M11\_L2\_RomilShah

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library(RCurl)

## Loading required package: bitops

library(plyr)

## Warning: package 'plyr' was built under R version 3.2.5

library(forecast)

## Warning: package 'forecast' was built under R version 3.2.5

## Loading required package: zoo

## Warning: package 'zoo' was built under R version 3.2.5

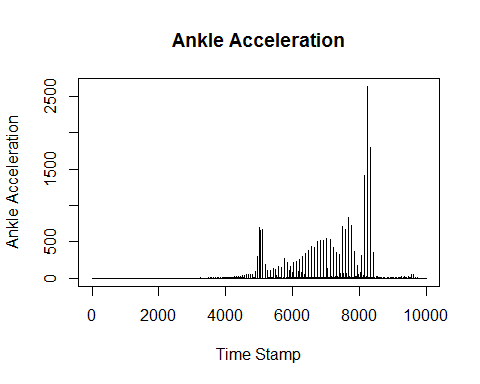
##   
## Attaching package: 'zoo'

## The following objects are masked from 'package:base':  
##   
## as.Date, as.Date.numeric

## Loading required package: timeDate

## This is forecast 7.1

#Link to the dataset: https://archive.ics.uci.edu/ml/datasets/Daphnet+Freezing+of+Gait  
  
#This dataset is for Parkinsons patients giving the gait data.  
  
data <- read.table("C:/Users/rams1/Desktop/DSCS6030/S01R01.txt")  
names(data) <- c("time","ankle1","ankle2","ankle3","ul1","ul2","ul3","ta1","ta2","ta3","labels")  
  
#This data consists of the ankle acceleration, upper leg acceleration and trunk acceleration with different subjects who are either healthy or have parkisons disease. This is a time series data which I am using in my project. Here I am using the information of a parkisons patient where the ankle data will be used to analyse using ARIMA models.  
  
ankles <- count(data, c("ankle1","ankle2"))  
  
#Taking first 10000 values for consideration with frequency 2  
ankles\_timeseries <- ts(ankles$freq,start = c(1, 1), end = c(10000, 1), frequency = 2)   
plot(ankles\_timeseries, xlab='Time Stamp' ,ylab='Ankle Acceleration', main='Ankle Acceleration')



d <- 0 : 2  
p <- 0 : 4  
q <- 0 : 6  
ankles\_models <- expand.grid(d = d, p = p, q = q)  
head(ankles\_models, n = 4)

## d p q  
## 1 0 0 0  
## 2 1 0 0  
## 3 2 0 0  
## 4 0 1 0

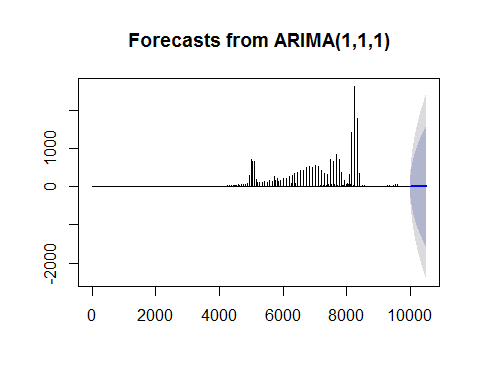
getTSModelAIC <- function(ts\_data, p, d, q) {  
 ts\_model <- arima(ts\_data, order = c(p, d, q))  
 return(ts\_model$aic)  
 }  
  
getTSModelAICSafe <- function(ts\_data, p, d, q) {   
 result = tryCatch({  
 getTSModelAIC(ts\_data, p, d, q)  
 }, error = function(e) {  
 Inf  
 })  
}  
  
ankles\_models$aic <- mapply(function(x, y, z)   
 getTSModelAICSafe(ankles\_timeseries,x, y, z),ankles\_models$p,ankles\_models$d,ankles\_models$q)  
  
subset(ankles\_models,aic == min(aic))

## d p q aic  
## 95 1 1 6 174078.9

ankles\_model <- arima(ankles\_timeseries, order = c(1, 1, 1))  
summary(ankles\_model)

##   
## Call:  
## arima(x = ankles\_timeseries, order = c(1, 1, 1))  
##   
## Coefficients:  
## ar1 ma1  
## 0.0667 0.7438  
## s.e. 0.0085 0.0051  
##   
## sigma^2 estimated as 431.6: log likelihood = -89045.22, aic = 178096.5  
##   
## Training set error measures:  
## ME RMSE MAE MPE MAPE MASE  
## Training set 1.10955e-05 20.77438 4.292803 -21.07958 124.2438 1.357487  
## ACF1  
## Training set 0.01253783

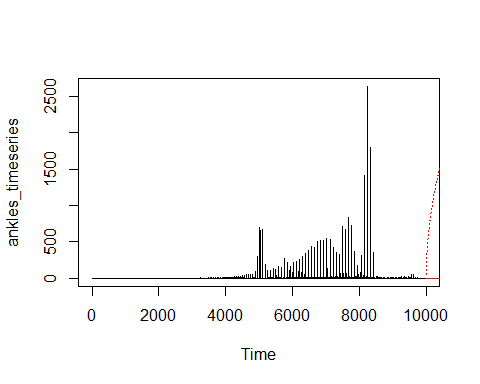
predictedData <- forecast(ankles\_model,1000)  
  
#Thus the future predicted 1000 values can be shown as:  
plot(forecast(ankles\_model, 1000))



#Looking at the plots of the predicted data and the actual data, it seems to be coninciding. Thus the arima models provides a best fit for the time series analysis for the dataset used by me.   
#Thus ARIMA can be used for prediction based on the model generated using the test dataset.  
#The model parameters are as follows:  
predictedData

## Point Forecast Lo 80 Hi 80 Lo 95 Hi 95  
## 10000.5 1.399313 -25.22479 28.02341 -39.31873 42.11736  
## 10001.0 1.425943 -53.63981 56.49169 -82.78985 85.64174  
## 10001.5 1.427719 -72.71018 75.56562 -111.95641 114.81185  
## 10002.0 1.427838 -87.84789 90.70357 -135.10761 137.96328  
## 10002.5 1.427846 -100.77059 103.62628 -154.87118 157.72687  
## 10003.0 1.427846 -112.23361 115.08931 -172.40236 175.25805  
## 10003.5 1.427846 -122.64204 125.49774 -188.32068 191.17637  
## 10004.0 1.427846 -132.24245 135.09814 -203.00323 205.85892  
## 10004.5 1.427846 -141.19809 144.05378 -216.69970 219.55539  
## 10005.0 1.427846 -149.62370 152.47939 -229.58555 232.44124  
## 10005.5 1.427846 -157.60353 160.45922 -241.78966 244.64535  
## 10006.0 1.427846 -165.20165 168.05734 -253.40998 256.26567  
## 10006.5 1.427846 -172.46810 175.32379 -264.52305 267.37874  
## 10007.0 1.427846 -179.44285 182.29854 -275.19002 278.04571  
## 10007.5 1.427846 -186.15845 189.01415 -285.46064 288.31633  
## 10008.0 1.427846 -192.64181 195.49750 -295.37607 298.23177  
## 10008.5 1.427846 -198.91546 201.77115 -304.97080 307.82649  
## 10009.0 1.427846 -204.99853 207.85423 -314.27406 317.12975  
## 10009.5 1.427846 -210.90741 213.76310 -323.31090 326.16660  
## 10010.0 1.427846 -216.65624 219.51194 -332.10299 334.95868  
## 10010.5 1.427846 -222.25738 225.11307 -340.66919 343.52488  
## 10011.0 1.427846 -227.72165 230.57734 -349.02606 351.88176  
## 10011.5 1.427846 -233.05862 235.91431 -357.18825 360.04394  
## 10012.0 1.427846 -238.27679 241.13248 -365.16876 368.02445  
## 10012.5 1.427846 -243.38376 246.23945 -372.97919 375.83489  
## 10013.0 1.427846 -248.38635 251.24204 -380.63000 383.48569  
## 10013.5 1.427846 -253.29071 256.14640 -388.13057 390.98626  
## 10014.0 1.427846 -258.10241 260.95810 -395.48942 398.34512  
## 10014.5 1.427846 -262.82651 265.68220 -402.71431 405.57000  
## 10015.0 1.427846 -267.46762 270.32331 -409.81229 412.66798  
## 10015.5 1.427846 -272.02998 274.88567 -416.78981 419.64550  
## 10016.0 1.427846 -276.51746 279.37315 -423.65282 426.50851  
## 10016.5 1.427846 -280.93363 283.78932 -430.40677 433.26246  
## 10017.0 1.427846 -285.28179 288.13748 -437.05670 439.91239  
## 10017.5 1.427846 -289.56498 292.42067 -443.60728 446.46297  
## 10018.0 1.427846 -293.78603 296.64173 -450.06282 452.91851  
## 10018.5 1.427846 -297.94758 300.80327 -456.42735 459.28305  
## 10019.0 1.427846 -302.05206 304.90775 -462.70462 465.56031  
## 10019.5 1.427846 -306.10177 308.95746 -468.89812 471.75381  
## 10020.0 1.427846 -310.09884 312.95453 -475.01110 477.86680  
## 10020.5 1.427846 -314.04527 316.90096 -481.04665 483.90234  
## 10021.0 1.427846 -317.94294 320.79863 -487.00761 489.86331  
## 10021.5 1.427846 -321.79360 324.64930 -492.89670 495.75240  
## 10022.0 1.427846 -325.59894 328.45463 -498.71646 501.57215  
## 10022.5 1.427846 -329.36049 332.21619 -504.46927 507.32496  
## 10023.0 1.427846 -333.07976 335.93545 -510.15739 513.01308  
## 10023.5 1.427846 -336.75812 339.61381 -515.78296 518.63865  
## 10024.0 1.427846 -340.39690 343.25259 -521.34799 524.20368  
## 10024.5 1.427846 -343.99735 346.85304 -526.85441 529.71010  
## 10025.0 1.427846 -347.56066 350.41635 -532.30402 535.15971  
## 10025.5 1.427846 -351.08795 353.94364 -537.69854 540.55424  
## 10026.0 1.427846 -354.58030 357.43599 -543.03962 545.89532  
## 10026.5 1.427846 -358.03871 360.89441 -548.32882 551.18451  
## 10027.0 1.427846 -361.46417 364.31987 -553.56761 556.42330  
## 10027.5 1.427846 -364.85760 367.71329 -558.75740 561.61310  
## 10028.0 1.427846 -368.21988 371.07557 -563.89956 566.75525  
## 10028.5 1.427846 -371.55184 374.40754 -568.99537 571.85106  
## 10029.0 1.427846 -374.85431 377.71000 -574.04605 576.90174  
## 10029.5 1.427846 -378.12804 380.98373 -579.05279 581.90848  
## 10030.0 1.427846 -381.37377 384.22947 -584.01671 586.87240  
## 10030.5 1.427846 -384.59222 387.44791 -588.93890 591.79459  
## 10031.0 1.427846 -387.78405 390.63974 -593.82038 596.67608  
## 10031.5 1.427846 -390.94992 393.80561 -598.66216 601.51785  
## 10032.0 1.427846 -394.09045 396.94614 -603.46519 606.32088  
## 10032.5 1.427846 -397.20624 400.06193 -608.23037 611.08606  
## 10033.0 1.427846 -400.29786 403.15355 -612.95860 615.81429  
## 10033.5 1.427846 -403.36587 406.22156 -617.65072 620.50641  
## 10034.0 1.427846 -406.41080 409.26649 -622.30754 625.16323  
## 10034.5 1.427846 -409.43317 412.28886 -626.92985 629.78554  
## 10035.0 1.427846 -412.43346 415.28915 -631.51840 634.37410  
## 10035.5 1.427846 -415.41216 418.26785 -636.07393 638.92963  
## 10036.0 1.427846 -418.36973 421.22542 -640.59714 643.45283  
## 10036.5 1.427846 -421.30660 424.16229 -645.08870 647.94439  
## 10037.0 1.427846 -424.22321 427.07890 -649.54927 652.40496  
## 10037.5 1.427846 -427.11997 429.97567 -653.97949 656.83518  
## 10038.0 1.427846 -429.99729 432.85298 -658.37995 661.23565  
## 10038.5 1.427846 -432.85553 435.71123 -662.75127 665.60696  
## 10039.0 1.427846 -435.69509 438.55079 -667.09400 669.94969  
## 10039.5 1.427846 -438.51633 441.37202 -671.40870 674.26440  
## 10040.0 1.427846 -441.31958 444.17527 -675.69591 678.55160  
## 10040.5 1.427846 -444.10520 446.96089 -679.95615 682.81184  
## 10041.0 1.427846 -446.87351 449.72920 -684.18991 687.04560  
## 10041.5 1.427846 -449.62483 452.48052 -688.39769 691.25338  
## 10042.0 1.427846 -452.35947 455.21516 -692.57996 695.43565  
## 10042.5 1.427846 -455.07772 457.93342 -696.73718 699.59287  
## 10043.0 1.427846 -457.77989 460.63558 -700.86978 703.72548  
## 10043.5 1.427846 -460.46625 463.32194 -704.97822 707.83391  
## 10044.0 1.427846 -463.13708 465.99277 -709.06289 711.91858  
## 10044.5 1.427846 -465.79263 468.64833 -713.12422 715.97991  
## 10045.0 1.427846 -468.43318 471.28888 -717.16259 720.01828  
## 10045.5 1.427846 -471.05898 473.91467 -721.17839 724.03408  
## 10046.0 1.427846 -473.67026 476.52595 -725.17200 728.02769  
## 10046.5 1.427846 -476.26726 479.12296 -729.14378 731.99947  
## 10047.0 1.427846 -478.85023 481.70592 -733.09408 735.94977  
## 10047.5 1.427846 -481.41937 484.27507 -737.02325 739.87895  
## 10048.0 1.427846 -483.97492 486.83062 -740.93163 743.78732  
## 10048.5 1.427846 -486.51709 489.37278 -744.81953 747.67523  
## 10049.0 1.427846 -489.04608 491.90177 -748.68729 751.54298  
## 10049.5 1.427846 -491.56209 494.41778 -752.53520 755.39089  
## 10050.0 1.427846 -494.06533 496.92102 -756.36358 759.21927  
## 10050.5 1.427846 -496.55599 499.41168 -760.17271 763.02840  
## 10051.0 1.427846 -499.03425 501.88994 -763.96288 766.81857  
## 10051.5 1.427846 -501.50030 504.35599 -767.73438 770.59007  
## 10052.0 1.427846 -503.95432 506.81001 -771.48747 774.34317  
## 10052.5 1.427846 -506.39647 509.25217 -775.22243 778.07812  
## 10053.0 1.427846 -508.82694 511.68264 -778.93951 781.79521  
## 10053.5 1.427846 -511.24589 514.10158 -782.63897 785.49467  
## 10054.0 1.427846 -513.65348 516.50917 -786.32106 789.17675  
## 10054.5 1.427846 -516.04987 518.90556 -789.98602 792.84171  
## 10055.0 1.427846 -518.43521 521.29090 -793.63408 796.48977  
## 10055.5 1.427846 -520.80965 523.66534 -797.26548 800.12117  
## 10056.0 1.427846 -523.17335 526.02904 -800.88044 803.73614  
## 10056.5 1.427846 -525.52644 528.38214 -804.47919 807.33489  
## 10057.0 1.427846 -527.86908 530.72477 -808.06194 810.91764  
## 10057.5 1.427846 -530.20139 533.05708 -811.62891 814.48460  
## 10058.0 1.427846 -532.52351 535.37920 -815.18029 818.03598  
## 10058.5 1.427846 -534.83558 537.69127 -818.71629 821.57198  
## 10059.0 1.427846 -537.13772 539.99342 -822.23712 825.09281  
## 10059.5 1.427846 -539.43007 542.28576 -825.74295 828.59865  
## 10060.0 1.427846 -541.71274 544.56843 -829.23400 832.08969  
## 10060.5 1.427846 -543.98585 546.84155 -832.71043 835.56612  
## 10061.0 1.427846 -546.24954 549.10523 -836.17243 839.02812  
## 10061.5 1.427846 -548.50390 551.35959 -839.62018 842.47587  
## 10062.0 1.427846 -550.74906 553.60475 -843.05386 845.90955  
## 10062.5 1.427846 -552.98513 555.84082 -846.47363 849.32932  
## 10063.0 1.427846 -555.21221 558.06791 -849.87966 852.73535  
## 10063.5 1.427846 -557.43042 560.28612 -853.27212 856.12781  
## 10064.0 1.427846 -559.63986 562.49556 -856.65117 859.50686  
## 10064.5 1.427846 -561.84064 564.69633 -860.01696 862.87266  
## 10065.0 1.427846 -564.03285 566.88854 -863.36966 866.22535  
## 10065.5 1.427846 -566.21659 569.07228 -866.70940 869.56510  
## 10066.0 1.427846 -568.39196 571.24766 -870.03635 872.89204  
## 10066.5 1.427846 -570.55907 573.41476 -873.35065 876.20634  
## 10067.0 1.427846 -572.71799 575.57368 -876.65243 879.50812  
## 10067.5 1.427846 -574.86882 577.72451 -879.94185 882.79754  
## 10068.0 1.427846 -577.01166 579.86735 -883.21903 886.07472  
## 10068.5 1.427846 -579.14658 582.00228 -886.48412 889.33981  
## 10069.0 1.427846 -581.27369 584.12938 -889.73725 892.59294  
## 10069.5 1.427846 -583.39306 586.24875 -892.97854 895.83424  
## 10070.0 1.427846 -585.50477 588.36047 -896.20813 899.06383  
## 10070.5 1.427846 -587.60892 590.46461 -899.42615 902.28184  
## 10071.0 1.427846 -589.70557 592.56127 -902.63270 905.48840  
## 10071.5 1.427846 -591.79482 594.65051 -905.82793 908.68362  
## 10072.0 1.427846 -593.87673 596.73242 -909.01194 911.86763  
## 10072.5 1.427846 -595.95139 598.80708 -912.18485 915.04055  
## 10073.0 1.427846 -598.01887 600.87456 -915.34679 918.20248  
## 10073.5 1.427846 -600.07924 602.93493 -918.49785 921.35354  
## 10074.0 1.427846 -602.13257 604.98827 -921.63816 924.49385  
## 10074.5 1.427846 -604.17895 607.03464 -924.76782 927.62351  
## 10075.0 1.427846 -606.21843 609.07413 -927.88694 930.74264  
## 10075.5 1.427846 -608.25110 611.10679 -930.99563 933.85132  
## 10076.0 1.427846 -610.27700 613.13269 -934.09399 936.94968  
## 10076.5 1.427846 -612.29622 615.15191 -937.18212 940.03781  
## 10077.0 1.427846 -614.30882 617.16451 -940.26012 943.11581  
## 10077.5 1.427846 -616.31486 619.17055 -943.32810 946.18379  
## 10078.0 1.427846 -618.31441 621.17010 -946.38614 949.24183  
## 10078.5 1.427846 -620.30753 623.16322 -949.43435 952.29004  
## 10079.0 1.427846 -622.29427 625.14997 -952.47282 955.32851  
## 10079.5 1.427846 -624.27471 627.13041 -955.50164 958.35733  
## 10080.0 1.427846 -626.24890 629.10460 -958.52091 961.37660  
## 10080.5 1.427846 -628.21691 631.07260 -961.53070 964.38640  
## 10081.0 1.427846 -630.17878 633.03447 -964.53112 967.38682  
## 10081.5 1.427846 -632.13457 634.99026 -967.52225 970.37795  
## 10082.0 1.427846 -634.08434 636.94004 -970.50418 973.35987  
## 10082.5 1.427846 -636.02816 638.88385 -973.47698 976.33267  
## 10083.0 1.427846 -637.96606 640.82175 -976.44075 979.29644  
## 10083.5 1.427846 -639.89810 642.75380 -979.39556 982.25125  
## 10084.0 1.427846 -641.82435 644.68004 -982.34149 985.19718  
## 10084.5 1.427846 -643.74484 646.60053 -985.27863 988.13432  
## 10085.0 1.427846 -645.65963 648.51533 -988.20705 991.06275  
## 10085.5 1.427846 -647.56878 650.42447 -991.12684 993.98253  
## 10086.0 1.427846 -649.47232 652.32801 -994.03805 996.89375  
## 10086.5 1.427846 -651.37031 654.22601 -996.94078 999.79648  
## 10087.0 1.427846 -653.26280 656.11850 -999.83510 1002.69079  
## 10087.5 1.427846 -655.14984 658.00553 -1002.72107 1005.57676  
## 10088.0 1.427846 -657.03147 659.88716 -1005.59877 1008.45447  
## 10088.5 1.427846 -658.90773 661.76343 -1008.46827 1011.32397  
## 10089.0 1.427846 -660.77868 663.63438 -1011.32965 1014.18534  
## 10089.5 1.427846 -662.64436 665.50005 -1014.18295 1017.03865  
## 10090.0 1.427846 -664.50481 667.36051 -1017.02827 1019.88396  
## 10090.5 1.427846 -666.36008 669.21578 -1019.86566 1022.72135  
## 10091.0 1.427846 -668.21021 671.06590 -1022.69519 1025.55088  
## 10091.5 1.427846 -670.05524 672.91094 -1025.51692 1028.37261  
## 10092.0 1.427846 -671.89522 674.75091 -1028.33092 1031.18661  
## 10092.5 1.427846 -673.73018 676.58587 -1031.13725 1033.99294  
## 10093.0 1.427846 -675.56017 678.41586 -1033.93597 1036.79167  
## 10093.5 1.427846 -677.38522 680.24091 -1036.72715 1039.58285  
## 10094.0 1.427846 -679.20538 682.06107 -1039.51085 1042.36654  
## 10094.5 1.427846 -681.02069 683.87638 -1042.28712 1045.14281  
## 10095.0 1.427846 -682.83118 685.68687 -1045.05602 1047.91172  
## 10095.5 1.427846 -684.63689 687.49258 -1047.81762 1050.67331  
## 10096.0 1.427846 -686.43786 689.29355 -1050.57197 1053.42766  
## 10096.5 1.427846 -688.23413 691.08982 -1053.31913 1056.17482  
## 10097.0 1.427846 -690.02573 692.88143 -1056.05915 1058.91484  
## 10097.5 1.427846 -691.81271 694.66840 -1058.79209 1061.64778  
## 10098.0 1.427846 -693.59508 696.45078 -1061.51800 1064.37369  
## 10098.5 1.427846 -695.37290 698.22859 -1064.23694 1067.09263  
## 10099.0 1.427846 -697.14620 700.00189 -1066.94896 1069.80465  
## 10099.5 1.427846 -698.91500 701.77069 -1069.65411 1072.50980  
## 10100.0 1.427846 -700.67935 703.53504 -1072.35245 1075.20814  
## 10100.5 1.427846 -702.43927 705.29497 -1075.04402 1077.89971  
## 10101.0 1.427846 -704.19481 707.05050 -1077.72888 1080.58457  
## 10101.5 1.427846 -705.94599 708.80168 -1080.40708 1083.26277  
## 10102.0 1.427846 -707.69284 710.54854 -1083.07866 1085.93436  
## 10102.5 1.427846 -709.43541 712.29110 -1085.74368 1088.59937  
## 10103.0 1.427846 -711.17371 714.02940 -1088.40218 1091.25788  
## 10103.5 1.427846 -712.90778 715.76347 -1091.05422 1093.90991  
## 10104.0 1.427846 -714.63765 717.49334 -1093.69983 1096.55552  
## 10104.5 1.427846 -716.36335 719.21905 -1096.33906 1099.19475  
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## 10465.0 1.427846 -1514.90786 1517.76356 -2317.60750 2320.46319  
## 10465.5 1.427846 -1515.72356 1518.57925 -2318.85500 2321.71070  
## 10466.0 1.427846 -1516.53882 1519.39451 -2320.10184 2322.95753  
## 10466.5 1.427846 -1517.35364 1520.20934 -2321.34800 2324.20369  
## 10467.0 1.427846 -1518.16803 1521.02372 -2322.59350 2325.44919  
## 10467.5 1.427846 -1518.98198 1521.83767 -2323.83832 2326.69402  
## 10468.0 1.427846 -1519.79549 1522.65119 -2325.08249 2327.93818  
## 10468.5 1.427846 -1520.60857 1523.46426 -2326.32598 2329.18167  
## 10469.0 1.427846 -1521.42122 1524.27691 -2327.56881 2330.42451  
## 10469.5 1.427846 -1522.23343 1525.08912 -2328.81098 2331.66668  
## 10470.0 1.427846 -1523.04521 1525.90090 -2330.05249 2332.90819  
## 10470.5 1.427846 -1523.85655 1526.71225 -2331.29334 2334.14903  
## 10471.0 1.427846 -1524.66747 1527.52316 -2332.53353 2335.38922  
## 10471.5 1.427846 -1525.47795 1528.33365 -2333.77306 2336.62875  
## 10472.0 1.427846 -1526.28801 1529.14370 -2335.01193 2337.86762  
## 10472.5 1.427846 -1527.09763 1529.95333 -2336.25014 2339.10584  
## 10473.0 1.427846 -1527.90683 1530.76252 -2337.48770 2340.34340  
## 10473.5 1.427846 -1528.71560 1531.57129 -2338.72461 2341.58030  
## 10474.0 1.427846 -1529.52394 1532.37963 -2339.96086 2342.81655  
## 10474.5 1.427846 -1530.33185 1533.18755 -2341.19646 2344.05215  
## 10475.0 1.427846 -1531.13934 1533.99504 -2342.43141 2345.28710  
## 10475.5 1.427846 -1531.94641 1534.80210 -2343.66570 2346.52140  
## 10476.0 1.427846 -1532.75305 1535.60874 -2344.89935 2347.75505  
## 10476.5 1.427846 -1533.55926 1536.41495 -2346.13235 2348.98805  
## 10477.0 1.427846 -1534.36505 1537.22075 -2347.36471 2350.22040  
## 10477.5 1.427846 -1535.17042 1538.02612 -2348.59641 2351.45210  
## 10478.0 1.427846 -1535.97537 1538.83106 -2349.82747 2352.68317  
## 10478.5 1.427846 -1536.77990 1539.63559 -2351.05789 2353.91358  
## 10479.0 1.427846 -1537.58400 1540.43970 -2352.28766 2355.14336  
## 10479.5 1.427846 -1538.38769 1541.24338 -2353.51680 2356.37249  
## 10480.0 1.427846 -1539.19096 1542.04665 -2354.74529 2357.60098  
## 10480.5 1.427846 -1539.99380 1542.84950 -2355.97314 2358.82883  
## 10481.0 1.427846 -1540.79623 1543.65193 -2357.20035 2360.05604  
## 10481.5 1.427846 -1541.59825 1544.45394 -2358.42692 2361.28261  
## 10482.0 1.427846 -1542.39984 1545.25554 -2359.65286 2362.50855  
## 10482.5 1.427846 -1543.20102 1546.05672 -2360.87815 2363.73385  
## 10483.0 1.427846 -1544.00179 1546.85748 -2362.10282 2364.95851  
## 10483.5 1.427846 -1544.80214 1547.65783 -2363.32685 2366.18254  
## 10484.0 1.427846 -1545.60207 1548.45777 -2364.55025 2367.40594  
## 10484.5 1.427846 -1546.40160 1549.25729 -2365.77301 2368.62870  
## 10485.0 1.427846 -1547.20071 1550.05640 -2366.99514 2369.85084  
## 10485.5 1.427846 -1547.99940 1550.85510 -2368.21665 2371.07234  
## 10486.0 1.427846 -1548.79769 1551.65338 -2369.43752 2372.29321  
## 10486.5 1.427846 -1549.59557 1552.45126 -2370.65776 2373.51346  
## 10487.0 1.427846 -1550.39303 1553.24872 -2371.87738 2374.73307  
## 10487.5 1.427846 -1551.19009 1554.04578 -2373.09637 2375.95207  
## 10488.0 1.427846 -1551.98673 1554.84243 -2374.31474 2377.17043  
## 10488.5 1.427846 -1552.78297 1555.63866 -2375.53248 2378.38817  
## 10489.0 1.427846 -1553.57880 1556.43450 -2376.74960 2379.60529  
## 10489.5 1.427846 -1554.37423 1557.22992 -2377.96609 2380.82179  
## 10490.0 1.427846 -1555.16924 1558.02494 -2379.18197 2382.03766  
## 10490.5 1.427846 -1555.96385 1558.81955 -2380.39722 2383.25291  
## 10491.0 1.427846 -1556.75806 1559.61375 -2381.61185 2384.46755  
## 10491.5 1.427846 -1557.55186 1560.40755 -2382.82587 2385.68156  
## 10492.0 1.427846 -1558.34526 1561.20095 -2384.03926 2386.89496  
## 10492.5 1.427846 -1559.13825 1561.99395 -2385.25204 2388.10774  
## 10493.0 1.427846 -1559.93084 1562.78654 -2386.46421 2389.31990  
## 10493.5 1.427846 -1560.72303 1563.57873 -2387.67576 2390.53145  
## 10494.0 1.427846 -1561.51482 1564.37051 -2388.88669 2391.74238  
## 10494.5 1.427846 -1562.30621 1565.16190 -2390.09701 2392.95270  
## 10495.0 1.427846 -1563.09719 1565.95289 -2391.30672 2394.16241  
## 10495.5 1.427846 -1563.88778 1566.74347 -2392.51582 2395.37151  
## 10496.0 1.427846 -1564.67797 1567.53366 -2393.72431 2396.58000  
## 10496.5 1.427846 -1565.46776 1568.32345 -2394.93219 2397.78788  
## 10497.0 1.427846 -1566.25715 1569.11284 -2396.13945 2398.99515  
## 10497.5 1.427846 -1567.04614 1569.90183 -2397.34612 2400.20181  
## 10498.0 1.427846 -1567.83474 1570.69043 -2398.55217 2401.40786  
## 10498.5 1.427846 -1568.62294 1571.47863 -2399.75762 2402.61331  
## 10499.0 1.427846 -1569.41075 1572.26644 -2400.96247 2403.81816  
## 10499.5 1.427846 -1570.19816 1573.05385 -2402.16671 2405.02240  
## 10500.0 1.427846 -1570.98517 1573.84087 -2403.37034 2406.22604

#Just another way to show the future 1000 predictions with data in the positive as the acceleration values are positive in this particular dataset.  
fit<-arima(ankles\_timeseries,order=c(0,1,0))  
plot(ankles\_timeseries)  
A.pred <- predict(fit,n.ahead=1000)  
lines(A.pred$pred,col="red")  
lines(A.pred$pred+2\*A.pred$se,col="red",lty=3)



#Thus Arima model is used to predict the future values of a time series dataset and for the dataset I am using, it helps in prediction of the future values of the ankle acceleration and hereby helping in prediction of parkinsons disease in a person.  
  
#NOTE: I have used only the acceleration data here but can also be applied to the speech data that I am using in my project.