2022-10-17

## Week 1 Assessment

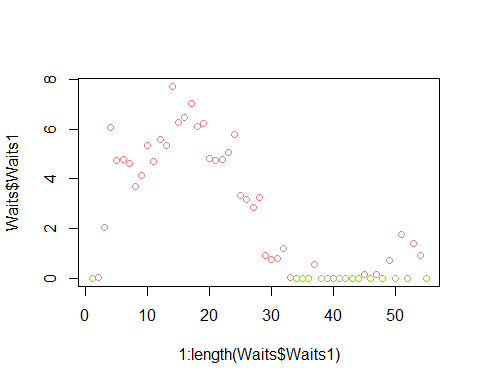
### Average queue time

Average queue time is 2.51 and 1.76 for queues 1 and 2 respectively.

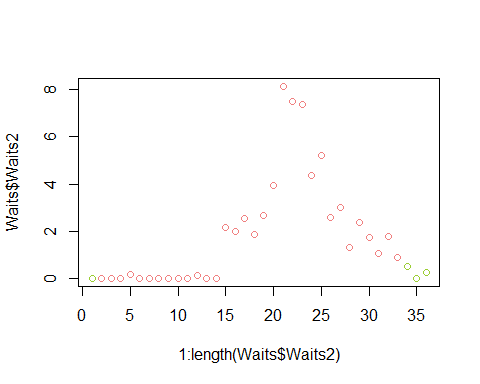
### Plot Waiting times

Green dots represent points with zero waiting time.

plot(1:length(Waits$Waits1),Waits$Waits1,col = ifelse(Waits$Waits1 == 0,'olivedrab3','lightcoral'))



plot(1:length(Waits$Waits2),Waits$Waits2,col = ifelse(Waits$Waits1 == 0,'olivedrab3','lightcoral'))



### Record Sample Path

Tandem(Starting.seed = 12345,c=c(1,1),Tend=50)

## [1] "0.441807792522013" "Arrival1"   
## [1] "0.969280547858074" "Arrival1"   
## [1] "0.987729219184115" "Arrival1"   
## [1] "1.0077349125528" "Departure1"   
## [1] "1.44313972669174" "Arrival1"   
## [1] "3.02214076275623" "Departure1"   
## [1] "3.04842200906447" "Arrival1"   
## [1] "4.30638253063851" "Arrival1"   
## [1] "5.26857061767785" "Arrival1"   
## [1] "7.08657365740092" "Arrival1"   
## [1] "7.31306116819122" "Arrival1"   
## [1] "7.50367322908943" "Departure1"   
## [1] "7.50367322908943" "Arrival2"   
## [1] "7.58297738512275" "Departure2"   
## [1] "7.75982407948915" "Arrival1"   
## [1] "7.78163432423254" "Departure1"   
## [1] "7.78163432423254" "Arrival2"   
## [1] "8.10893484601048" "Departure2"   
## [1] "9.10323007380525" "Departure1"   
## [1] "9.10323007380525" "Arrival2"   
## [1] "9.48198828234638" "Arrival1"   
## [1] "9.48839956097407" "Departure2"   
## [1] "9.9009846964923" "Departure1"   
## [1] "10.7613676756525" "Departure1"   
## [1] "10.7613676756525" "Arrival2"   
## [1] "10.9405357198259" "Arrival1"   
## [1] "11.1916213136567" "Arrival1"   
## [1] "11.4099822475699" "Arrival1"   
## [1] "11.4459997876158" "Departure1"   
## [1] "13.1013725630599" "Departure1"   
## [1] "13.1013725630599" "Arrival2"   
## [1] "13.1423241144903" "Arrival1"   
## [1] "13.2838070722728" "Departure2"   
## [1] "13.2940871919386" "Arrival1"   
## [1] "13.3770437908834" "Departure2"   
## [1] "13.6444964668254" "Arrival1"   
## [1] "14.1972930292755" "Departure1"   
## [1] "14.1972930292755" "Arrival2"   
## [1] "14.4113985994987" "Departure2"   
## [1] "14.82938862667" "Arrival1"   
## [1] "15.1830960818562" "Arrival1"   
## [1] "16.5189354309724" "Departure1"   
## [1] "16.5391537799412" "Departure1"   
## [1] "16.5391537799412" "Arrival2"   
## [1] "16.7701761283067" "Arrival1"   
## [1] "17.6834503279666" "Arrival1"   
## [1] "17.927304396042" "Departure2"   
## [1] "18.3347640533598" "Arrival1"   
## [1] "18.3394533379601" "Arrival1"   
## [1] "18.9465985896664" "Arrival1"   
## [1] "19.1250944054989" "Departure1"   
## [1] "19.1250944054989" "Arrival2"   
## [1] "19.1500165813906" "Departure2"   
## [1] "19.4257862383338" "Departure1"   
## [1] "19.7757110162011" "Departure1"   
## [1] "19.7757110162011" "Arrival2"   
## [1] "20.5596189297662" "Departure2"   
## [1] "20.674826464803" "Departure1"   
## [1] "20.674826464803" "Arrival2"   
## [1] "20.9222444436057" "Departure2"   
## [1] "20.9277963753314" "Departure1"   
## [1] "21.416129076497" "Departure1"   
## [1] "21.416129076497" "Arrival2"   
## [1] "21.5693955391807" "Departure1"   
## [1] "21.7738165561904" "Arrival1"   
## [1] "22.3637606832062" "Arrival1"   
## [1] "22.417860045457" "Departure1"   
## [1] "22.417860045457" "Arrival2"   
## [1] "22.5203622265502" "Departure2"   
## [1] "22.6273843464691" "Departure2"   
## [1] "22.7712951633646" "Arrival1"   
## [1] "22.8011302836738" "Arrival1"   
## [1] "23.1012808655893" "Departure1"   
## [1] "23.1012808655893" "Arrival2"   
## [1] "23.3952417349948" "Departure1"   
## [1] "23.641697662933" "Departure2"   
## [1] "24.7108661584473" "Departure1"   
## [1] "24.7108661584473" "Arrival2"   
## [1] "25.0948347628033" "Departure1"   
## [1] "25.0948347628033" "Arrival2"   
## [1] "25.3159616197629" "Arrival1"   
## [1] "25.5327087335205" "Departure1"   
## [1] "25.6224911340357" "Departure1"   
## [1] "25.6224911340357" "Arrival2"   
## [1] "25.6422840975394" "Arrival1"   
## [1] "25.6858393684199" "Arrival1"   
## [1] "26.0533551213176" "Departure1"   
## [1] "26.0533551213176" "Arrival2"   
## [1] "26.0729207218794" "Arrival1"   
## [1] "26.2352751415999" "Departure1"   
## [1] "26.4158338121738" "Departure1"   
## [1] "26.4984939391393" "Departure1"   
## [1] "27.2693578520164" "Departure1"   
## [1] "27.2693578520164" "Arrival2"   
## [1] "27.2694873100414" "Departure2"   
## [1] "27.5989795611973" "Departure2"   
## [1] "27.6352781027816" "Arrival1"   
## [1] "27.668050726068" "Departure1"   
## [1] "27.668050726068" "Arrival2"   
## [1] "27.852633287489" "Departure1"   
## [1] "27.852633287489" "Arrival2"   
## [1] "28.1165991335436" "Arrival1"   
## [1] "28.2079174808439" "Departure1"   
## [1] "28.2079174808439" "Arrival2"   
## [1] "28.2372687450847" "Arrival1"   
## [1] "28.5231510907649" "Departure1"   
## [1] "28.5983241311414" "Departure2"   
## [1] "28.7388004312529" "Arrival1"   
## [1] "29.1298232938768" "Departure2"   
## [1] "29.3969543577409" "Arrival1"   
## [1] "29.9474733940906" "Departure1"   
## [1] "29.9474733940906" "Arrival2"   
## [1] "30.116127947391" "Departure1"   
## [1] "30.116127947391" "Arrival2"   
## [1] "30.3295109620545" "Departure2"   
## [1] "31.3532706443549" "Arrival1"   
## [1] "31.5021135316768" "Departure1"   
## [1] "31.8062018408842" "Departure2"   
## [1] "31.861397158853" "Arrival1"   
## [1] "33.5653424780974" "Arrival1"   
## [1] "33.5660653261272" "Departure1"   
## [1] "33.5660653261272" "Arrival2"   
## [1] "33.6446029914812" "Departure1"   
## [1] "33.6446029914812" "Arrival2"   
## [1] "36.1268028071911" "Arrival1"   
## [1] "36.344159159937" "Departure2"   
## [1] "36.4005096434911" "Departure1"   
## [1] "36.4005096434911" "Arrival2"   
## [1] "37.0038007418034" "Arrival1"   
## [1] "37.0526721353052" "Departure1"   
## [1] "37.0526721353052" "Arrival2"   
## [1] "37.2305046363933" "Arrival1"   
## [1] "37.4276034659673" "Departure2"   
## [1] "37.4898394193002" "Departure2"   
## [1] "37.9327766991873" "Departure2"   
## [1] "38.7311123045008" "Departure1"   
## [1] "38.7311123045008" "Arrival2"   
## [1] "38.8484497735886" "Departure2"   
## [1] "38.9780513018979" "Departure2"   
## [1] "38.9801748922385" "Arrival1"   
## [1] "39.0133021749846" "Arrival1"   
## [1] "39.1648560961294" "Departure1"   
## [1] "39.3417195892013" "Departure1"   
## [1] "39.3417195892013" "Arrival2"   
## [1] "39.6418651279519" "Arrival1"   
## [1] "39.8753101848678" "Arrival1"   
## [1] "40.0364560506116" "Departure2"   
## [1] "40.0469700625398" "Departure2"   
## [1] "40.0488042101721" "Departure1"   
## [1] "40.0488042101721" "Arrival2"   
## [1] "40.9346576630263" "Departure1"   
## [1] "41.7168492551368" "Departure2"   
## [1] "41.7686514114027" "Departure2"   
## [1] "41.9772734591897" "Arrival1"   
## [1] "42.3593447628591" "Arrival1"   
## [1] "43.0727789297272" "Departure1"   
## [1] "43.0727789297272" "Arrival2"   
## [1] "43.0870487757929" "Departure1"   
## [1] "43.0870487757929" "Arrival2"   
## [1] "43.3238832150326" "Arrival1"   
## [1] "43.4119739982111" "Arrival1"   
## [1] "44.1352532177464" "Departure2"   
## [1] "44.8527663915272" "Departure2"   
## [1] "45.1757694897962" "Departure1"   
## [1] "45.1757694897962" "Arrival2"   
## [1] "45.5909136798487" "Departure1"   
## [1] "45.5909136798487" "Arrival2"   
## [1] "46.0567457156663" "Departure2"   
## [1] "46.0902685896435" "Departure2"   
## [1] "46.4600965022051" "Departure2"   
## [1] "47.1035316642879" "Arrival1"   
## [1] "47.766769830188" "Arrival1"   
## [1] "48.3965241183101" "Arrival1"   
## [1] "49.1819000581486" "Departure1"   
## [1] "49.1819000581486" "Arrival2"   
## [1] "49.3200202527197" "Departure1"   
## [1] "49.3200202527197" "Arrival2"   
## [1] "49.4283998086324" "Departure1"   
## [1] "49.4283998086324" "Arrival2"   
## [1] "49.5568232219407" "Departure2"   
## [1] "49.7935814619251" "Arrival1"   
## [1] "50" "EndSimulation"

## $Waits1  
## [1] 0.000000000 0.038454365 2.034411544 6.060533502 4.733212315 4.796847543  
## [7] 4.632414079 3.674794018 4.132938619 5.341548484 4.715304747 5.578399711  
## [13] 5.347532466 7.715112158 6.283462124 6.481623824 7.030329998 6.098407749  
## [19] 6.233032995 4.799219411 4.734409717 4.766516812 5.055788397 5.764267569  
## [25] 3.321018207 3.168948050 2.851195971 3.252224838 0.919313522 0.773549715  
## [31] 0.812654571 1.196437130 0.032772623 0.000000000 0.000000000 0.000000000  
## [37] 0.550519036 0.000000000 0.000000000 0.000722848 0.000000000 0.000000000  
## [43] 0.000000000 0.000000000 0.151553921 0.000000000 0.173494025 0.000000000  
## [49] 0.713434167 0.000000000 1.763795492 0.000000000 1.415130228 0.923496134  
## [55] 0.000000000  
##   
## $Waits2  
## [1] 0.0000000 0.0000000 0.0000000 0.0000000 0.1824345 0.0000000 0.0000000  
## [8] 0.0000000 0.0000000 0.0000000 0.0000000 0.1025022 0.0000000 0.0000000  
## [15] 2.1746525 1.9764884 2.5449690 1.8604654 2.6614602 3.9535686 8.1362417  
## [22] 7.4801301 7.3737115 4.3667114 5.2038468 2.5775417 2.9837839 1.3158578  
## [29] 2.3751297 1.7198472 1.0624743 1.7657176 0.8809762 0.4993549 0.0000000  
## [36] 0.2368030