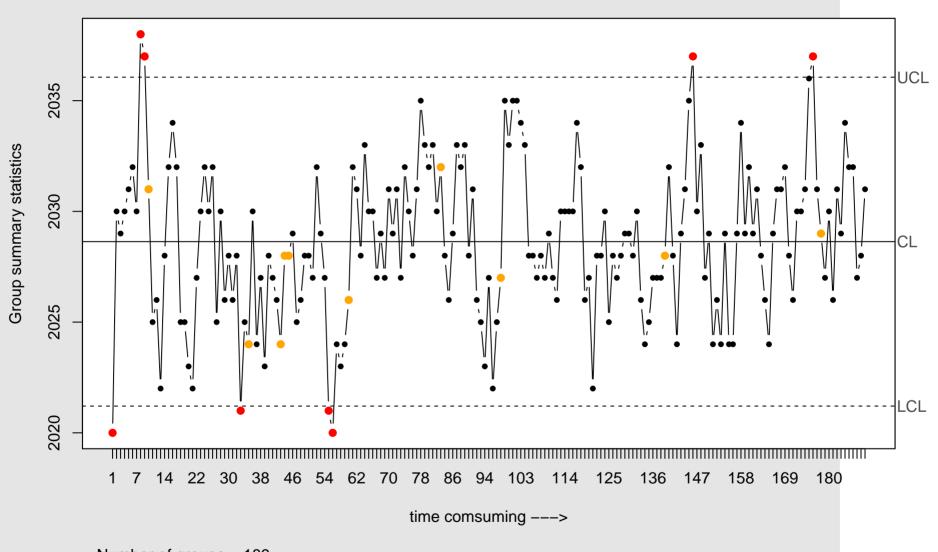
Number of groups = 189 Center = 2028.847 StdDev = 2.320054

LCL = 2021.886 UCL = 2035.807 Number beyond limits = 12 Number violating runs = 31



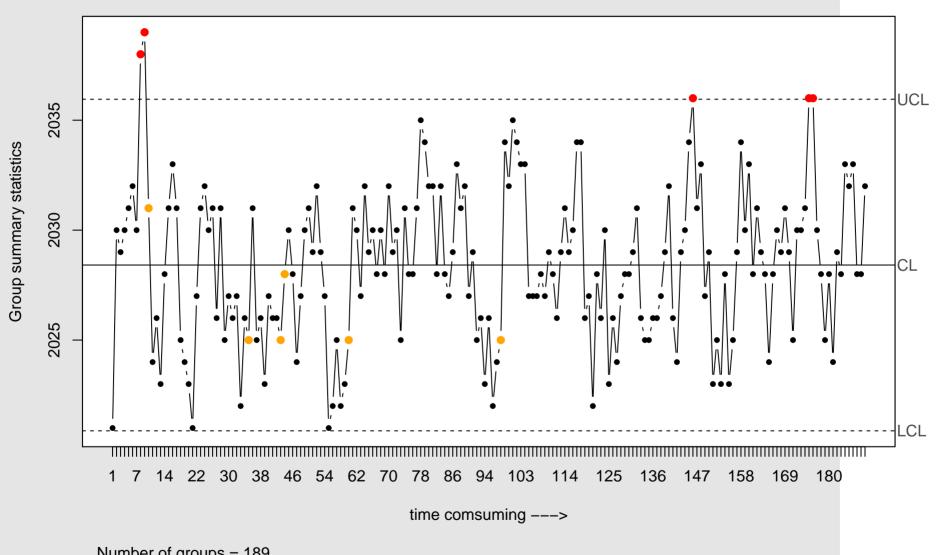
Number of groups = 189 Center = 2028.73 StdDev = 2.414365

LCL = 2021.487 UCL = 2035.973 Number beyond limits = 11 Number violating runs = 15



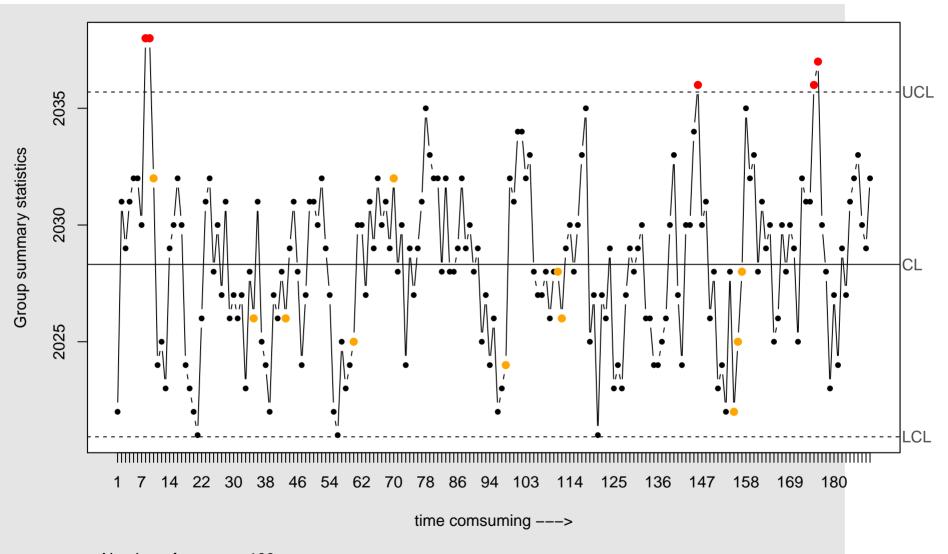
Number of groups = 189 Center = 2028.635 StdDev = 2.475668

LCL = 2021.208 UCL = 2036.062 Number beyond limits = 8 Number violating runs = 12



Number of groups = 189 Center = 2028.413 StdDev = 2.513392

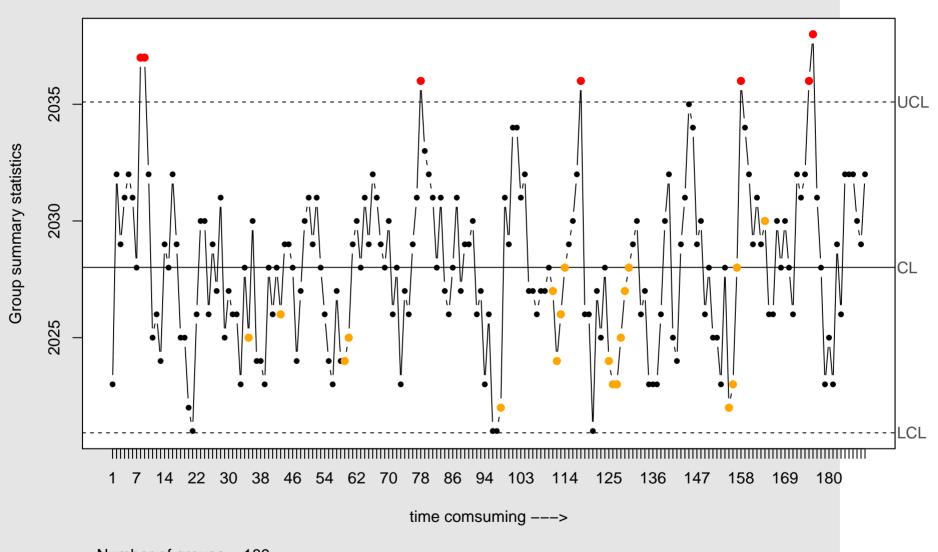
LCL = 2020.873 UCL = 2035.953 Number beyond limits = 5 Number violating runs = 8



Number of groups = 189 Center = 2028.312 StdDev = 2.461521

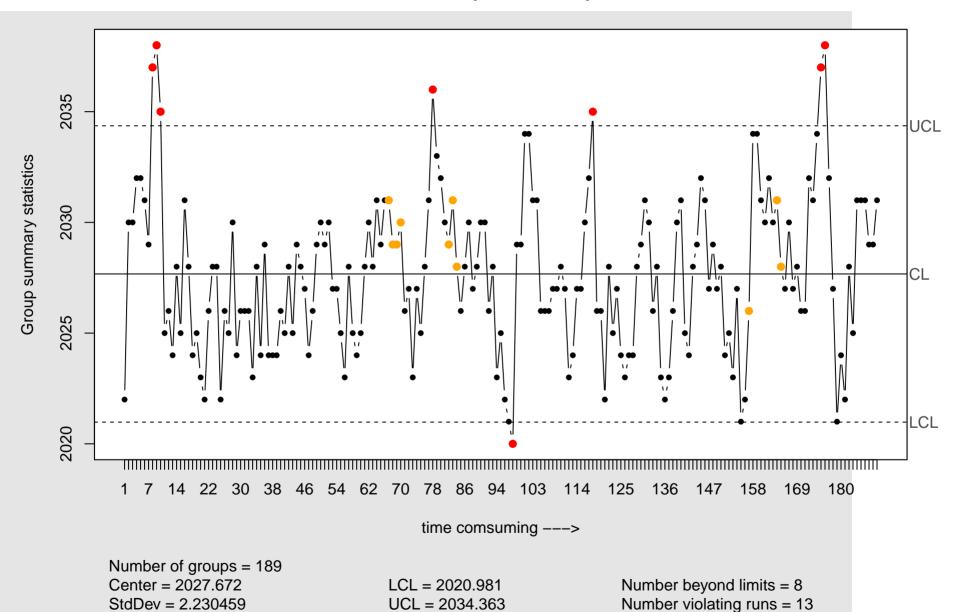
LCL = 2020.928 UCL = 2035.697

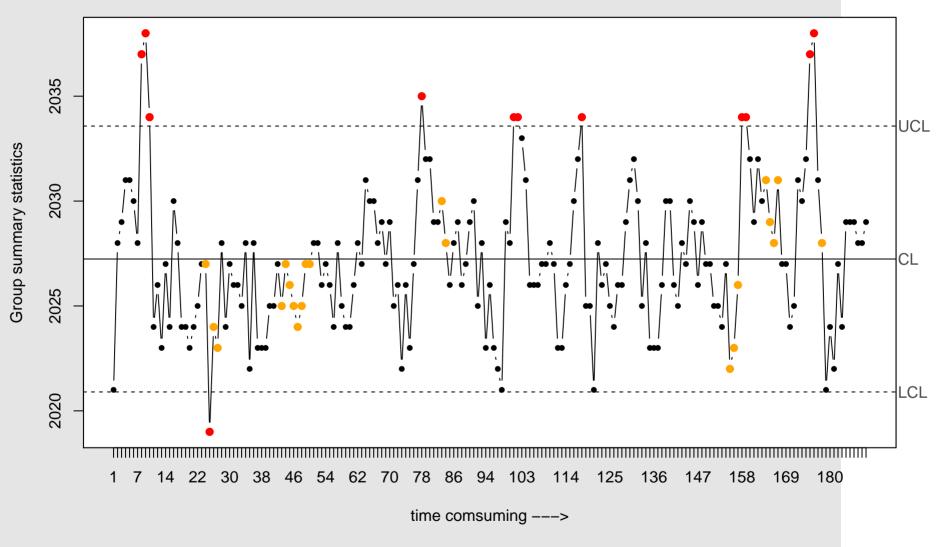
Number beyond limits = 5 Number violating runs = 13



Number of groups = 189 Center = 2028.011 StdDev = 2.362494

LCL = 2020.923 UCL = 2035.098 Number beyond limits = 7 Number violating runs = 19

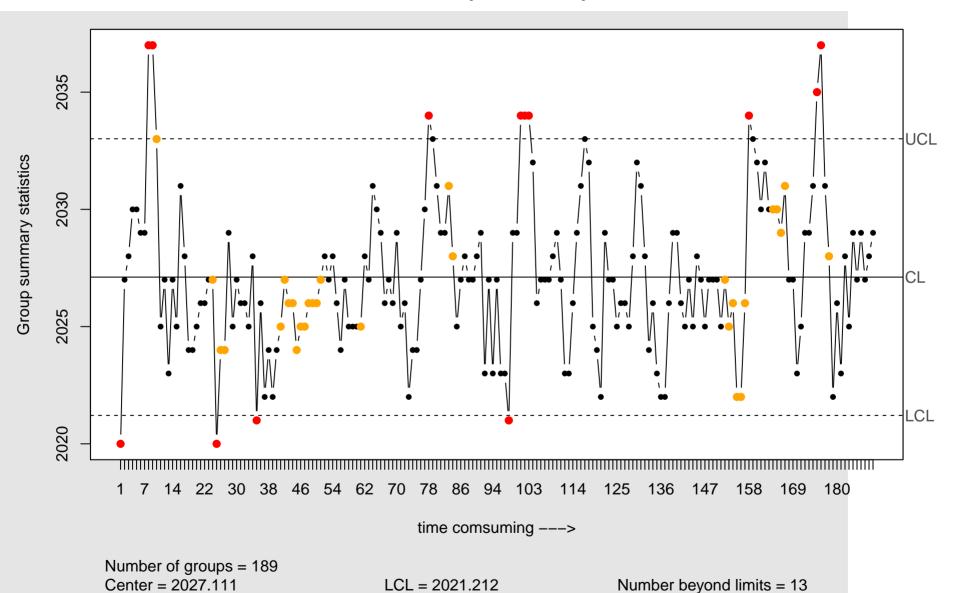




Number of groups = 189 Center = 2027.238 StdDev = 2.11257

LCL = 2020.9 UCL = 2033.576

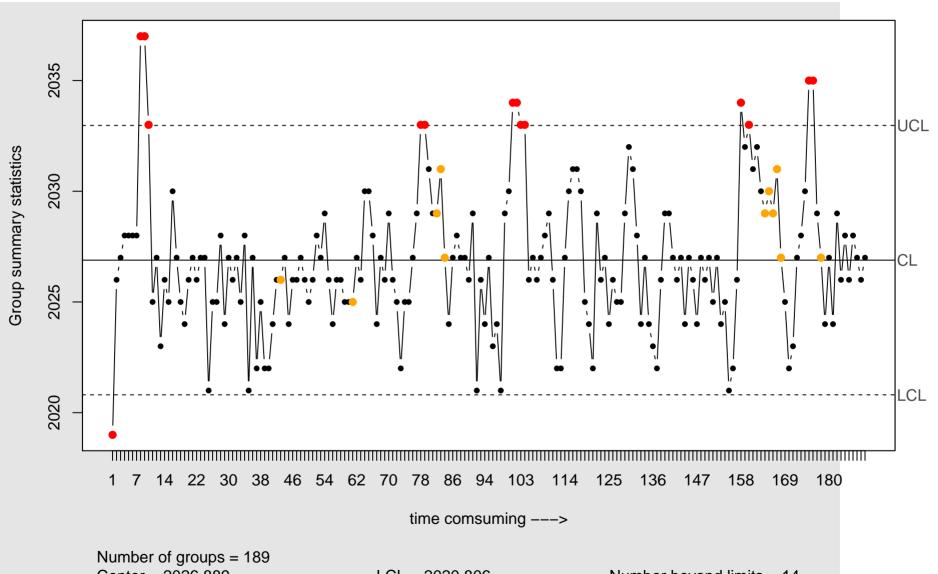
Number beyond limits = 12 Number violating runs = 25



UCL = 2033.01

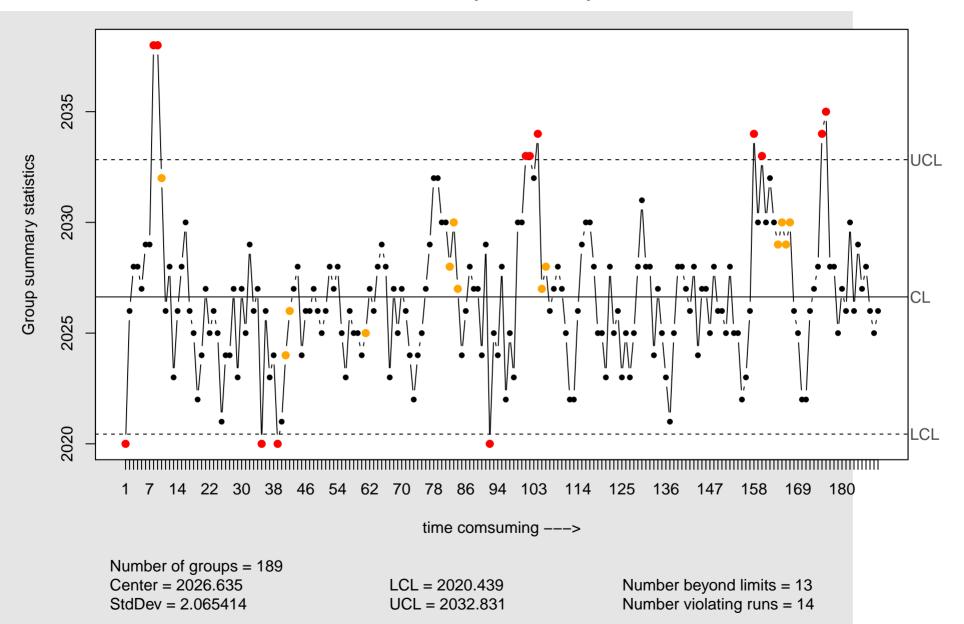
Number violating runs = 32

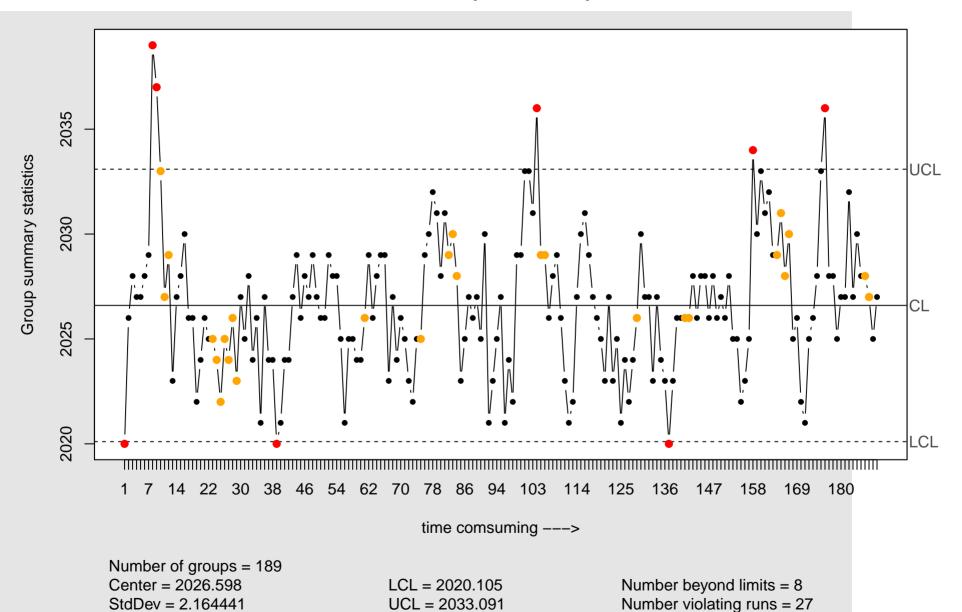
StdDev = 1.966388

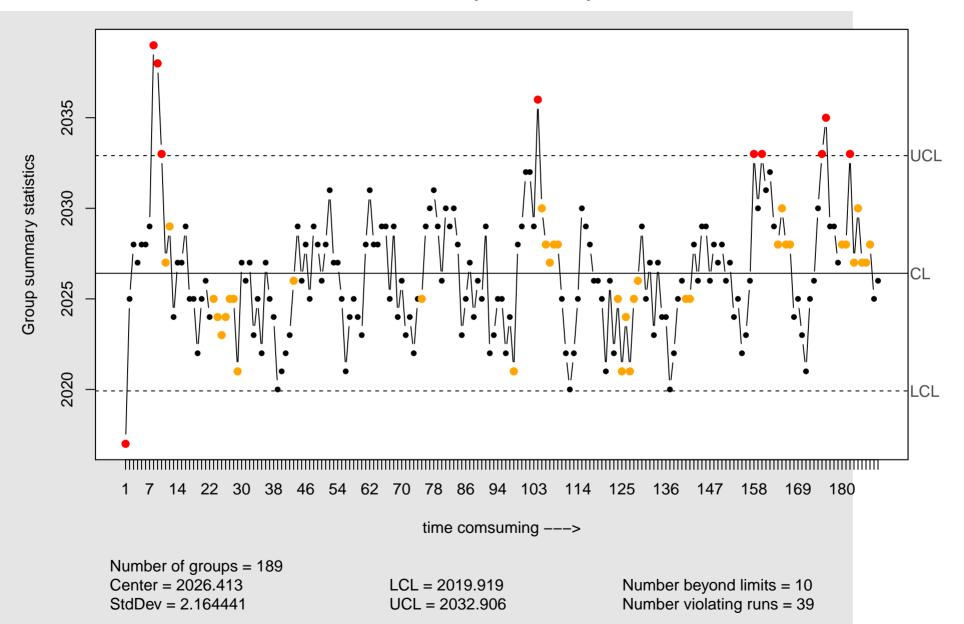


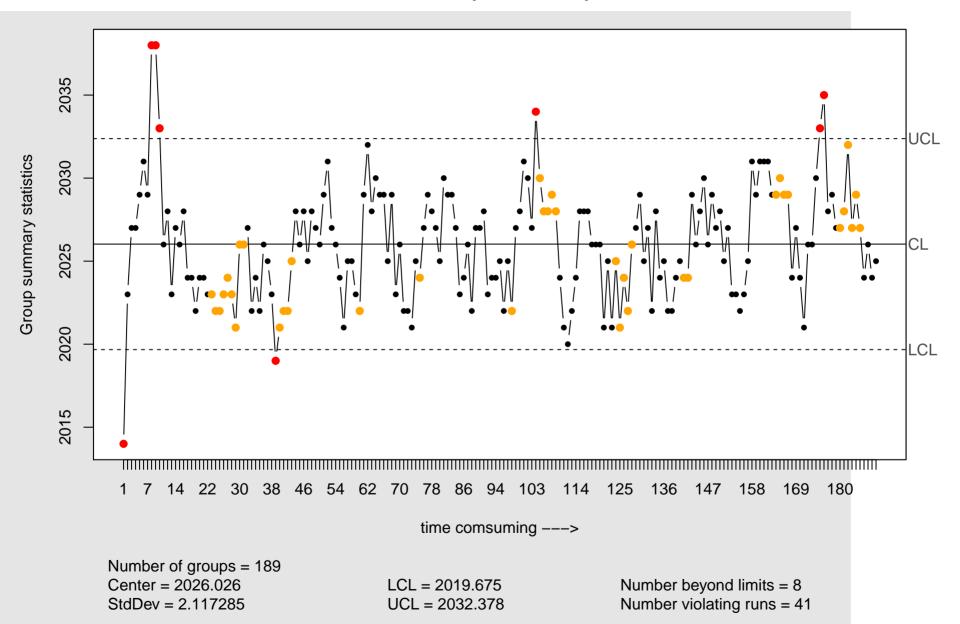
Number of groups = 189 Center = 2026.889 StdDev = 2.02769

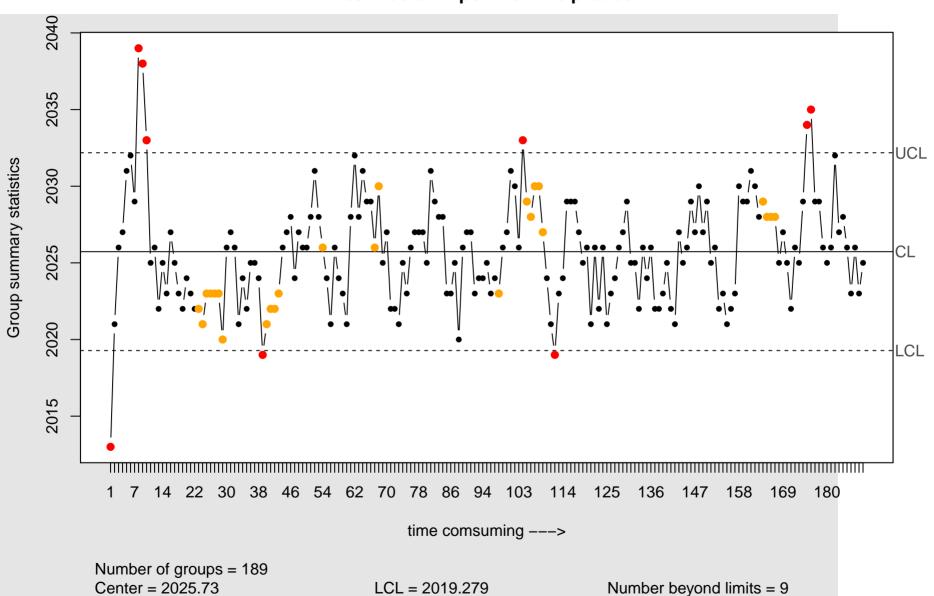
LCL = 2020.806 UCL = 2032.972 Number beyond limits = 14 Number violating runs = 13







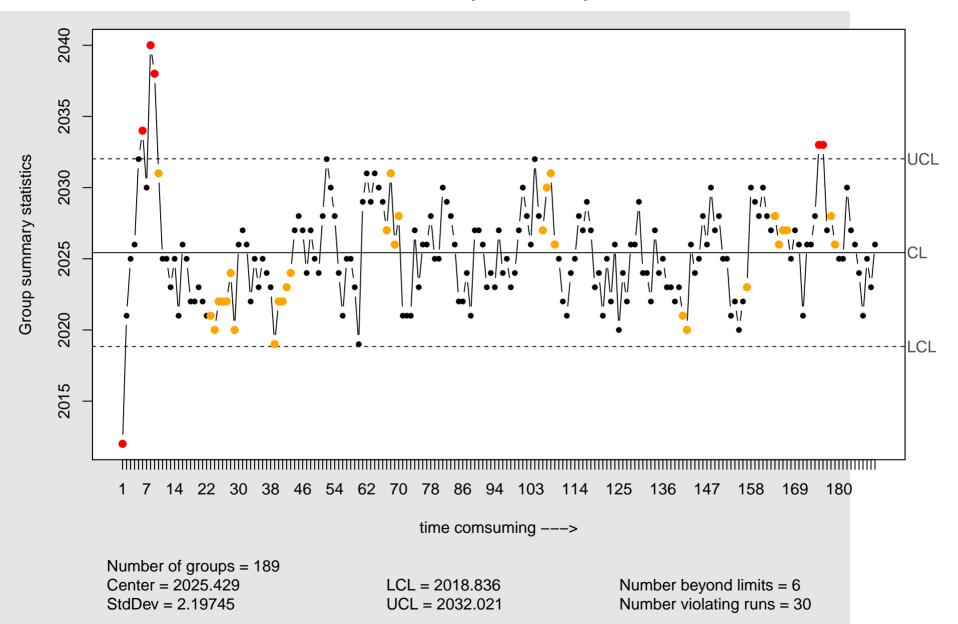


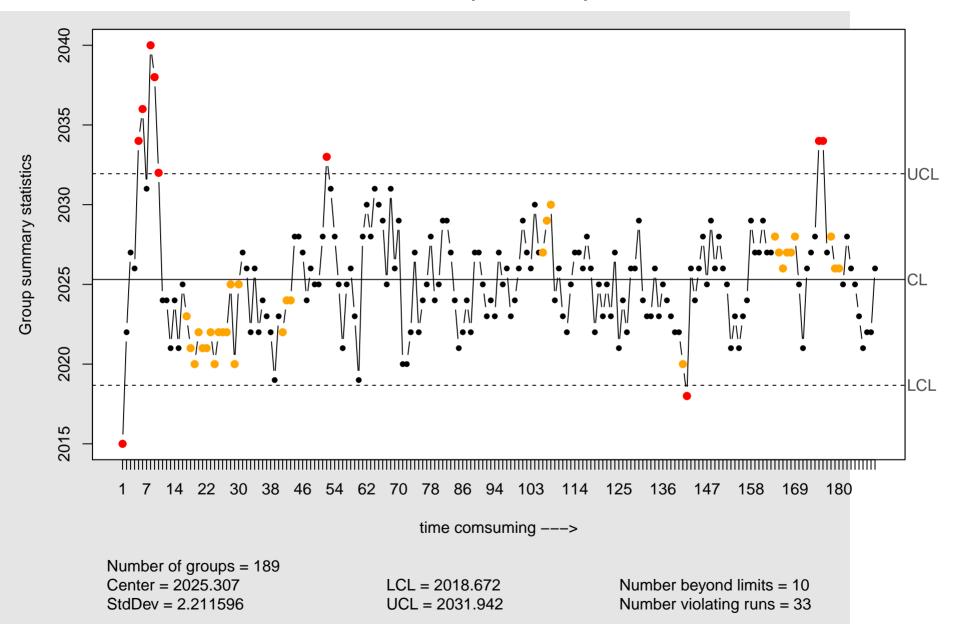


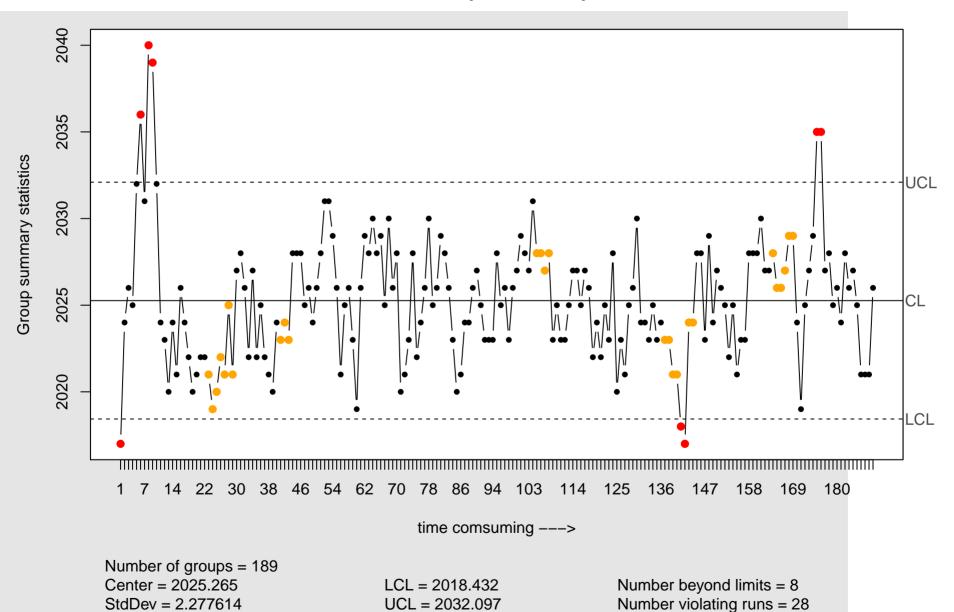
UCL = 2032.181

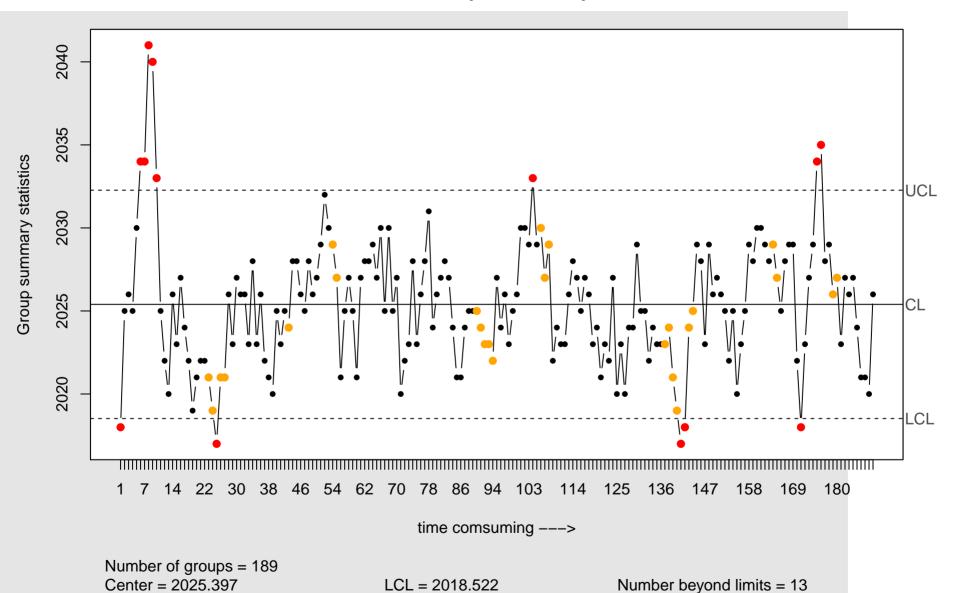
Number violating runs = 27

StdDev = 2.150294





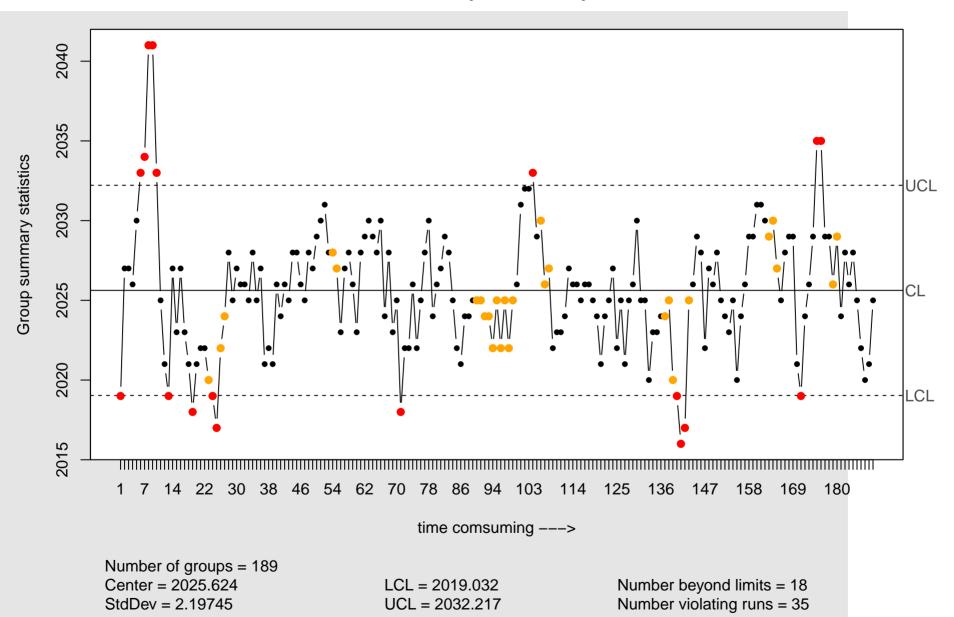


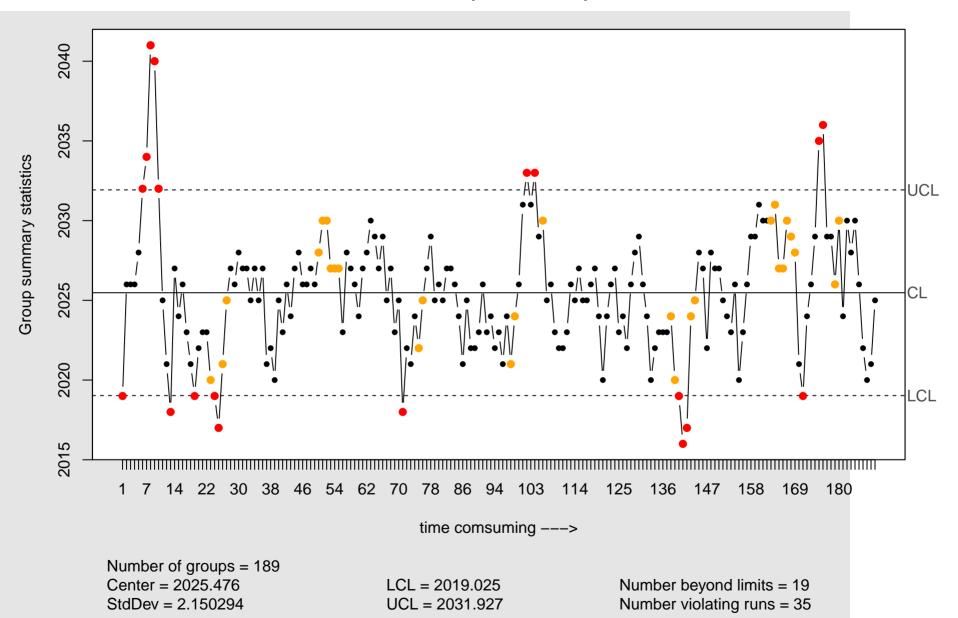


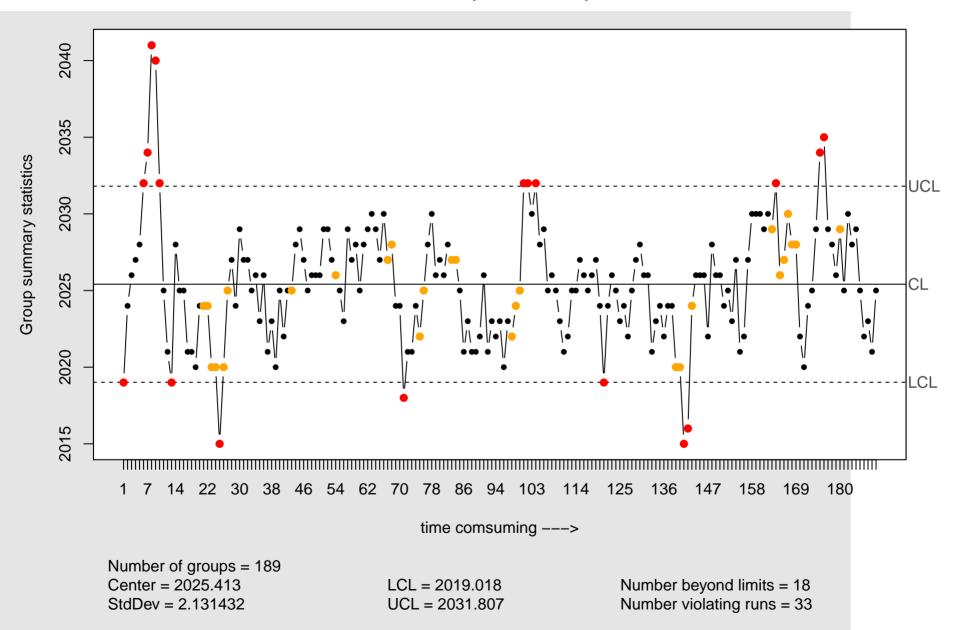
UCL = 2032.272

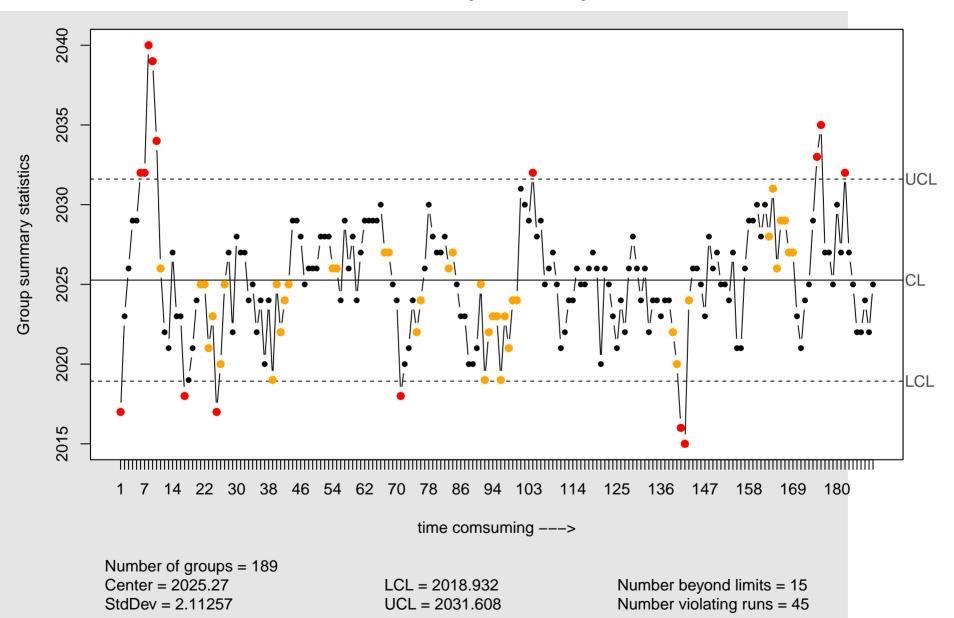
Number violating runs = 28

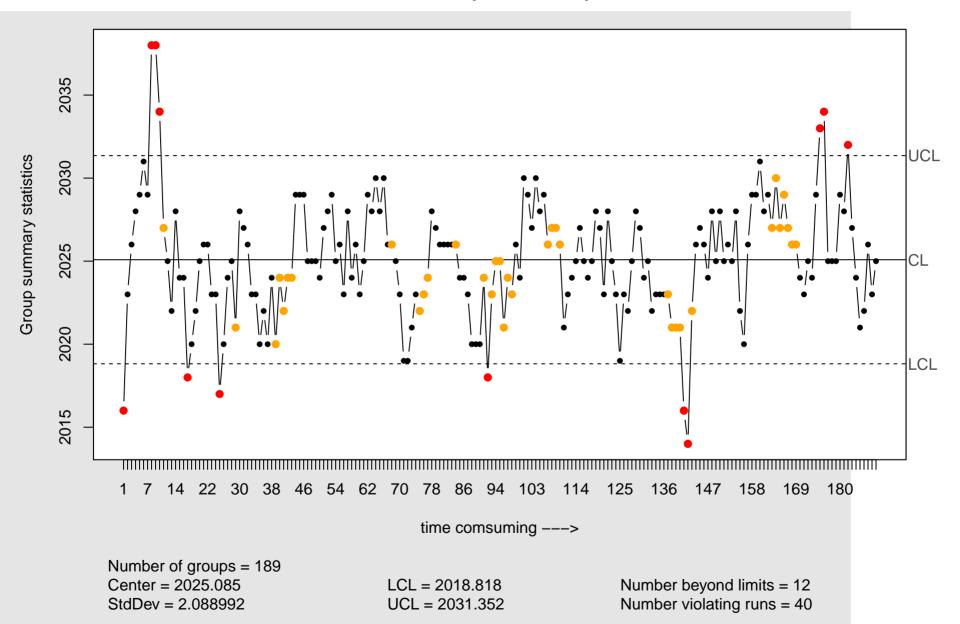
StdDev = 2.291761

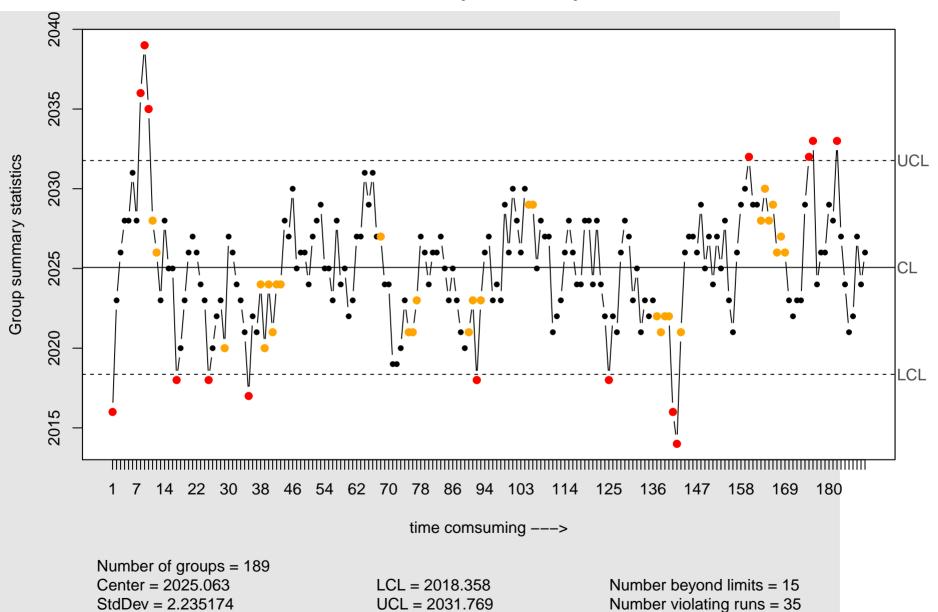


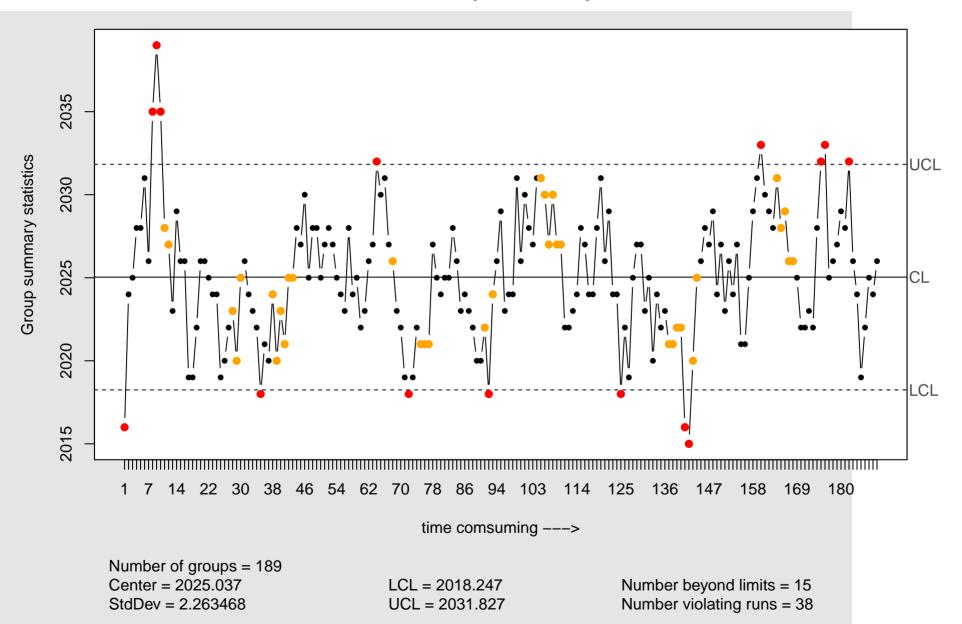


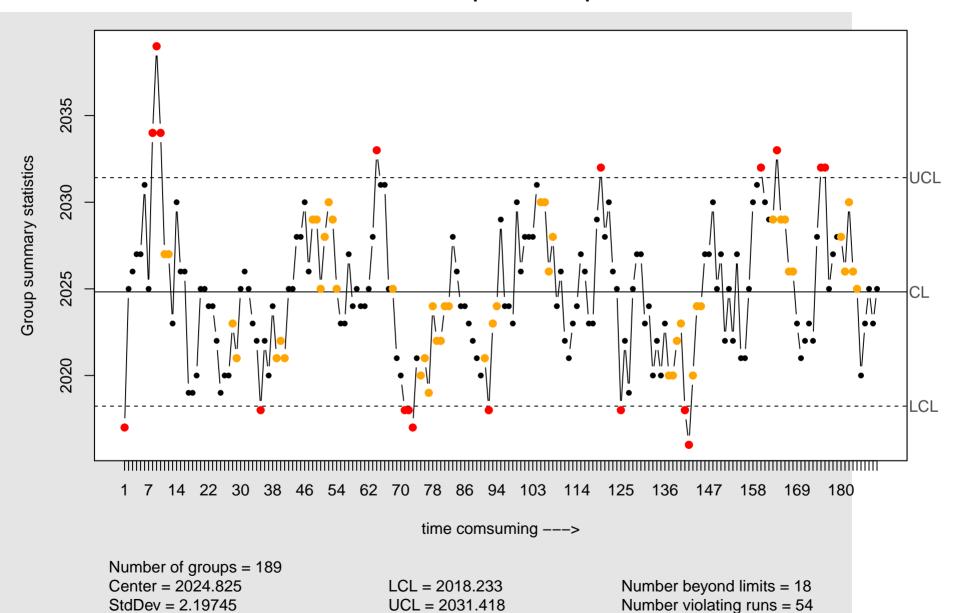


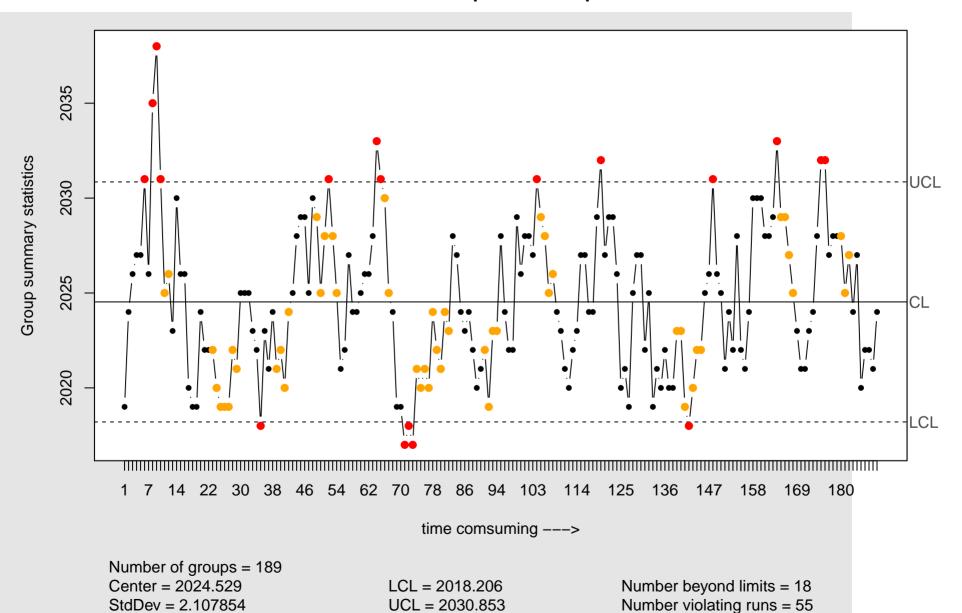


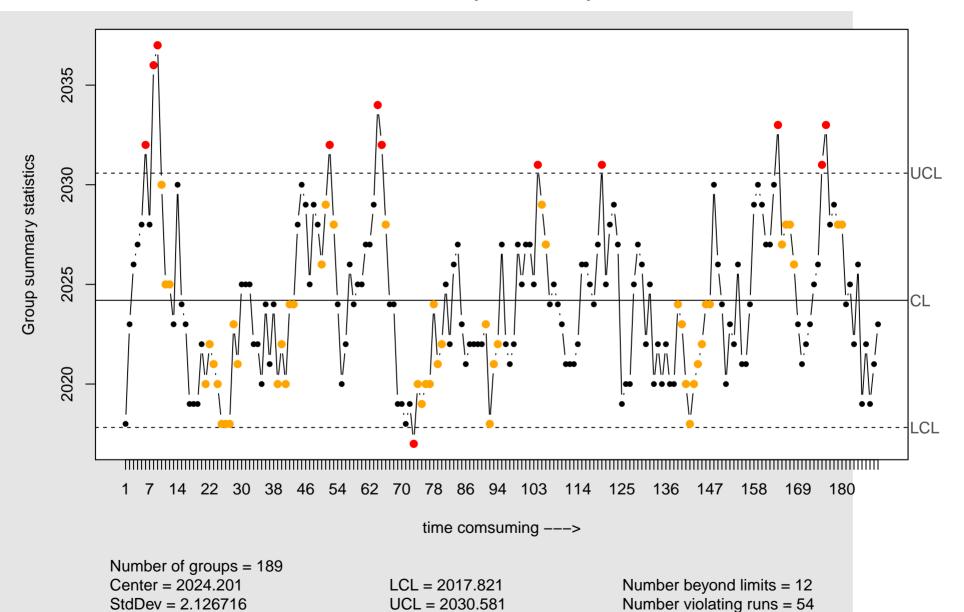


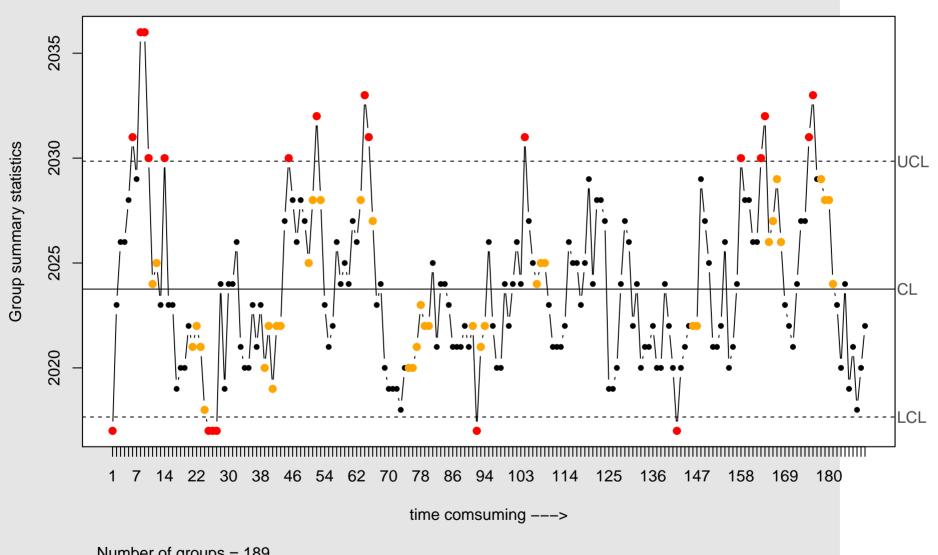






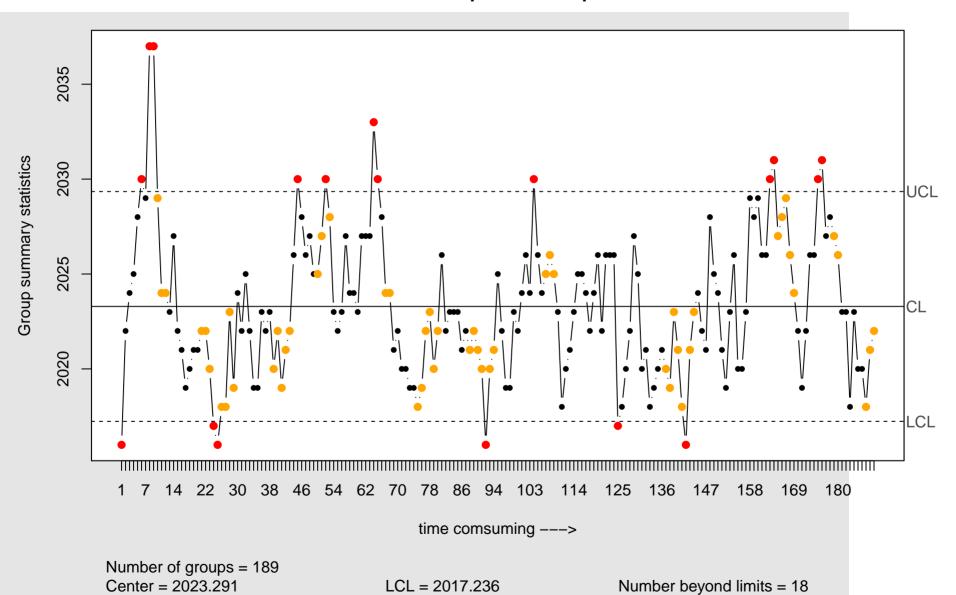






Number of groups = 189 Center = 2023.757 StdDev = 2.032405

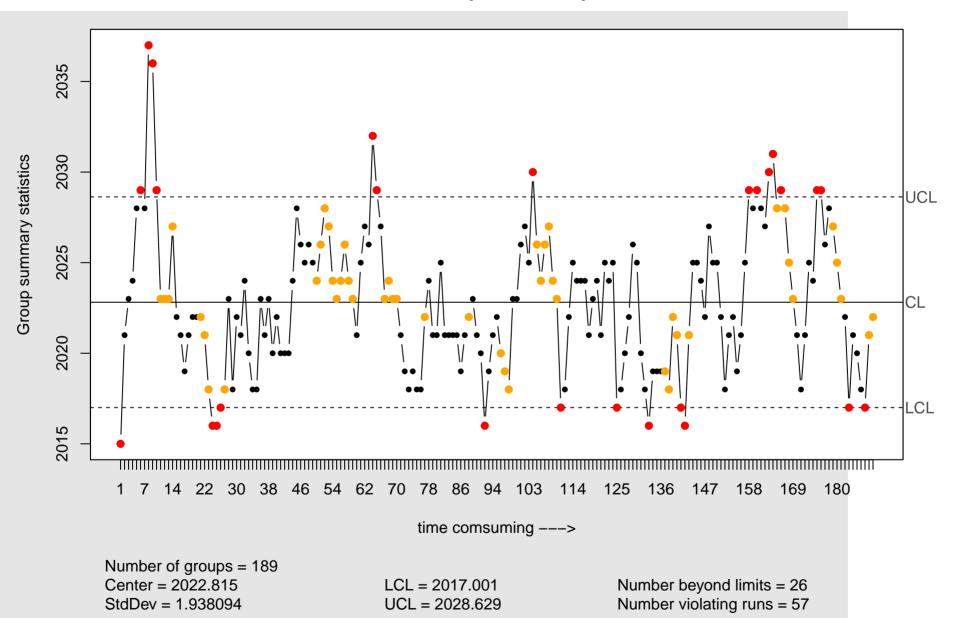
LCL = 2017.659 UCL = 2029.854 Number beyond limits = 21 Number violating runs = 49

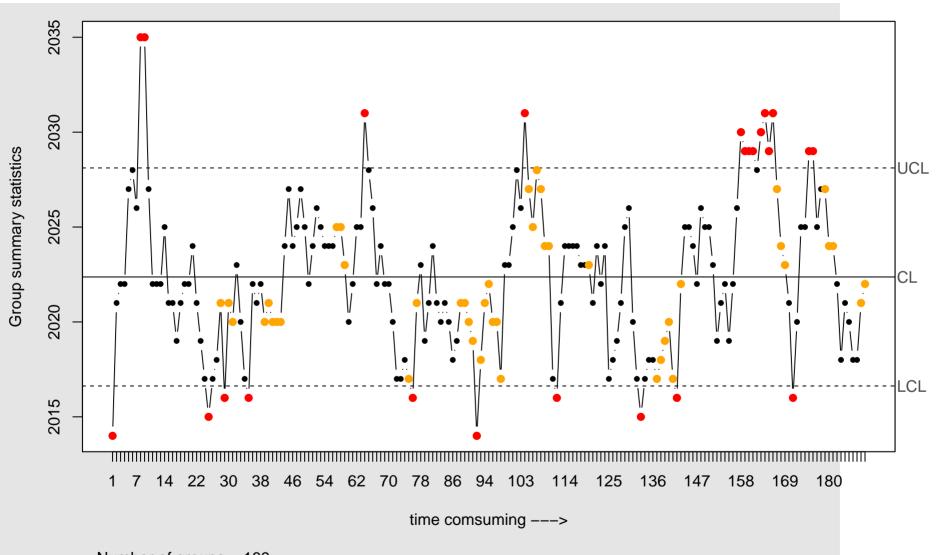


UCL = 2029.346

Number violating runs = 59

StdDev = 2.018259

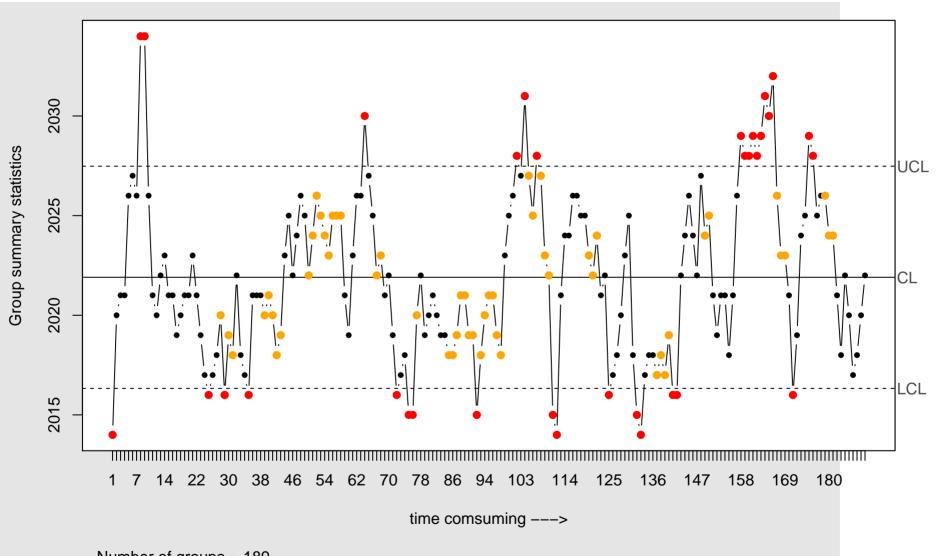




Number of groups = 189 Center = 2022.37 StdDev = 1.914516

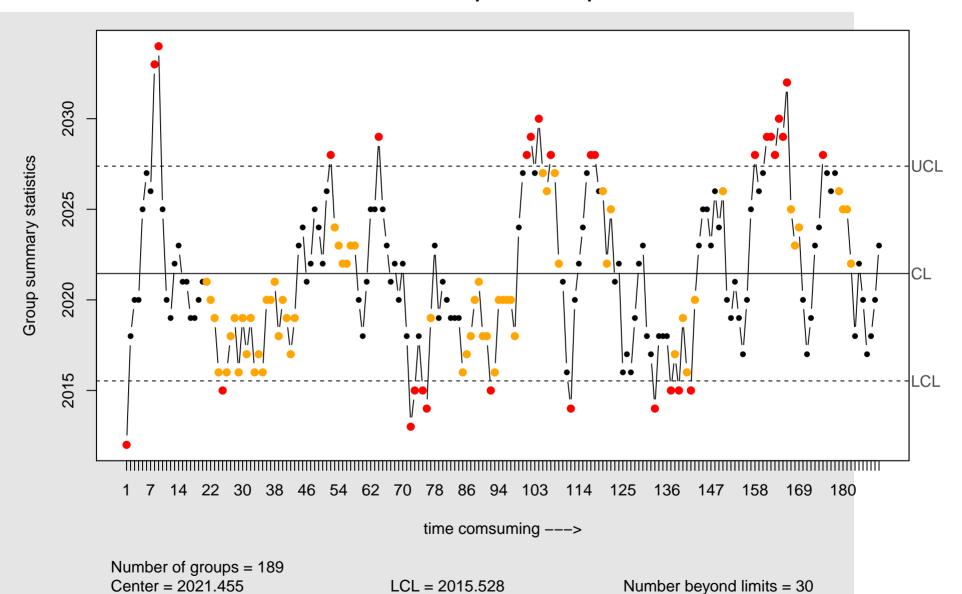
LCL = 2016.627 UCL = 2028.114

Number beyond limits = 24 Number violating runs = 52



Number of groups = 189 Center = 2021.905 StdDev = 1.85793

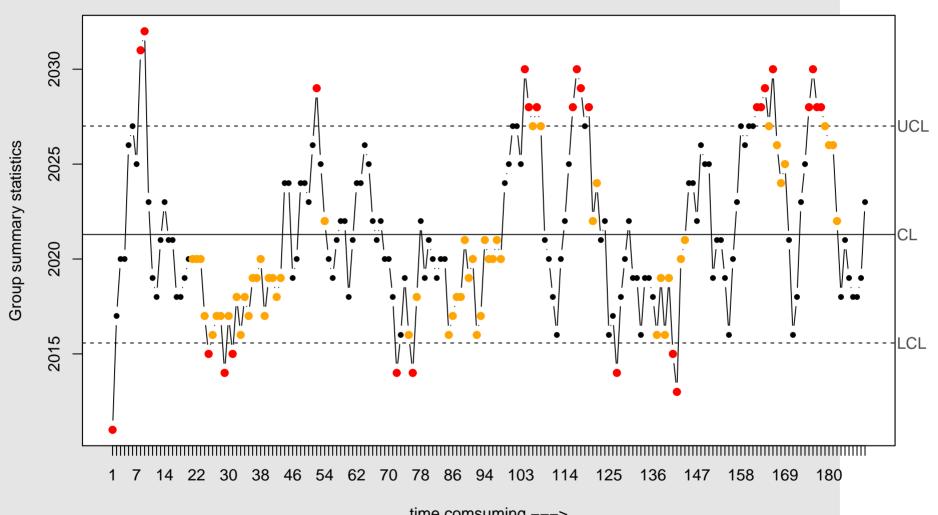
LCL = 2016.331 UCL = 2027.479 Number beyond limits = 33 Number violating runs = 62



UCL = 2027.382

Number violating runs = 71

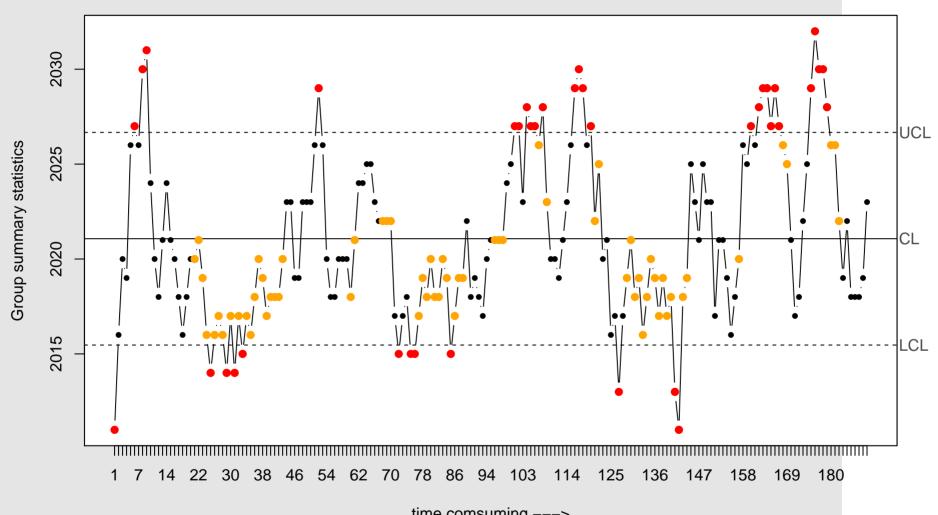
StdDev = 1.975819



time comsuming --->

Number of groups = 189 Center = 2021.291StdDev = 1.905085

LCL = 2015.576UCL = 2027.006 Number beyond limits = 27 Number violating runs = 67

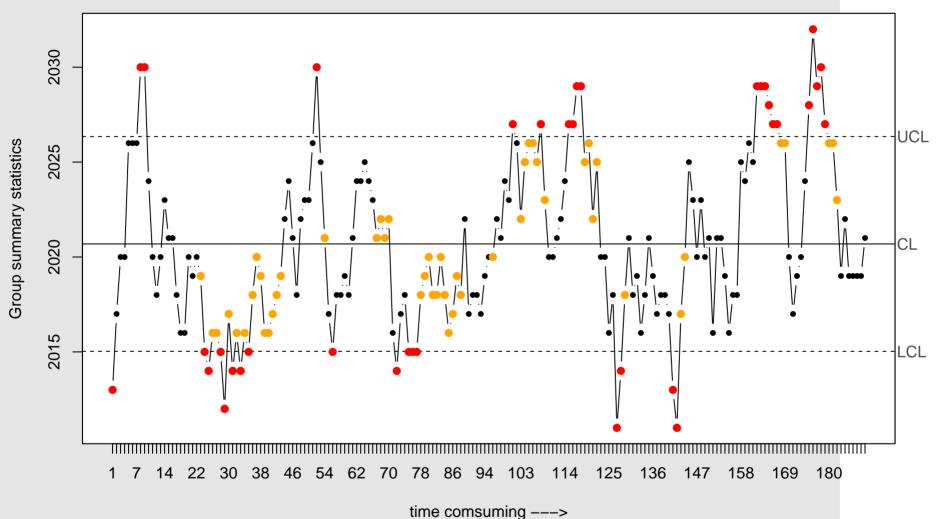


time comsuming --->

Number of groups = 189 Center = 2021.069StdDev = 1.867361

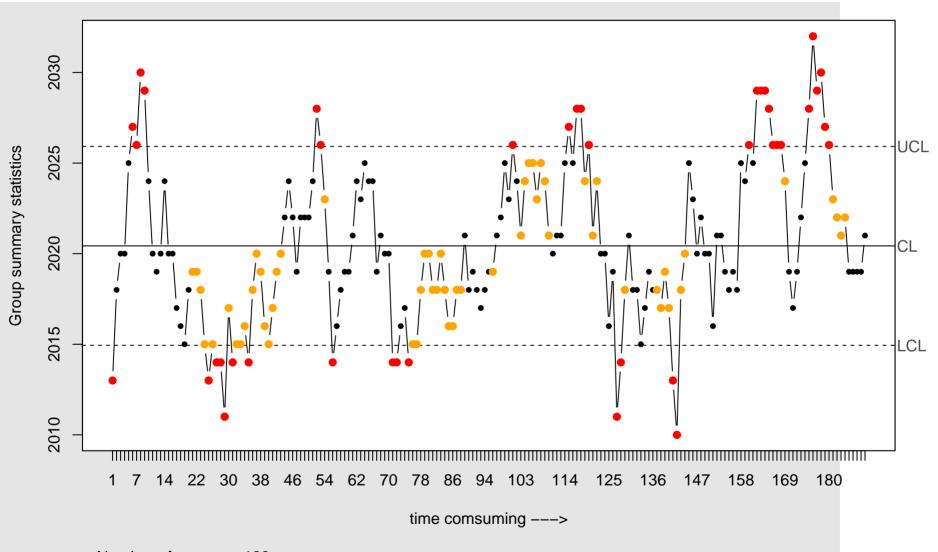
LCL = 2015.467UCL = 2026.671

Number beyond limits = 38 Number violating runs = 78



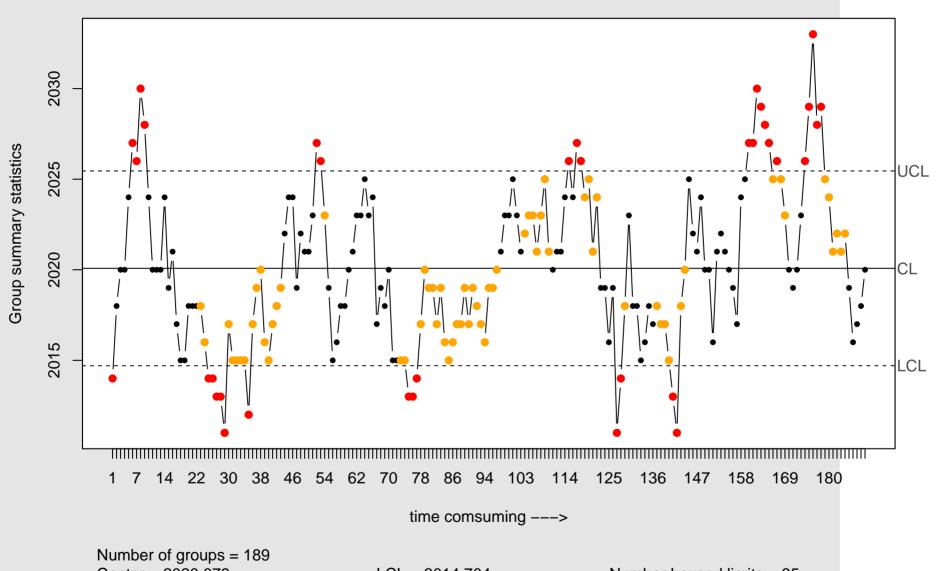
Number of groups = 189 Center = 2020.688 StdDev = 1.886223

LCL = 2015.029UCL = 2026.346 Number beyond limits = 37 Number violating runs = 64



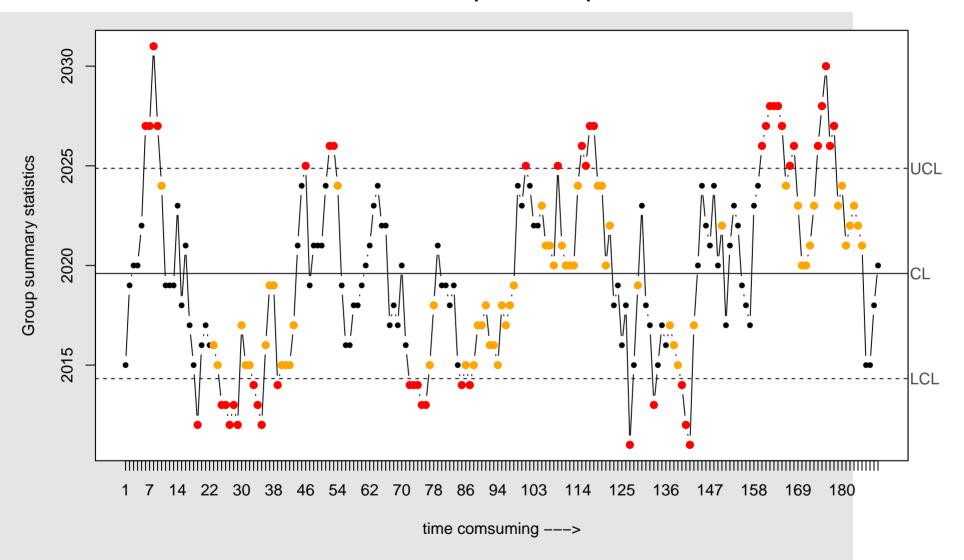
Number of groups = 189 Center = 2020.429 StdDev = 1.829636

LCL = 2014.94 UCL = 2025.917 Number beyond limits = 40 Number violating runs = 73



Number of groups = 189 Center = 2020.079 StdDev = 1.791912

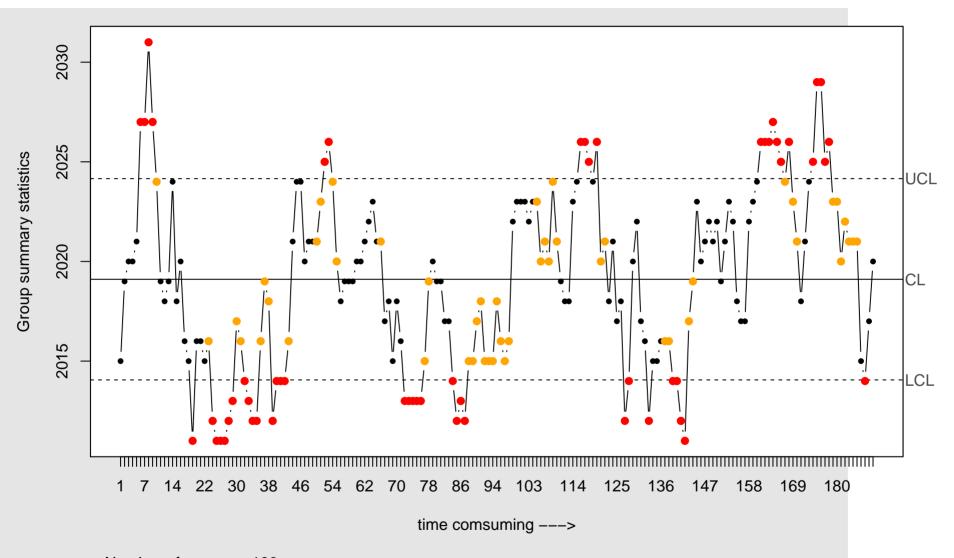
LCL = 2014.704 UCL = 2025.455 Number beyond limits = 35 Number violating runs = 80



Number of groups = 189 Center = 2019.598 StdDev = 1.758903

LCL = 2014.321 UCL = 2024.875

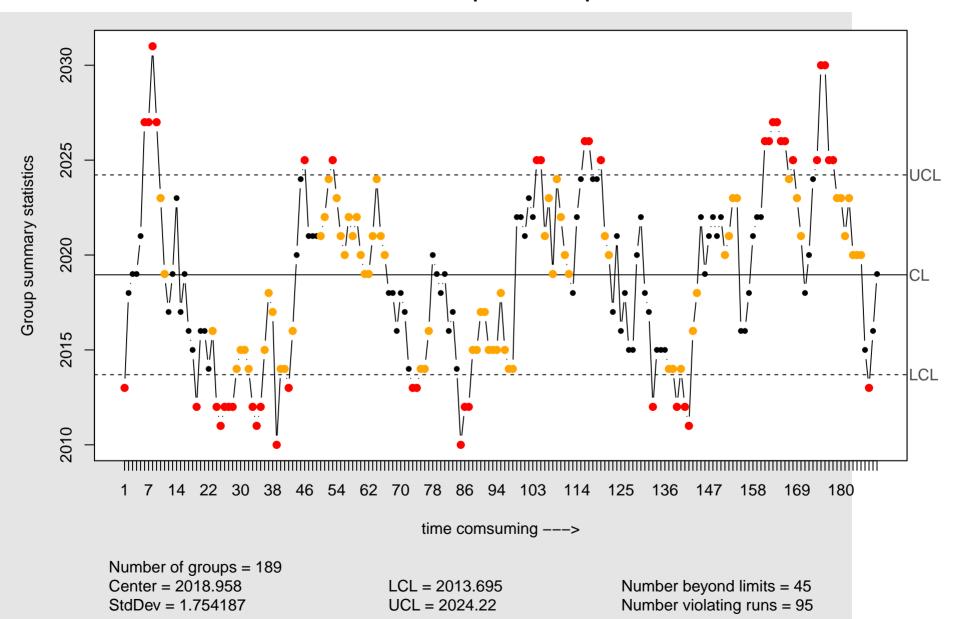
Number beyond limits = 48 Number violating runs = 88

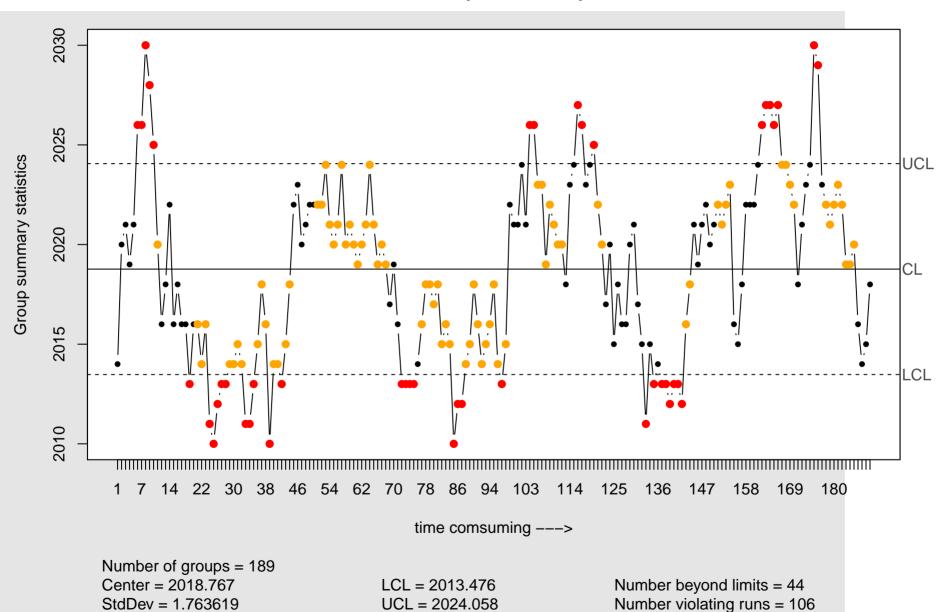


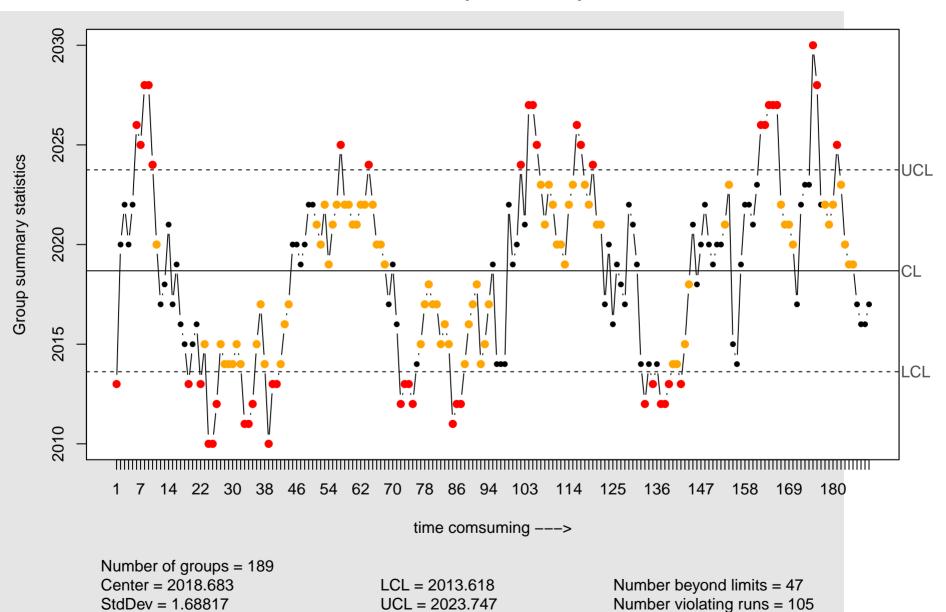
Number of groups = 189 Center = 2019.106 StdDev = 1.683454

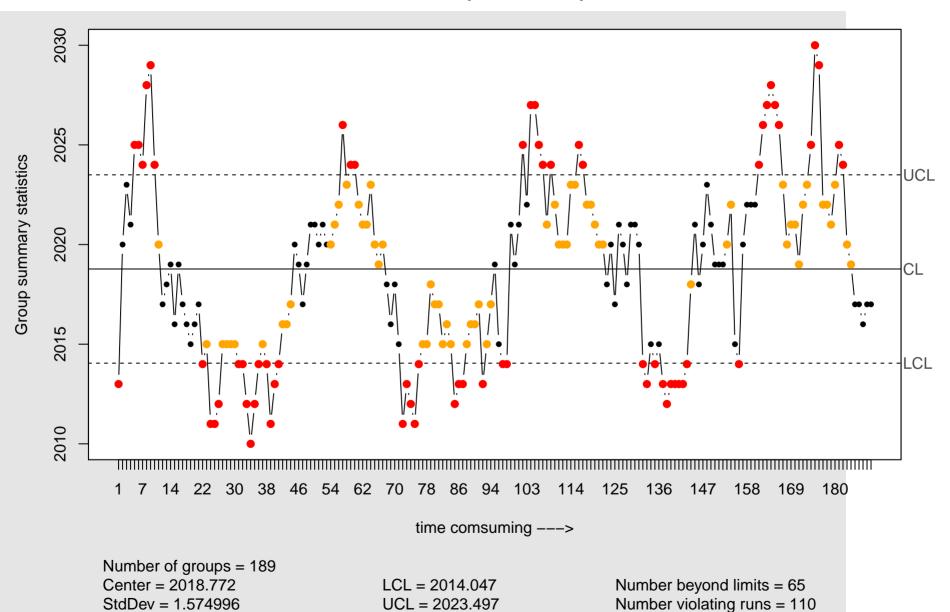
LCL = 2014.055 UCL = 2024.156

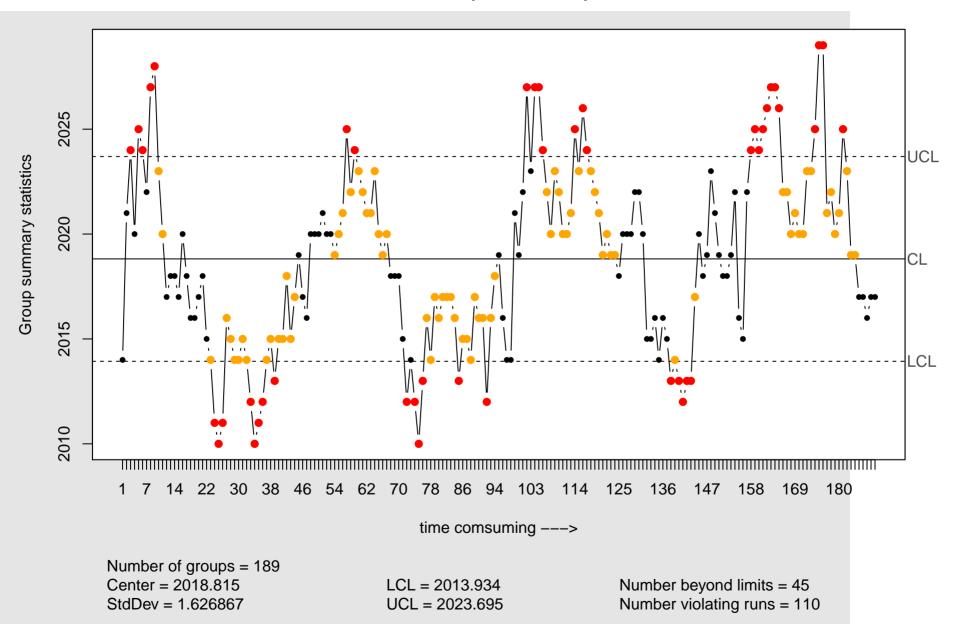
Number beyond limits = 54 Number violating runs = 81

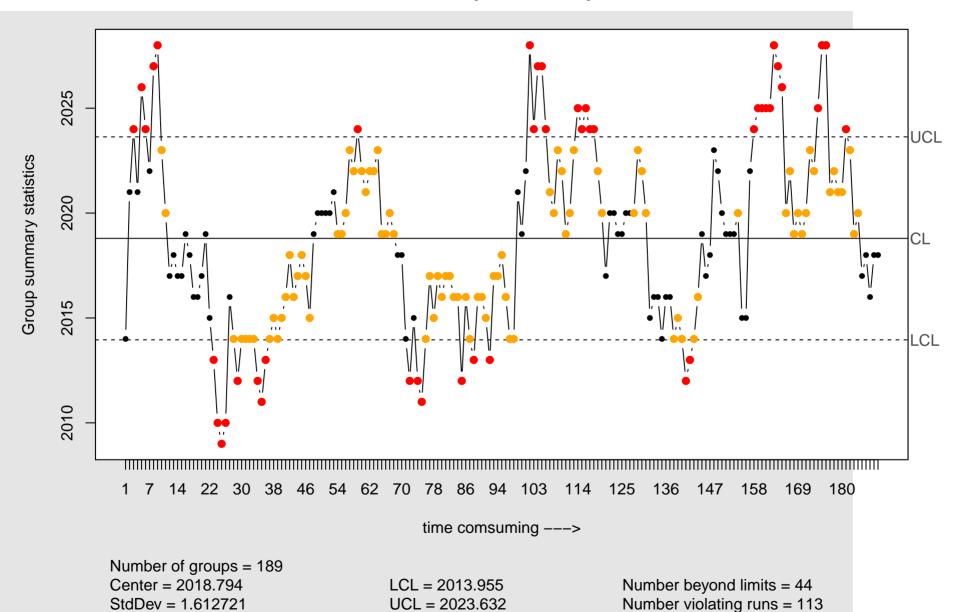


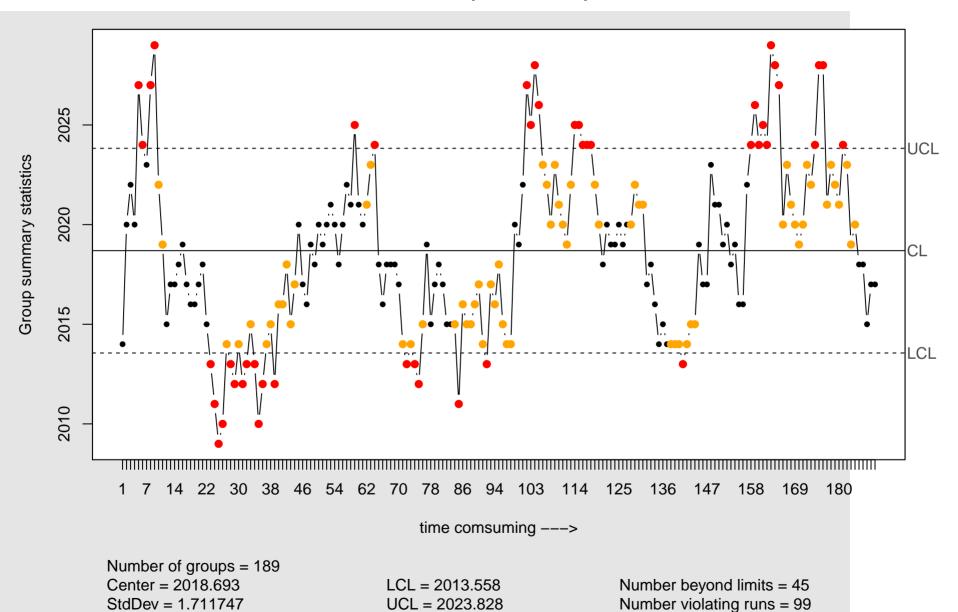


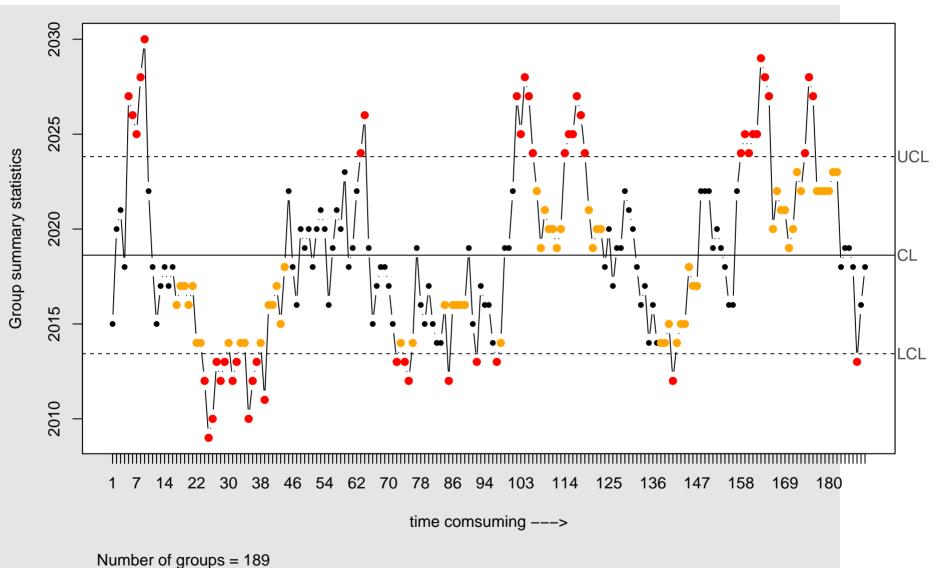






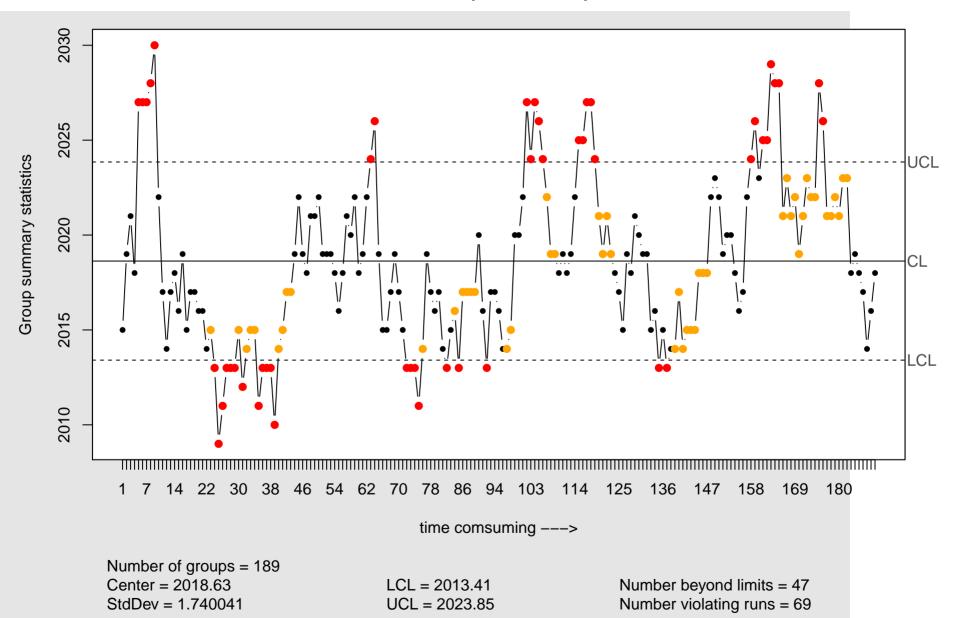


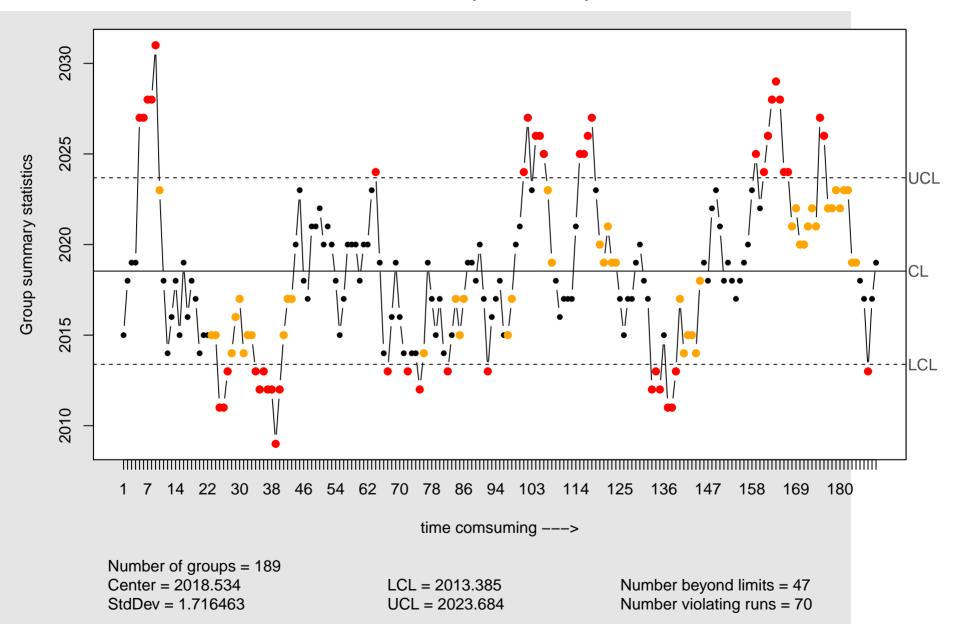


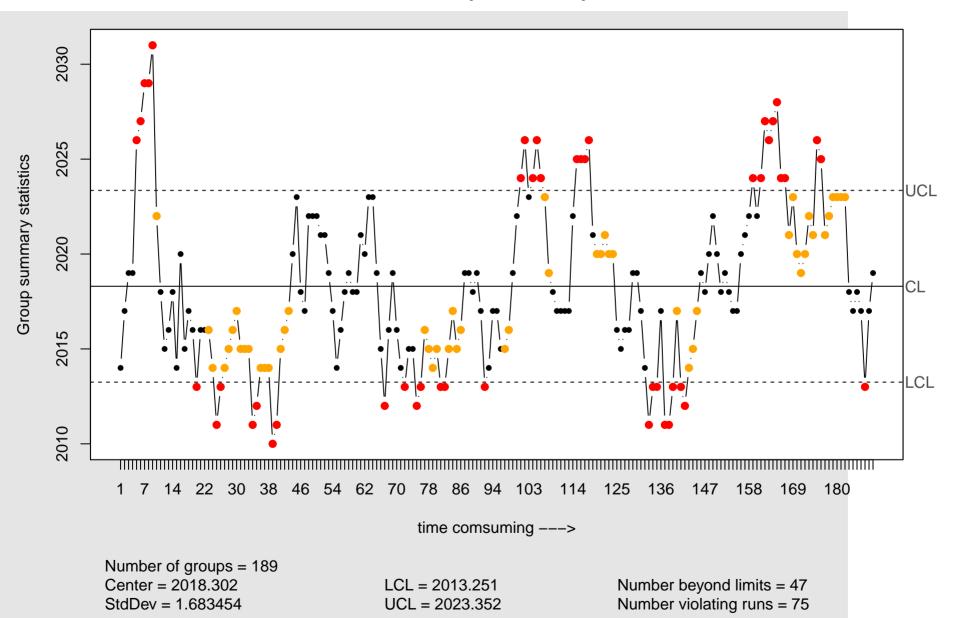


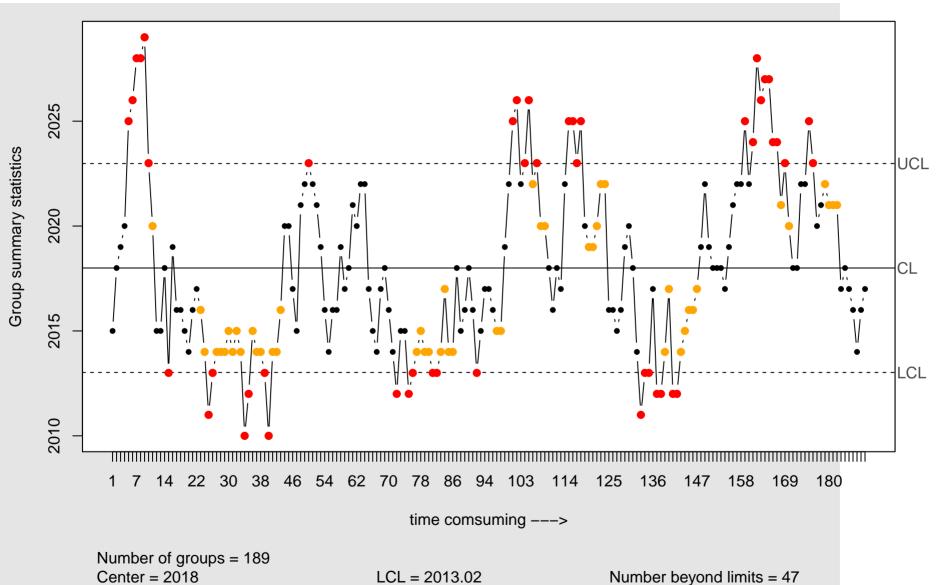
Number of groups = 189 Center = 2018.624 StdDev = 1.73061

LCL = 2013.433 UCL = 2023.816 Number beyond limits = 49 Number violating runs = 90





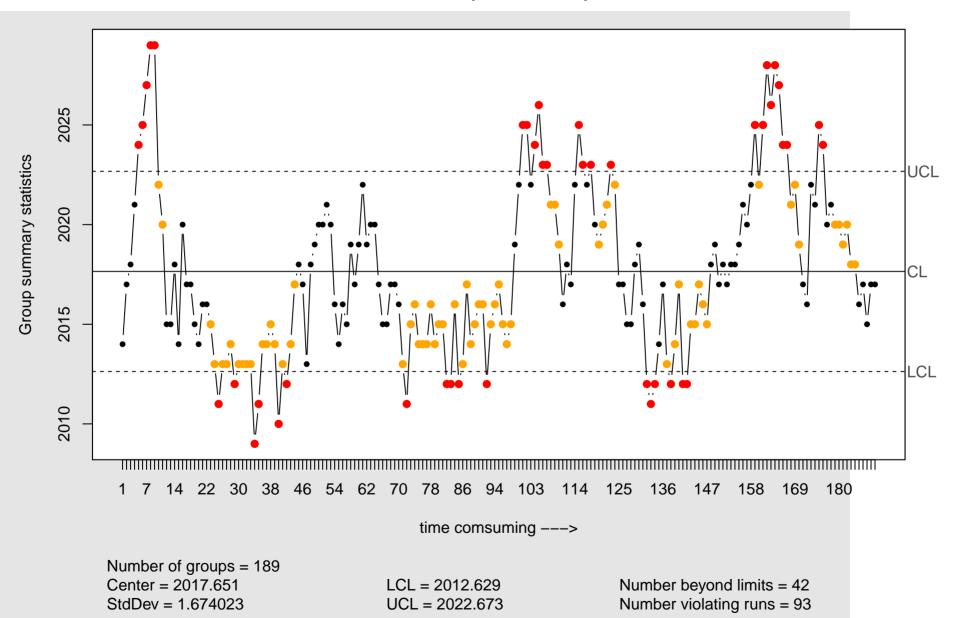


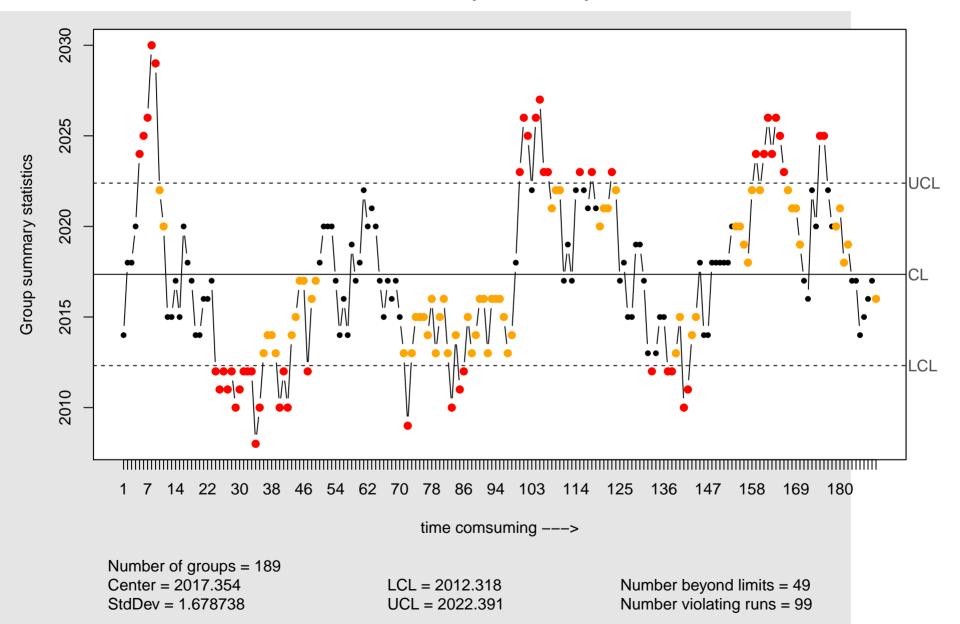


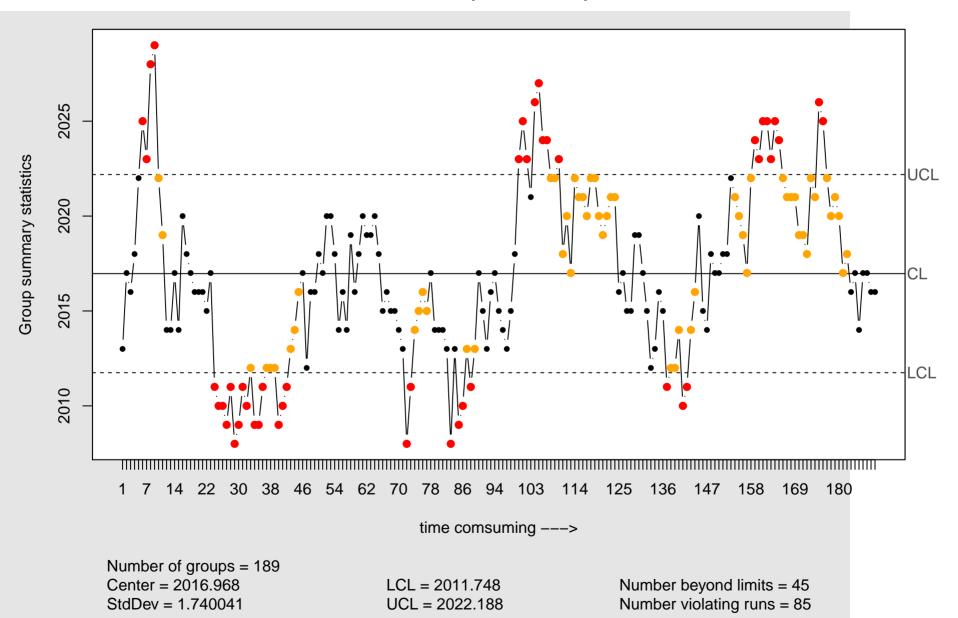
StdDev = 1.659876

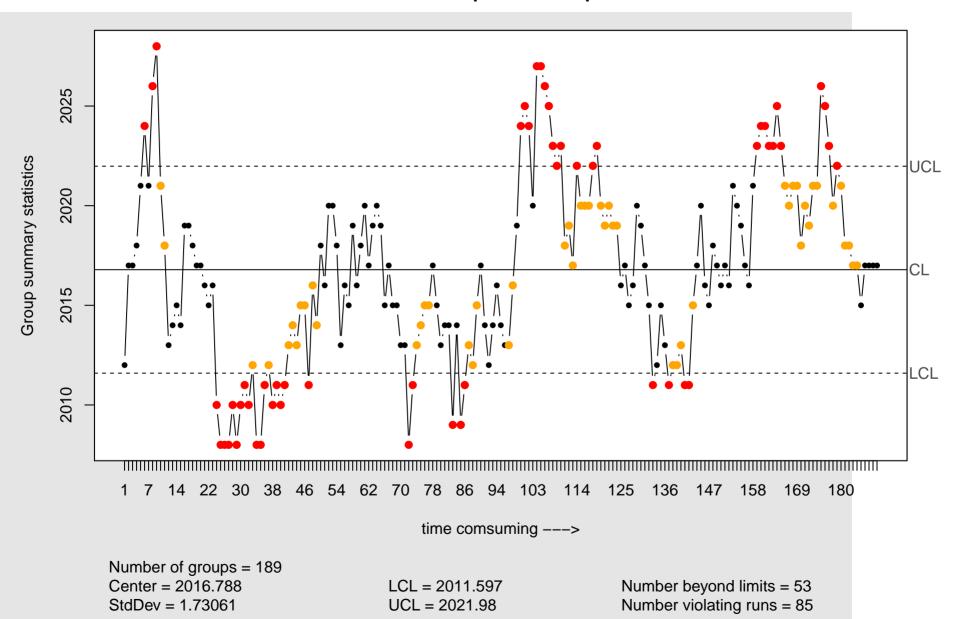
UCL = 2022.98

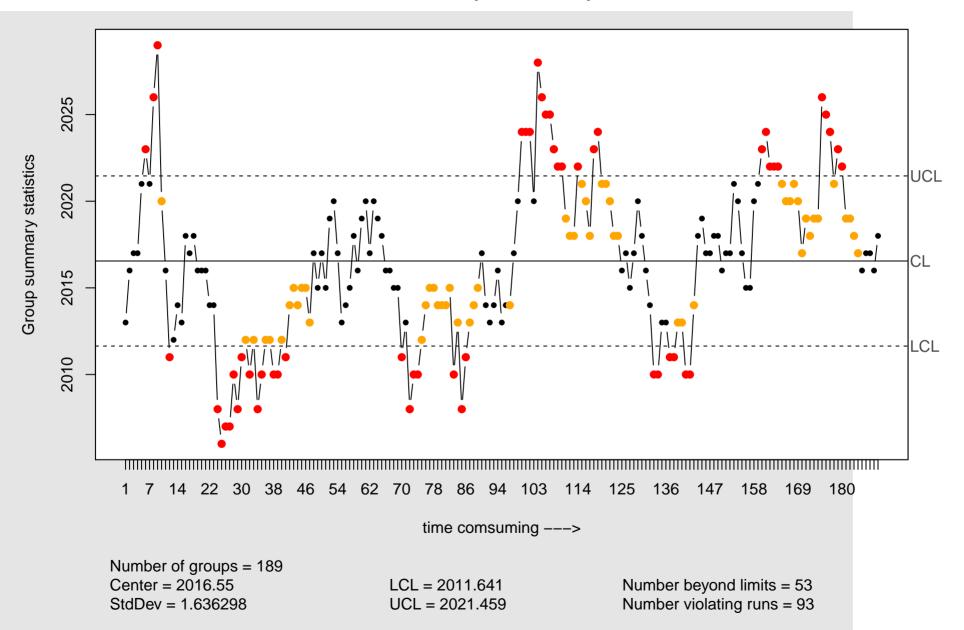
Number violating runs = 71

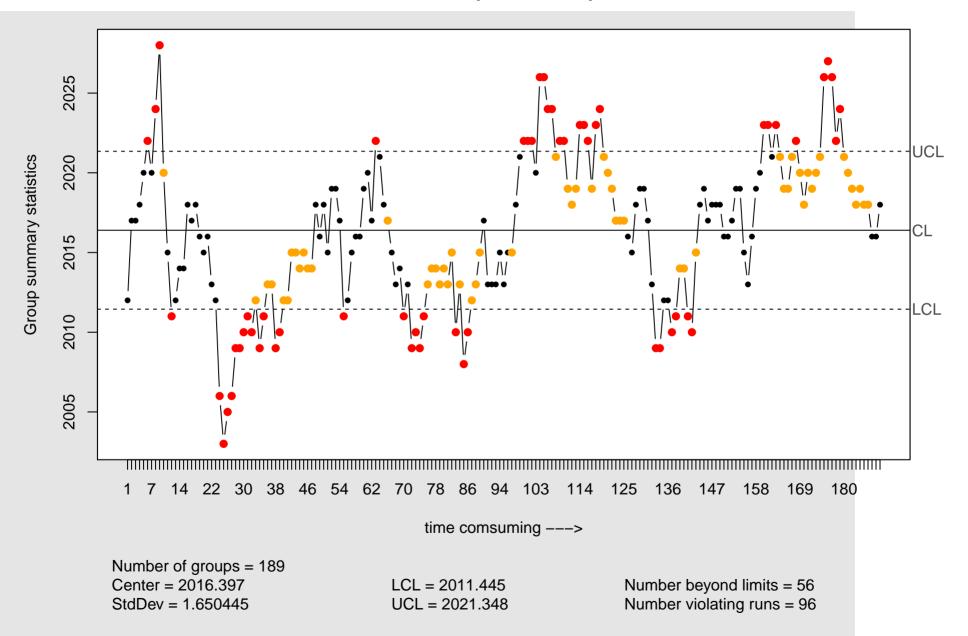


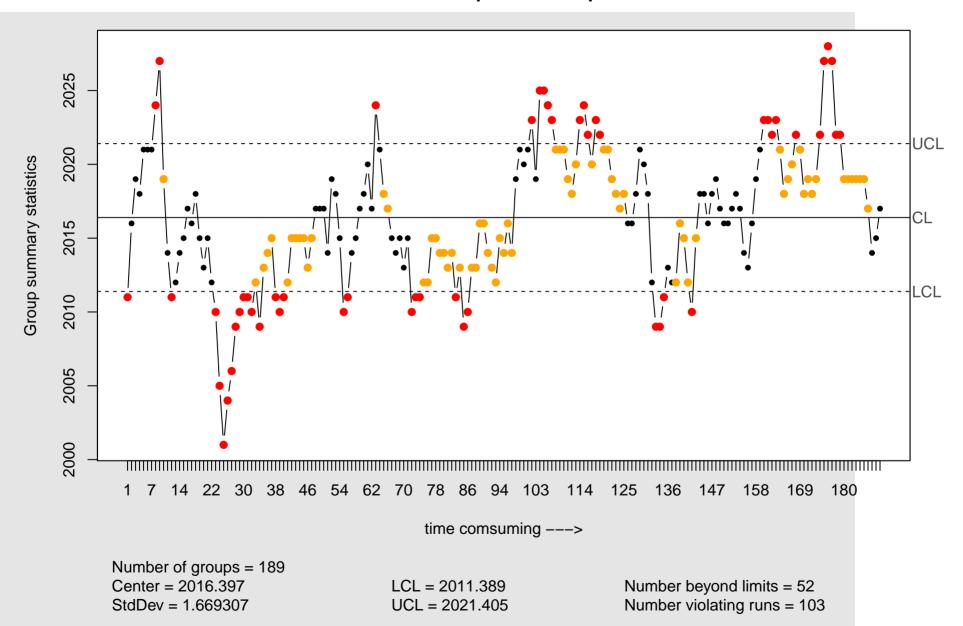


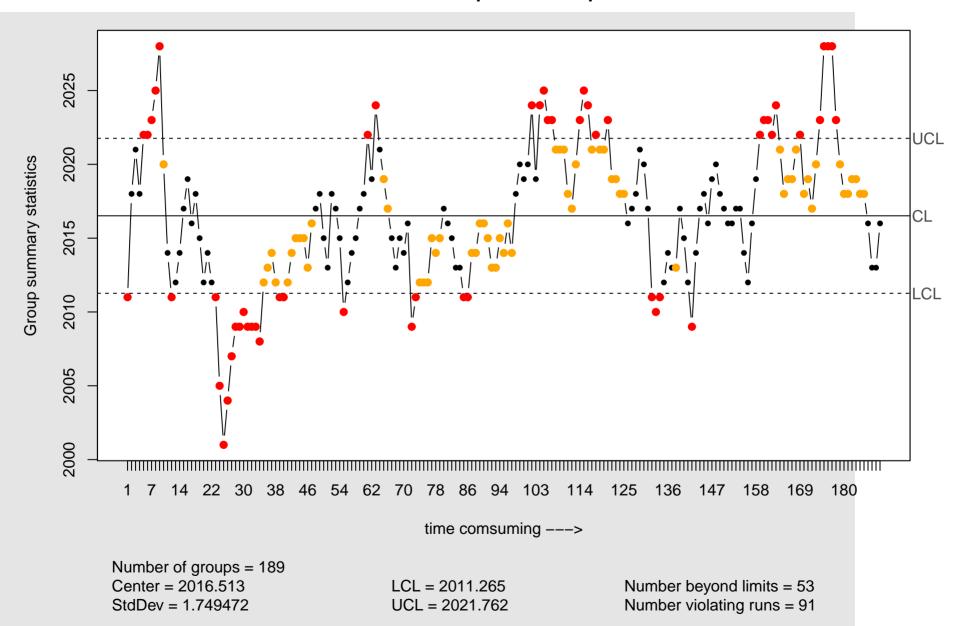


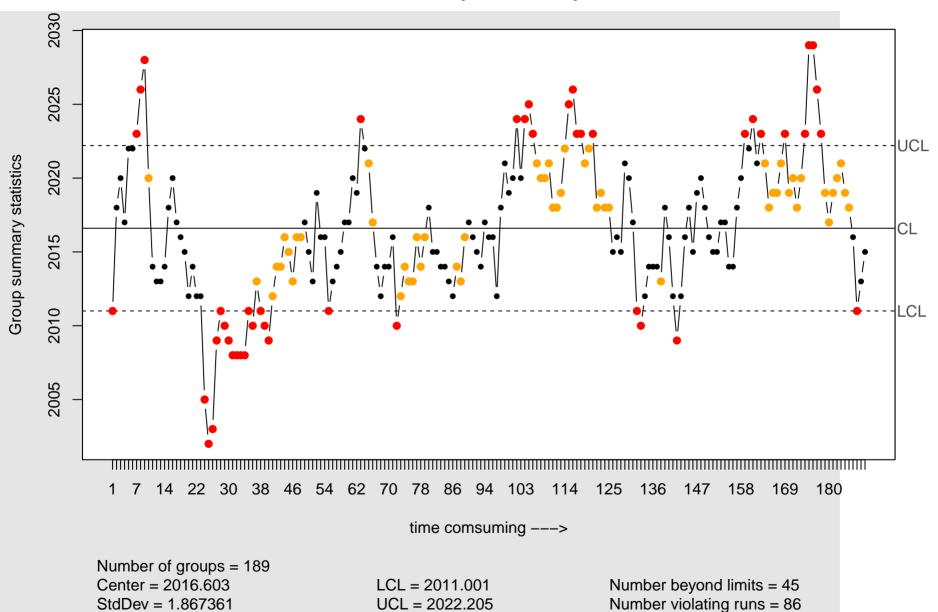


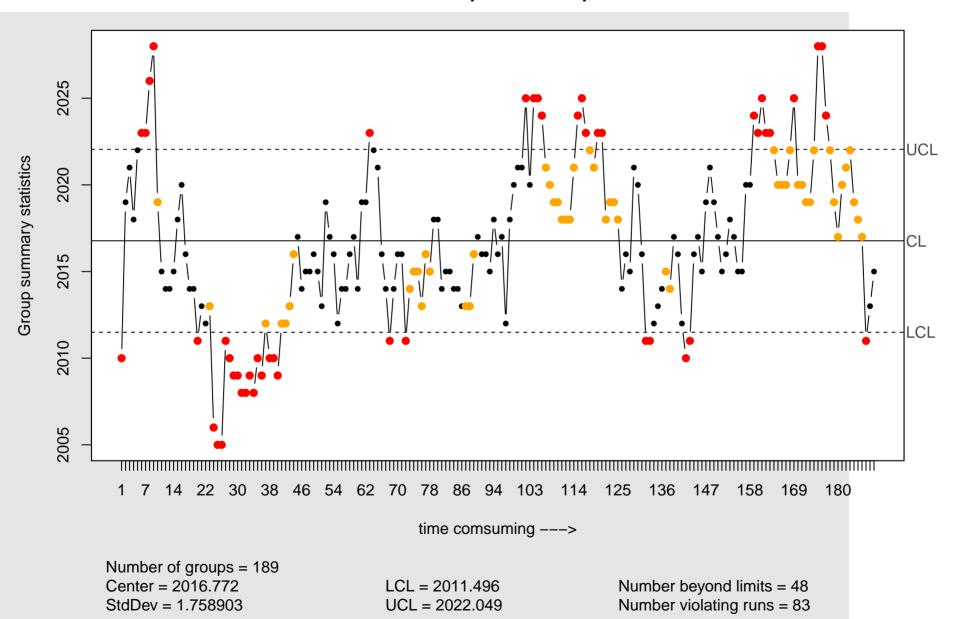


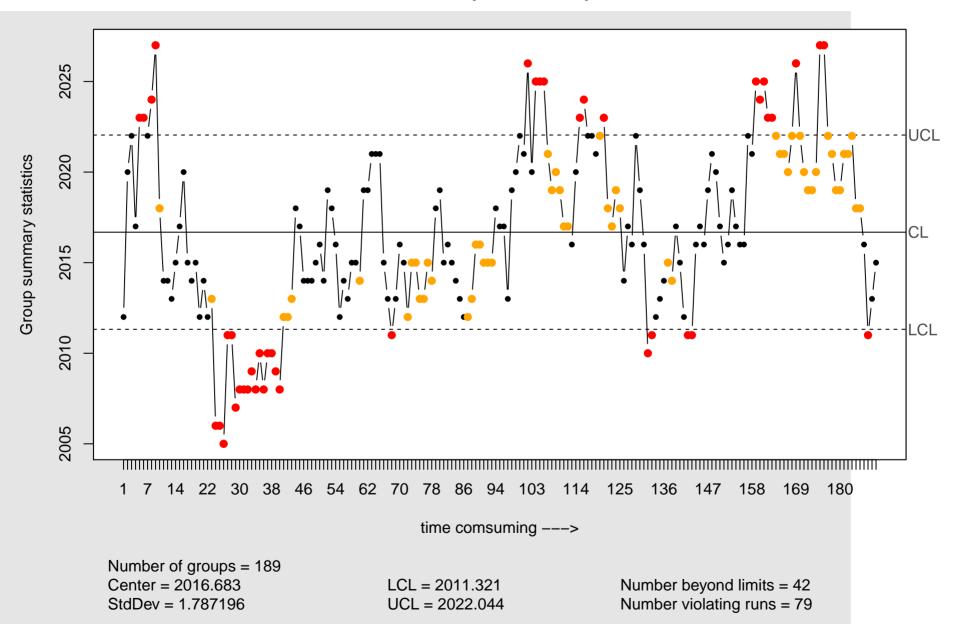


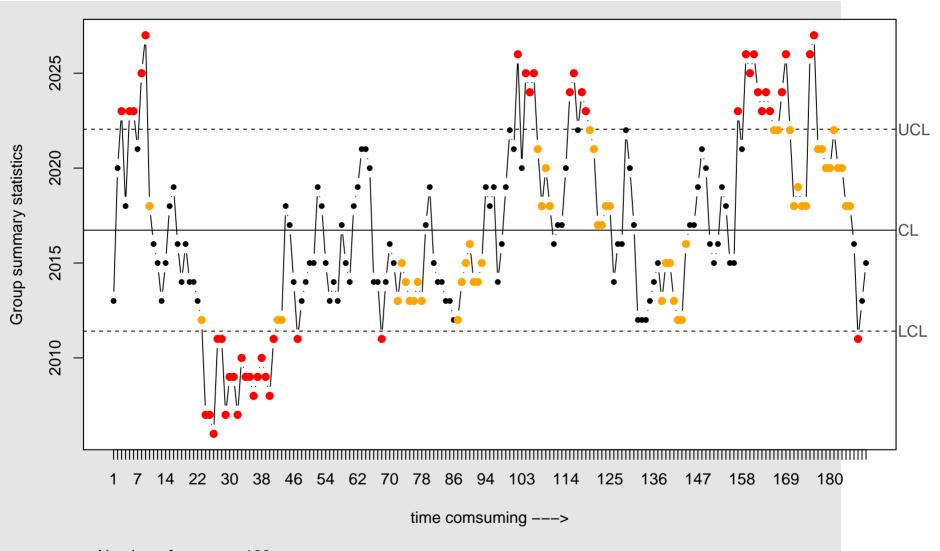






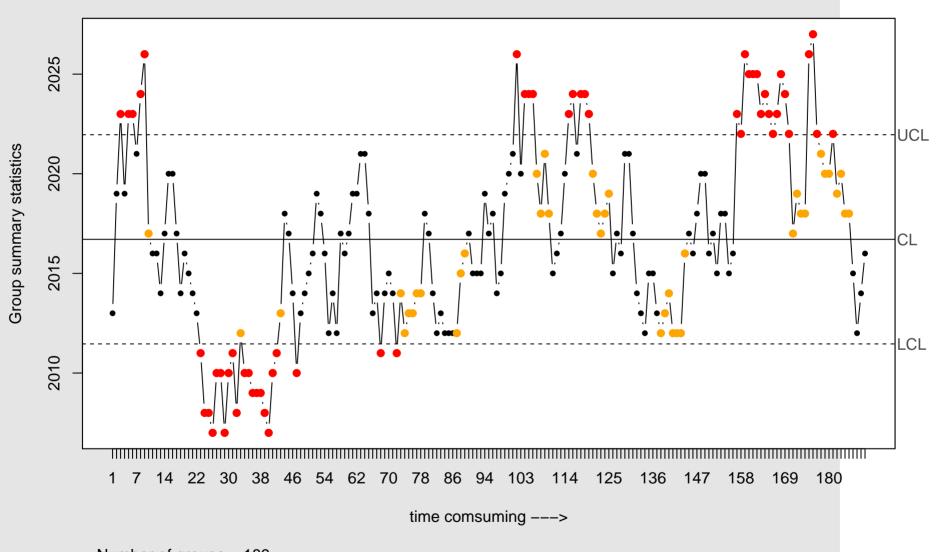






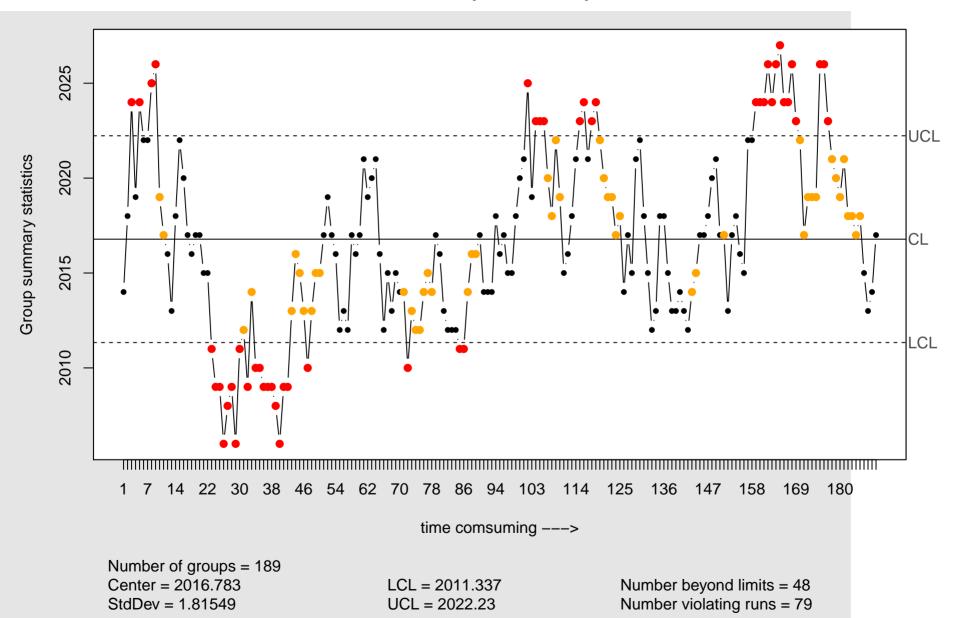
Number of groups = 189 Center = 2016.73 StdDev = 1.77305

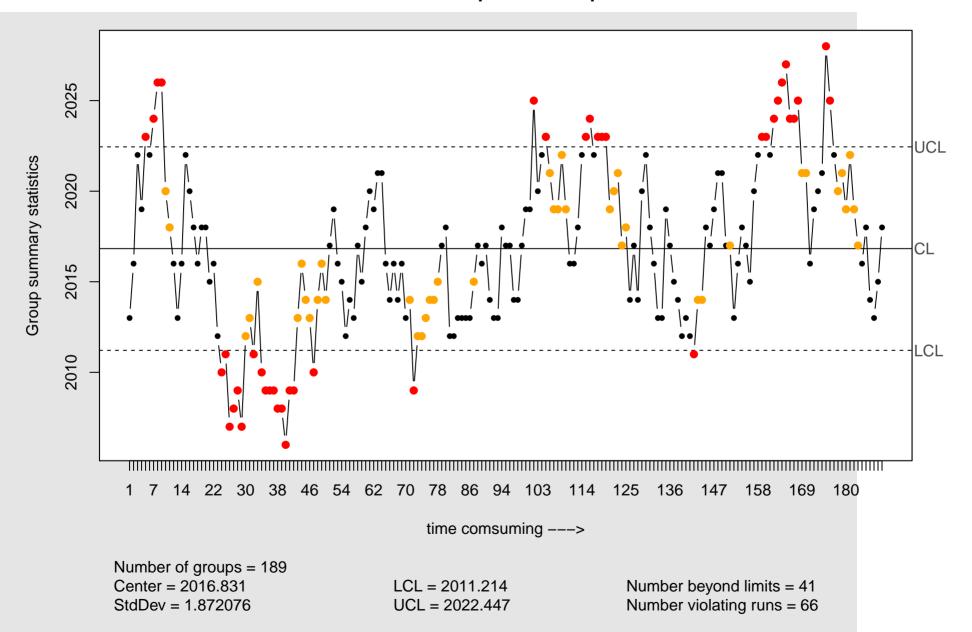
LCL = 2011.411 UCL = 2022.049 Number beyond limits = 46 Number violating runs = 82

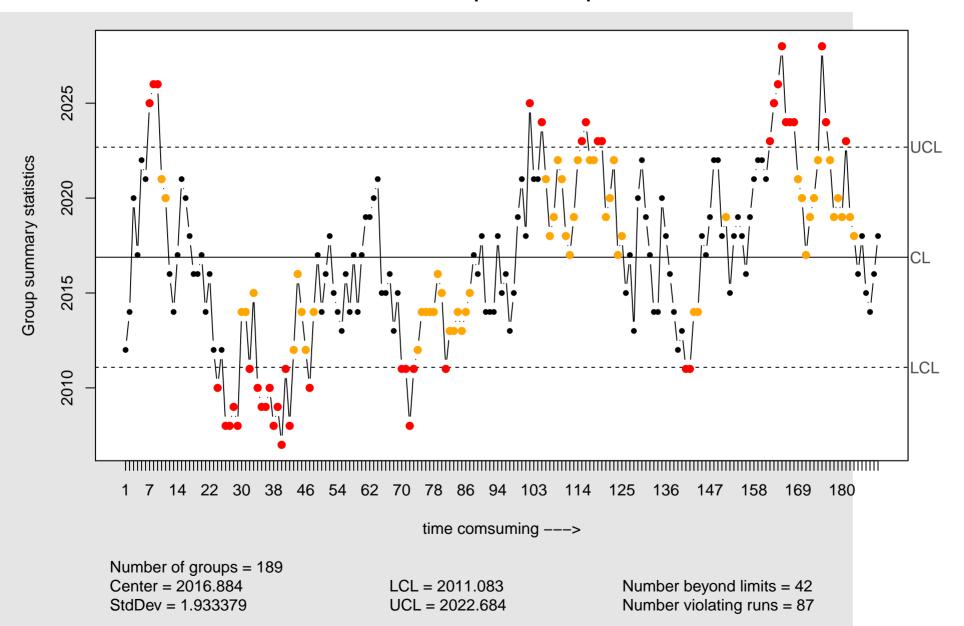


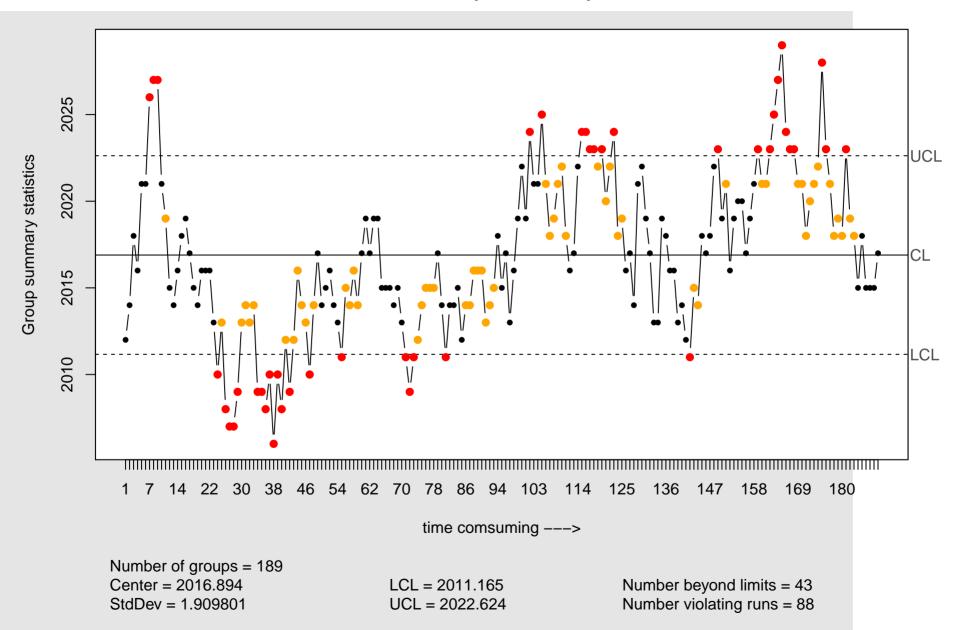
Number of groups = 189 Center = 2016.709 StdDev = 1.749472

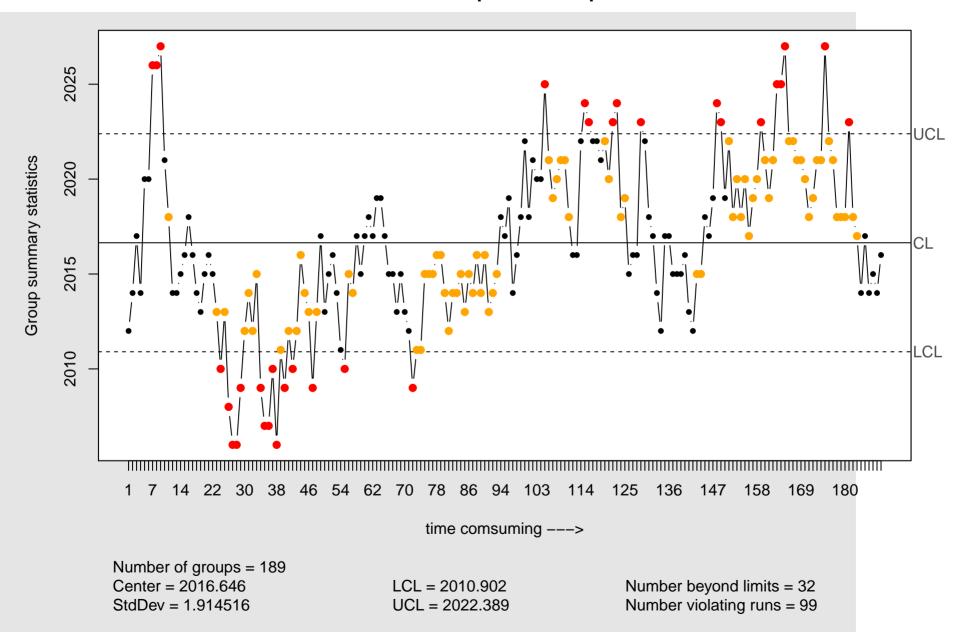
LCL = 2011.461 UCL = 2021.957 Number beyond limits = 54 Number violating runs = 76

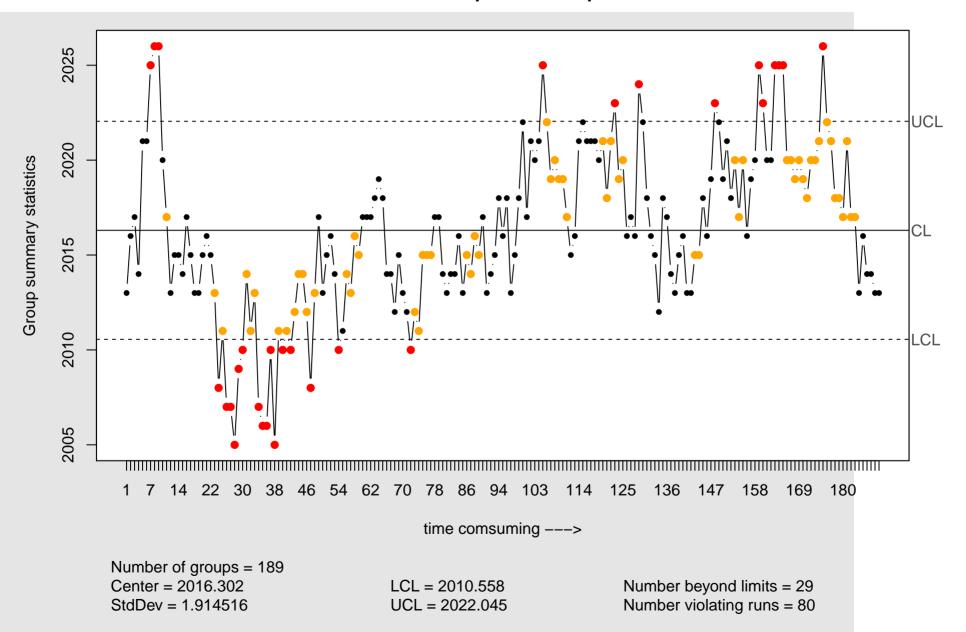


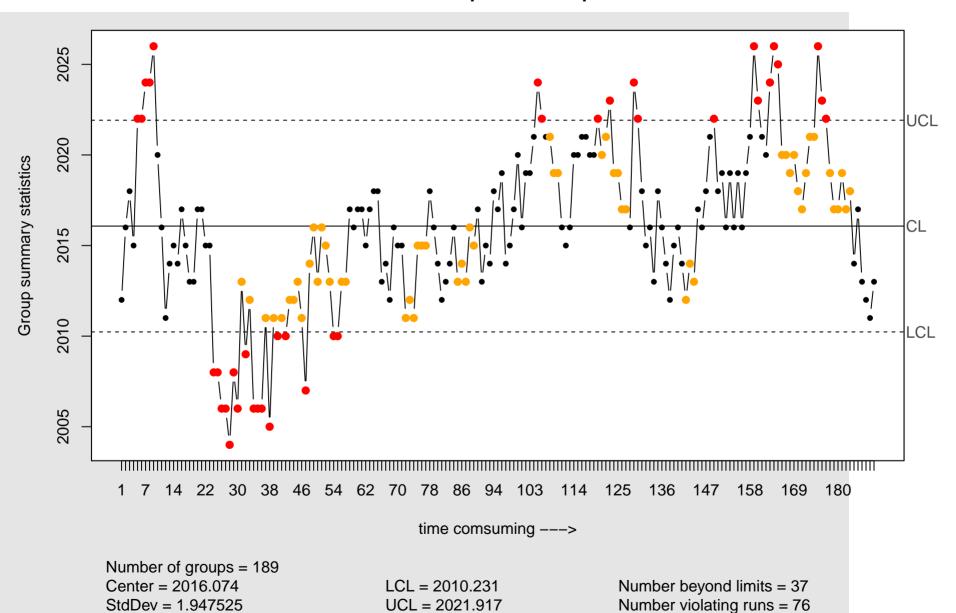


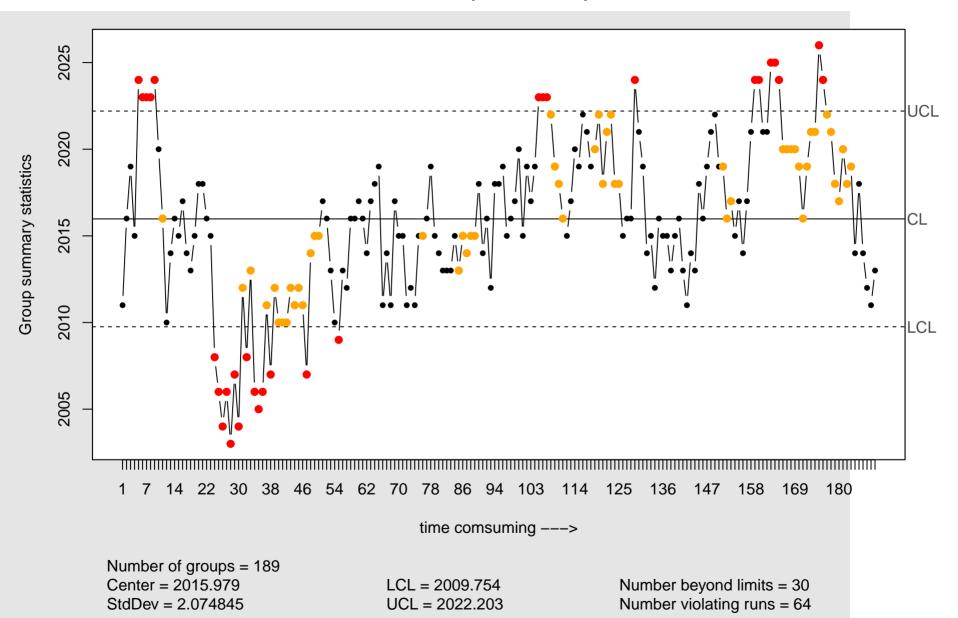


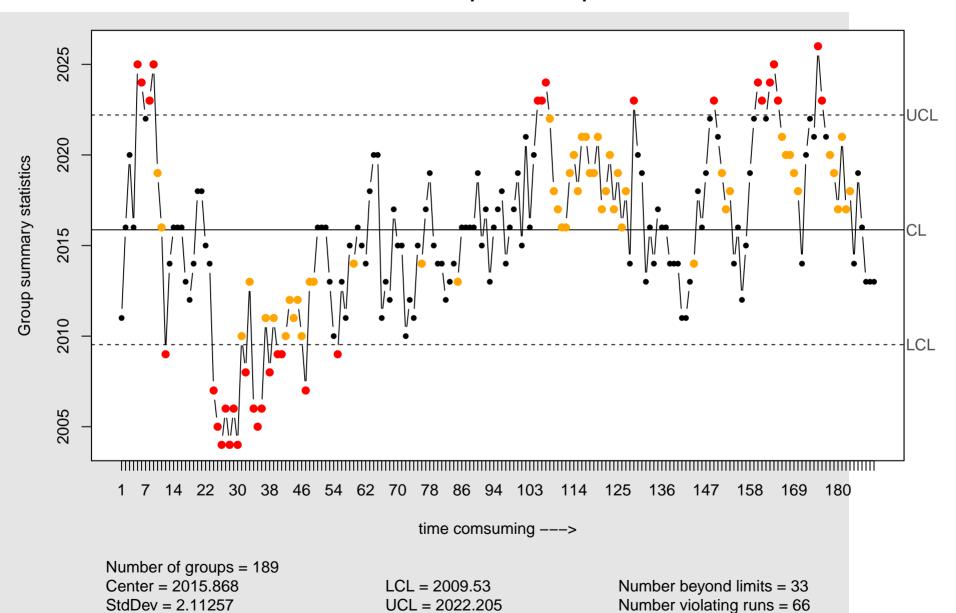


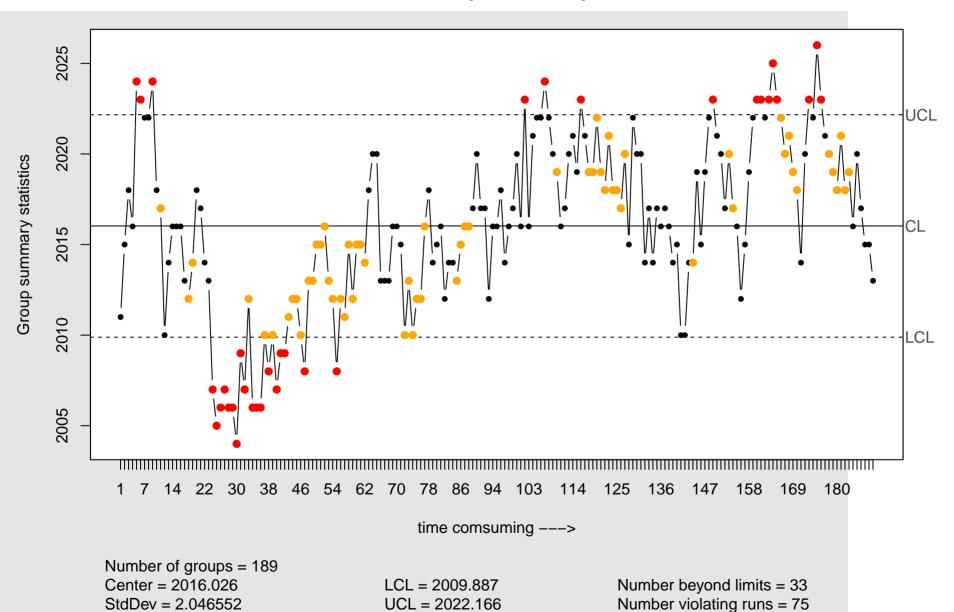


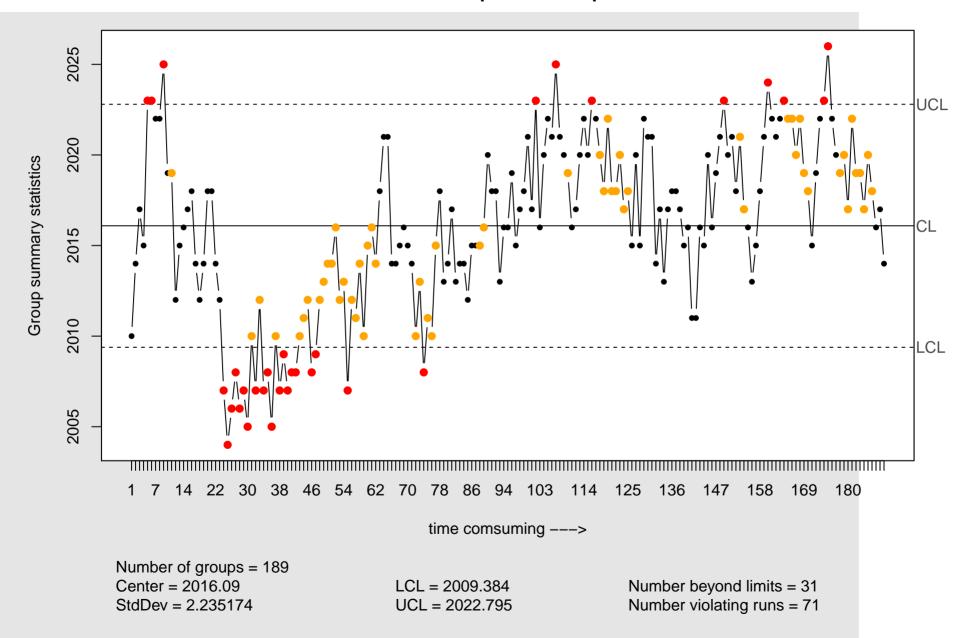


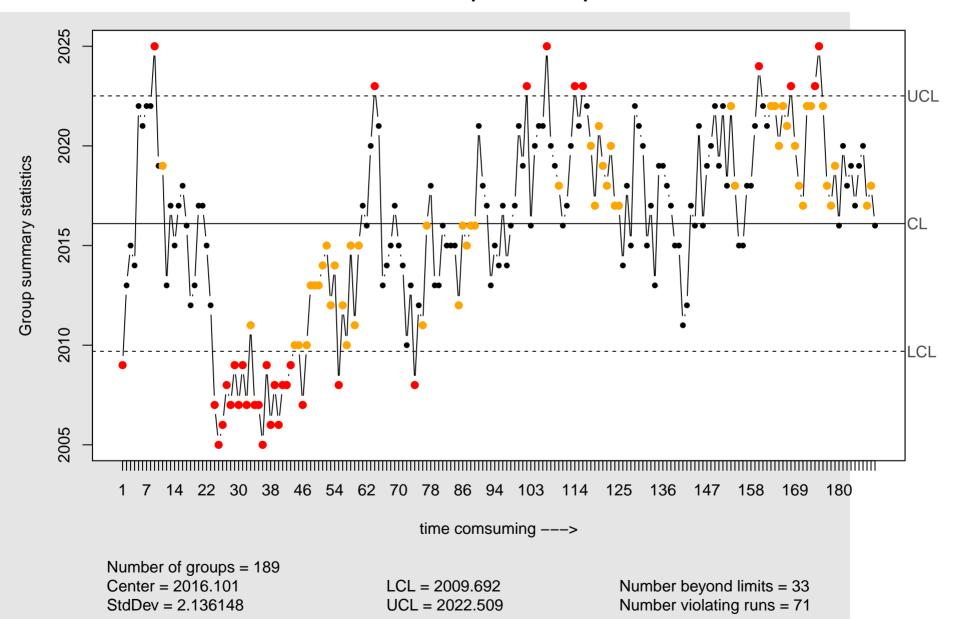


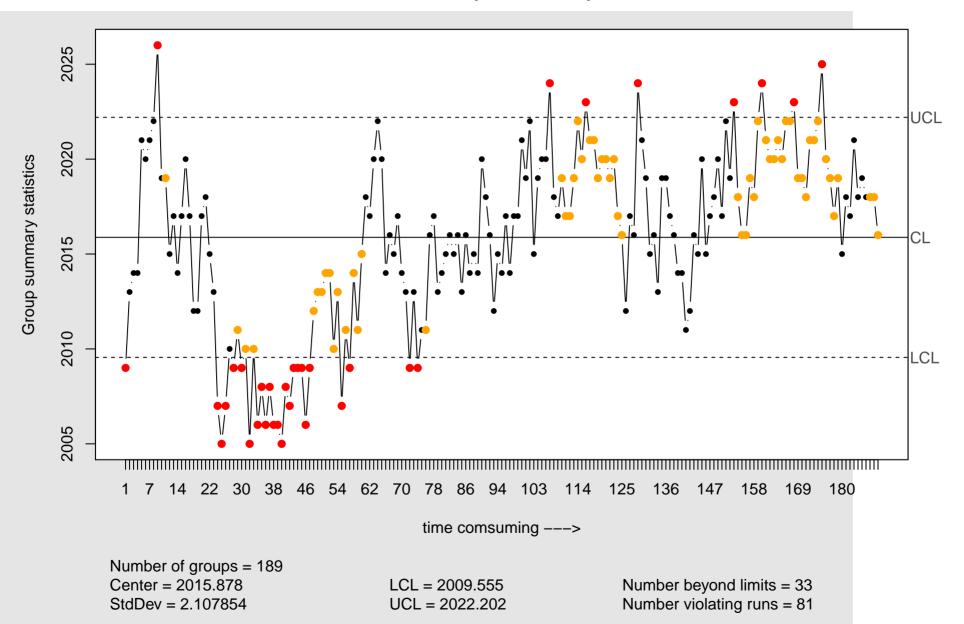


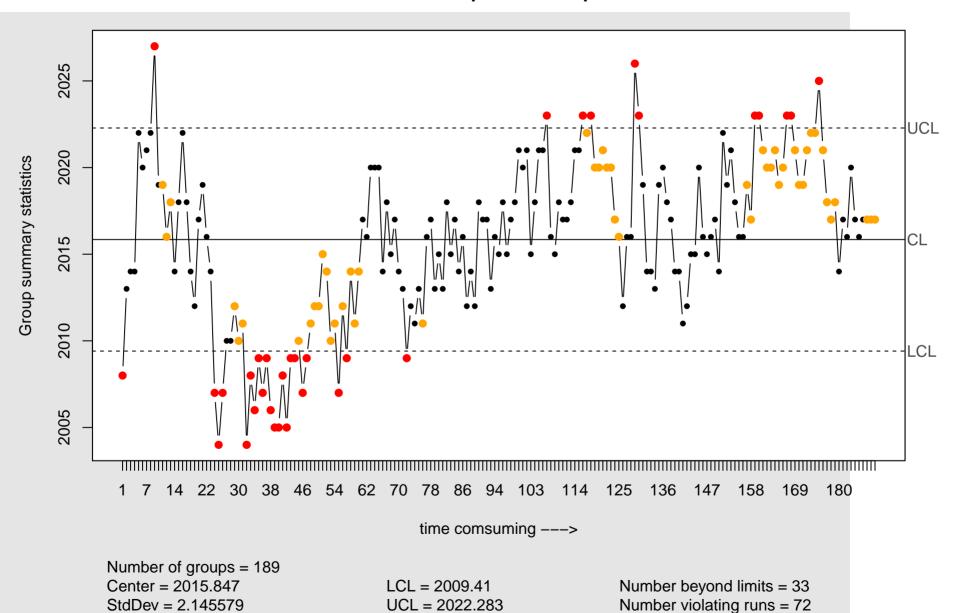


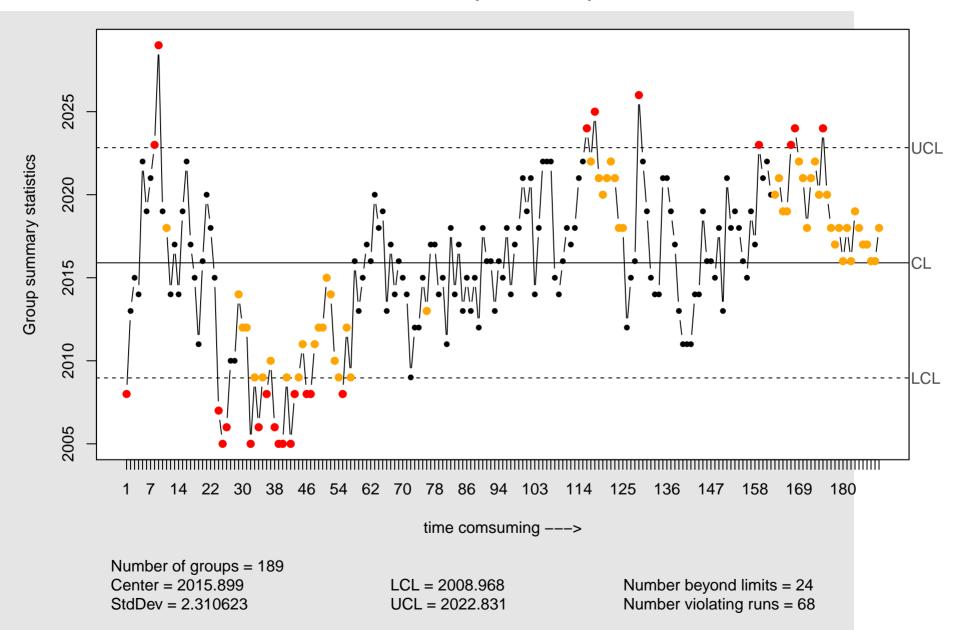


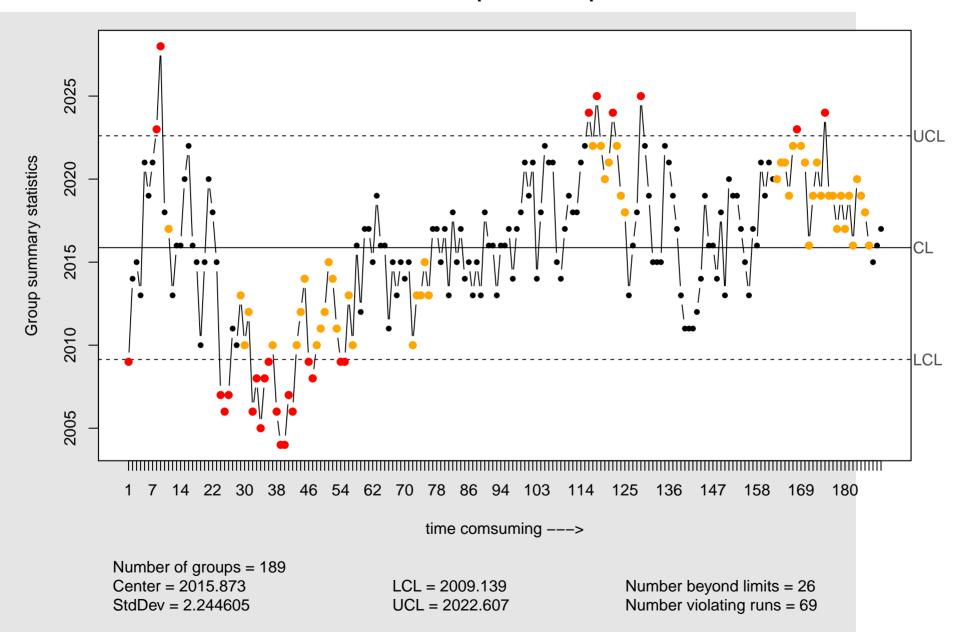


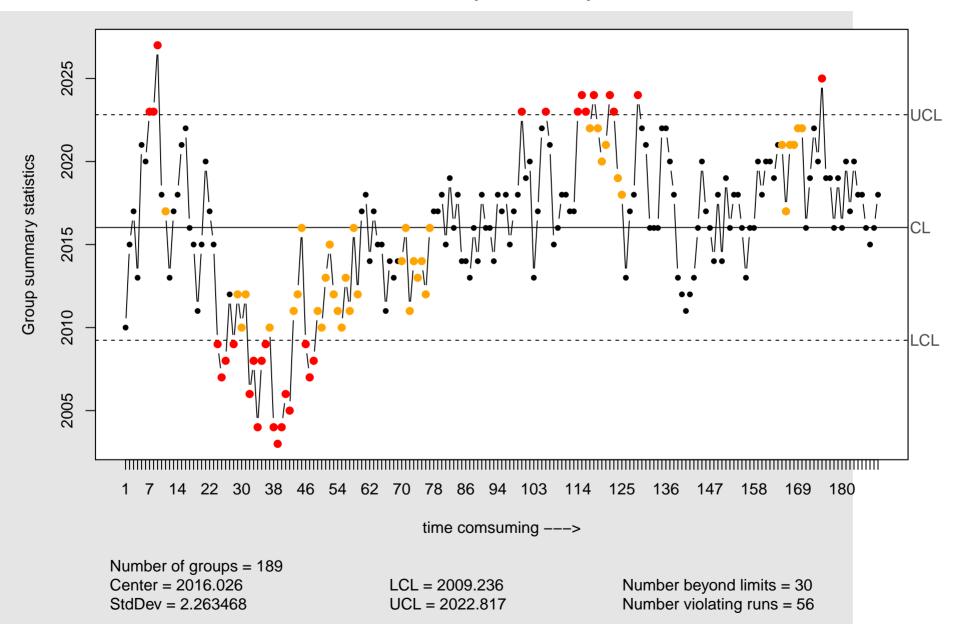


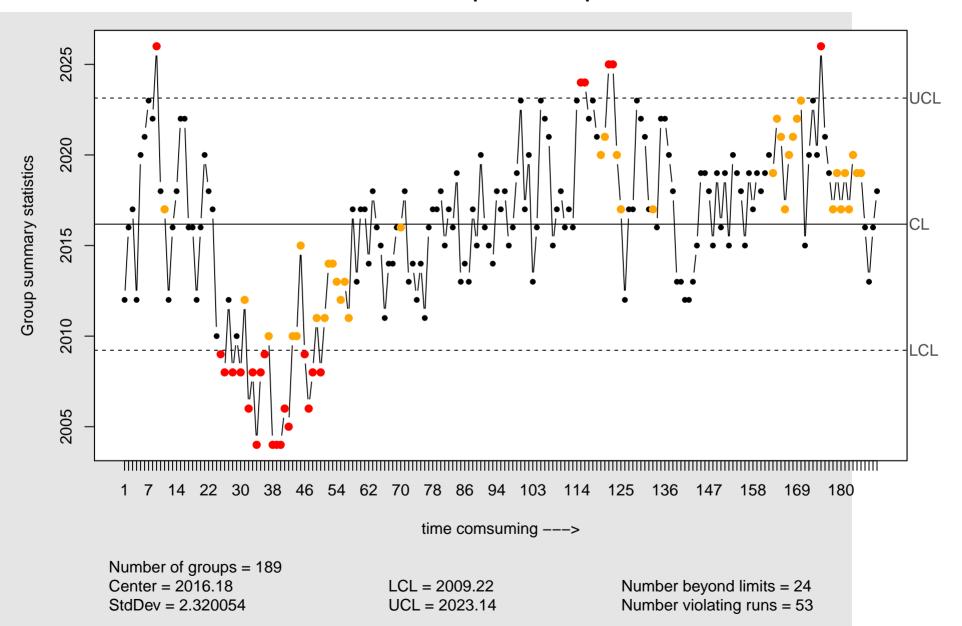


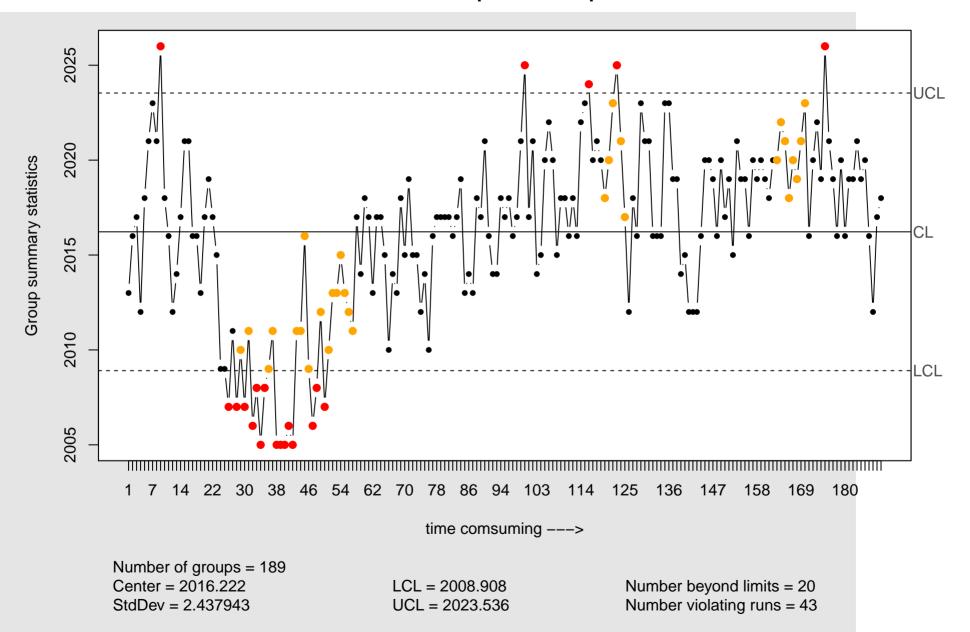


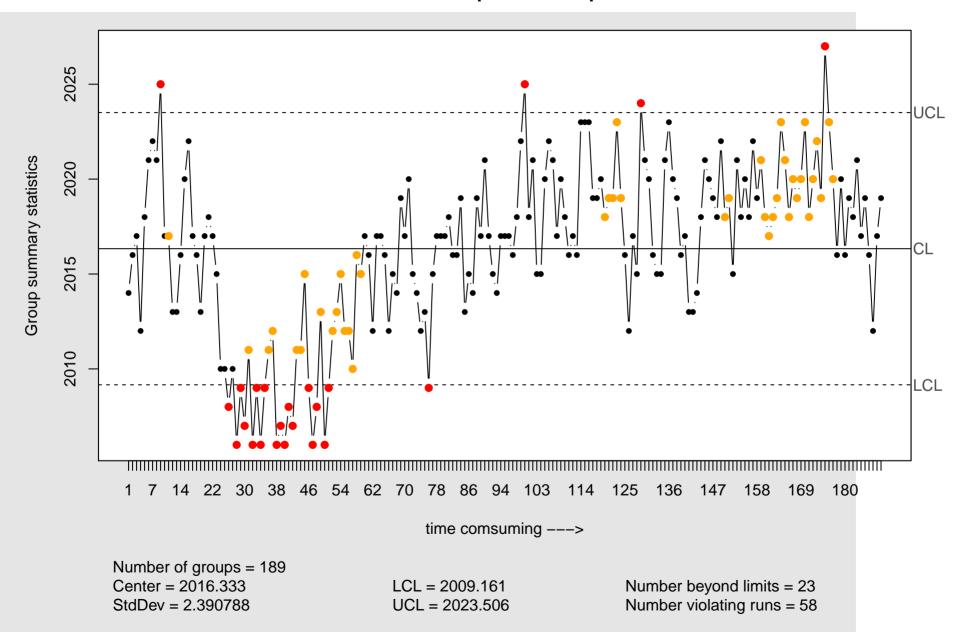


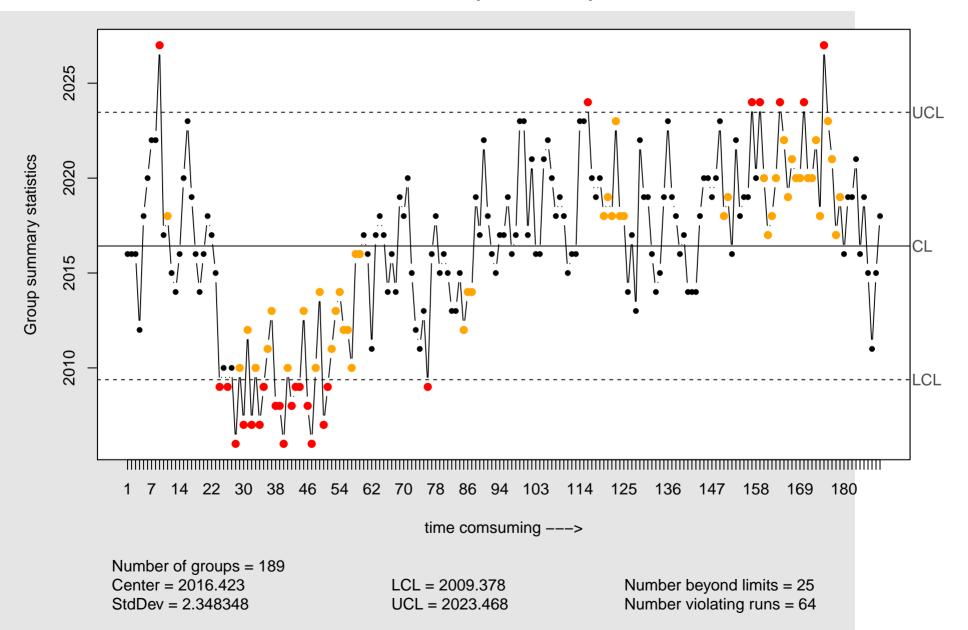


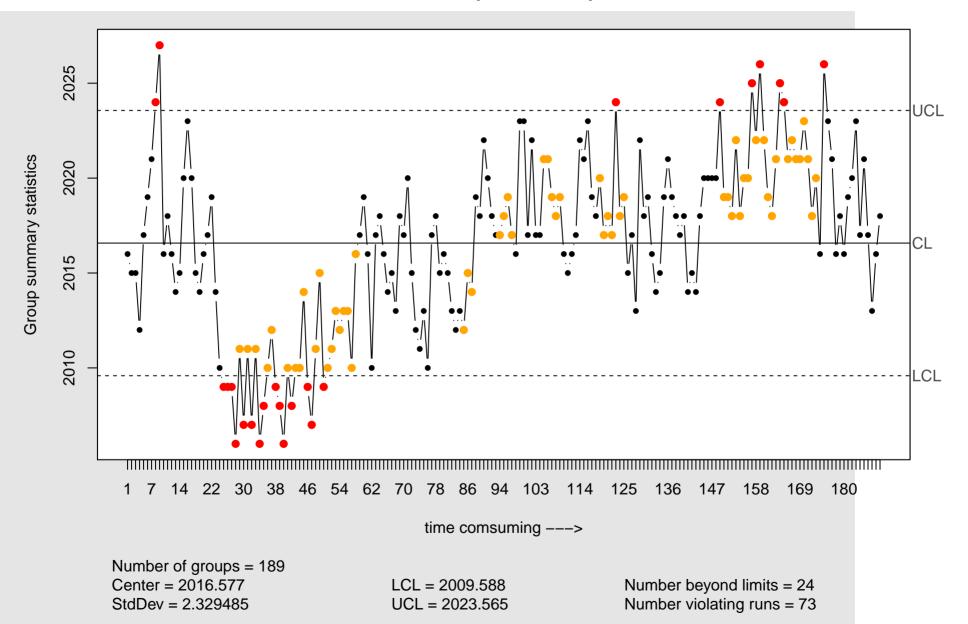


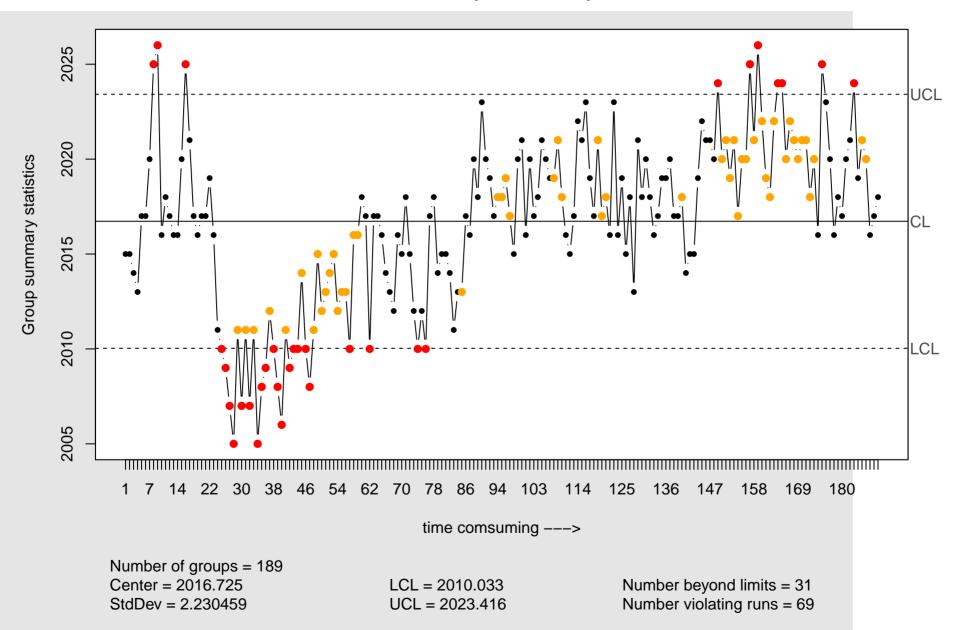


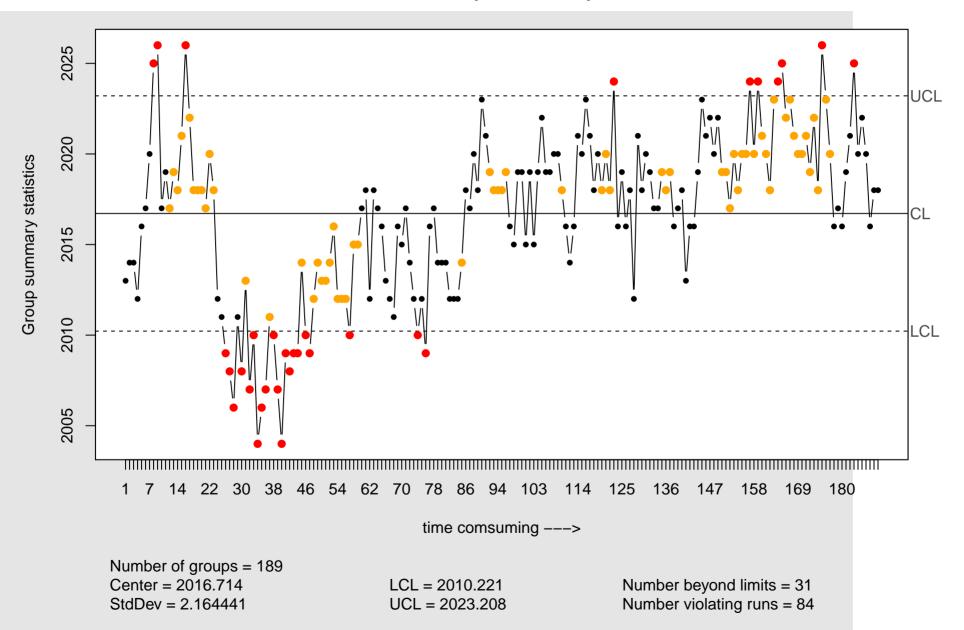


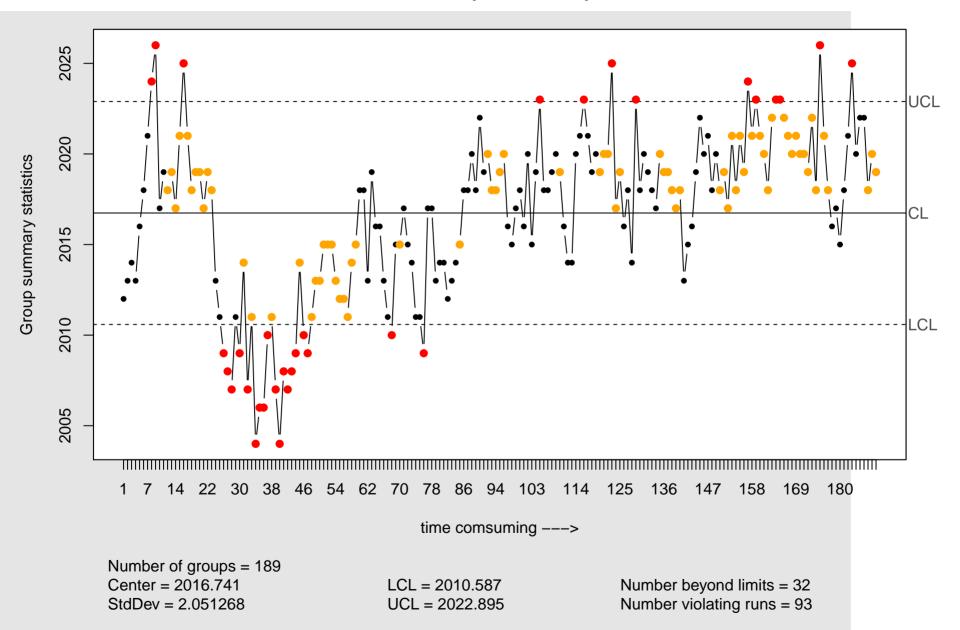


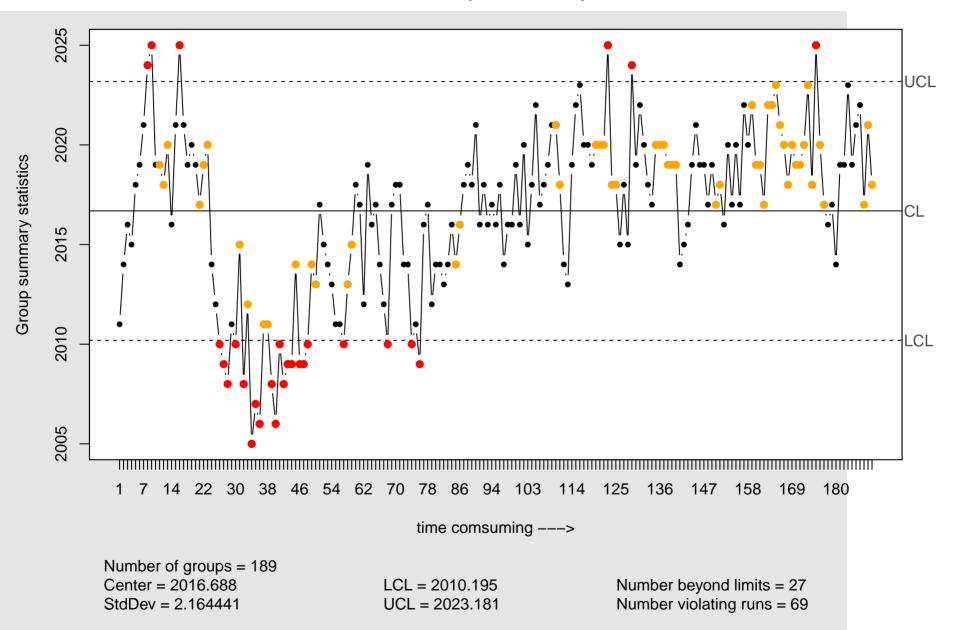


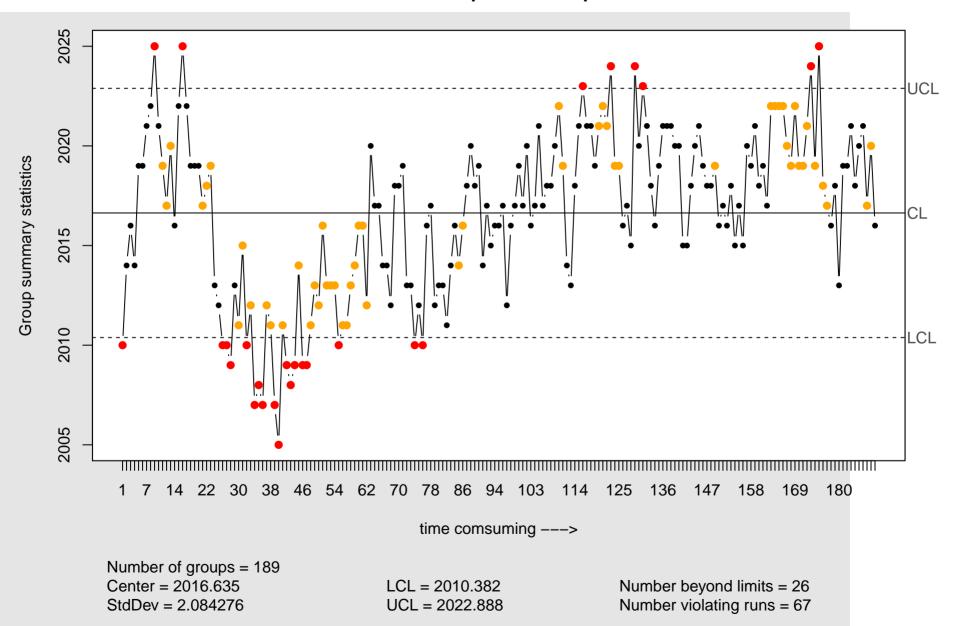


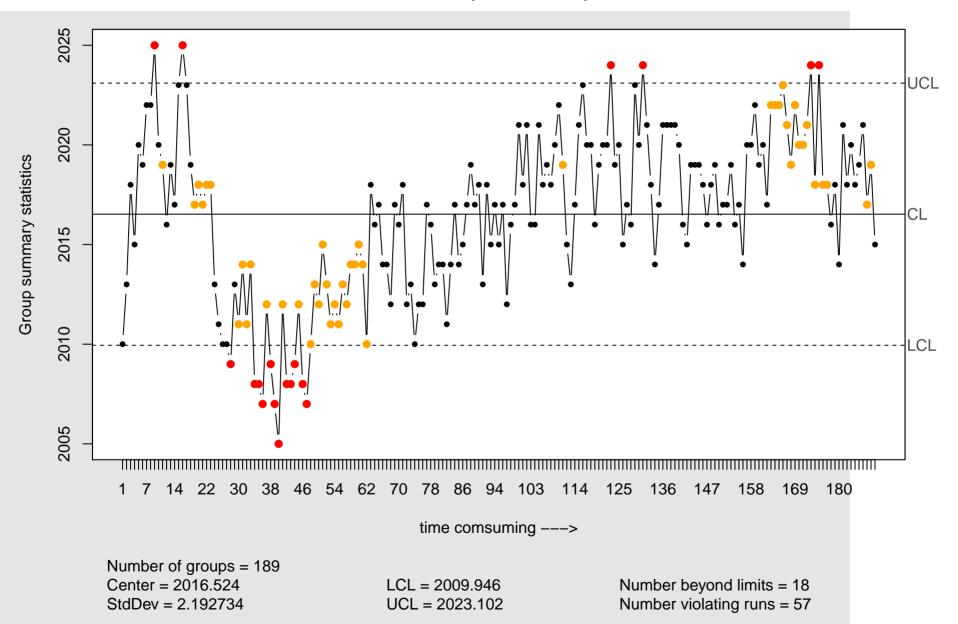


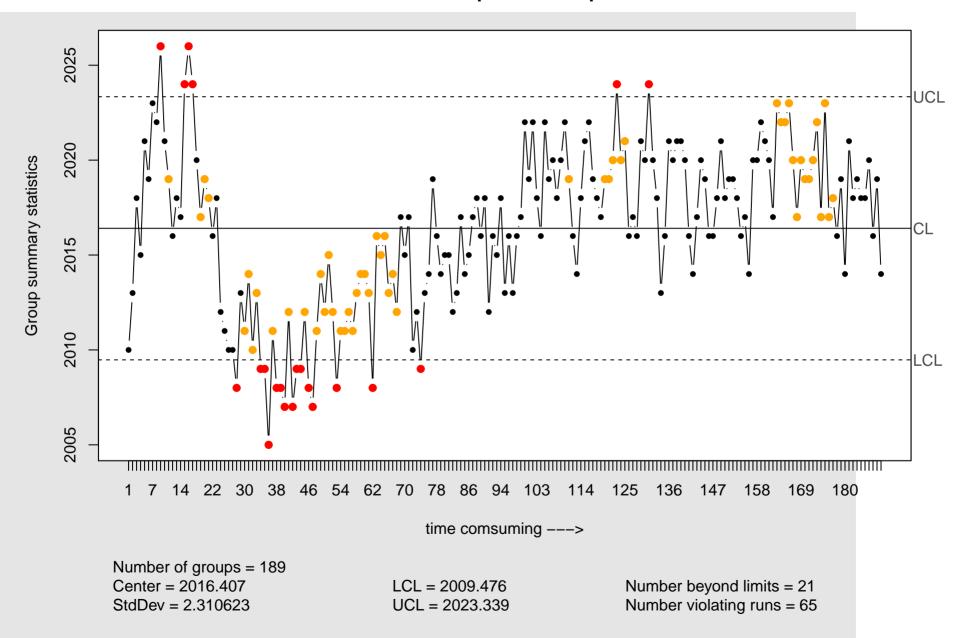


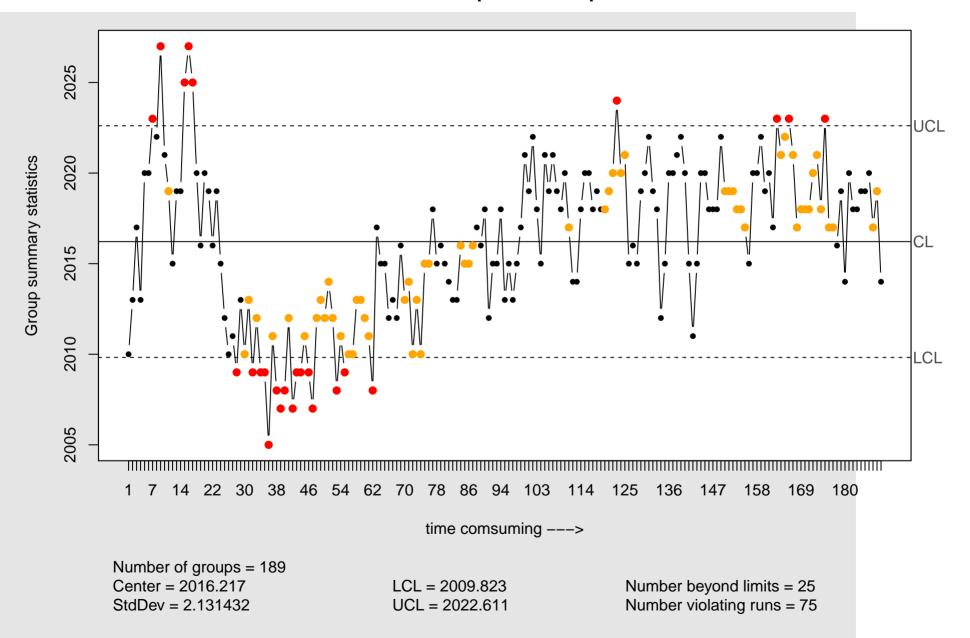


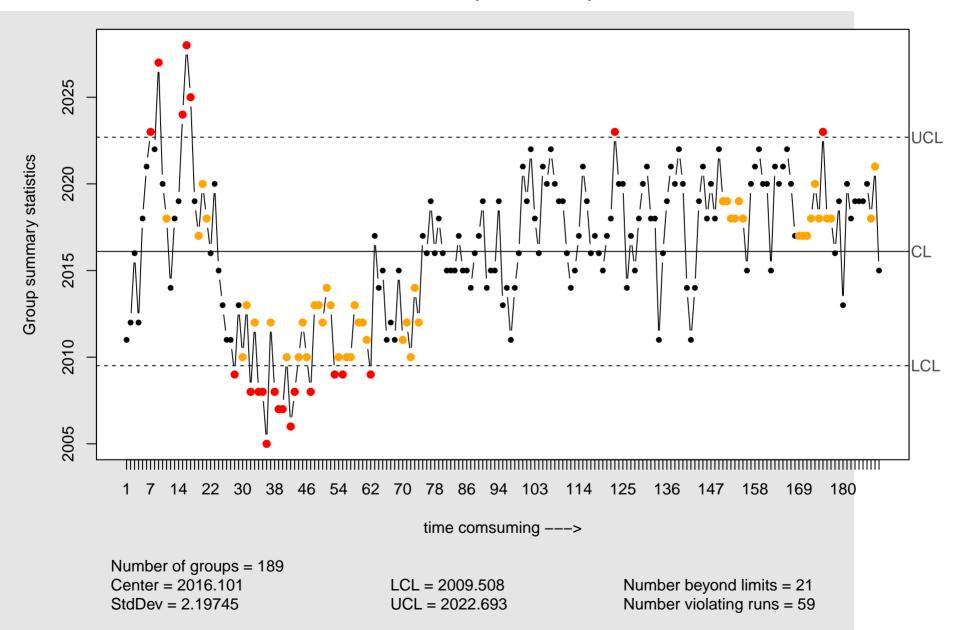


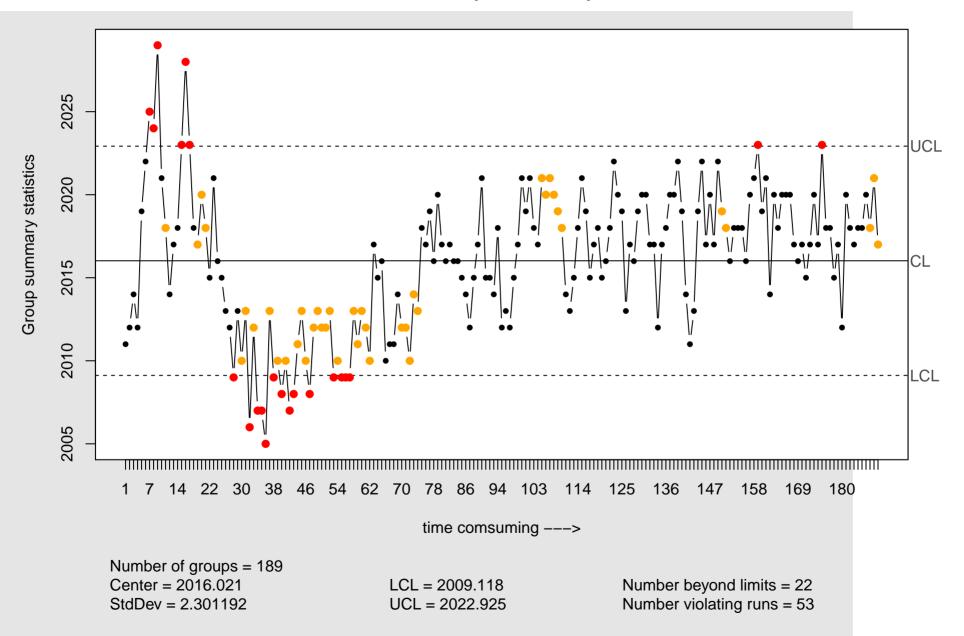


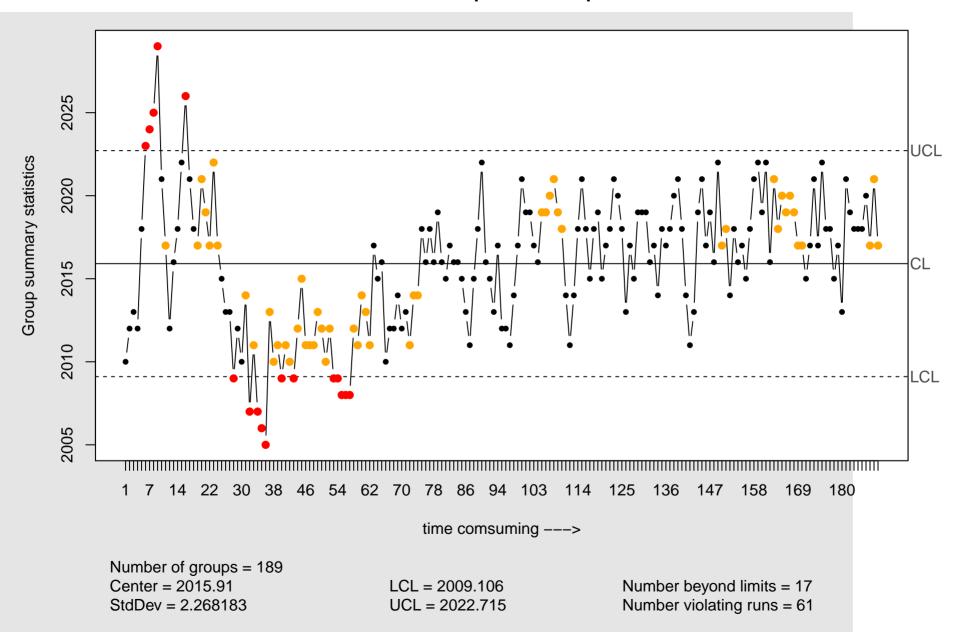


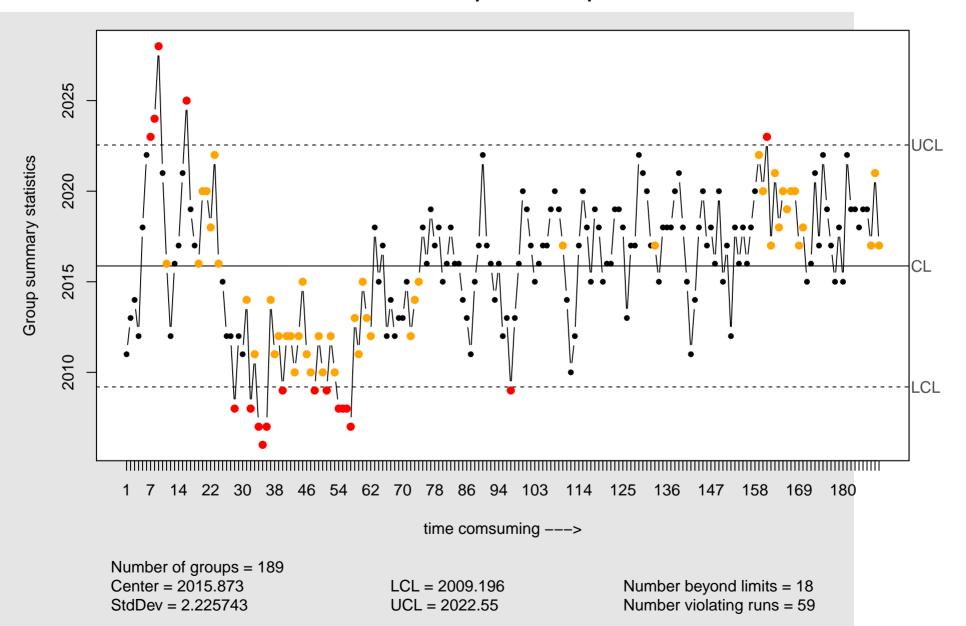


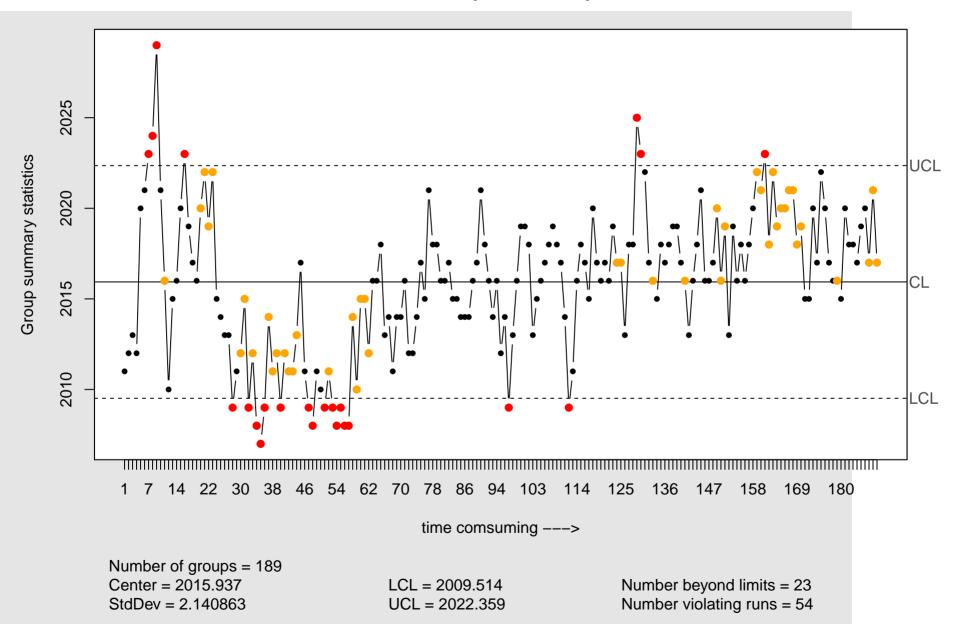


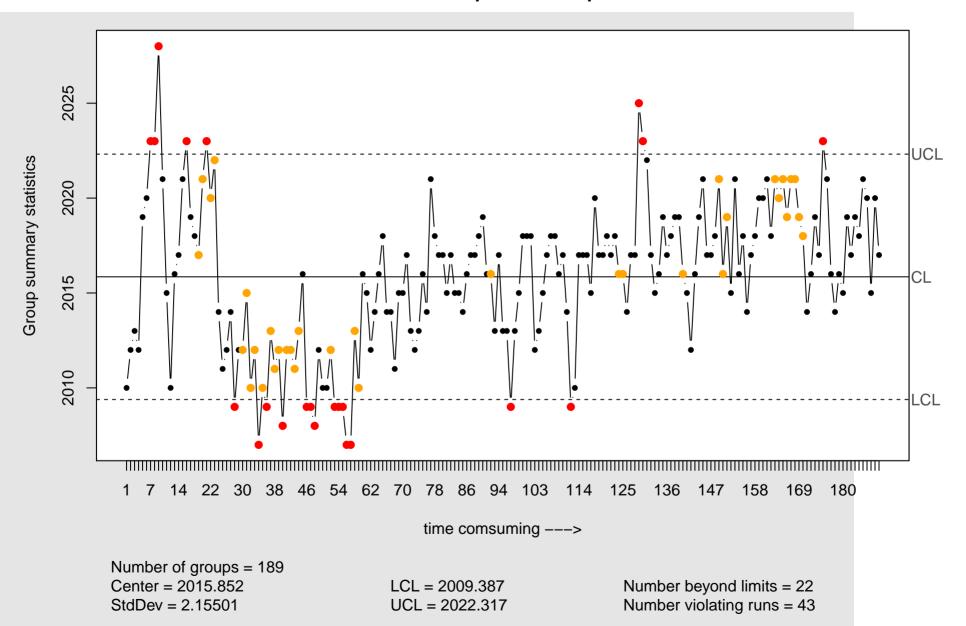


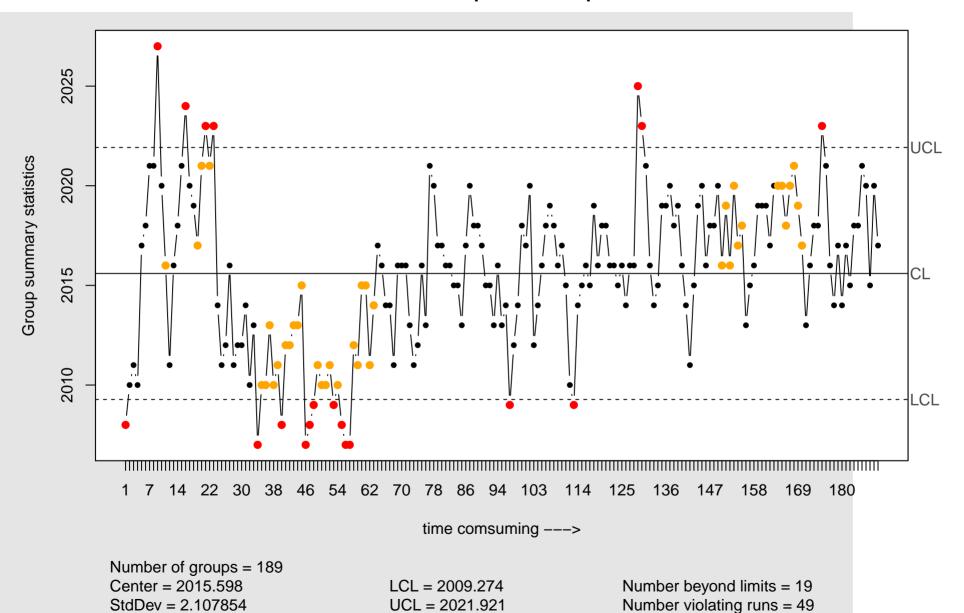


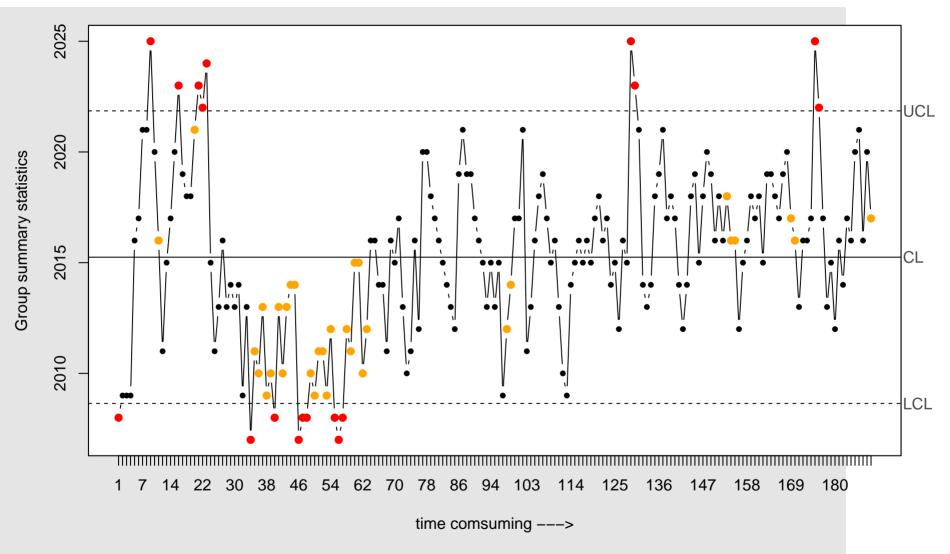






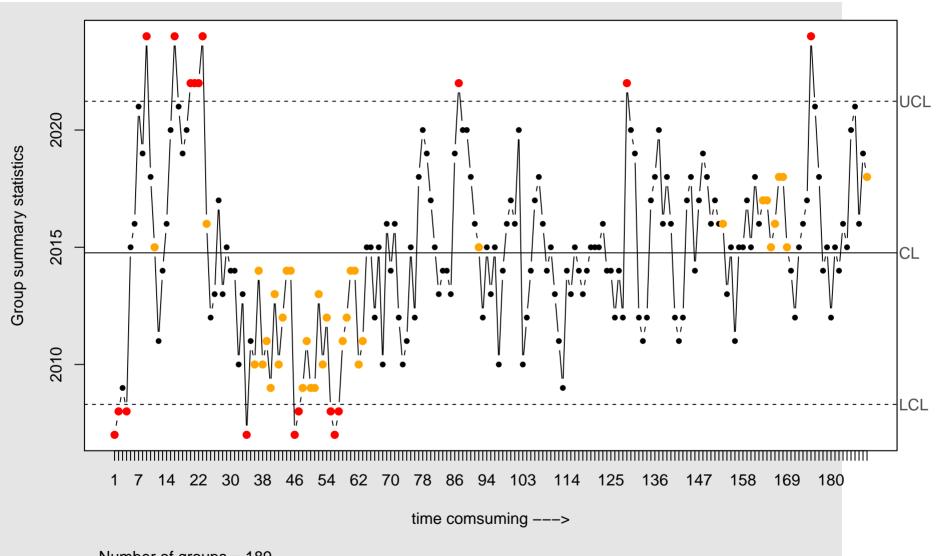






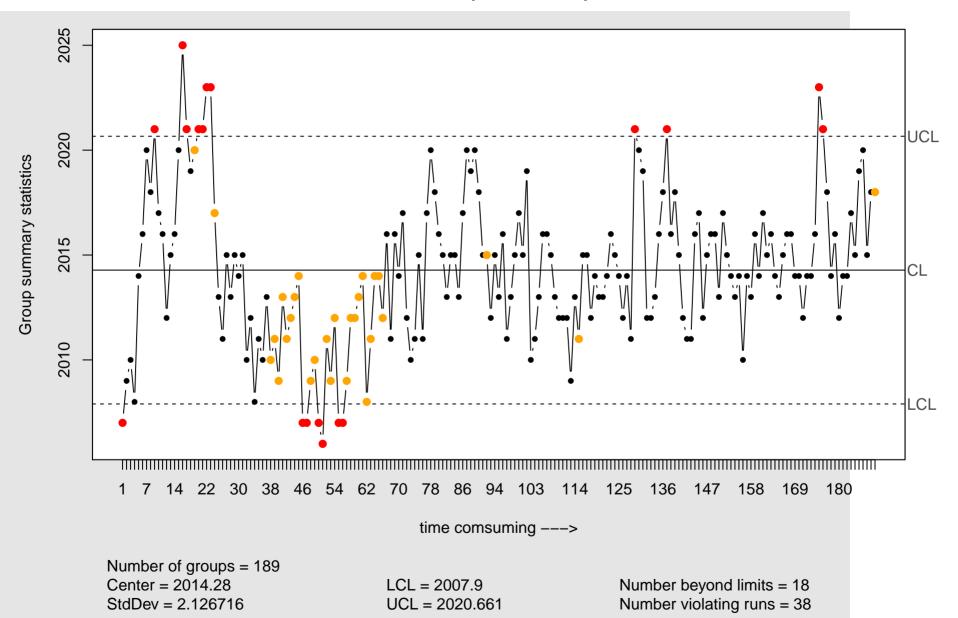
Number of groups = 189 Center = 2015.249 StdDev = 2.202165

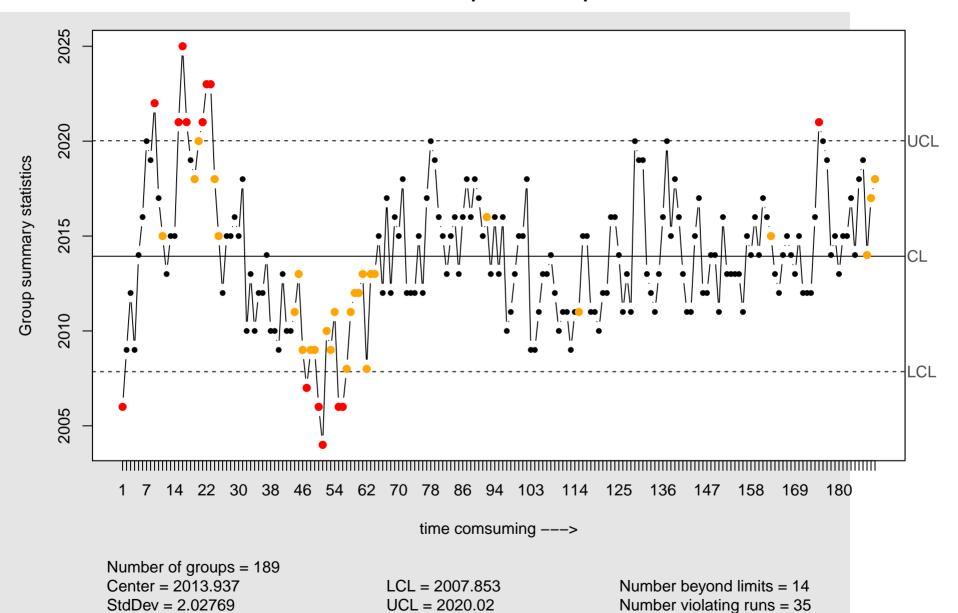
LCL = 2008.642 UCL = 2021.855 Number beyond limits = 18 Number violating runs = 43

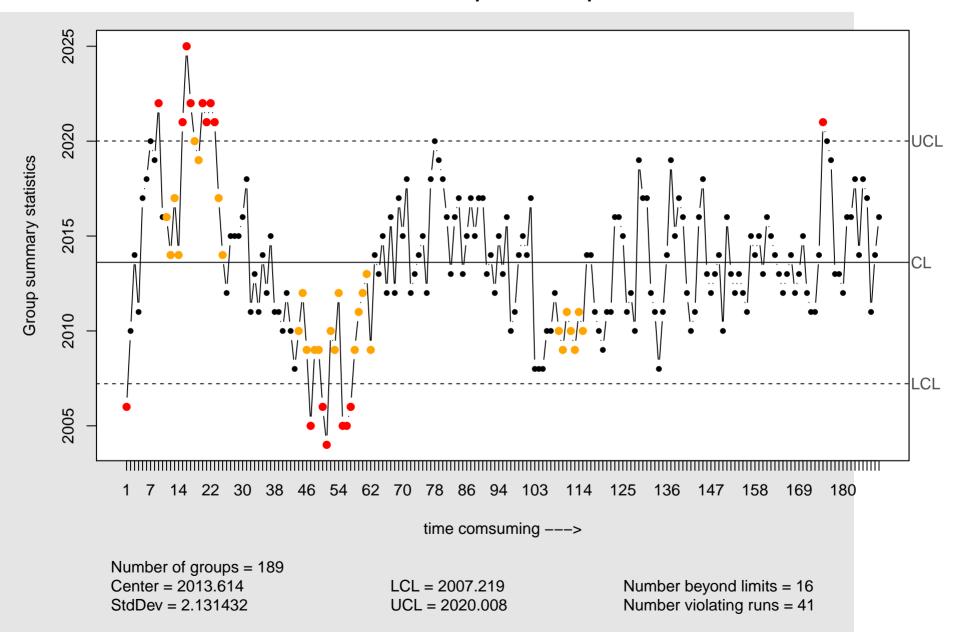


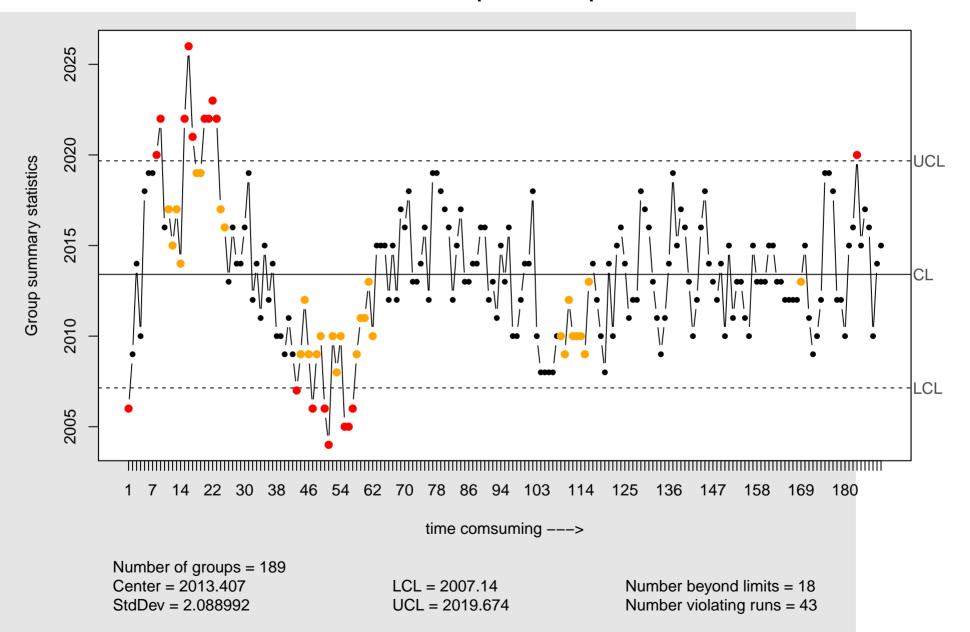
Number of groups = 189 Center = 2014.762 StdDev = 2.15501

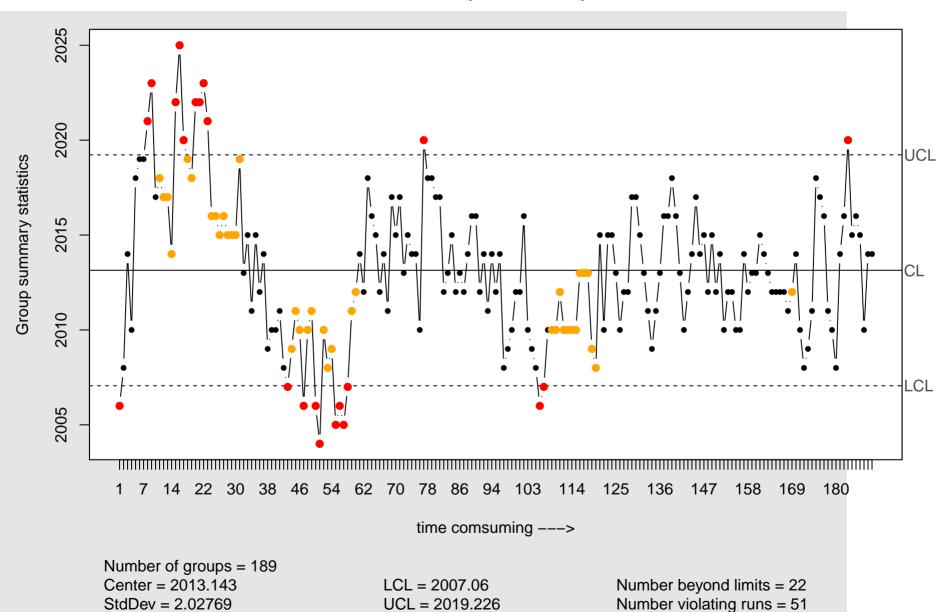
LCL = 2008.297 UCL = 2021.227 Number beyond limits = 18 Number violating runs = 44

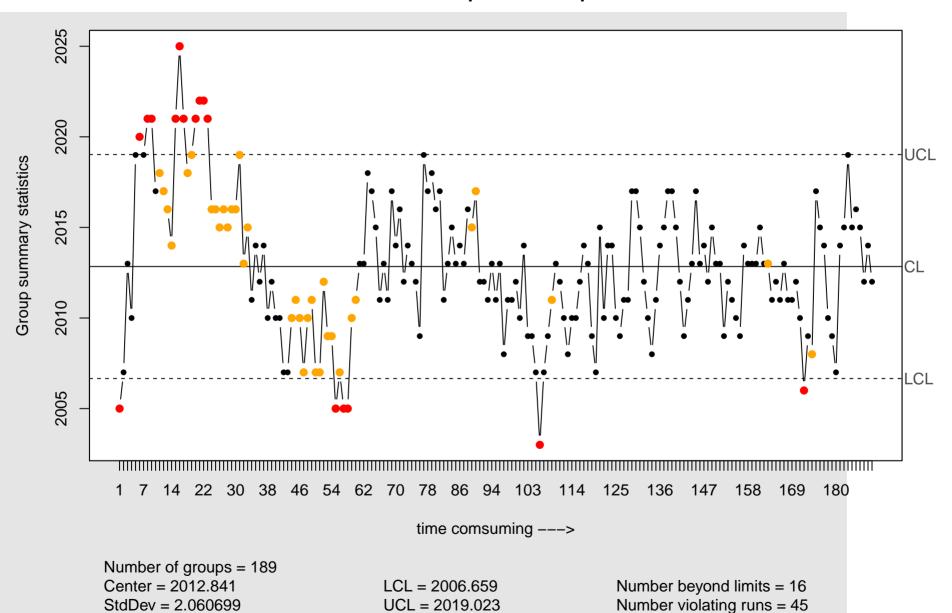


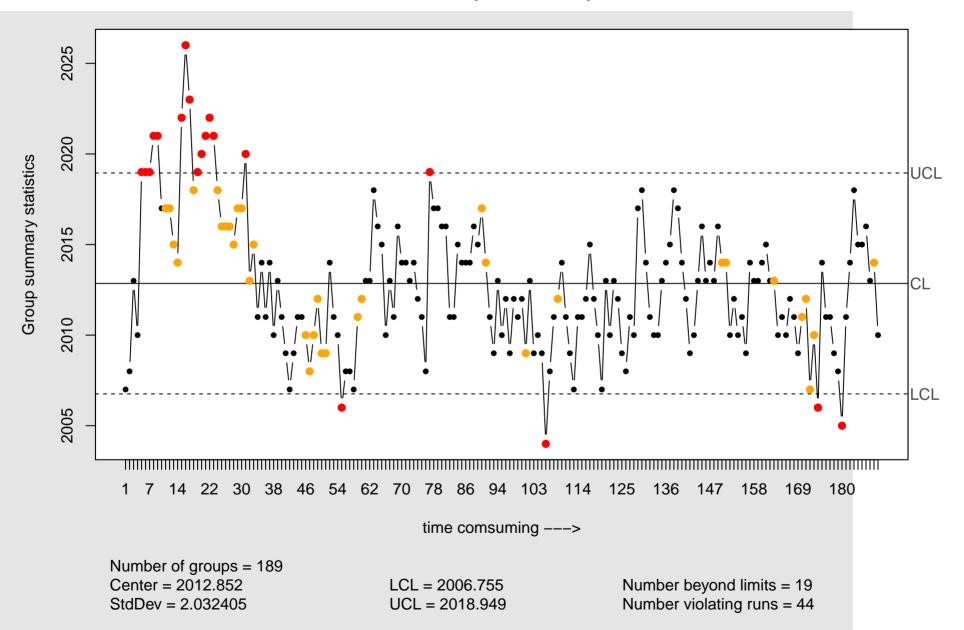


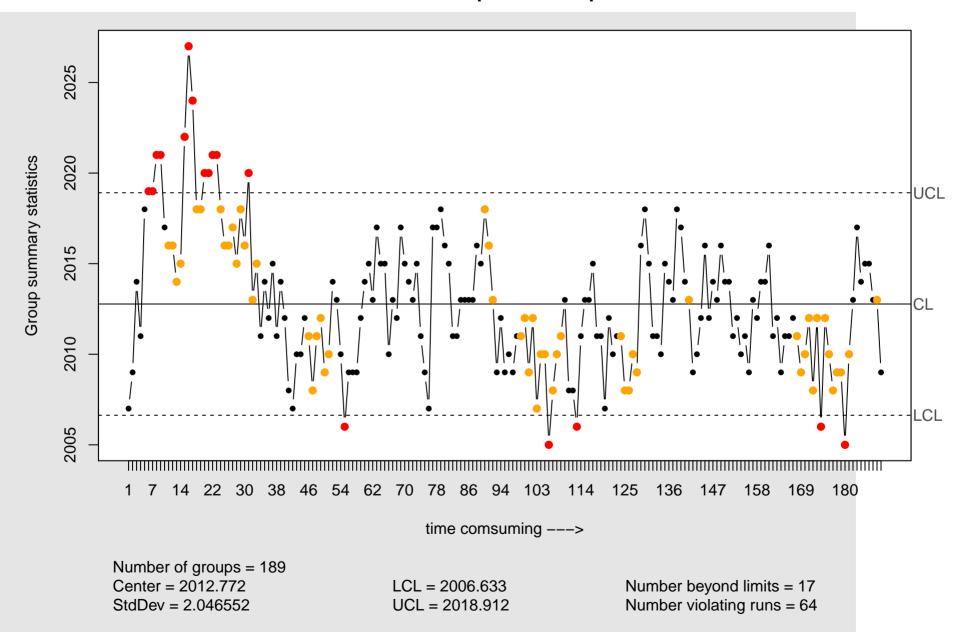


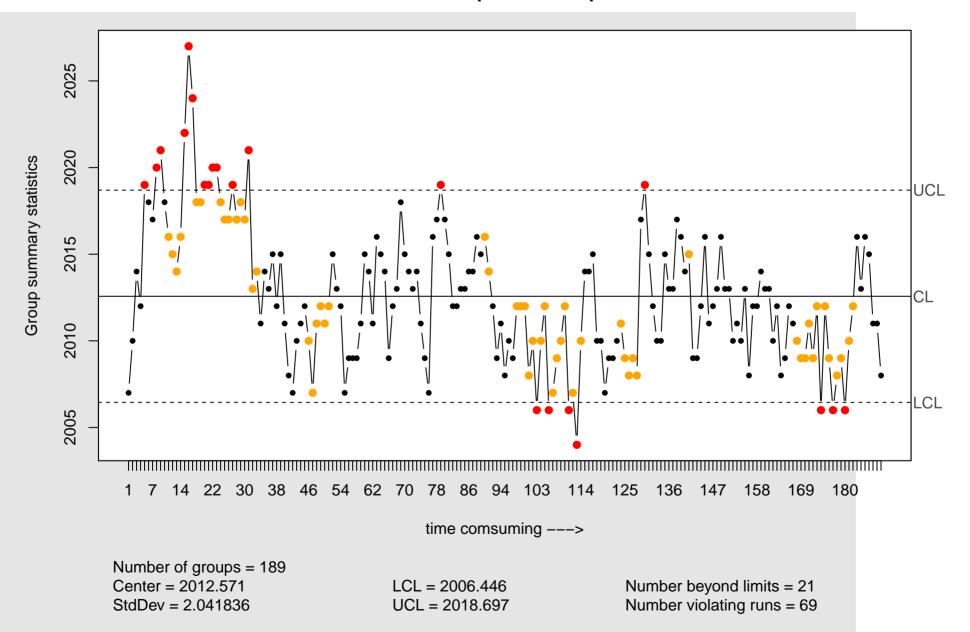


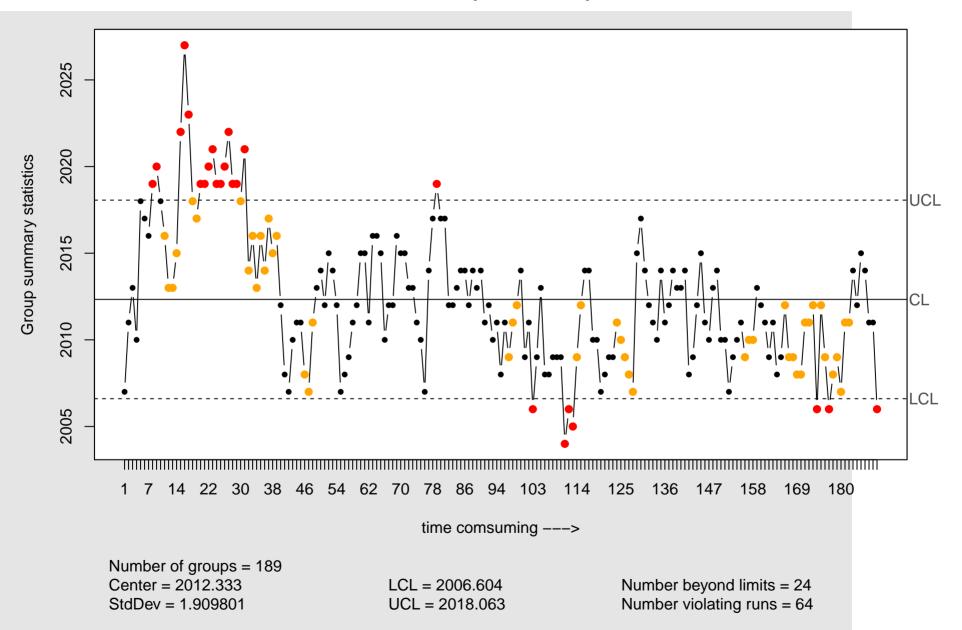


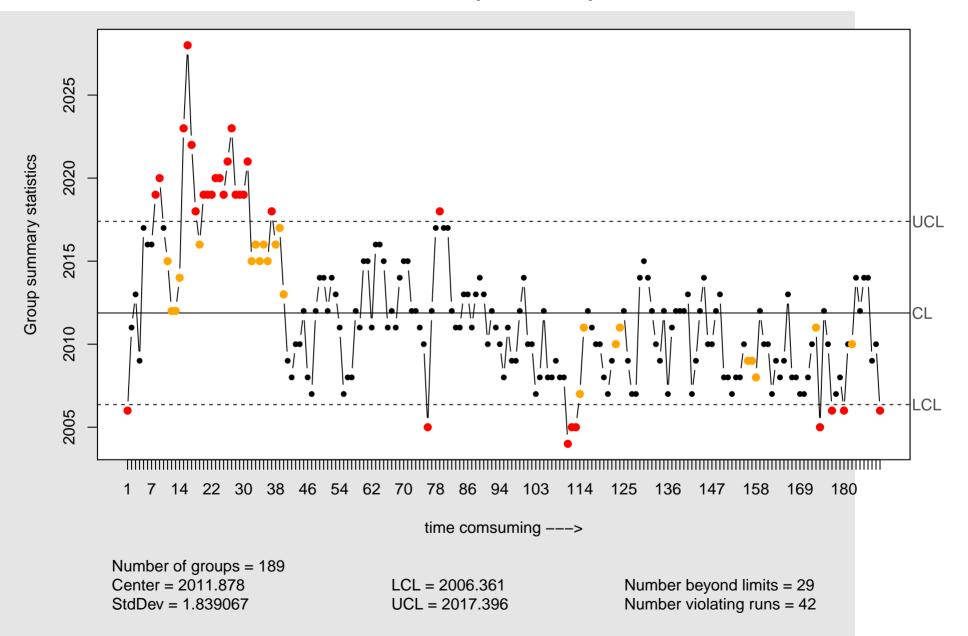


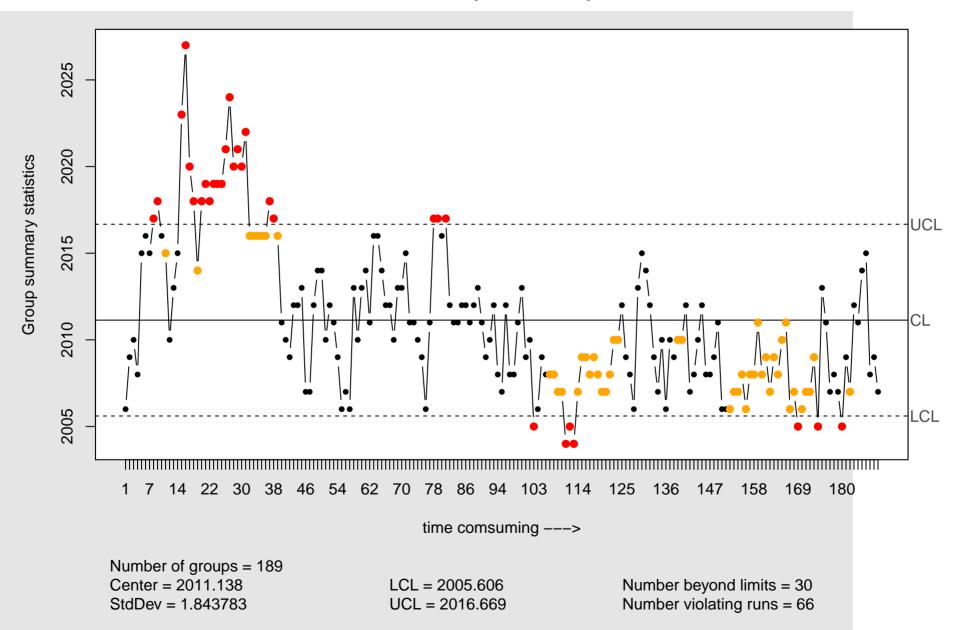


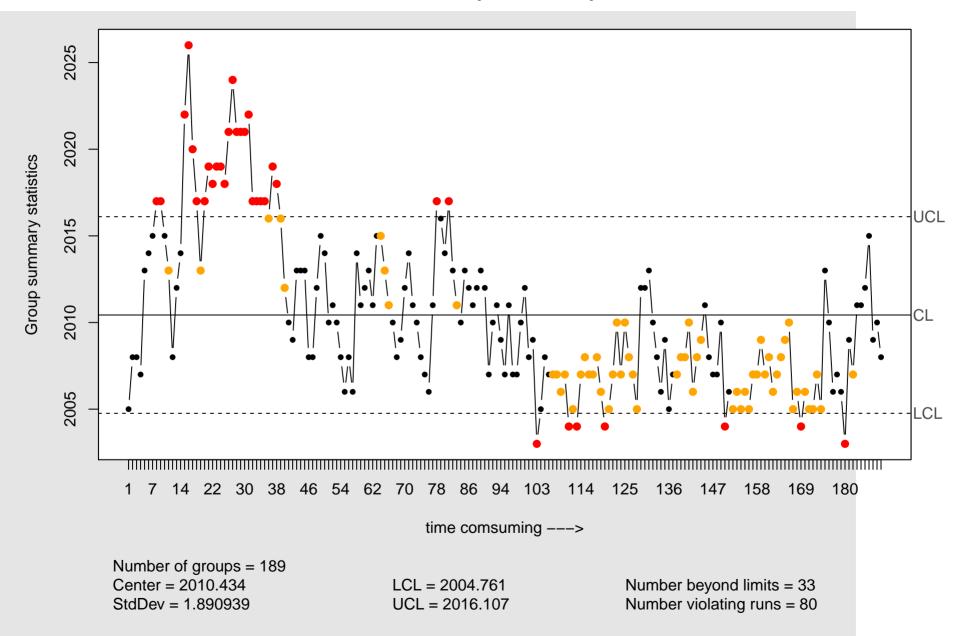


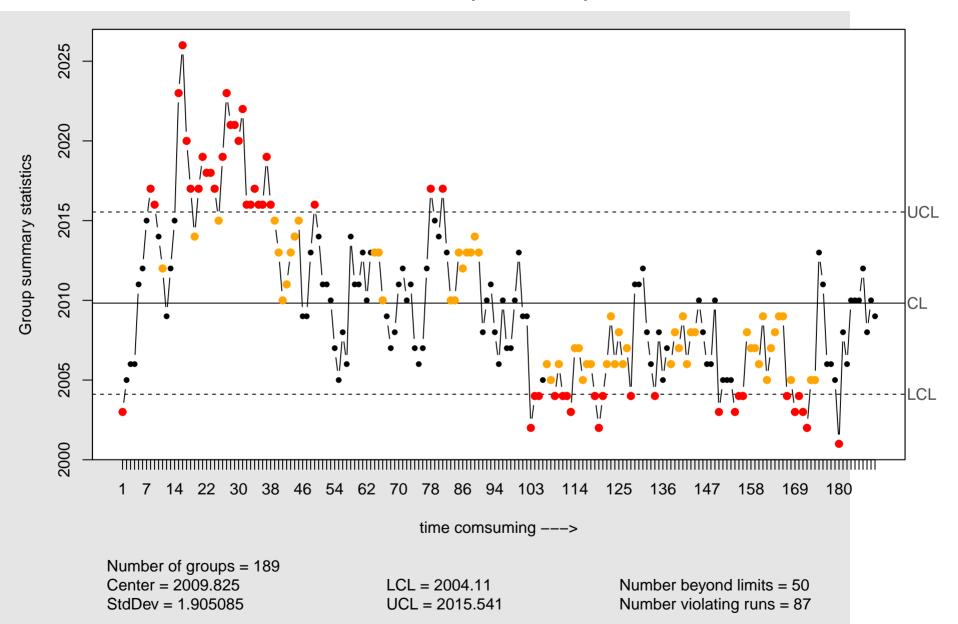


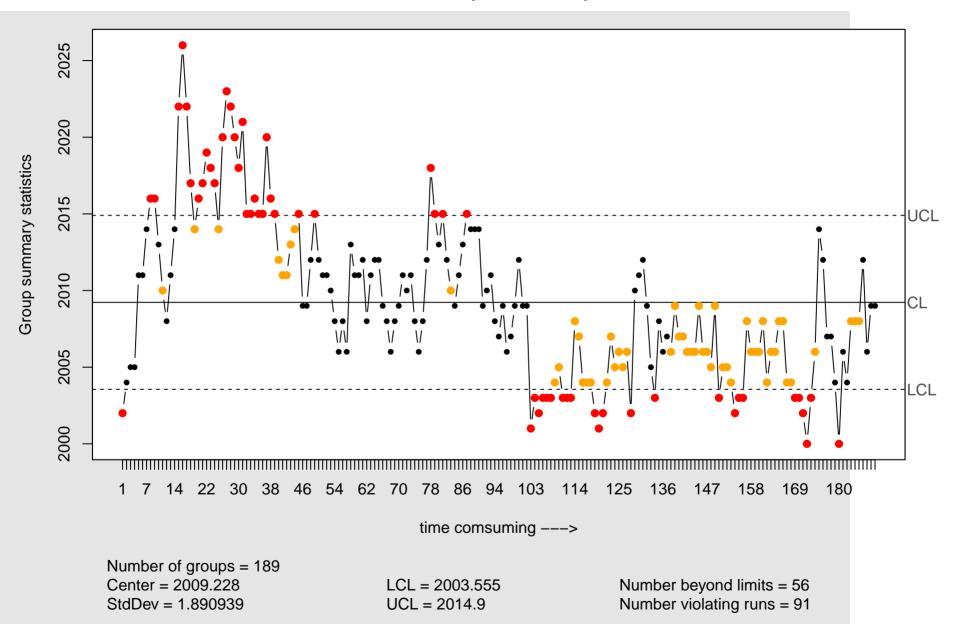


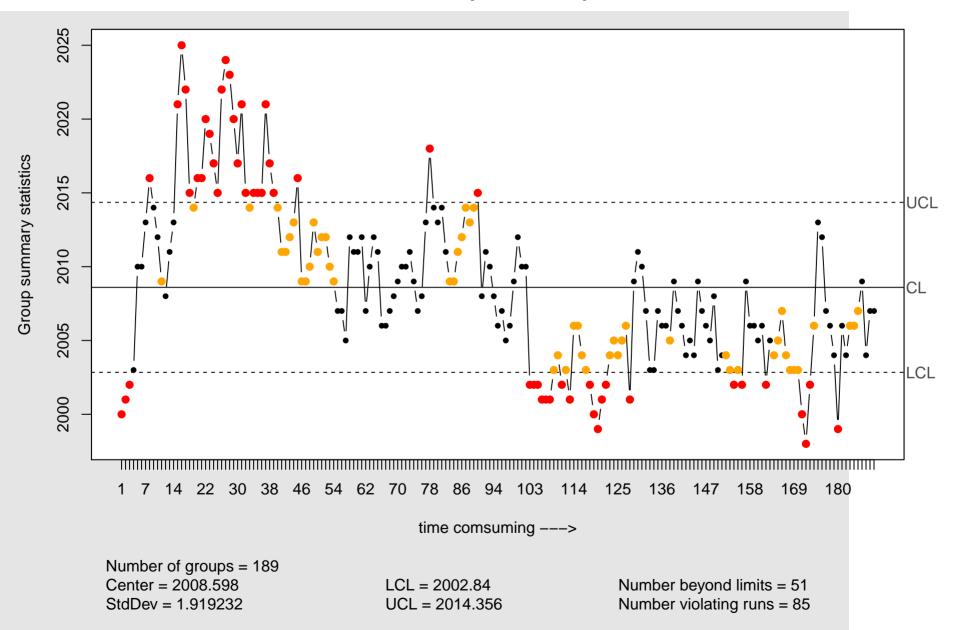


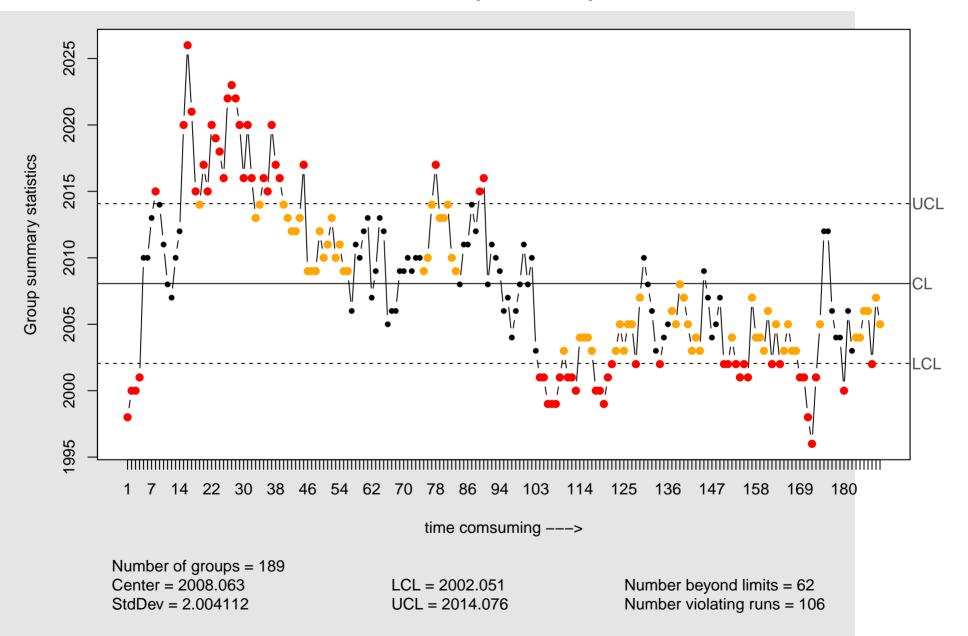


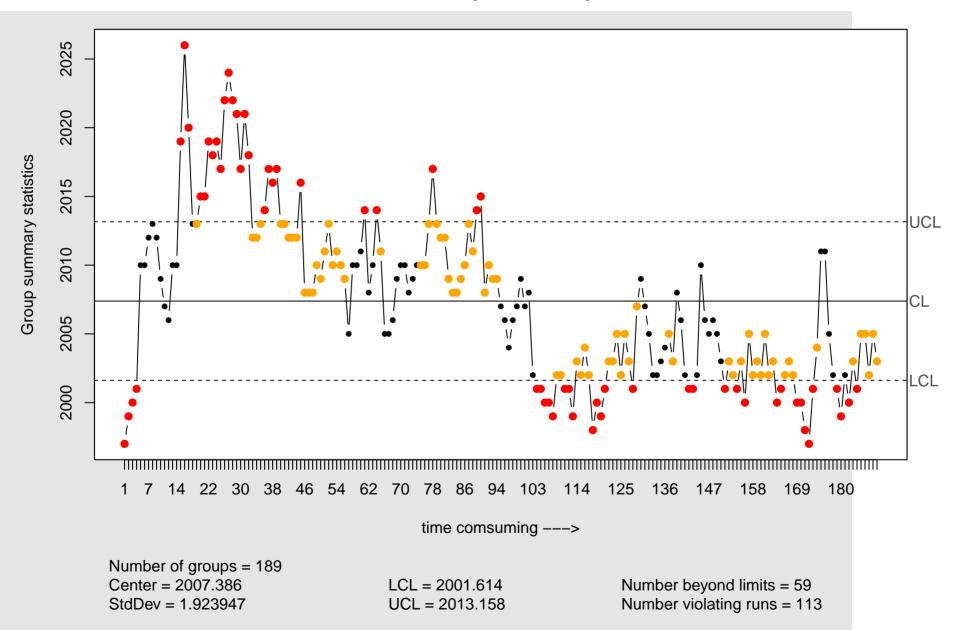


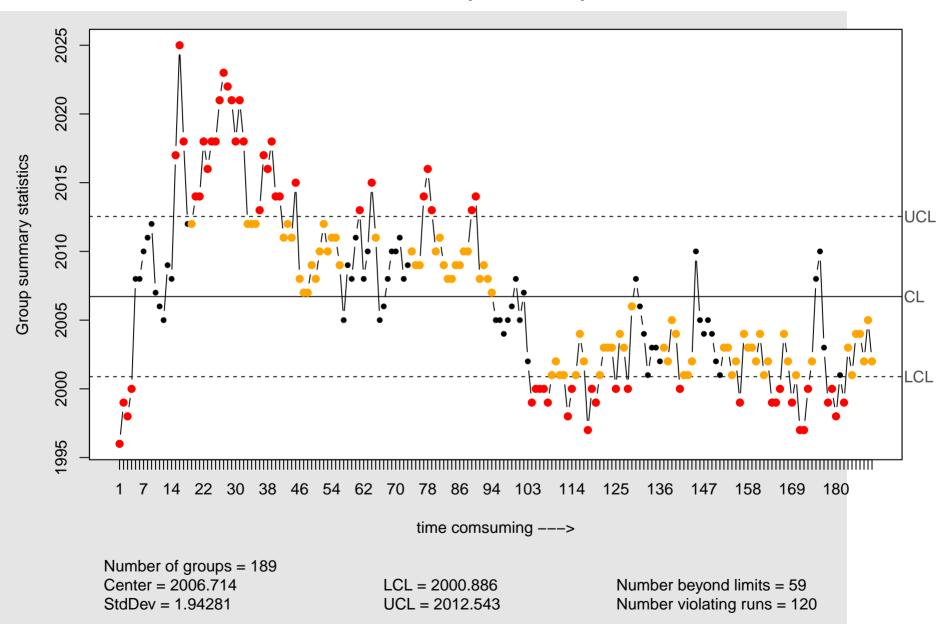


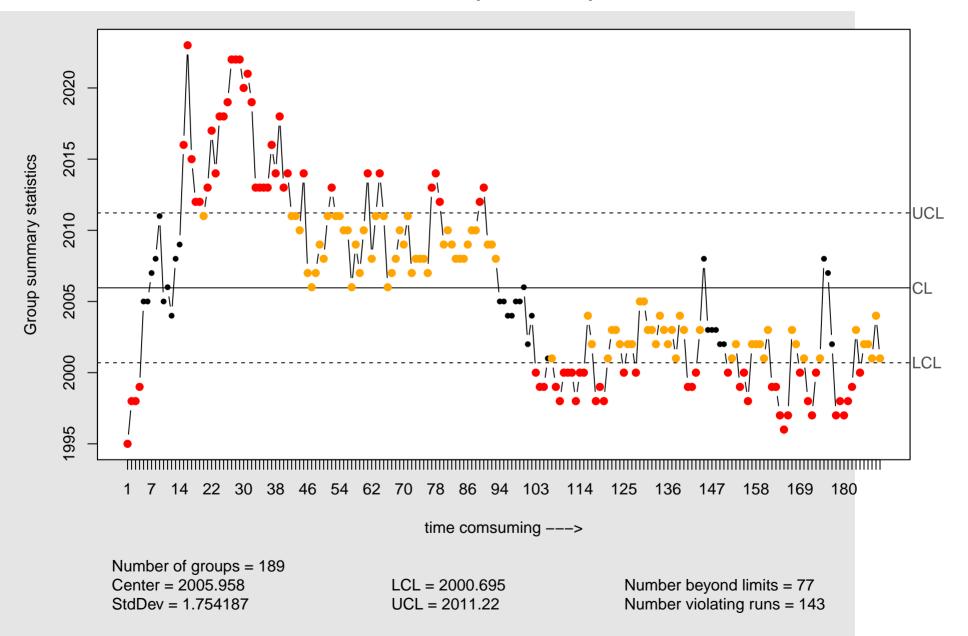


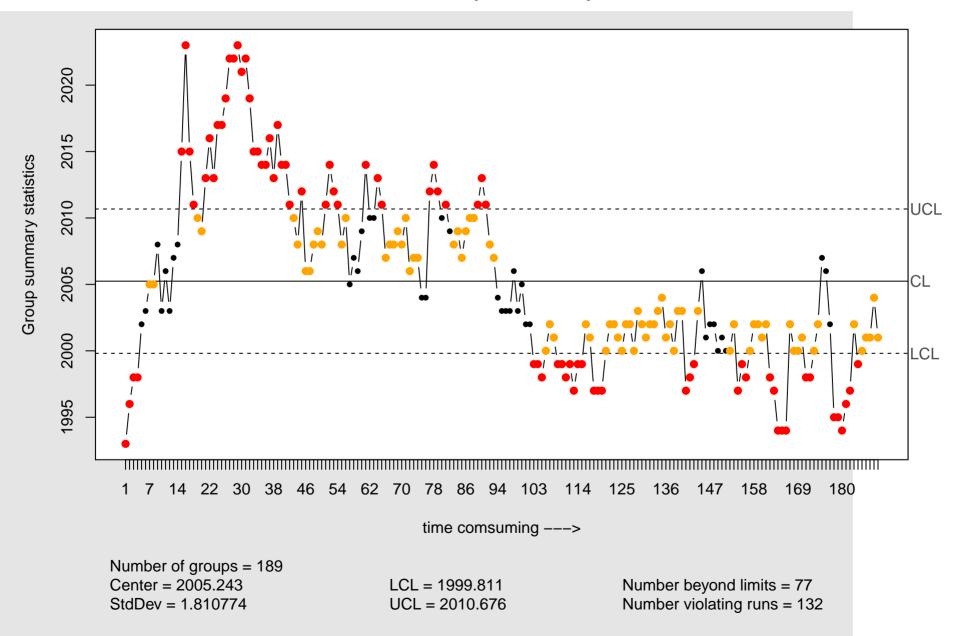


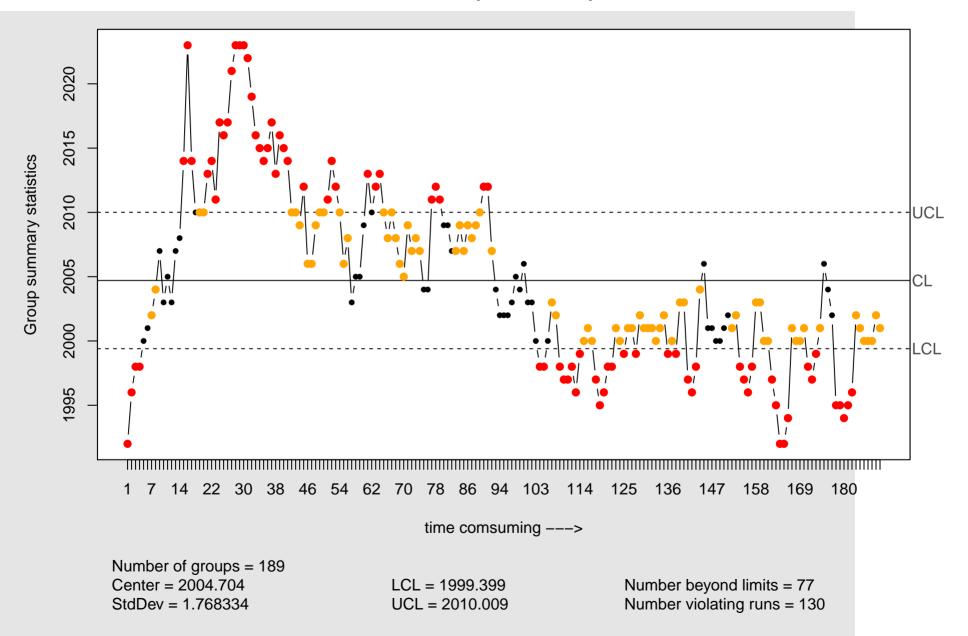


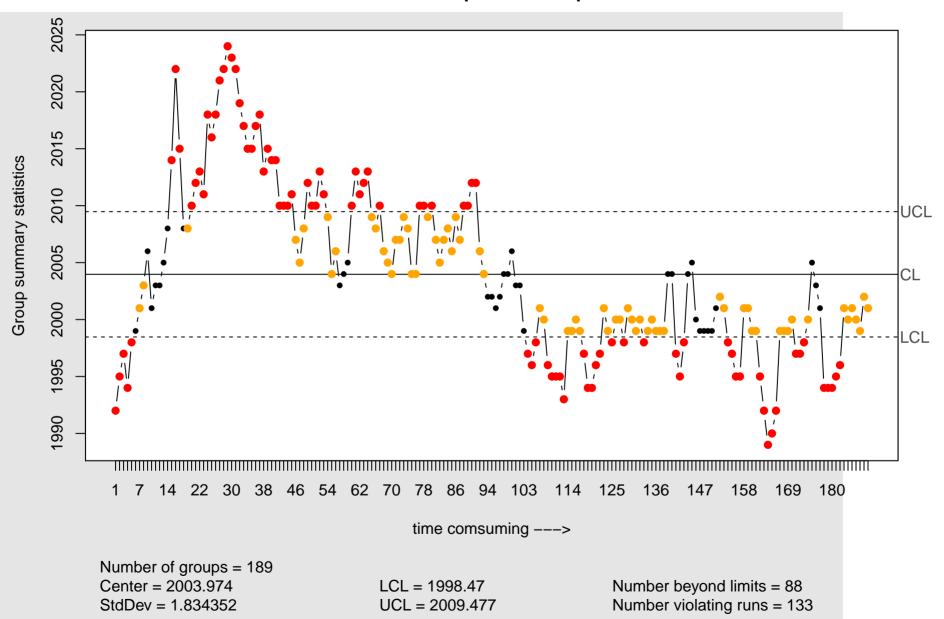


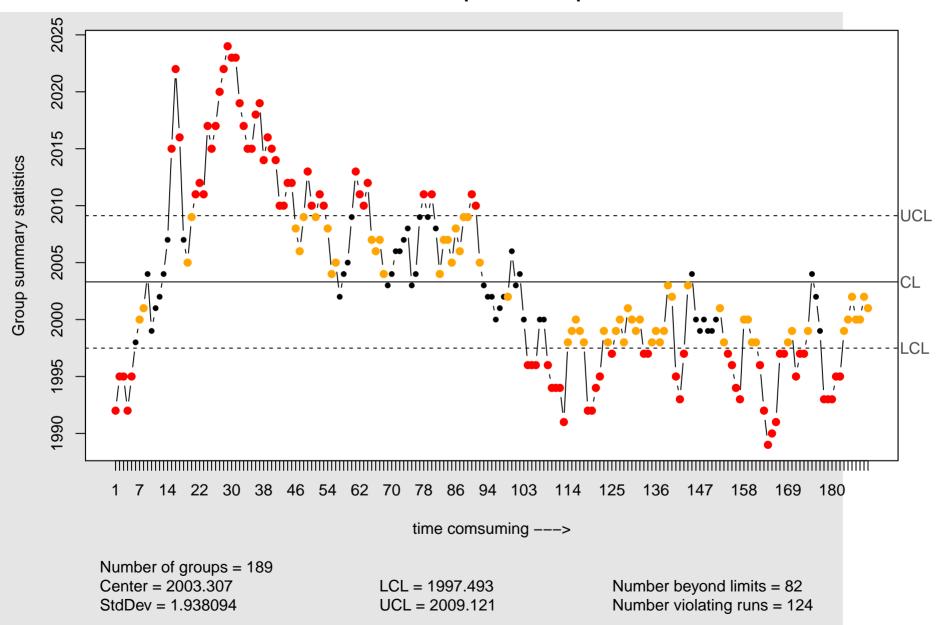


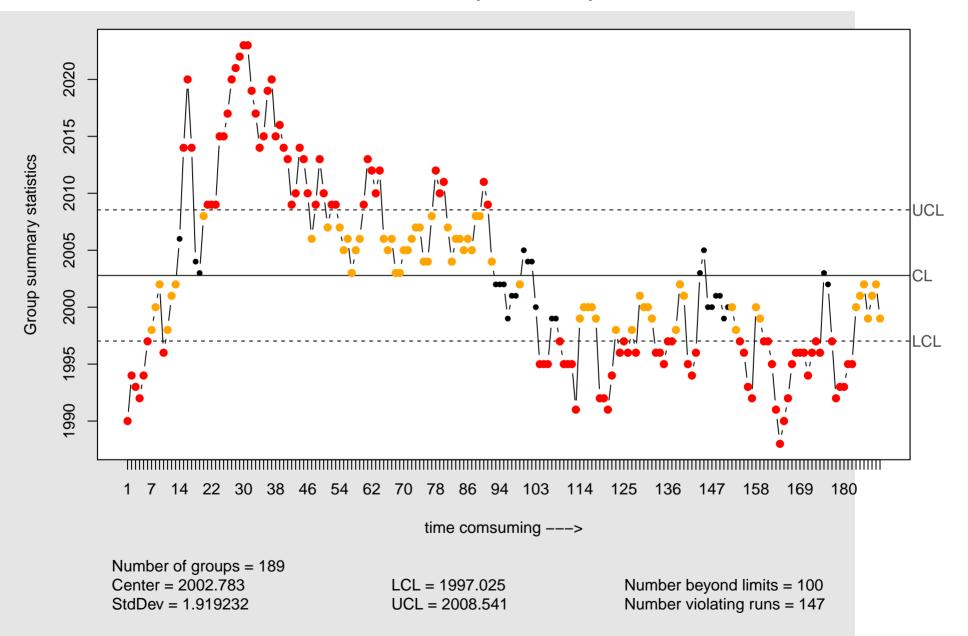


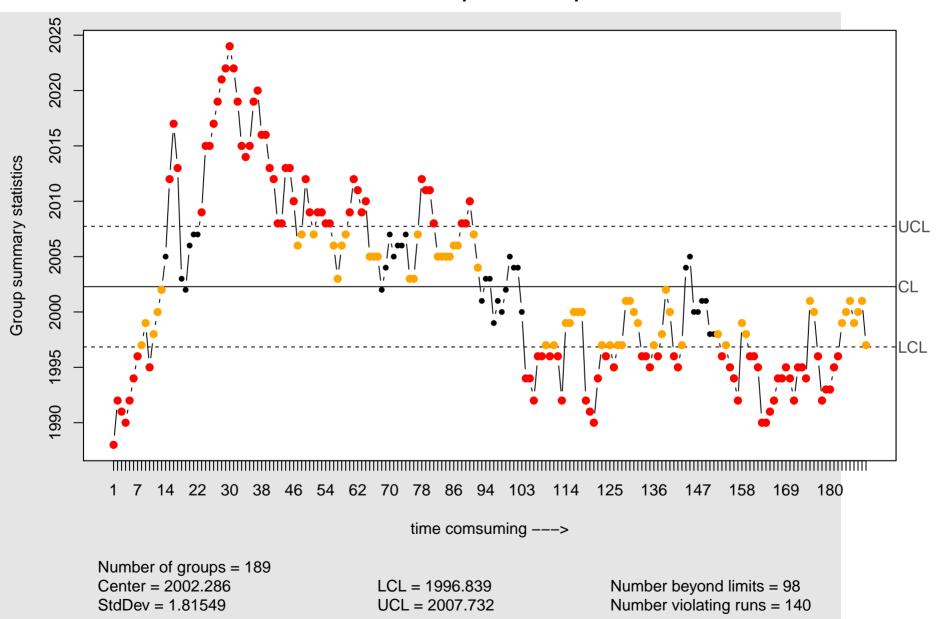


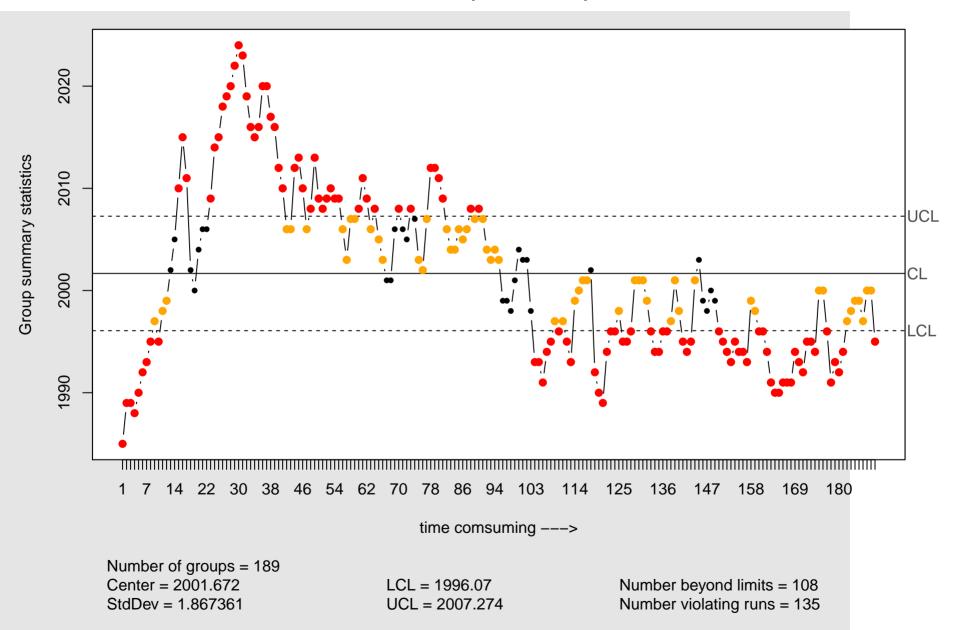


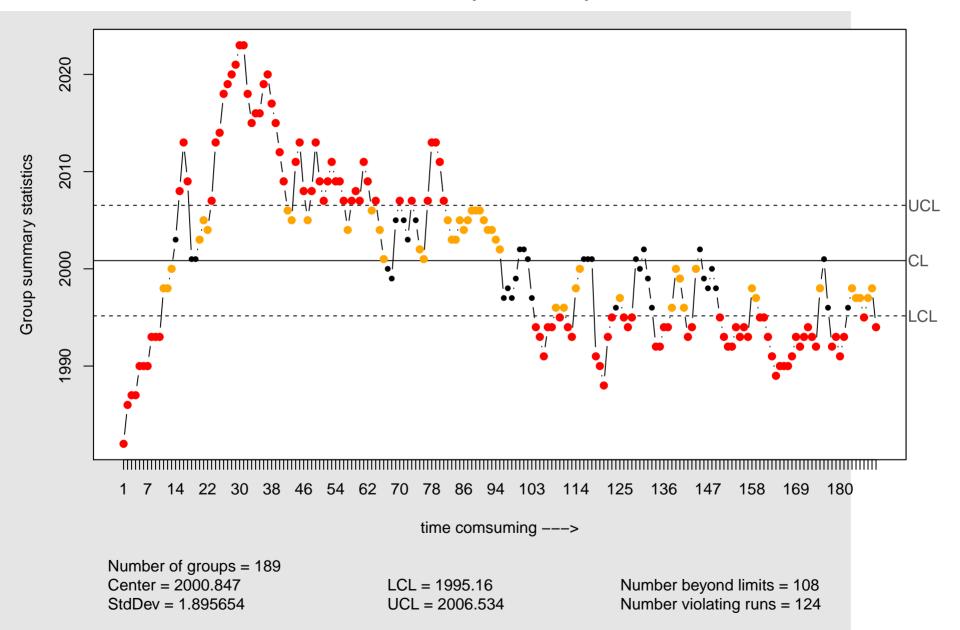


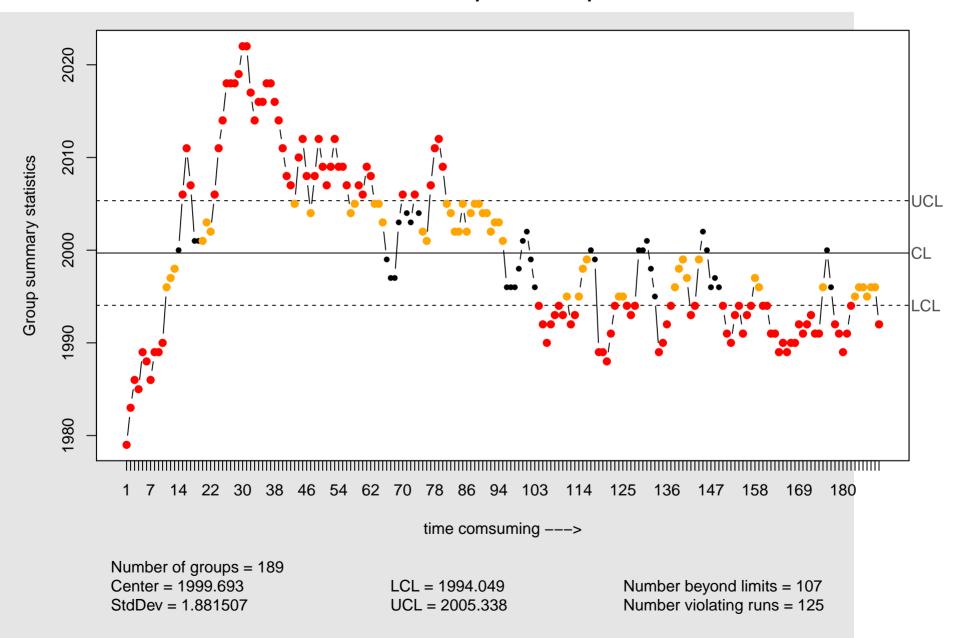


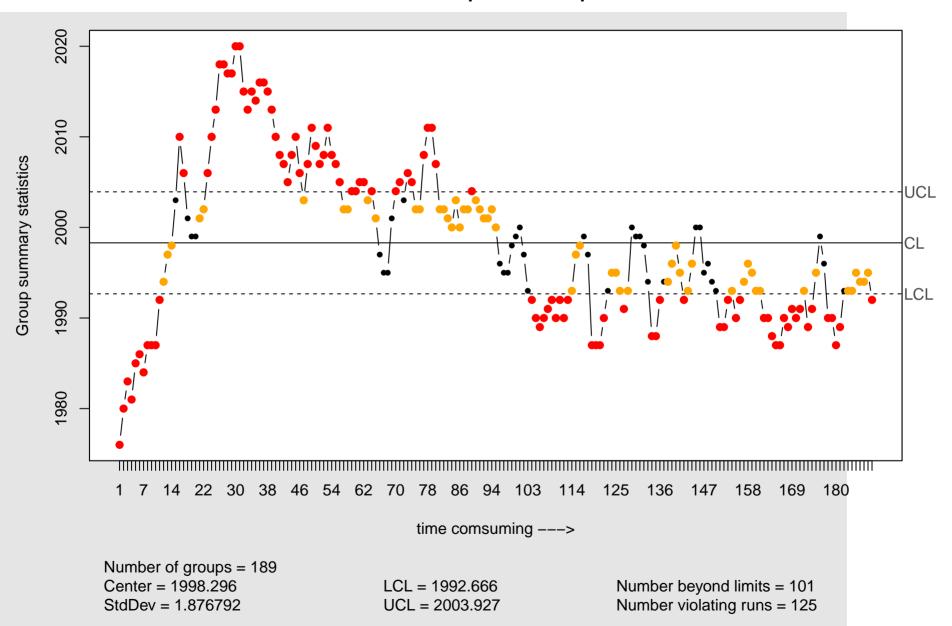


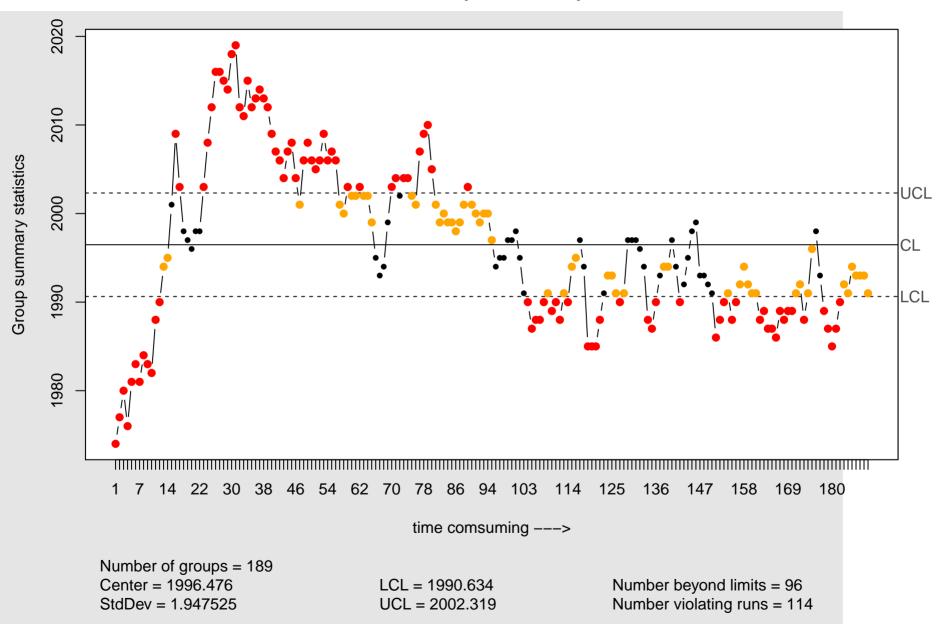


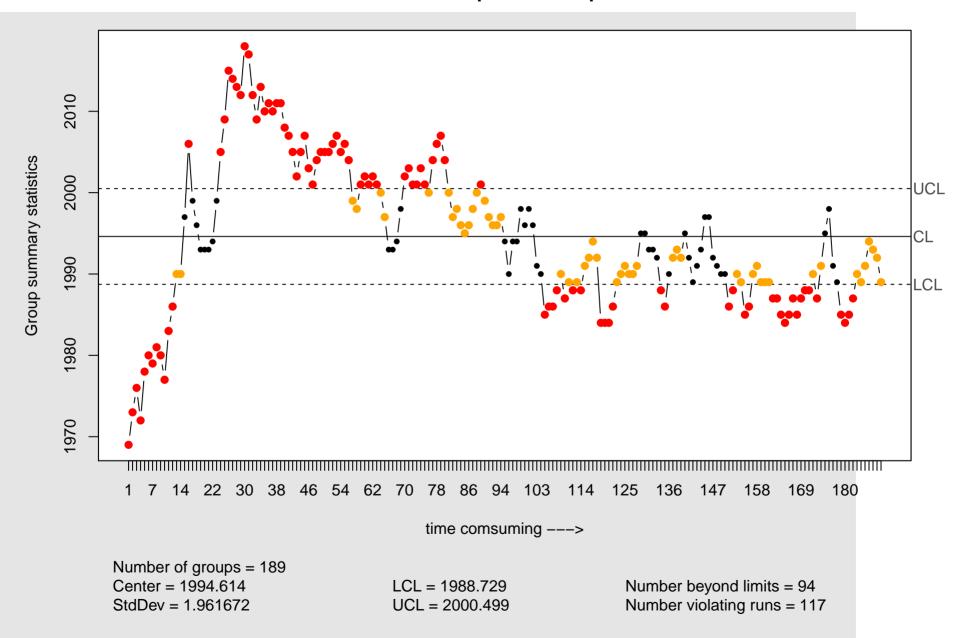


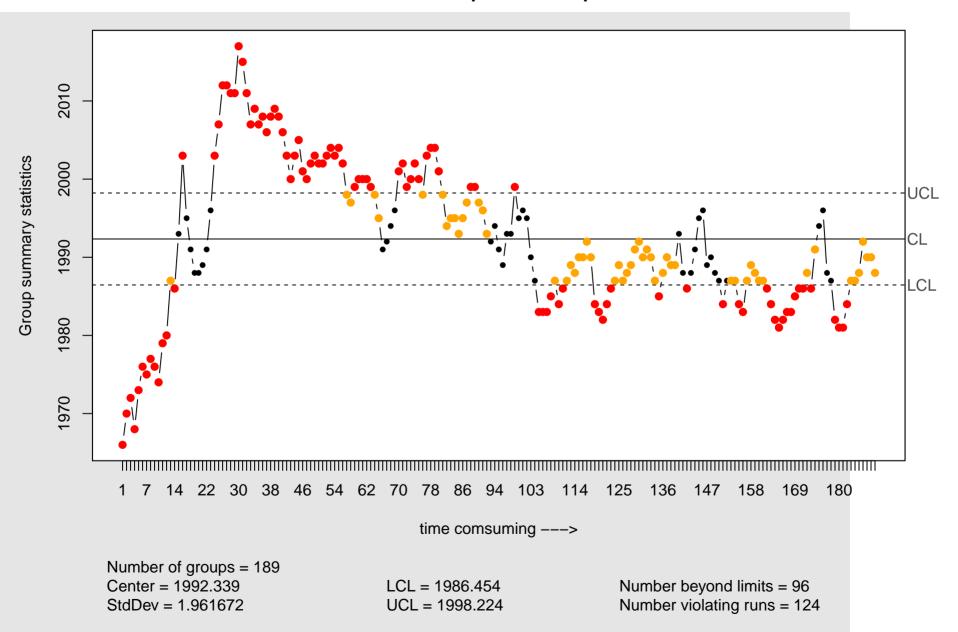


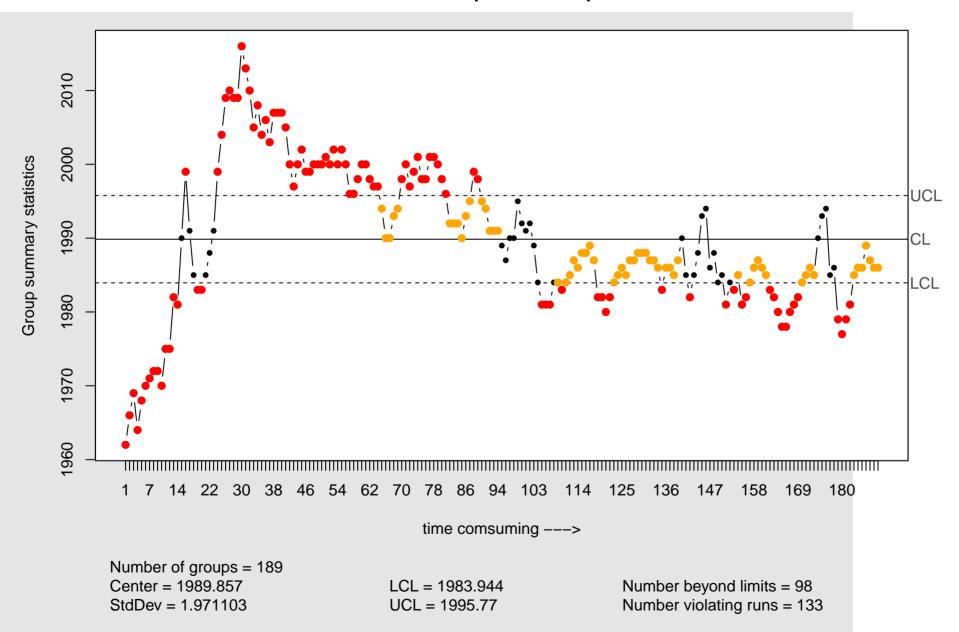


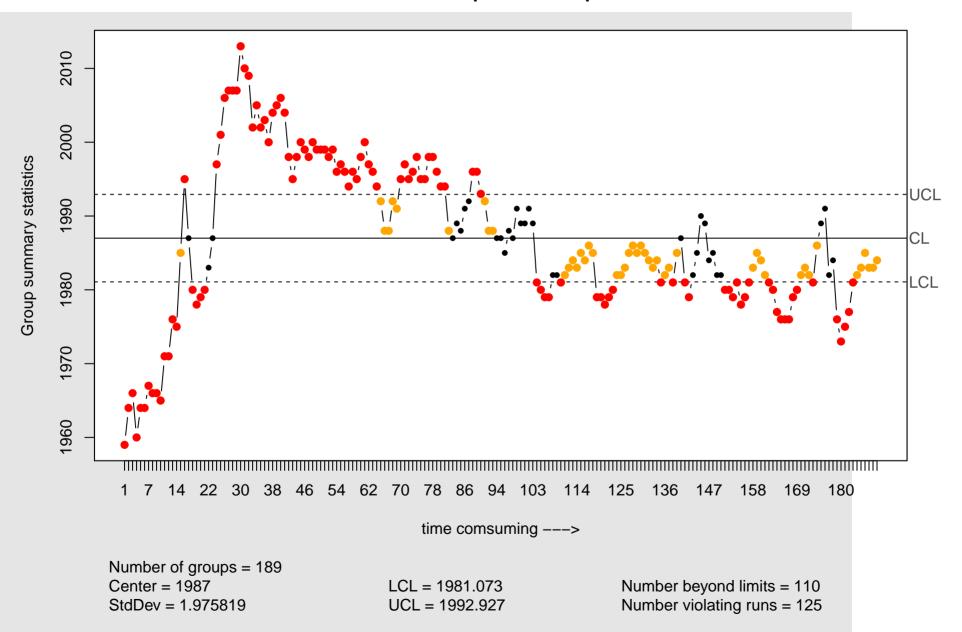


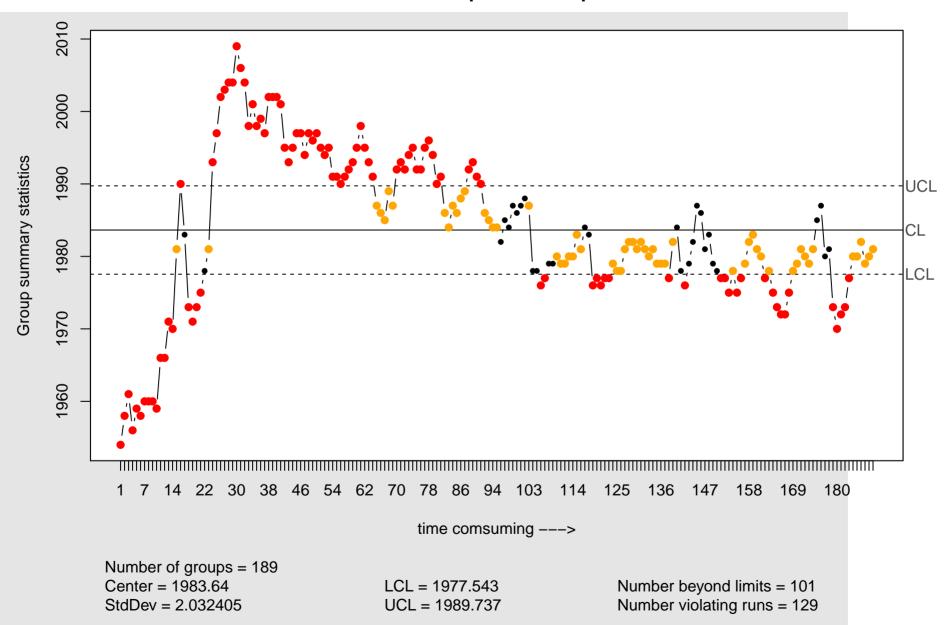


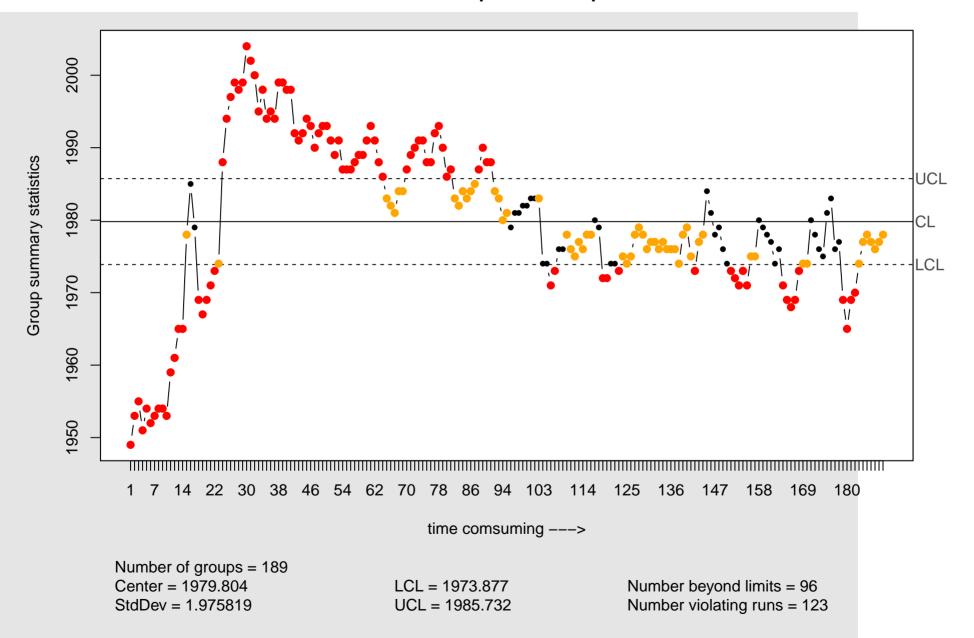


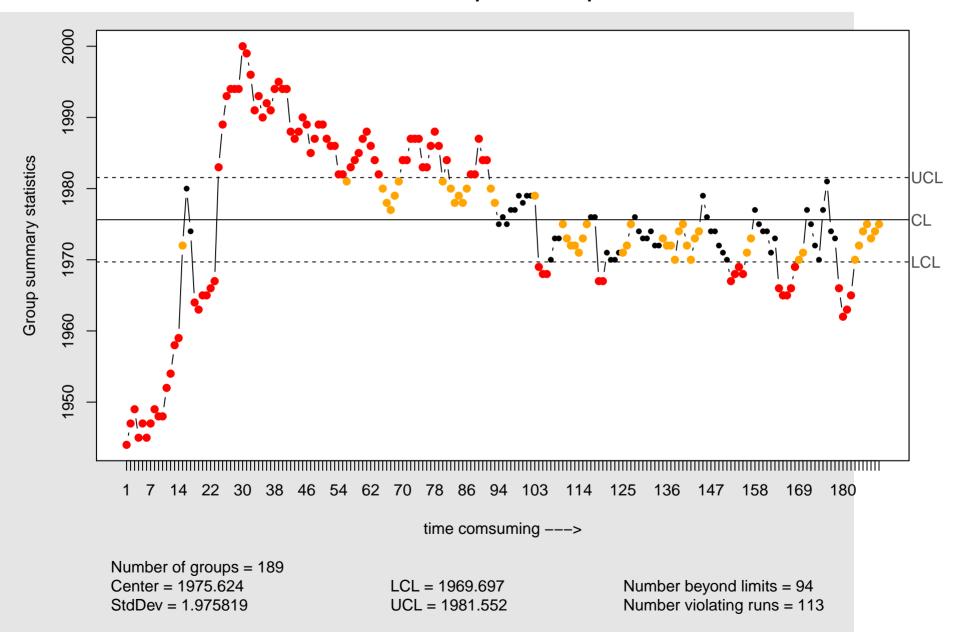


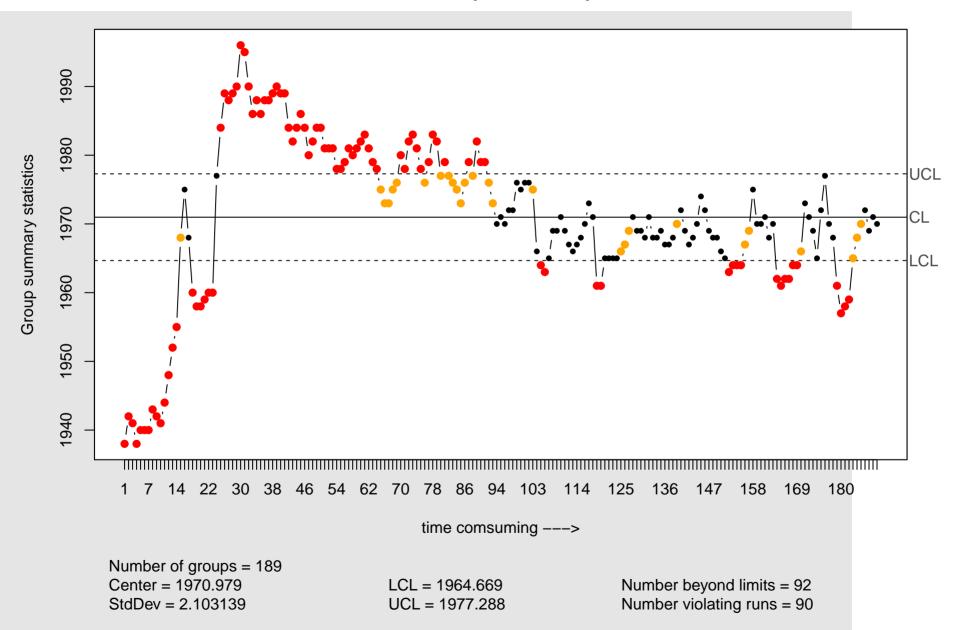


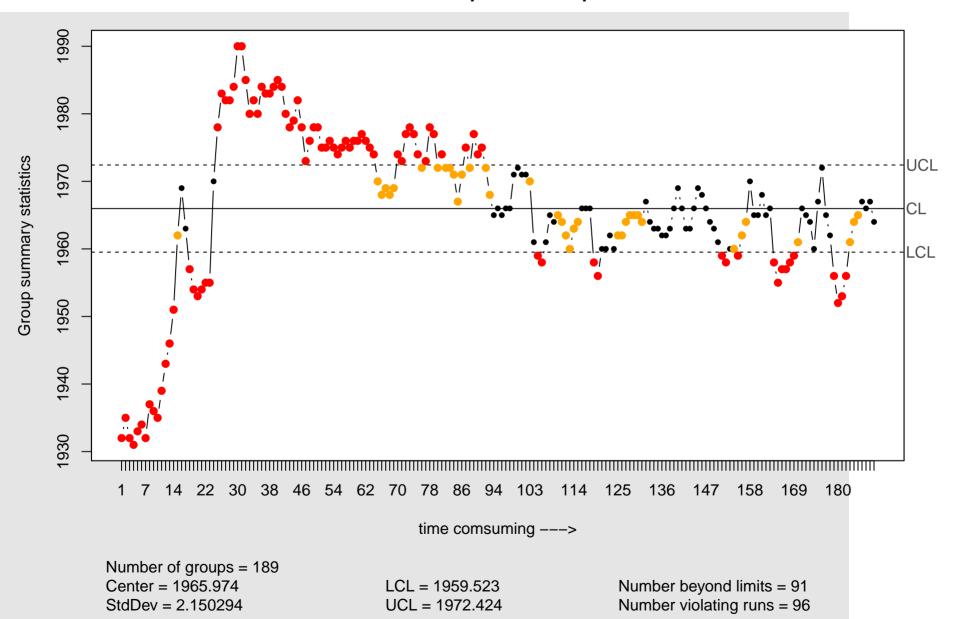


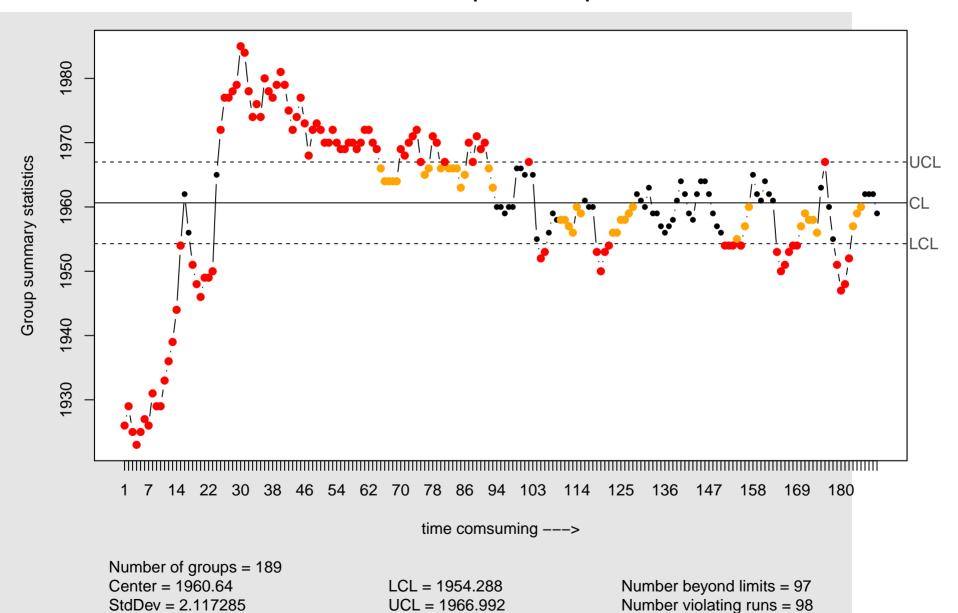


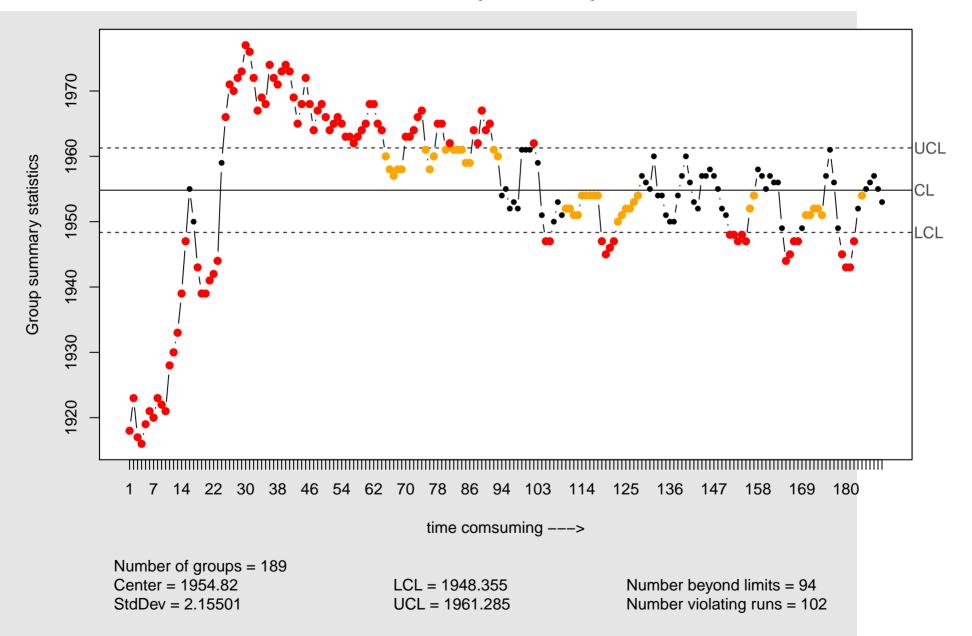


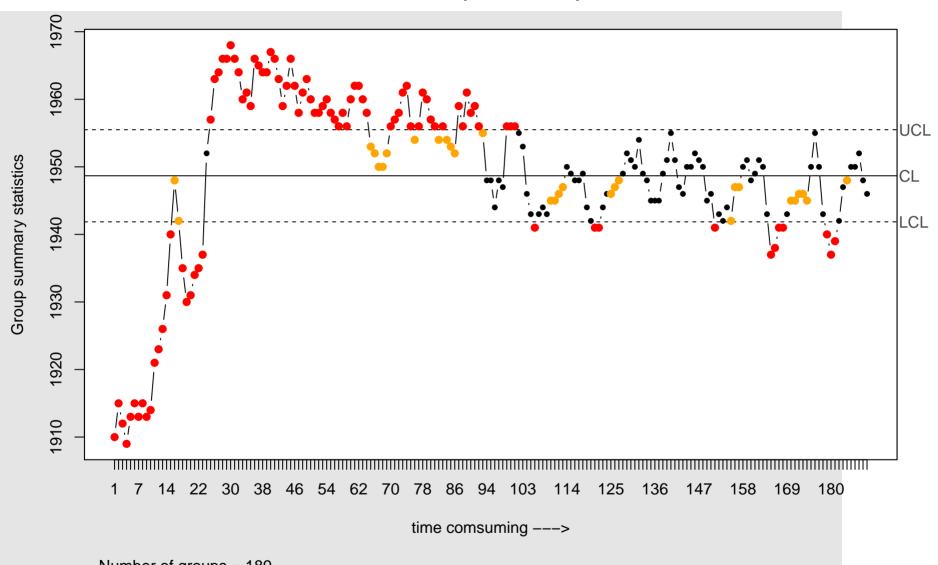






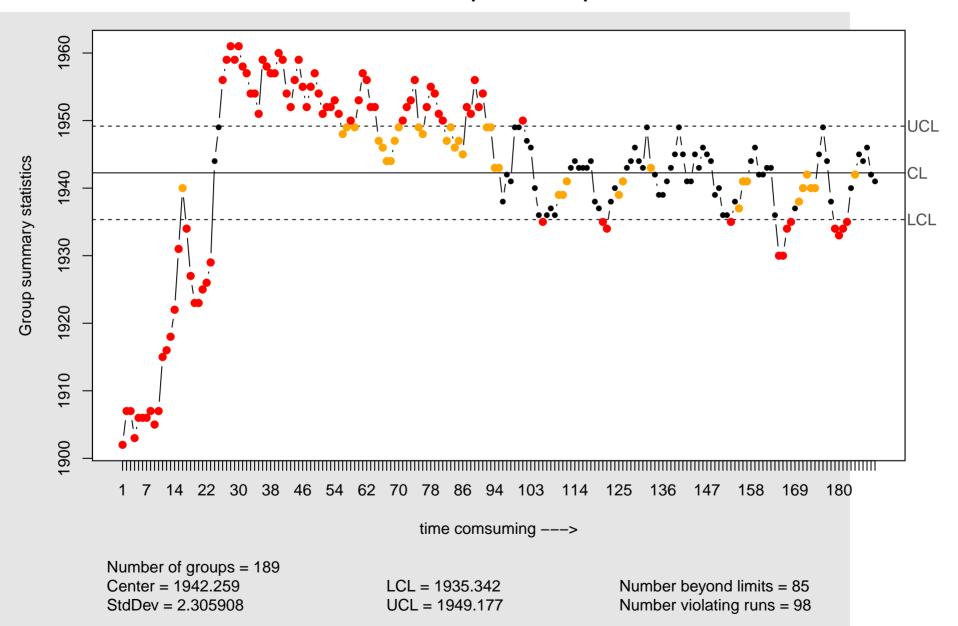


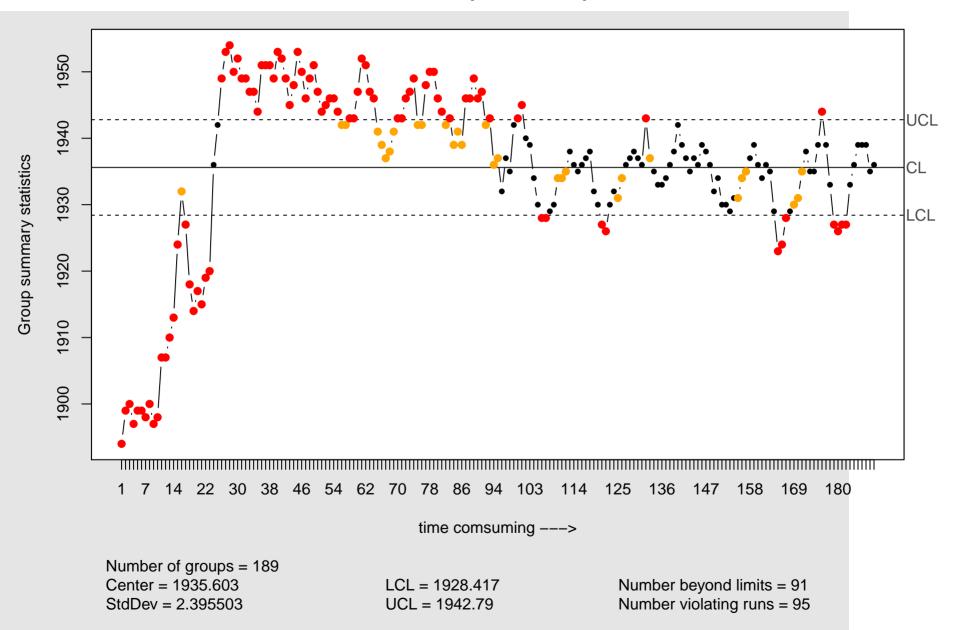


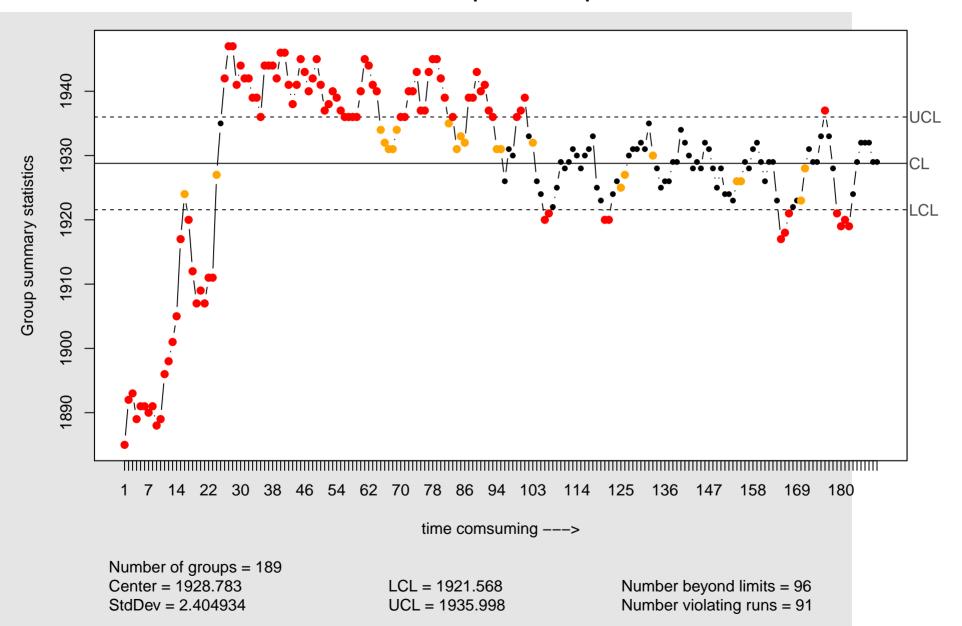


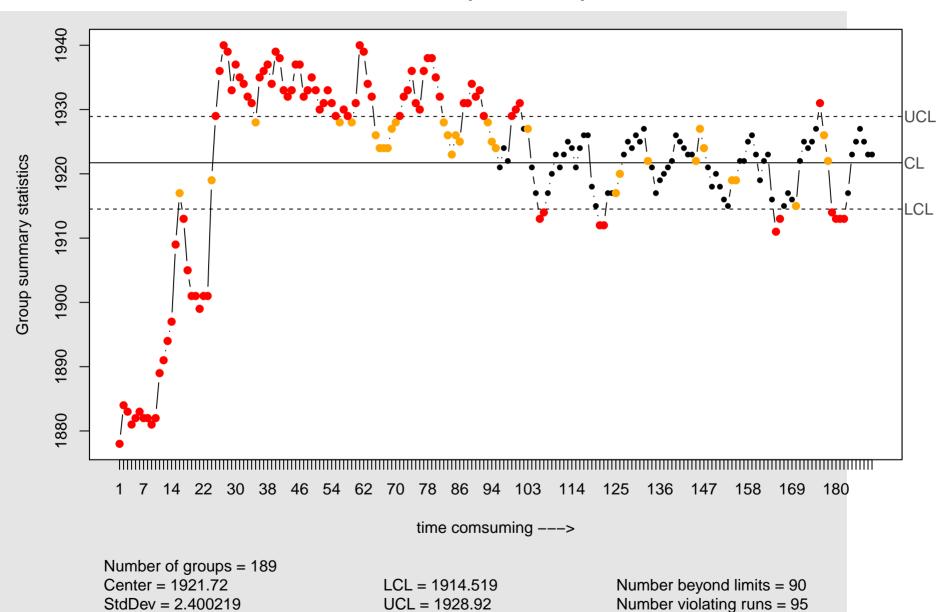
Number of groups = 189 Center = 1948.677 StdDev = 2.272899

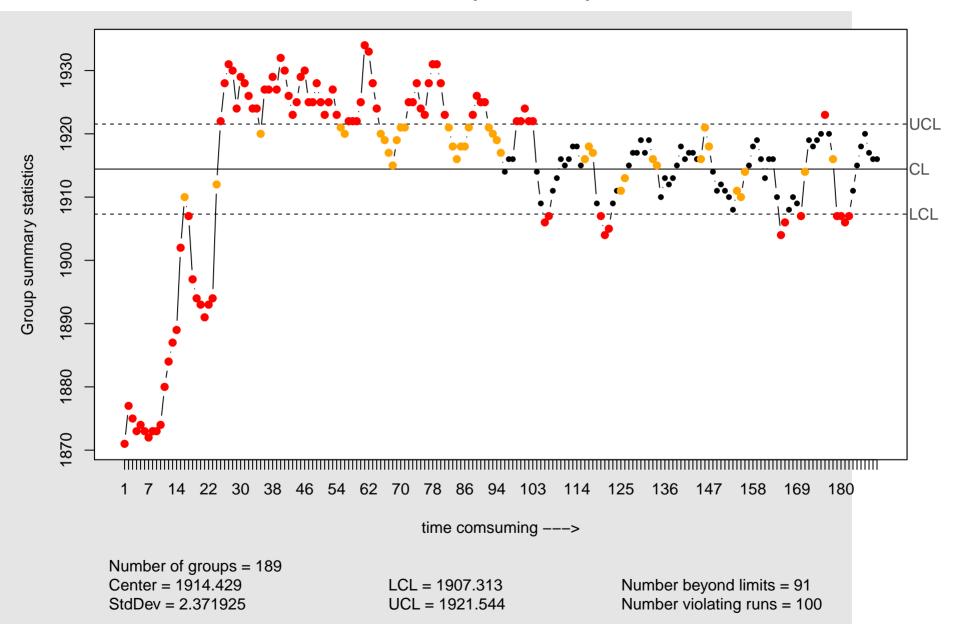
LCL = 1941.859 UCL = 1955.496 Number beyond limits = 93 Number violating runs = 97

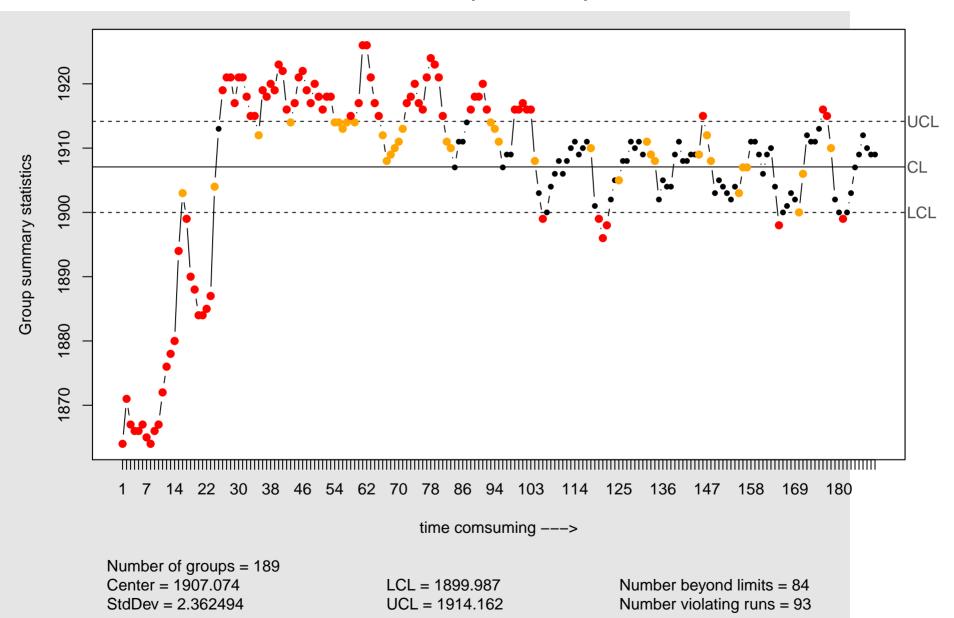


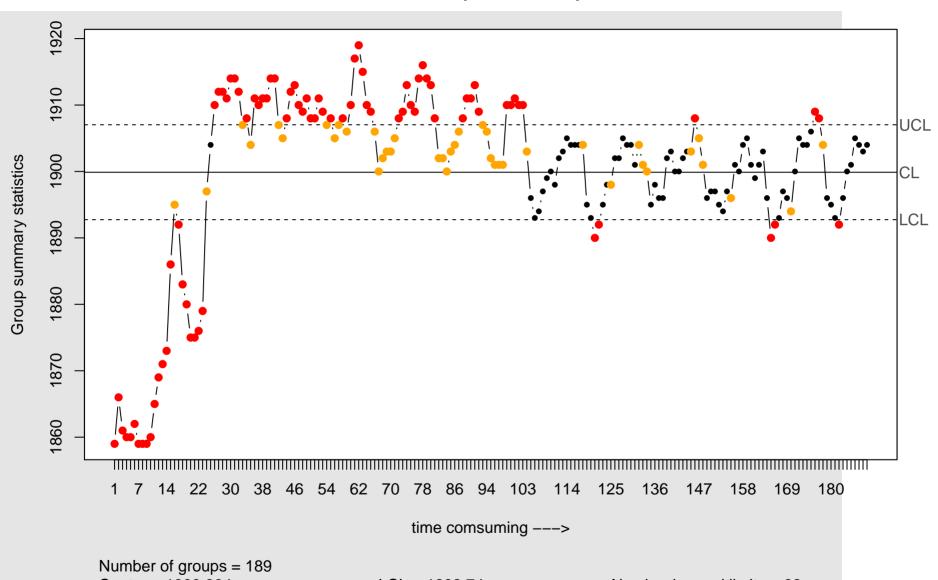






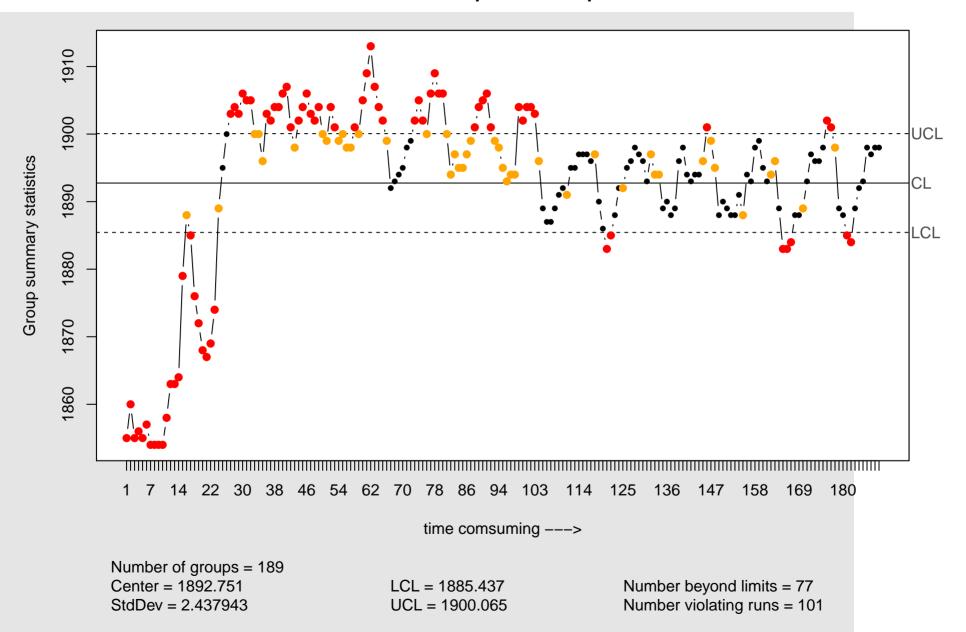


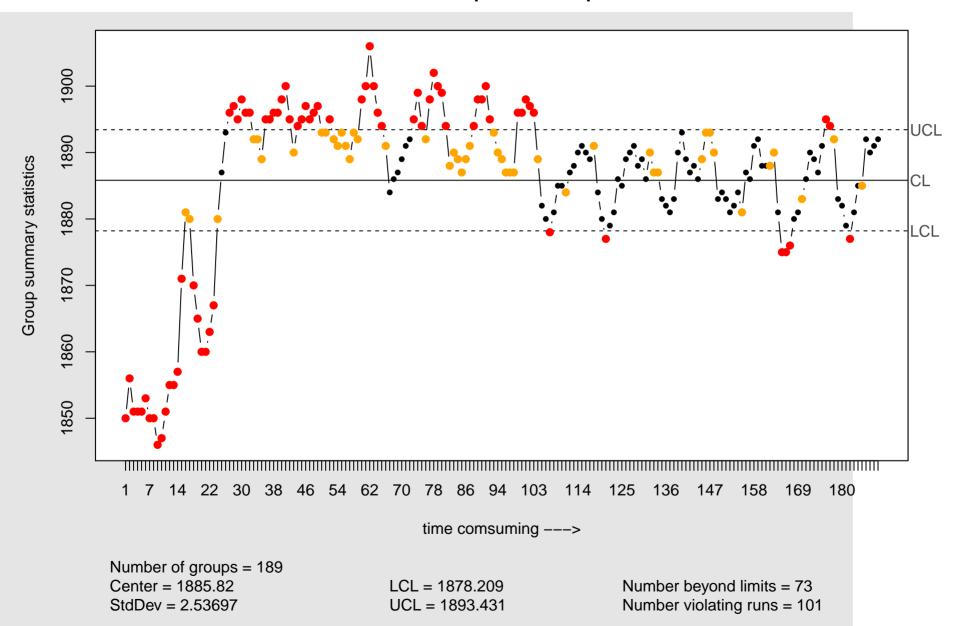


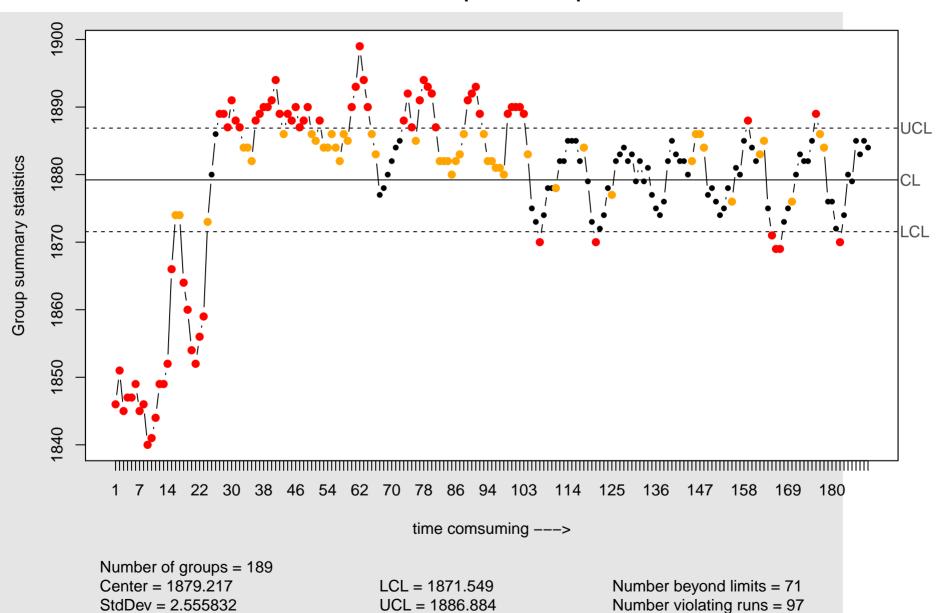


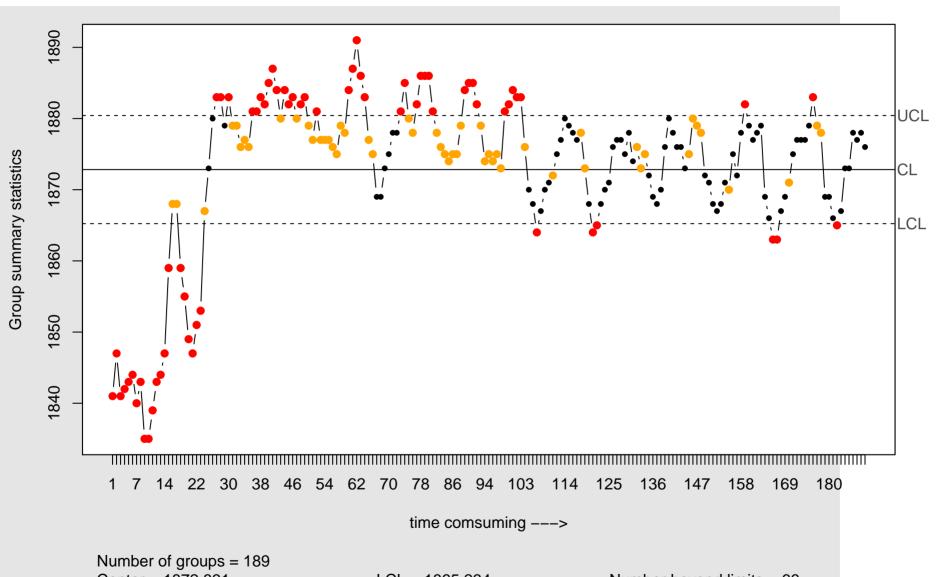
Number of groups = 189 Center = 1899.884 StdDev = 2.381357

LCL = 1892.74 UCL = 1907.028 Number beyond limits = 82 Number violating runs = 105



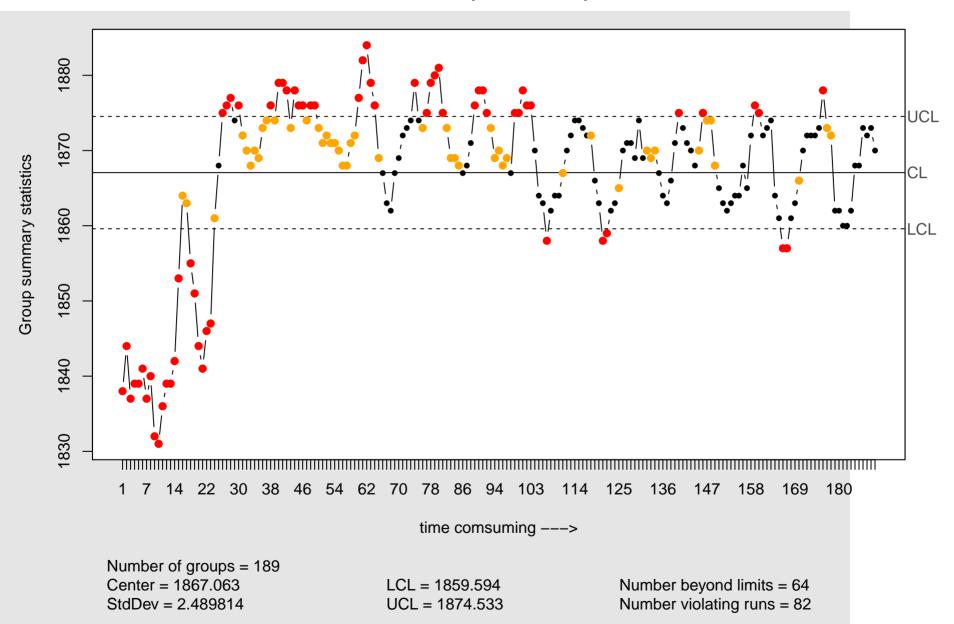


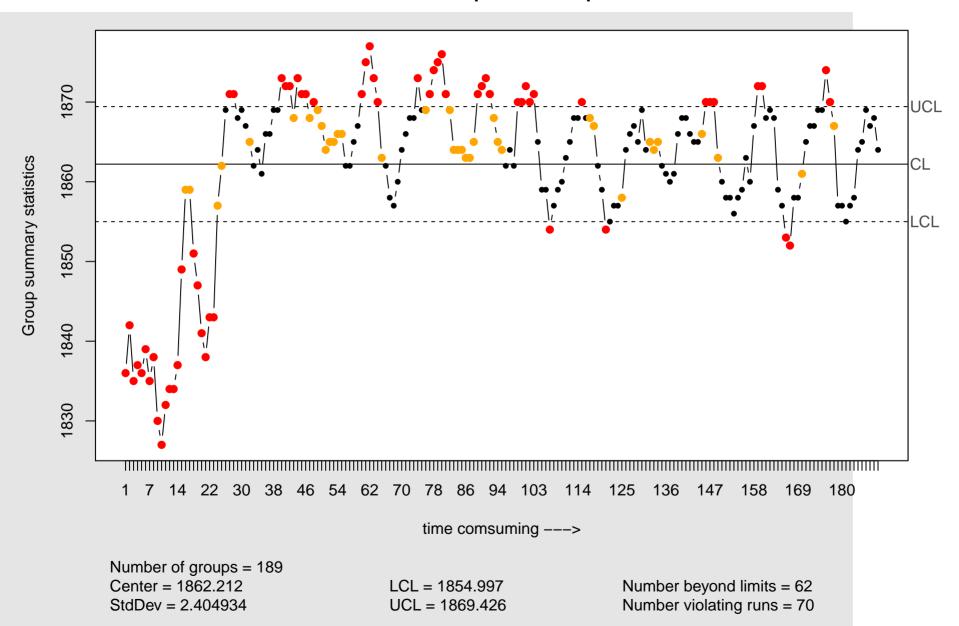


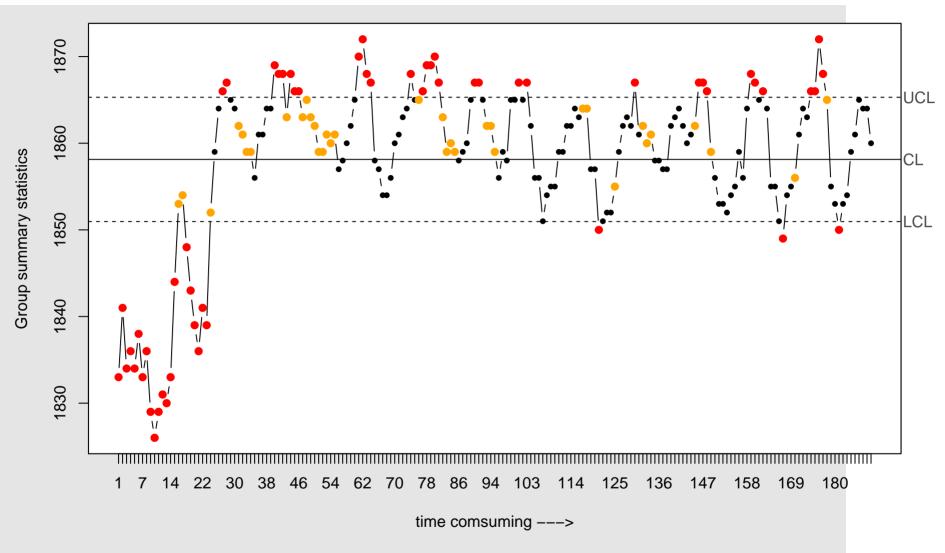


Number of groups = 189 Center = 1872.831 StdDev = 2.532254

LCL = 1865.234 UCL = 1880.427 Number beyond limits = 66 Number violating runs = 98

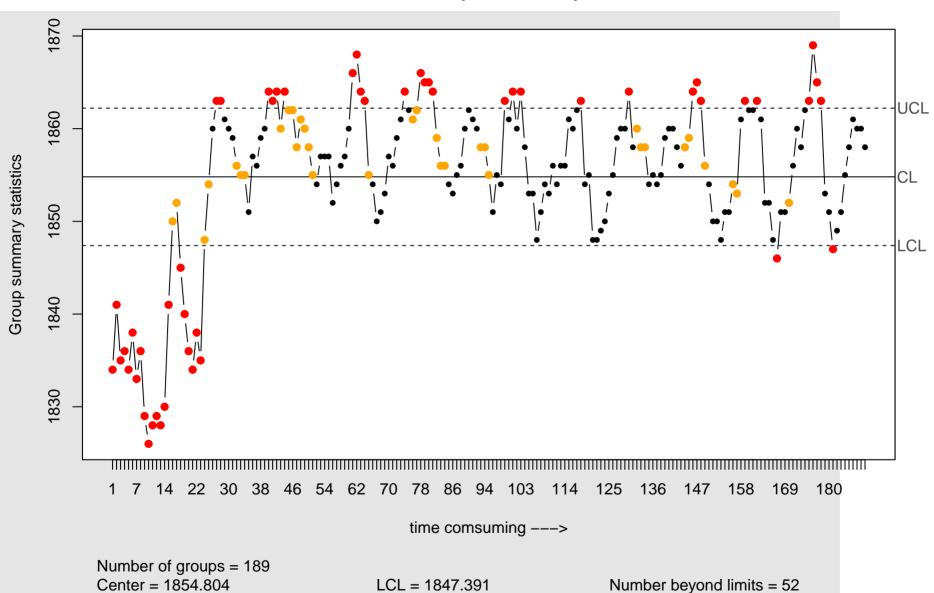






Number of groups = 189 Center = 1858.132 StdDev = 2.390788

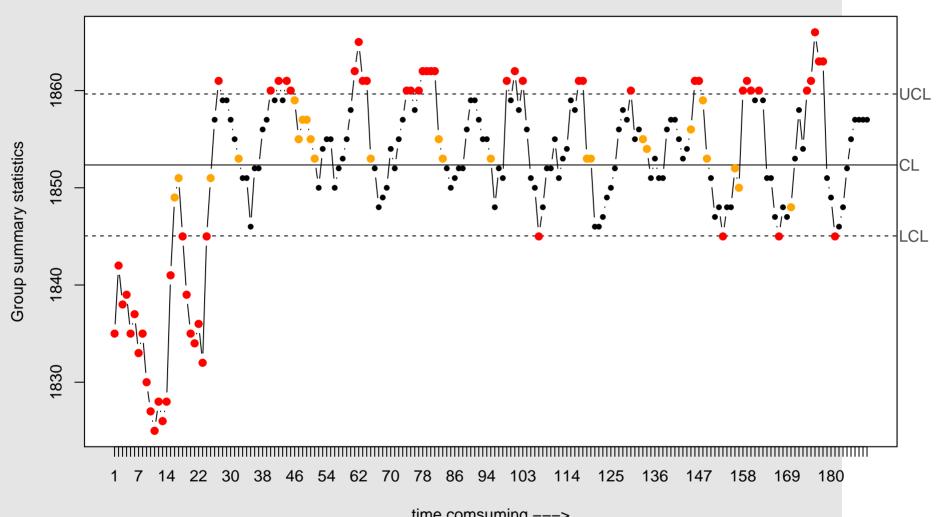
LCL = 1850.96 UCL = 1865.305 Number beyond limits = 57 Number violating runs = 64



UCL = 1862.217

Number violating runs = 60

StdDev = 2.470952

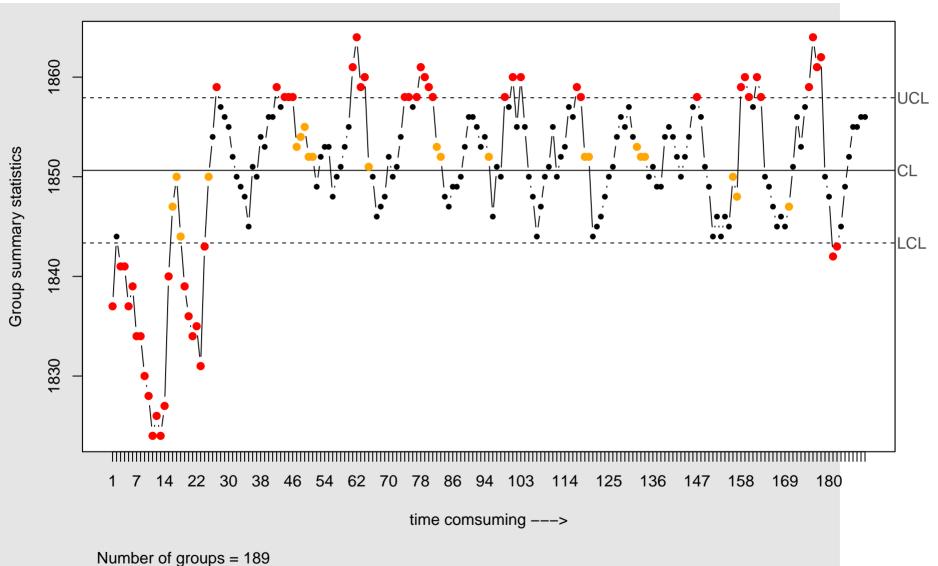


time comsuming --->

Number of groups = 189 Center = 1852.349StdDev = 2.433228

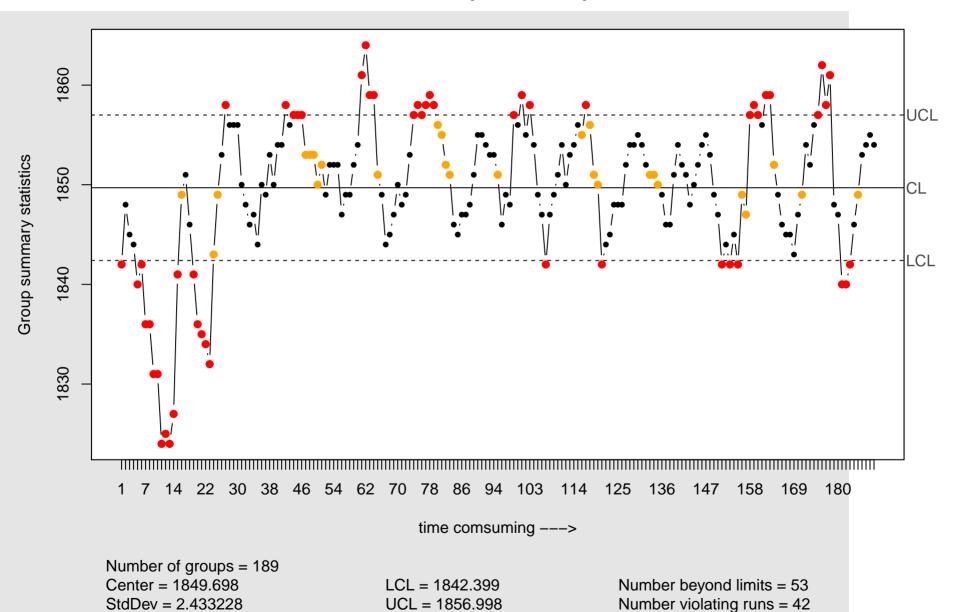
LCL = 1845.05 UCL = 1859.649

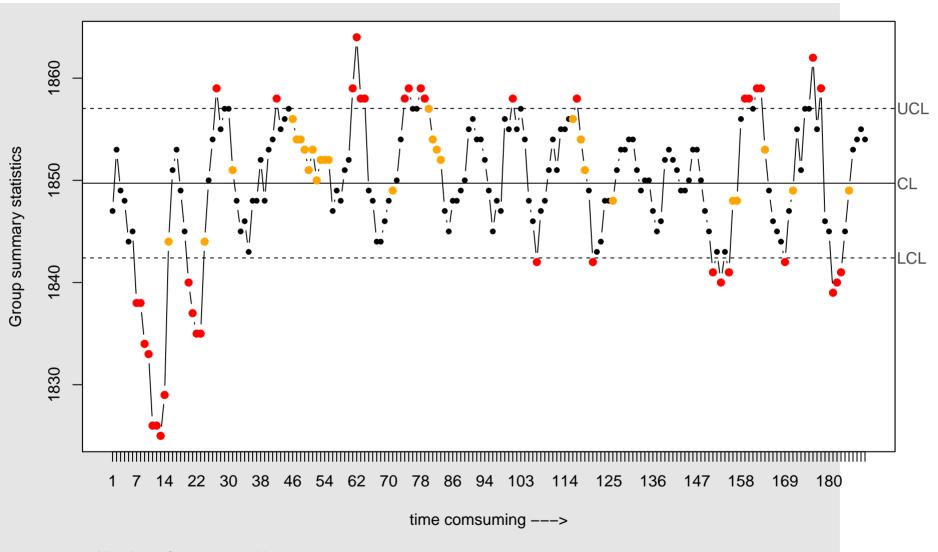
Number beyond limits = 59 Number violating runs = 51



Number of groups = 189 Center = 1850.64 StdDev = 2.428512

LCL = 1843.355 UCL = 1857.926 Number beyond limits = 53 Number violating runs = 46

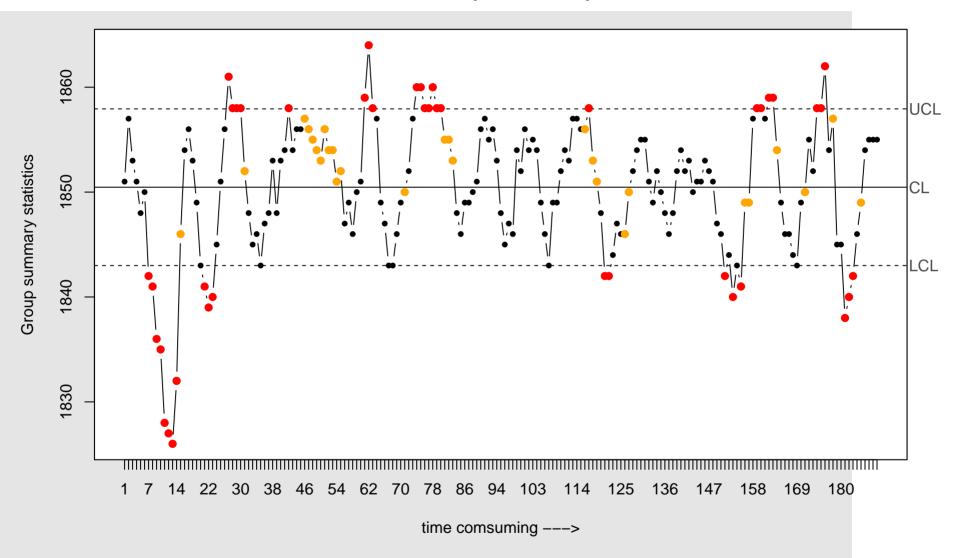




Number of groups = 189 Center = 1849.72 StdDev = 2.437943

LCL = 1842.406 UCL = 1857.033

Number beyond limits = 39 Number violating runs = 38



Number of groups = 189 Center = 1850.466

StdDev = 2.489814

LCL = 1842.996 UCL = 1857.935 Number beyond limits = 42 Number violating runs = 36