بسم الله الرحمن الرحیم

دانشگاه صنعتی امیرکبیر

(پلی تکنیک تهران)

دانشکده مهندسی کامپیوتر

گزارش پروژه اول

سیستم های عامل

دکتر طاهری جوان

وحید پوراکبر

9523022

3.5.1 Modified XV6 Original Algorithm's performance

_____
##
##################################__QUANTUM = 1__##############################
##

❚-------------------❚Process: 0 ❚-------------------
ID: 8
create: 768 ❚ terminate: 3162 ❚ sleep: 388 ❚ ready: 1496 ❚ running: 506
Turnaround time: 2394 ❚ CBT: 506 ❚ Waiting time: 1888

❚-------------------❚Process: 1 ❚-------------------
ID: 7
create: 768 ❚ terminate: 3381 ❚ sleep: 419 ❚ ready: 1648 ❚ running: 546
Turnaround time: 2613 ❚ CBT: 546 ❚ Waiting time: 2067

❚-------------------❚Process: 2 ❚-------------------
ID: 5
create: 767 ❚ terminate: 3477 ❚ sleep: 432 ❚ ready: 1694 ❚ running: 584
Turnaround time: 2710 ❚ CBT: 584 ❚ Waiting time: 2126

❚-------------------❚Process: 3 ❚-------------------
ID: 6
create: 767 ❚ terminate: 3546 ❚ sleep: 438 ❚ ready: 1745 ❚ running: 595
Turnaround time: 2779 ❚ CBT: 595 ❚ Waiting time: 2184

❚-------------------❚Process: 4 ❚-------------------
ID: 9
create: 772 ❚ terminate: 3575 ❚ sleep: 432 ❚ ready: 1858 ❚ running: 513
Turnaround time: 2803 ❚ CBT: 513 ❚ Waiting time: 2290

❚-------------------❚Process: 5 ❚-------------------
ID: 11
create: 772 ❚ terminate: 3766 ❚ sleep: 480 ❚ ready: 1979 ❚ running: 532
Turnaround time: 2994 ❚ CBT: 532 ❚ Waiting time: 2462

❚-------------------❚Process: 6 ❚-------------------
ID: 10
create: 772 ❚ terminate: 3775 ❚ sleep: 446 ❚ ready: 1955 ❚ running: 602
Turnaround time: 3003 ❚ CBT: 602 ❚ Waiting time: 2401

❚-------------------❚Process: 7 ❚-------------------
ID: 4
create: 767 ❚ terminate: 3810 ❚ sleep: 490 ❚ ready: 1896 ❚ running: 657
Turnaround time: 3043 ❚ CBT: 657 ❚ Waiting time: 2386

❚-------------------❚Process: 8 ❚-------------------
ID: 12
create: 775 ❚ terminate: 3881 ❚ sleep: 479 ❚ ready: 2055 ❚ running: 572
Turnaround time: 3106 ❚ CBT: 572 ❚ Waiting time: 2534

❚-------------------❚Process: 9 ❚-------------------
ID: 13
create: 775 ❚ terminate: 3911 ❚ sleep: 472 ❚ ready: 2103 ❚ running: 561
Turnaround time: 3136 ❚ CBT: 561 ❚ Waiting time: 2575

########################__Total Avg_TT, Avg_CBT, and Avg_WT__########################

Average Turnaround time: 2858, ▯ Average CBT: 566, ▯ Average Waiting time: 2291

_____

##
#################################__QUANTUM = 10__#######################
##

▯-------------------▯Process: 0 ▯-------------------
ID: 4
create: 866 ▯ terminate: 2578 ▯ sleep: 181 ▯ ready: 897 ▯ running: 634
Turnaround time: 1712 ▯ CBT: 634 ▯ Waiting time: 1078

▯-------------------▯Process: 1 ▯-------------------
ID: 7
create: 867 ▯ terminate: 2833 ▯ sleep: 205 ▯ ready: 1153 ▯ running: 608
Turnaround time: 1966 ▯ CBT: 608 ▯ Waiting time: 1358

▯-------------------▯Process: 2 ▯-------------------
ID: 5
create: 866 ▯ terminate: 2942 ▯ sleep: 226 ▯ ready: 1163 ▯ running: 687
Turnaround time: 2076 ▯ CBT: 687 ▯ Waiting time: 1389

▯-------------------▯Process: 3 ▯-------------------
ID: 8
create: 867 ▯ terminate: 3334 ▯ sleep: 288 ▯ ready: 1598 ▯ running: 581
Turnaround time: 2467 ▯ CBT: 581 ▯ Waiting time: 1886

▯-------------------▯Process: 4 ▯-------------------
ID: 6
create: 866 ▯ terminate: 3587 ▯ sleep: 327 ▯ ready: 1779 ▯ running: 614
Turnaround time: 2721 ▯ CBT: 614 ▯ Waiting time: 2107

▯-------------------▯Process: 5 ▯-------------------
ID: 9
create: 867 ▯ terminate: 3632 ▯ sleep: 321 ▯ ready: 1897 ▯ running: 546
Turnaround time: 2765 ▯ CBT: 546 ▯ Waiting time: 2219

▯-------------------▯Process: 6 ▯-------------------
ID: 10
create: 868 ▯ terminate: 3673 ▯ sleep: 315 ▯ ready: 1899 ▯ running: 591
Turnaround time: 2805 ▯ CBT: 591 ▯ Waiting time: 2214

▯-------------------▯Process: 7 ▯-------------------
ID: 11
create: 868 ▯ terminate: 3967 ▯ sleep: 351 ▯ ready: 2173 ▯ running: 575
Turnaround time: 3099 ▯ CBT: 575 ▯ Waiting time: 2524

▯-------------------▯Process: 8 ▯-------------------
ID: 12
create: 868 ▯ terminate: 3984 ▯ sleep: 333 ▯ ready: 2158 ▯ running: 625
Turnaround time: 3116 ▯ CBT: 625 ▯ Waiting time: 2491

▯-------------------▯Process: 9 ▯-------------------
ID: 13
create: 868 ▯ terminate: 4275 ▯ sleep: 365 ▯ ready: 2429 ▯ running: 612
Turnaround time: 3407 ▯ CBT: 612 ▯ Waiting time: 2795

#########################__Total Avg_TT, Avg_CBT, and Avg_WT__#########################

Average Turnaround time: 2613, □ Average CBT: 607, □ Average Waiting time: 2006

_____
##
#################################__QUANTUM = 100__##################
##

□-------------------□Process: 0 □-------------------
ID: 4
create: 1164 □ terminate: 1926 □ sleep: 46 □ ready: 104 □ running: 608
Turnaround time: 762 □ CBT: 608 □ Waiting time: 154

□-------------------□Process: 1 □-------------------
ID: 5
create: 1168 □ terminate: 2322 □ sleep: 98 □ ready: 404 □ running: 650
Turnaround time: 1154 □ CBT: 650 □ Waiting time: 504

□-------------------□Process: 2 □-------------------
ID: 6
create: 1170 □ terminate: 2574 □ sleep: 134 □ ready: 532 □ running: 735
Turnaround time: 1404 □ CBT: 735 □ Waiting time: 669

□-------------------□Process: 3 □-------------------
ID: 7
create: 1173 □ terminate: 2732 □ sleep: 128 □ ready: 807 □ running: 624
Turnaround time: 1559 □ CBT: 624 □ Waiting time: 935

□-------------------□Process: 4 □-------------------
ID: 8
create: 1173 □ terminate: 3267 □ sleep: 213 □ ready: 1241 □ running: 640
Turnaround time: 2094 □ CBT: 640 □ Waiting time: 1454

□-------------------□Process: 5 □-------------------
ID: 9
create: 1173 □ terminate: 3374 □ sleep: 217 □ ready: 1351 □ running: 632
Turnaround time: 2201 □ CBT: 632 □ Waiting time: 1569

□-------------------□Process: 6 □-------------------
ID: 10
create: 1174 □ terminate: 3917 □ sleep: 267 □ ready: 1794 □ running: 682
Turnaround time: 2743 □ CBT: 682 □ Waiting time: 2061

□-------------------□Process: 7 □-------------------
ID: 11
create: 1174 □ terminate: 4306 □ sleep: 331 □ ready: 2096 □ running: 705
Turnaround time: 3132 □ CBT: 705 □ Waiting time: 2427

□-------------------□Process: 8 □-------------------
ID: 12
create: 1174 □ terminate: 4615 □ sleep: 362 □ ready: 2380 □ running: 698
Turnaround time: 3441 □ CBT: 698 □ Waiting time: 2743

□-------------------□Process: 9 □-------------------
ID: 13
create: 1175 □ terminate: 4834 □ sleep: 380 □ ready: 2630 □ running: 649
Turnaround time: 3659 □ CBT: 649 □ Waiting time: 3010

######################__Total Avg_TT, Avg_CBT, and Avg_WT__######################

Average Turnaround time: 2214, Average CBT: 662, Average Waiting time: 1552

_____
###
###############################__QUANTUM= 1000__###############################
###

------------------Process: 0 ------------------
ID: 4
create: 748 terminate: 1353 sleep: 45 ready: 8 running: 552
Turnaround time: 605 CBT: 552 Waiting time: 53

------------------Process: 1 ------------------
ID: 6
create: 748 terminate: 1713 sleep: 50 ready: 245 running: 669
Turnaround time: 965 CBT: 669 Waiting time: 296

------------------Process: 2 ------------------
ID: 5
create: 748 terminate: 1782 sleep: 97 ready: 310 running: 627
Turnaround time: 1034 CBT: 627 Waiting time: 407

------------------Process: 3 ------------------
ID: 7
create: 749 terminate: 2319 sleep: 137 ready: 876 running: 556
Turnaround time: 1570 CBT: 556 Waiting time: 1014

------------------Process: 4 ------------------
ID: 8
create: 750 terminate: 2464 sleep: 155 ready: 964 running: 595
Turnaround time: 1714 CBT: 595 Waiting time: 1119

------------------Process: 5 ------------------
ID: 9
create: 750 terminate: 2906 sleep: 216 ready: 1395 running: 543
Turnaround time: 2156 CBT: 543 Waiting time: 1613

------------------Process: 6 ------------------
ID: 10
create: 752 terminate: 3118 sleep: 234 ready: 1501 running: 630
Turnaround time: 2366 CBT: 630 Waiting time: 1736

------------------Process: 7 ------------------
ID: 11
create: 753 terminate: 3511 sleep: 299 ready: 1896 running: 562
Turnaround time: 2758 CBT: 562 Waiting time: 2196

------------------Process: 8 ------------------
ID: 12
create: 754 terminate: 3795 sleep: 333 ready: 2085 running: 623
Turnaround time: 3041 CBT: 623 Waiting time: 2418

------------------Process: 9 ------------------
ID: 13
create: 754 terminate: 4134 sleep: 360 ready: 2412 running: 608
Turnaround time: 3380 CBT: 608 Waiting time: 2772

######################__Total Avg_TT, Avg_CBT, and Avg_WT__######################

Average Turnaround time: 1958, ꢀ Average CBT: 596, ꢀ Average Waiting time: 1362

_____
##
################################__QUANTUM= 10000__#######################################
##

ꢀ-------------------ꢀProcess: 0 ꢀ-------------------
ID: 4
create: 1145 ꢀ terminate: 1902 ꢀ sleep: 40 ꢀ ready: 9 ꢀ running: 708
Turnaround time: 757 ꢀ CBT: 708 ꢀ Waiting time: 49

ꢀ-------------------ꢀProcess: 1 ꢀ-------------------
ID: 5
create: 1145 ꢀ terminate: 1898 ꢀ sleep: 36 ꢀ ready: 24 ꢀ running: 693
Turnaround time: 753 ꢀ CBT: 693 ꢀ Waiting time: 60

ꢀ-------------------ꢀProcess: 2 ꢀ-------------------
ID: 6
create: 1145 ꢀ terminate: 2558 ꢀ sleep: 114 ꢀ ready: 691 ꢀ running: 608
Turnaround time: 1413 ꢀ CBT: 608 ꢀ Waiting time: 805

ꢀ-------------------ꢀProcess: 3 ꢀ-------------------
ID: 7
create: 1145 ꢀ terminate: 2589 ꢀ sleep: 109 ꢀ ready: 682 ꢀ running: 652
Turnaround time: 1444 ꢀ CBT: 652 ꢀ Waiting time: 792

ꢀ-------------------ꢀProcess: 4 ꢀ-------------------
ID: 8
create: 1146 ꢀ terminate: 3265 ꢀ sleep: 183 ꢀ ready: 1273 ꢀ running: 663
Turnaround time: 2119 ꢀ CBT: 663 ꢀ Waiting time: 1456

ꢀ-------------------ꢀProcess: 5 ꢀ-------------------
ID: 9
create: 1146 ꢀ terminate: 3441 ꢀ sleep: 211 ꢀ ready: 1307 ꢀ running: 777
Turnaround time: 2295 ꢀ CBT: 777 ꢀ Waiting time: 1518

ꢀ-------------------ꢀProcess: 6 ꢀ-------------------
ID: 10
create: 1146 ꢀ terminate: 3972 ꢀ sleep: 266 ꢀ ready: 1893 ꢀ running: 666
Turnaround time: 2826 ꢀ CBT: 666 ꢀ Waiting time: 2160

ꢀ-------------------ꢀProcess: 7 ꢀ-------------------
ID: 11
create: 1147 ꢀ terminate: 4168 ꢀ sleep: 323 ꢀ ready: 2037 ꢀ running: 659
Turnaround time: 3021 ꢀ CBT: 659 ꢀ Waiting time: 2362

ꢀ-------------------ꢀProcess: 8 ꢀ-------------------
ID: 12
create: 1150 ꢀ terminate: 4707 ꢀ sleep: 371 ꢀ ready: 2519 ꢀ running: 665
Turnaround time: 3557 ꢀ CBT: 665 ꢀ Waiting time: 2892

ꢀ-------------------ꢀProcess: 9 ꢀ-------------------
ID: 13
create: 1152 ꢀ terminate: 4881 ꢀ sleep: 406 ꢀ ready: 2657 ꢀ running: 665
Turnaround time: 3729 ꢀ CBT: 665 ꢀ Waiting time: 3064

######################__Total Avg_TT, Avg_CBT, and Avg_WT__######################

Average Turnaround time: 2191, ⍰ Average CBT: 675, ⍰ Average Waiting time: 1515

_____

##
################################__QUANTUM= 100000__###############################
##

⍰-------------------⍰Process: 0 ⍰-------------------
ID: 5
create: 630 ⍰ terminate: 1170 ⍰ sleep: 30 ⍰ ready: 18 ⍰ running: 492
Turnaround time: 540 ⍰ CBT: 492 ⍰ Waiting time: 48

⍰-------------------⍰Process: 1 ⍰-------------------
ID: 4
create: 630 ⍰ terminate: 1285 ⍰ sleep: 23 ⍰ ready: 12 ⍰ running: 620
Turnaround time: 655 ⍰ CBT: 620 ⍰ Waiting time: 35

⍰-------------------⍰Process: 2 ⍰-------------------
ID: 6
create: 630 ⍰ terminate: 1857 ⍰ sleep: 100 ⍰ ready: 505 ⍰ running: 621
Turnaround time: 1227 ⍰ CBT: 621 ⍰ Waiting time: 606

⍰-------------------⍰Process: 3 ⍰-------------------
ID: 7
create: 631 ⍰ terminate: 2018 ⍰ sleep: 118 ⍰ ready: 599 ⍰ running: 668
Turnaround time: 1387 ⍰ CBT: 668 ⍰ Waiting time: 719

⍰-------------------⍰Process: 4 ⍰-------------------
ID: 8
create: 633 ⍰ terminate: 2625 ⍰ sleep: 196 ⍰ ready: 1072 ⍰ running: 723
Turnaround time: 1992 ⍰ CBT: 723 ⍰ Waiting time: 1269

⍰-------------------⍰Process: 5 ⍰-------------------
ID: 9
create: 634 ⍰ terminate: 2624 ⍰ sleep: 206 ⍰ ready: 1209 ⍰ running: 575
Turnaround time: 1990 ⍰ CBT: 575 ⍰ Waiting time: 1415

⍰-------------------⍰Process: 6 ⍰-------------------
ID: 10
create: 634 ⍰ terminate: 3321 ⍰ sleep: 277 ⍰ ready: 1764 ⍰ running: 646
Turnaround time: 2687 ⍰ CBT: 646 ⍰ Waiting time: 2041

⍰-------------------⍰Process: 7 ⍰-------------------
ID: 11
create: 634 ⍰ terminate: 3353 ⍰ sleep: 314 ⍰ ready: 1757 ⍰ running: 647
Turnaround time: 2719 ⍰ CBT: 647 ⍰ Waiting time: 2072

⍰-------------------⍰Process: 8 ⍰-------------------
ID: 12
create: 635 ⍰ terminate: 4093 ⍰ sleep: 381 ⍰ ready: 2344 ⍰ running: 733
Turnaround time: 3458 ⍰ CBT: 733 ⍰ Waiting time: 2725

⍰-------------------⍰Process: 9 ⍰-------------------
ID: 13
create: 635 ⍰ terminate: 4096 ⍰ sleep: 401 ⍰ ready: 2376 ⍰ running: 684

Turnaround time: 3461 ☐ CBT: 684 ☐ Waiting time: 2777

######################__Total Avg_TT, Avg_CBT, and Avg_WT__######################

Average Turnaround time: 2011, ☐ Average CBT: 640, ☐ Average Waiting time: 1370

3.5.2 Modified Priority Scheduling Algorithm's performance

\---

_____

##############__Turnaround time, CBT, and Waiting time for all children__##############
Process: 0 ▯ child id: 4
Turnaround time: 57 ▯ CBT: 41 ▯ Waiting time: 16

###
Process: 1 ▯ child id: 25
Turnaround time: 61 ▯ CBT: 49 ▯ Waiting time: 12

###
Process: 2 ▯ child id: 6
Turnaround time: 158 ▯ CBT: 42 ▯ Waiting time: 116

###
Process: 3 ▯ child id: 24
Turnaround time: 109 ▯ CBT: 53 ▯ Waiting time: 56

###
Process: 4 ▯ child id: 26
Turnaround time: 160 ▯ CBT: 64 ▯ Waiting time: 96

###
Process: 5 ▯ child id: 28
Turnaround time: 212 ▯ CBT: 53 ▯ Waiting time: 159

###
Process: 6 ▯ child id: 27
Turnaround time: 233 ▯ CBT: 81 ▯ Waiting time: 152

###
Process: 7 ▯ child id: 19
Turnaround time: 288 ▯ CBT: 78 ▯ Waiting time: 210

###
Process: 8 ▯ child id: 22
Turnaround time: 360 ▯ CBT: 61 ▯ Waiting time: 299

###
Process: 9 ▯ child id: 20
Turnaround time: 377 ▯ CBT: 47 ▯ Waiting time: 330

###
Process: 10 ▯ child id: 21
Turnaround time: 392 ▯ CBT: 68 ▯ Waiting time: 324

###
Process: 11 ▯ child id: 23
Turnaround time: 422 ▯ CBT: 71 ▯ Waiting time: 351

###
Process: 12 ▯ child id: 16
Turnaround time: 464 ▯ CBT: 60 ▯ Waiting time: 404

###
Process: 13 ▯ child id: 17
Turnaround time: 497 ▯ CBT: 56 ▯ Waiting time: 441

###

Process: 14 ☐ child id: 15
Turnaround time: 510 ☐ CBT: 28 ☐ Waiting time: 482

##
Process: 15 ☐ child id: 18
Turnaround time: 519 ☐ CBT: 69 ☐ Waiting time: 450

##
Process: 16 ☐ child id: 14
Turnaround time: 535 ☐ CBT: 41 ☐ Waiting time: 494

##
Process: 17 ☐ child id: 9
Turnaround time: 603 ☐ CBT: 57 ☐ Waiting time: 546

##
Process: 18 ☐ child id: 13
Turnaround time: 604 ☐ CBT: 55 ☐ Waiting time: 549

##
Process: 19 ☐ child id: 10
Turnaround time: 621 ☐ CBT: 21 ☐ Waiting time: 600

##
Process: 20 ☐ child id: 12
Turnaround time: 630 ☐ CBT: 71 ☐ Waiting time: 559

##
Process: 21 ☐ child id: 5
Turnaround time: 694 ☐ CBT: 46 ☐ Waiting time: 648

##
Process: 22 ☐ child id: 11
Turnaround time: 709 ☐ CBT: 67 ☐ Waiting time: 642

##
Process: 23 ☐ child id: 7
Turnaround time: 741 ☐ CBT: 54 ☐ Waiting time: 687

##
Process: 24 ☐ child id: 8
Turnaround time: 766 ☐ CBT: 58 ☐ Waiting time: 708

##
##

#########__Avg_TT, Avg_CBT, and Ag_WT for each group with the same priority__#########

☐#########__☐Group with Priority: 5☐__#########
Average Turnaround time: 109, ☐ Average CBT: 49, ☐ Average Waiting time: 59

☐#########__☐Group with Priority: 4☐__#########
Average Turnaround time: 294, ☐ Average CBT: 64, ☐ Average Waiting time: 230

☐#########__☐Group with Priority: 3☐__#########
Average Turnaround time: 457, ☐ Average CBT: 56, ☐ Average Waiting time: 400

#########__Group with Priority: 2__#########
Average Turnaround time: 576, Average CBT: 48, Average Waiting time: 527

#########__Group with Priority: 1__#########
Average Turnaround time: 708, Average CBT: 59, Average Waiting time: 648

##
##

#########################__Total Avg_TT, Avg_CBT, and Ag_WT__#########################
Average Turnaround time: 428, Average CBT: 55, Average Waiting time: 373