
Scheduling Process Queue 1:

Process A [arrivalTime=0.000000, expectedRunTime=1, priority=4]
Process B [arrivalTime=2.392130, expectedRunTime=3, priority=3]
Process C [arrivalTime=4.101510, expectedRunTime=10, priority=1]
Process D [arrivalTime=9.076006, expectedRunTime=3, priority=3]
Process E [arrivalTime=9.358302, expectedRunTime=10, priority=4]
Process F [arrivalTime=14.271805, expectedRunTime=6, priority=2]
Process G [arrivalTime=17.877575, expectedRunTime=7, priority=1]
Process H [arrivalTime=26.865806, expectedRunTime=4, priority=4]
Process I [arrivalTime=33.404211, expectedRunTime=3, priority=3]
Process J [arrivalTime=38.598428, expectedRunTime=3, priority=3]
Process K [arrivalTime=43.786903, expectedRunTime=5, priority=1]
Process L [arrivalTime=45.434962, expectedRunTime=3, priority=1]
Process M [arrivalTime=53.594409, expectedRunTime=7, priority=3]
Process N [arrivalTime=58.200266, expectedRunTime=5, priority=1]
Process O [arrivalTime=65.751258, expectedRunTime=4, priority=2]
Process P [arrivalTime=70.507303, expectedRunTime=9, priority=1]
Process Q [arrivalTime=74.440040, expectedRunTime=3, priority=1]
Process R [arrivalTime=80.059636, expectedRunTime=4, priority=2]
Process S [arrivalTime=82.242388, expectedRunTime=8, priority=4]
Process T [arrivalTime=85.509864, expectedRunTime=6, priority=2]

First Come First Served

A__BBBCCCCCCCCDDDEEEEEEEEEFFFFFGGGGGGHHHIIJJJKKKKKLLMMMMMMNNNNNOOOOPPPPPPPQQQRRRRSSSSSSSTTTTT
Turnaround: 13.600 Waiting: 8.400 Response: 5.200 Throughput: 18.868

Shortest Job First

A__BBBCCCCCCCCFFFGGGGGGDDHHHIIJJJEEEEEEEEELLLKKKKNNNNMMMMMMPPPPPPPPQQQ000RRRRTTTTTSSSSSSS
Turnaround: 12.500 Waiting: 7.300 Response: 5.200 Throughput: 18.868

Shortest Remaining Time

A__BBBCCCCDDCCCCFFFGGHHHGGGGIIJJJEKKKKLLLEEEEEENNNNMM000OMMMMMQQQPPRRRRPPPPPTTTTTTSSSSSSS
Turnaround: 6.350 Waiting: 5.700 Response: 5.550 Throughput: 18.868

Round Robin

A__BBCBCCCECFECDFGECFECGHEFCGHEIFCGHJEIFGKHLJEIGKLJMEKLMNEKMNKMONMONPMONQPMOQPRQSPRTSPRTSPRTSPTSS
Turnaround: 19.300 Waiting: 14.150 Response: 1.050 Throughput: 18.868

Non-Preemptive Highest Priority First

A__BBBCCCCCCCCFFFGGGGGGDDDEEEEEEEEEIIKKKKLLJJJMMMMMMNNNNNOOOOPPPPPPPPPQQQRRRRTTTTTHHHSSSSSSS
Turnaround: 14.000 Waiting: 8.800 Response: 5.200 Throughput: 18.868

Preemptive Highest Priority First (RR switching between same priority processes)

A__BBCCCCCCCCFFFGGGGGGFFDBDDEHIIIEHJJJEHKKLKLKEHMMMMNNNNMM0000EPPPPQPPPPRRRTTTTTTSESESESESSS
Turnaround: 11.800 Waiting: 9.500 Response: 3.900 Throughput: 18.868

***** (Bonus) ***** Non-Preemptive Highest Priority First with Aging

A__BBBCCCCCCCCFFFGGGGGGDDDEEEEEEEEEHHHHKKKKLLIIJJJMMMMMMNNNNNOOOOPPPPPPPPPQQQRRRRTTTTTSSSSSSS
Turnaround: 13.700 Waiting: 8.500 Response: 5.200 Throughput: 18.868

***** (Bonus) ***** Preemptive Highest Priority First with Aging

A__BBCBCCCCCCCCDDDEEEEEEEEEFFFFFGGGGGGHHHIIJJJKKKKKLLMMMMMMNNNNNOOOOPPPPPPPPPQQQRRRRSSSSSSSTTTTT
Turnaround: 5.300 Waiting: 8.450 Response: 9.350 Throughput: 18.868

Scheduling Process Queue 2:

Process A [arrivalTime=0.000000, expectedRunTime=6, priority=2]
Process B [arrivalTime=6.071085, expectedRunTime=8, priority=2]
Process C [arrivalTime=10.441327, expectedRunTime=4, priority=3]
Process D [arrivalTime=16.122449, expectedRunTime=7, priority=4]
Process E [arrivalTime=18.169461, expectedRunTime=3, priority=2]
Process F [arrivalTime=23.719611, expectedRunTime=5, priority=3]
Process G [arrivalTime=30.680110, expectedRunTime=6, priority=2]
Process H [arrivalTime=40.493587, expectedRunTime=7, priority=4]
Process I [arrivalTime=43.819533, expectedRunTime=8, priority=3]
Process J [arrivalTime=50.844906, expectedRunTime=8, priority=2]
Process K [arrivalTime=59.319169, expectedRunTime=9, priority=1]
Process L [arrivalTime=67.491344, expectedRunTime=8, priority=4]
Process M [arrivalTime=76.901886, expectedRunTime=8, priority=2]
Process N [arrivalTime=86.608469, expectedRunTime=9, priority=1]
Process O [arrivalTime=87.448192, expectedRunTime=7, priority=3]

First Come First Served

AAAAAA_BBBBBBBBCCCCDDDDDDDEEEFFFFFGGGGGG_HHHHHHHIIIIIIJJJJJJJJKKKKKKKKLLLLLLLLMMMMMMMMNNNNNNNNNOOOOOOOO
Turnaround: 10.533 Waiting: 3.667 Response: 6.867 Throughput: 14.286

Shortest Job First

AAAAAA_BBBBBBBBCCCCCEEEDDDDDDDFFFGGGGGG_HHHHHHHIIIIIIJJJJJJJJKKKKKKKKLLLLLLLLMMMMMMMMNNNNNNNNNOOOOOOOO
Turnaround: 10.267 Waiting: 3.400 Response: 6.867 Throughput: 14.286

Shortest Remaining Time

AAAAAA_BBBBBBBBCCCCCEEEDDDDDDDFFFGGGGGG_HHHHHHHIIIIIIJJJJJJJJKKKKKKKKLLLLLLLLMMMMMMMMOOOOOOONNNNNNNNN
Turnaround: 6.867 Waiting: 3.267 Response: 4.267 Throughput: 14.286

Round Robin

AAAAAA_BBBBCBCBCBDCEBDEFDFDFDGGGGGGG_HHHHHHHIIIIIIJJJJJJJJKKKKKKKKLLLLLLLLMMMMMMMMNNNNNNNNNOOOOOOOO
Turnaround: 13.467 Waiting: 6.600 Response: 1.000 Throughput: 14.286

Non-Preemptive Highest Priority First

AAAAAA_BBBBBBBBCCCCCEEEDDDDDDDFFFGGGGGG_HHHHHHHIIIIIIJJJJJJJJKKKKKKKKLLLLLLLLMMMMMMMMNNNNNNNNNOOOOOOOO
Turnaround: 10.267 Waiting: 3.400 Response: 6.867 Throughput: 14.286

Preemptive Highest Priority First (RR switching between same priority processes)

AAAAAA_BBBBBBBBCCCCCEEEDDDDDDDFFFGGGGGG_HHHHHHHIIIIIIJJJJJJJJKKKKKKKKLLLLLLLLMMMMMMMMLNNNNNNNNNOOOOOOOL
Turnaround: 11.933 Waiting: 6.267 Response: 2.200 Throughput: 14.286

***** (Bonus) ***** Non-Preemptive Highest Priority First with Aging

AAAAAA_BBBBBBBBCCCCCEEEDDDDDDDFFFGGGGGG_HHHHHHHIIIIIIJJJJJJJJKKKKKKKKLLLLLLLLMMMMMMMMNNNNNNNNNOOOOOOOO
Turnaround: 10.267 Waiting: 3.400 Response: 6.867 Throughput: 14.286

***** (Bonus) ***** Preemptive Highest Priority First with Aging

AAAAAA_BBBBBBBBCCCCDEDEDDDDDDFFFGGGGGG_HHHHHHHIIIIIIJJJJJJJJKKKKKKKKLLLLLLLLMMMMMMMMNNNNNNNNNOOOOOOOO
Turnaround: 7.200 Waiting: 3.600 Response: 4.267 Throughput: 14.286

Scheduling Process Queue 3:

```

Process A [arrivalTime=0.000000, expectedRunTime=4, priority=1]
Process B [arrivalTime=2.016151, expectedRunTime=7, priority=1]
Process C [arrivalTime=5.954202, expectedRunTime=1, priority=1]
Process D [arrivalTime=15.246672, expectedRunTime=10, priority=3]
Process E [arrivalTime=15.529698, expectedRunTime=2, priority=3]
Process F [arrivalTime=22.758785, expectedRunTime=8, priority=2]
Process G [arrivalTime=29.757867, expectedRunTime=7, priority=1]
Process H [arrivalTime=32.342824, expectedRunTime=3, priority=1]
Process I [arrivalTime=33.979753, expectedRunTime=6, priority=3]
Process J [arrivalTime=38.147959, expectedRunTime=5, priority=4]
Process K [arrivalTime=38.310763, expectedRunTime=1, priority=1]
Process L [arrivalTime=41.534909, expectedRunTime=4, priority=1]
Process M [arrivalTime=50.201280, expectedRunTime=3, priority=1]
Process N [arrivalTime=59.941065, expectedRunTime=9, priority=1]
Process O [arrivalTime=61.537684, expectedRunTime=10, priority=1]
Process P [arrivalTime=67.634018, expectedRunTime=9, priority=2]
Process Q [arrivalTime=70.365431, expectedRunTime=9, priority=1]
Process R [arrivalTime=74.391417, expectedRunTime=7, priority=3]
Process S [arrivalTime=79.175584, expectedRunTime=1, priority=1]
Process T [arrivalTime=81.749619, expectedRunTime=6, priority=4]

```

AAAABBBBBBBC_____DDDDDDDDDEEEEEEEEEFGGGGGGHHIIIIIIJJJJJLLLLMMMMNNNNNNNNNN0000000000PPPPPPPPQQQQQQQQ
Turnaround: 15.294 Waiting: 9.529 Response: 5.765 Throughput: 15.596

AAAABBBBBBBC_____DDDDDDDDDDFFFFFFFFFFHHHGGGGGGKKLLLLLEEMMMIIIIIIINNNNNNNNNNN000000000QQQQQQQQSPPPPPPPRRRRRRR
Turnaround: 13.667 Waiting: 8.056 Response: 5.611 Throughput: 16.364

AAAABCBBCBBB DEEDDDDDDDUFFFFFFFFHHKJJJJLLLLIIIMMIIIGGGGGGNNNNNNNNPRRRRRSRRTTTTTPPPPPPQQQQQQQ
Turnaround: 6.474 Waiting: 6.105 Response: 6.000 Throughput: 17.757[illegible]AAAABBBBBBBC_____DDDDDDDDDDFFFFFFFFFFGGGGGGGGHHKKLLLLLEEMMMIIIIIIINNNNNNNNNNN0000000000QQQQQQQQSPPPPPPPRRRRRRR
Turnaround: 13.889 Waiting: 8.278 Response: 5.611 Throughput: 16.364

```

AAABABCB BBBB DDDDDDDDDFFFGGGHGHGKGFLLLLLFFFEIMMEEIIIIINNONONONONONOQNOQNOQNOQOQQOQQQPPPPPPPPRRRRRRR
Turnaround: 9.167 Waiting: 8.889 Response: 6.333 Throughput: 16.981

```

AAAABBBBBBBC_____DDDDDDDDDDFFFFFFFFFFGGGGGGGHHHEEKIIIIIILLJJJMMNNNNNNNNNNNOOOOOOQQQPPPPPPPP
Turnaround: 15.412 Waiting: 9.647 Response: 5.765 Throughput: 16.505

AAAABBBBBBBC_____DDDDDDDDDEEEEEEEEEFGGGGGGHHIIIIIIKJLJLJLJLJMMNNNNNNNNNNNN0000000000PPPPPPPPQQQQQQQQ
Turnaround: 6.176 Waiting: 9.471 Response: 10.059 Throughput: 16.505

Scheduling Process Queue 4:

Process A [arrivalTime=0.000000, expectedRunTime=4, priority=1]
Process B [arrivalTime=5.024845, expectedRunTime=2, priority=3]
Process C [arrivalTime=9.029201, expectedRunTime=6, priority=2]
Process D [arrivalTime=14.301865, expectedRunTime=3, priority=3]
Process E [arrivalTime=16.495423, expectedRunTime=9, priority=1]
Process F [arrivalTime=25.023666, expectedRunTime=6, priority=3]
Process G [arrivalTime=34.619775, expectedRunTime=7, priority=1]
Process H [arrivalTime=38.502392, expectedRunTime=1, priority=2]
Process I [arrivalTime=45.775703, expectedRunTime=3, priority=3]
Process J [arrivalTime=47.141172, expectedRunTime=4, priority=3]
Process K [arrivalTime=53.659334, expectedRunTime=4, priority=1]
Process L [arrivalTime=59.238195, expectedRunTime=3, priority=1]
Process M [arrivalTime=67.094710, expectedRunTime=3, priority=3]
Process N [arrivalTime=72.684674, expectedRunTime=8, priority=3]
Process O [arrivalTime=79.538158, expectedRunTime=9, priority=2]
Process P [arrivalTime=81.648539, expectedRunTime=2, priority=4]
Process Q [arrivalTime=83.814347, expectedRunTime=1, priority=1]
Process R [arrivalTime=90.433212, expectedRunTime=8, priority=1]
Process S [arrivalTime=92.746362, expectedRunTime=3, priority=1]

First Come First Served

AAAA_BB_CCCCCDDDEEEEEEEEEFFFFF_GGGGGGGH_IIIJJJ_KKKK_LLL_MMM_NNNNNNNNOOOOOOOOPPQRRRRRRRR
Turnaround: 6.167 Waiting: 1.556 Response: 4.611 Throughput: 17.308

Shortest Job First

AAAA_BB_CCCCCDDDEEEEEEEEEFFFFF_GGGGGGGH_IIIJJJ_KKKK_LLL_MMM_NNNNNNNNOOOOOOOOQRRRRRRRRSSS
Turnaround: 5.889 Waiting: 1.222 Response: 4.667 Throughput: 17.308

Shortest Remaining Time

AAAA_BB_CCCCCDDDEEEEEEEEEFFFFF_GGGGHGGG_IIIJJJ_KKKK_LLL_MMM_NNNNNNNNOPQOOOOOOOSSRRRRRRRR
Turnaround: 4.737 Waiting: 0.842 Response: 1.632 Throughput: 18.269

Round Robin

AAAA_BB_CCCCDCEDEEEEEFEFEFFFF_GGGGHGGG_IIIJJJ_KKKK_LLL_MMM_NNNNNNNNONPOQOOOOOROSROSRSRRRR
Turnaround: 6.158 Waiting: 1.632 Response: 1.000 Throughput: 18.269

Non-Preemptive Highest Priority First

AAAA_BB_CCCCCDDDEEEEEEEEEFFFFF_GGGGGGGH_IIIJJJ_KKKK_LLL_MMM_NNNNNNNNOOOOOOOOQRRRRRRRRSSS
Turnaround: 5.889 Waiting: 1.222 Response: 4.667 Throughput: 17.308

Preemptive Highest Priority First (RR switching between same priority processes)

AAAA_BB_CCCCCDEEEEEEEFDFFFFF_GGGGGGGH_IIIJJJ_KKKK_LLL_MMM_NNNNNNNNOOOOQOOOONRRSRSRSRRRR
Turnaround: 6.389 Waiting: 1.944 Response: 1.222 Throughput: 17.476

***** (Bonus) ***** Non-Preemptive Highest Priority First with Aging

AAAA_BB_CCCCCDDDEEEEEEEEEFFFFF_GGGGGGGH_IIIJJJ_KKKK_LLL_MMM_NNNNNNNNOOOOOOOOQRRRRRRRRSSS
Turnaround: 5.889 Waiting: 1.222 Response: 4.667 Throughput: 17.308

***** (Bonus) ***** Preemptive Highest Priority First with Aging

AAAA_BB_CCCCDCEDEEEEEFEFEFFFF_GGGGGGGH_IIIJJJ_KKKK_LLL_MMM_NNNNNNNNOOOOOOOOQPPRRRRRRRR
Turnaround: 4.833 Waiting: 1.611 Response: 2.389 Throughput: 17.647

Scheduling Process Queue 5:

Process A [arrivalTime=0.000000, expectedRunTime=4, priority=1]
Process B [arrivalTime=4.783317, expectedRunTime=3, priority=3]
Process C [arrivalTime=13.923534, expectedRunTime=10, priority=1]
Process D [arrivalTime=16.854270, expectedRunTime=8, priority=3]
Process E [arrivalTime=25.274868, expectedRunTime=4, priority=3]
Process F [arrivalTime=33.871608, expectedRunTime=9, priority=4]
Process G [arrivalTime=35.049236, expectedRunTime=5, priority=4]
Process H [arrivalTime=41.333732, expectedRunTime=8, priority=1]
Process I [arrivalTime=42.213757, expectedRunTime=4, priority=3]
Process J [arrivalTime=52.065249, expectedRunTime=8, priority=2]
Process K [arrivalTime=52.201696, expectedRunTime=3, priority=2]
Process L [arrivalTime=55.175061, expectedRunTime=4, priority=4]
Process M [arrivalTime=57.732989, expectedRunTime=4, priority=4]
Process N [arrivalTime=61.969665, expectedRunTime=10, priority=2]
Process O [arrivalTime=67.687689, expectedRunTime=3, priority=4]
Process P [arrivalTime=72.471031, expectedRunTime=9, priority=2]
Process Q [arrivalTime=73.748647, expectedRunTime=8, priority=3]
Process R [arrivalTime=81.228399, expectedRunTime=1, priority=3]
Process S [arrivalTime=89.671524, expectedRunTime=8, priority=4]

First Come First Served

AAAA_BBB_____CCCCCCCCDDDDDDDEEEEEFFFFFFFFFGGGGGHHHHHHHHIIIIJJJJJJJKKKLLLLMMMMNNNNNNNNNOOOPPPPPPP
Turnaround: 16.750 Waiting: 10.750 Response: 6.000 Throughput: 14.414

Shortest Job First

AAAA_BBB_____CCCCCCCCDDDDDDDEEEEGGGGFFFFFFFFFHHHHHHHHKKJJJJJJJNNNNNNNNNNPPPPPPPRIIIQQQQQQQ
Turnaround: 14.600 Waiting: 8.333 Response: 6.267 Throughput: 14.423

Shortest Remaining Time

AAAA_BBB_____CCCCCCCCDDDEEEEDDDDDGGGGFFIIIIFFFFFFFFKKKLLLLMMMHOOHHHHJJJJJJJJQQQQQQSSSSSSSS
Turnaround: 6.235 Waiting: 5.353 Response: 5.647 Throughput: 16.667

Round Robin

AAAA_BBB_____CCDCDCDCDCDECDECDFGFGFGHIFGHIFGHIFJKHLIMFJKNHLMFJOKNHLPMFJONHLRPMJONHSPQJNSPQJNSPQJNSPQNSPQNSPQNSPS
Turnaround: 25.947 Waiting: 20.053 Response: 1.053 Throughput: 15.833

Non-Preemptive Highest Priority First

AAAA_BBB_____CCCCCCCCDDDDDDDEEEEEFFFFFFFFFHHHHHHHHJJJJJJJKKNNNNNNNNNNPPPPPPPIIIQQQQQQQRRGGGGG
Turnaround: 16.600 Waiting: 10.333 Response: 6.267 Throughput: 14.286

Preemptive Highest Priority First (RR switching between same priority processes)

AAAA_BBB_____CCCCCCCCDEDEDEDEDDDFGFGFGHHHHHHHHIIIIJKKJJJJJJNNNNNNNNPPPPPPQRIQQQQQQLMOSFLSFLSFLSFSFOSFMSMGSM
Turnaround: 19.316 Waiting: 20.474 Response: 8.105 Throughput: 15.833

***** (Bonus) ***** Non-Preemptive Highest Priority First with Aging

AAAA_BBB_____CCCCCCCCDDDDDDDEEEEEFFFFFFFFFHHHHHHHHGGGGIIIIJJJJJJJKKNNNNNNNNNNLLLLMMMMPPPPPPPPPOO
Turnaround: 18.063 Waiting: 12.063 Response: 6.000 Throughput: 14.414

***** (Bonus) ***** Preemptive Highest Priority First with Aging

AAAA_BBB_____CCCCCCCCDDDDDDDEEEEEFFFFFFFFFGGGGGHHHHHHHHIIIIJKKJJJJJJLLLLMMMMNNNNNNNNNOOOPPPPPPP
Turnaround: 6.313 Waiting: 10.625 Response: 11.313 Throughput: 15.385

Average Statistics

First Come First Served

Turnaround time: 12.430233
Waiting time: 6.802326
Response time: 5.627907
Throughput per 100 quanta: 16.074766

Shortest Job First

Turnaround time: 11.337209
Waiting time: 5.686047
Response time: 5.651163
Throughput per 100 quanta: 16.257089

Shortest Remaining Time

Turnaround time: 6.100000
Waiting time: 4.288889
Response time: 4.622222
Throughput per 100 quanta: 17.175573

Round Robin

Turnaround time: 17.870968
Waiting time: 12.344086
Response time: 1.043011
Throughput per 100 quanta: 16.878403

Non-Preemptive Highest Priority First

Turnaround time: 12.081395
Waiting time: 6.430233
Response time: 5.651163
Throughput per 100 quanta: 16.226415

Preemptive Highest Priority First (RR switching between same priority processes)

Turnaround time: 11.800000
Waiting time: 9.644444
Response time: 4.455556
Throughput per 100 quanta: 16.666667

***** (Bonus) ***** Non-Preemptive Highest Priority First with Aging

Turnaround time: 12.616279
Waiting time: 6.976744
Response time: 5.639535
Throughput per 100 quanta: 16.257089

***** (Bonus) ***** Preemptive Highest Priority First with Aging

Turnaround time: 5.895349
Waiting time: 6.779070
Response time: 7.511628
Throughput per 100 quanta: 16.538462