**Assignment 3**

**Question 1**

> print.stats(results)

stats(N = 116, NW = 115, WS = 500, WQ = 11071, T0 = 0, Tmax = 500

wq = 95.44 pw = 1, P0 = 0, PBS = Inf, ws = 4.31, AVM = 0.23 AVH = 0.23)

> results <-discreteEventSimulator(my.singleServerSystem(),startTime=00, endTime = 1000 , verbose = FALSE)

> print.stats(results)

stats(N = 225, NW = 224, WS = 1000, WQ = 43248, T0 = 0, Tmax = 1000

wq = 192.21 pw = 1, P0 = 0, PBS = Inf, ws = 4.44, AVM = 0.23 AVH = 0.22)

> results <-discreteEventSimulator(my.singleServerSystem(),startTime=00, endTime = 5000 , verbose = FALSE)

> print.stats(results)

stats(N = 1105, NW = 1102, WS = 5000, WQ = 1091099, T0 = 0, Tmax = 5000

wq = 987.42 pw = 1, P0 = 0, PBS = Inf, ws = 4.52, AVM = 0.22 AVH = 0.22)

2nd RUN:

> print.stats(results)

stats(N = 103, NW = 101, WS = 498, WQ = 9585, T0 = 2, Tmax = 500

wq = 93.06 pw = 1, P0 = 0, PBS = Inf, ws = 4.83, AVM = 0.21 AVH = 0.21)

> results <-discreteEventSimulator(my.singleServerSystem(),startTime=00, endTime = 1000 , verbose = FALSE)

> print.stats(results)

stats(N = 221, NW = 219, WS = 999, WQ = 44526, T0 = 1, Tmax = 1000

wq = 201.48 pw = 1, P0 = 0, PBS = Inf, ws = 4.52, AVM = 0.22 AVH = 0.22)

> results <-discreteEventSimulator(my.singleServerSystem(),startTime=00, endTime = 5000 , verbose = FALSE)

> print.stats(results)

stats(N = 1092, NW = 1089, WS = 4995, WQ = 1105697, T0 = 5, Tmax = 5000

wq = 1012.54 pw = 1, P0 = 0, PBS = Inf, ws = 4.57, AVM = 0.22 AVH = 0.22)

I didn’t include the verbose results as there are far too long, But the print.stats function is modified in this file, and will print out this information if Verbose is set to true.

As the System time gets higher, the Average length per hour event out, I noticed that the T0 value is rarely higher than 0, so the PBS value doesn’t always get a value, because its dividing by 0.

The average wait time seems to increase as the system is ran with longer times

The average service time seems to stay around the same value of ~4.5 for all three times

**Question 2**

> source('C:/Users/Nathan/Desktop/2460/sssWithTL.R')

stats(N = 26, NW = 24, WS = 99, WQ = 682, T0 = 1, Tmax = 100

T(1)=4, T(2)=1, T(3)=2, T(4)=3, T(5)=6, T(6)=3, T(7)=8, T(8)=3, T(9)=1, T(10)=2, T(11)=6, T(12)=3, T(13)=5, T(14)=7, T(15)=3, T(16)=6, T(17)=5, T(18)=3, T(19)=3, T(20)=5, T(21)=2, T(22)=1, T(23)=6, T(24)=4, T(25)=7, T(26)=1,

T(1)%=0.04, T(2)%=0.01, T(3)%=0.02, T(4)%=0.03, T(5)%=0.06, T(6)%=0.03, T(7)%=0.08, T(8)%=0.03, T(9)%=0.01, T(10)%=0.02, T(11)%=0.06, T(12)%=0.03, T(13)%=0.05, T(14)%=0.07, T(15)%=0.03, T(16)%=0.06, T(17)%=0.05, T(18)%=0.03, T(19)%=0.03, T(20)%=0.05, T(21)%=0.02, T(22)%=0.01, T(23)%=0.06, T(24)%=0.04, T(25)%=0.07, T(26)%=0.01, )stats(N = 129, NW = 128, WS = 500, WQ = 15329, T0 = 0, Tmax = 500

T(1)=4, T(2)=6, T(3)=8, T(4)=1, T(5)=3, T(6)=1, T(7)=5, T(8)=4, T(9)=6, T(10)=2, T(11)=2, T(12)=4, T(13)=5, T(14)=4, T(15)=4, T(16)=3, T(17)=2, T(18)=3, T(19)=4, T(20)=1, T(21)=3, T(22)=4, T(23)=5, T(24)=7, T(25)=5, T(26)=8, T(27)=3, T(28)=8, T(29)=6, T(30)=3, T(31)=6, T(32)=6, T(33)=1, T(34)=3, T(35)=6, T(36)=4, T(37)=4, T(38)=3, T(39)=4, T(40)=8, T(41)=1, T(42)=1, T(43)=7, T(44)=1, T(45)=4, T(46)=8, T(47)=1, T(48)=5, T(49)=3, T(50)=2, T(51)=3, T(52)=2, T(53)=5, T(54)=1, T(55)=3, T(56)=4, T(57)=5, T(58)=1, T(59)=4, T(60)=1, T(61)=2, T(62)=5, T(63)=3, T(64)=4, T(65)=1, T(66)=8, T(67)=5, T(68)=8, T(69)=3, T(70)=7, T(71)=4, T(72)=3, T(73)=4, T(74)=4, T(75)=2, T(76)=2, T(77)=5, T(78)=2, T(79)=8, T(80)=2, T(81)=1, T(82)=3, T(83)=3, T(84)=3, T(85)=7, T(86)=6, T(87)=2, T(88)=1, T(89)=3, T(90)=4, T(91)=2, T(92)=1, T(93)=7, T(94)=1, T(95)=4, T(96)=8, T(97)=8, T(98)=5, T(99)=7, T(100)=6, T(101)=4, T(102)=5, T(103)=6, T(104)=7, T(105)=6, T(106)=7, T(107)=6, T(108)=4, T(109)=3, T(110)=1, T(111)=3, T(112)=2, T(113)=6, T(114)=1, T(115)=4, T(116)=1, T(117)=2, T(118)=6, T(119)=4, T(120)=3, T(121)=5, T(122)=1, T(123)=2, T(124)=2, T(125)=2, T(126)=2, T(127)=1, T(128)=7, T(129)=2,

T(1)%=0.008, T(2)%=0.012, T(3)%=0.016, T(4)%=0.002, T(5)%=0.006, T(6)%=0.002, T(7)%=0.01, T(8)%=0.008, T(9)%=0.012, T(10)%=0.004, T(11)%=0.004, T(12)%=0.008, T(13)%=0.01, T(14)%=0.008, T(15)%=0.008, T(16)%=0.006, T(17)%=0.004, T(18)%=0.006, T(19)%=0.008, T(20)%=0.002, T(21)%=0.006, T(22)%=0.008, T(23)%=0.01, T(24)%=0.014, T(25)%=0.01, T(26)%=0.016, T(27)%=0.006, T(28)%=0.016, T(29)%=0.012, T(30)%=0.006, T(31)%=0.012, T(32)%=0.012, T(33)%=0.002, T(34)%=0.006, T(35)%=0.012, T(36)%=0.008, T(37)%=0.008, T(38)%=0.006, T(39)%=0.008, T(40)%=0.016, T(41)%=0.002, T(42)%=0.002, T(43)%=0.014, T(44)%=0.002, T(45)%=0.008, T(46)%=0.016, T(47)%=0.002, T(48)%=0.01, T(49)%=0.006, T(50)%=0.004, T(51)%=0.006, T(52)%=0.004, T(53)%=0.01, T(54)%=0.002, T(55)%=0.006, T(56)%=0.008, T(57)%=0.01, T(58)%=0.002, T(59)%=0.008, T(60)%=0.002, T(61)%=0.004, T(62)%=0.01, T(63)%=0.006, T(64)%=0.008, T(65)%=0.002, T(66)%=0.016, T(67)%=0.01, T(68)%=0.016, T(69)%=0.006, T(70)%=0.014, T(71)%=0.008, T(72)%=0.006, T(73)%=0.008, T(74)%=0.008, T(75)%=0.004, T(76)%=0.004, T(77)%=0.01, T(78)%=0.004, T(79)%=0.016, T(80)%=0.004, T(81)%=0.002, T(82)%=0.006, T(83)%=0.006, T(84)%=0.006, T(85)%=0.014, T(86)%=0.012, T(87)%=0.004, T(88)%=0.002, T(89)%=0.006, T(90)%=0.008, T(91)%=0.004, T(92)%=0.002, T(93)%=0.014, T(94)%=0.002, T(95)%=0.008, T(96)%=0.016, T(97)%=0.016, T(98)%=0.01, T(99)%=0.014, T(100)%=0.012, T(101)%=0.008, T(102)%=0.01, T(103)%=0.012, T(104)%=0.014, T(105)%=0.012, T(106)%=0.014, T(107)%=0.012, T(108)%=0.008, T(109)%=0.006, T(110)%=0.002, T(111)%=0.006, T(112)%=0.004, T(113)%=0.012, T(114)%=0.002, T(115)%=0.008, T(116)%=0.002, T(117)%=0.004, T(118)%=0.012, T(119)%=0.008, T(120)%=0.006, T(121)%=0.01, T(122)%=0.002, T(123)%=0.004, T(124)%=0.004, T(125)%=0.004, T(126)%=0.004, T(127)%=0.002, T(128)%=0.014, T(129)%=0.004, )stats(N = 219, NW = 218, WS = 1000, WQ = 41091, T0 = 0, Tmax = 1000

T(1)=3, T(2)=5, T(3)=3, T(4)=2, T(5)=7, T(6)=6, T(7)=3, T(8)=7, T(9)=8, T(10)=7, T(11)=6, T(12)=5, T(13)=4, T(14)=4, T(15)=4, T(16)=5, T(17)=7, T(18)=8, T(19)=7, T(20)=7, T(21)=2, T(22)=2, T(23)=4, T(24)=5, T(25)=3, T(26)=4, T(27)=7, T(28)=3, T(29)=4, T(30)=8, T(31)=7, T(32)=5, T(33)=7, T(34)=7, T(35)=8, T(36)=8, T(37)=2, T(38)=4, T(39)=1, T(40)=6, T(41)=1, T(42)=4, T(43)=5, T(44)=6, T(45)=4, T(46)=8, T(47)=2, T(48)=3, T(49)=1, T(50)=8, T(51)=8, T(52)=7, T(53)=6, T(54)=4, T(55)=5, T(56)=8, T(57)=5, T(58)=2, T(59)=6, T(60)=7, T(61)=5, T(62)=4, T(63)=2, T(64)=3, T(65)=7, T(66)=3, T(67)=3, T(68)=2, T(69)=5, T(70)=4, T(71)=5, T(72)=4, T(73)=4, T(74)=8, T(75)=4, T(76)=7, T(77)=4, T(78)=3, T(79)=8, T(80)=8, T(81)=4, T(82)=7, T(83)=6, T(84)=7, T(85)=1, T(86)=2, T(87)=1, T(88)=3, T(89)=4, T(90)=3, T(91)=6, T(92)=1, T(93)=4, T(94)=3, T(95)=5, T(96)=1, T(97)=1, T(98)=8, T(99)=4, T(100)=7, T(101)=7, T(102)=3, T(103)=4, T(104)=6, T(105)=4, T(106)=7, T(107)=7, T(108)=2, T(109)=2, T(110)=5, T(111)=1, T(112)=5, T(113)=8, T(114)=6, T(115)=3, T(116)=6, T(117)=2, T(118)=5, T(119)=3, T(120)=6, T(121)=8, T(122)=2, T(123)=3, T(124)=5, T(125)=6, T(126)=1, T(127)=6, T(128)=2, T(129)=2, T(130)=7, T(131)=5, T(132)=2, T(133)=7, T(134)=6, T(135)=7, T(136)=5, T(137)=2, T(138)=8, T(139)=2, T(140)=7, T(141)=1, T(142)=4, T(143)=4, T(144)=7, T(145)=7, T(146)=7, T(147)=1, T(148)=8, T(149)=4, T(150)=8, T(151)=1, T(152)=8, T(153)=7, T(154)=1, T(155)=1, T(156)=1, T(157)=1, T(158)=8, T(159)=4, T(160)=7, T(161)=3, T(162)=2, T(163)=2, T(164)=7, T(165)=7, T(166)=3, T(167)=8, T(168)=1, T(169)=4, T(170)=3, T(171)=1, T(172)=4, T(173)=1, T(174)=3, T(175)=7, T(176)=5, T(177)=3, T(178)=3, T(179)=6, T(180)=8, T(181)=4, T(182)=8, T(183)=1, T(184)=7, T(185)=5, T(186)=1, T(187)=7, T(188)=3, T(189)=3, T(190)=4, T(191)=1, T(192)=2, T(193)=3, T(194)=1, T(195)=1, T(196)=1, T(197)=5, T(198)=7, T(199)=4, T(200)=3, T(201)=8, T(202)=5, T(203)=4, T(204)=8, T(205)=3, T(206)=3, T(207)=8, T(208)=1, T(209)=5, T(210)=8, T(211)=7, T(212)=6, T(213)=4, T(214)=3, T(215)=8, T(216)=7, T(217)=1, T(218)=5, T(219)=3,

T(1)%=0.003, T(2)%=0.005, T(3)%=0.003, T(4)%=0.002, T(5)%=0.007, T(6)%=0.006, T(7)%=0.003, T(8)%=0.007, T(9)%=0.008, T(10)%=0.007, T(11)%=0.006, T(12)%=0.005, T(13)%=0.004, T(14)%=0.004, T(15)%=0.004, T(16)%=0.005, T(17)%=0.007, T(18)%=0.008, T(19)%=0.007, T(20)%=0.007, T(21)%=0.002, T(22)%=0.002, T(23)%=0.004, T(24)%=0.005, T(25)%=0.003, T(26)%=0.004, T(27)%=0.007, T(28)%=0.003, T(29)%=0.004, T(30)%=0.008, T(31)%=0.007, T(32)%=0.005, T(33)%=0.007, T(34)%=0.007, T(35)%=0.008, T(36)%=0.008, T(37)%=0.002, T(38)%=0.004, T(39)%=0.001, T(40)%=0.006, T(41)%=0.001, T(42)%=0.004, T(43)%=0.005, T(44)%=0.006, T(45)%=0.004, T(46)%=0.008, T(47)%=0.002, T(48)%=0.003, T(49)%=0.001, T(50)%=0.008, T(51)%=0.008, T(52)%=0.007, T(53)%=0.006, T(54)%=0.004, T(55)%=0.005, T(56)%=0.008, T(57)%=0.005, T(58)%=0.002, T(59)%=0.006, T(60)%=0.007, T(61)%=0.005, T(62)%=0.004, T(63)%=0.002, T(64)%=0.003, T(65)%=0.007, T(66)%=0.003, T(67)%=0.003, T(68)%=0.002, T(69)%=0.005, T(70)%=0.004, T(71)%=0.005, T(72)%=0.004, T(73)%=0.004, T(74)%=0.008, T(75)%=0.004, T(76)%=0.007, T(77)%=0.004, T(78)%=0.003, T(79)%=0.008, T(80)%=0.008, T(81)%=0.004, T(82)%=0.007, T(83)%=0.006, T(84)%=0.007, T(85)%=0.001, T(86)%=0.002, T(87)%=0.001, T(88)%=0.003, T(89)%=0.004, T(90)%=0.003, T(91)%=0.006, T(92)%=0.001, T(93)%=0.004, T(94)%=0.003, T(95)%=0.005, T(96)%=0.001, T(97)%=0.001, T(98)%=0.008, T(99)%=0.004, T(100)%=0.007, T(101)%=0.007, T(102)%=0.003, T(103)%=0.004, T(104)%=0.006, T(105)%=0.004, T(106)%=0.007, T(107)%=0.007, T(108)%=0.002, T(109)%=0.002, T(110)%=0.005, T(111)%=0.001, T(112)%=0.005, T(113)%=0.008, T(114)%=0.006, T(115)%=0.003, T(116)%=0.006, T(117)%=0.002, T(118)%=0.005, T(119)%=0.003, T(120)%=0.006, T(121)%=0.008, T(122)%=0.002, T(123)%=0.003, T(124)%=0.005, T(125)%=0.006, T(126)%=0.001, T(127)%=0.006, T(128)%=0.002, T(129)%=0.002, T(130)%=0.007, T(131)%=0.005, T(132)%=0.002, T(133)%=0.007, T(134)%=0.006, T(135)%=0.007, T(136)%=0.005, T(137)%=0.002, T(138)%=0.008, T(139)%=0.002, T(140)%=0.007, T(141)%=0.001, T(142)%=0.004, T(143)%=0.004, T(144)%=0.007, T(145)%=0.007, T(146)%=0.007, T(147)%=0.001, T(148)%=0.008, T(149)%=0.004, T(150)%=0.008, T(151)%=0.001, T(152)%=0.008, T(153)%=0.007, T(154)%=0.001, T(155)%=0.001, T(156)%=0.001, T(157)%=0.001, T(158)%=0.008, T(159)%=0.004, T(160)%=0.007, T(161)%=0.003, T(162)%=0.002, T(163)%=0.002, T(164)%=0.007, T(165)%=0.007, T(166)%=0.003, T(167)%=0.008, T(168)%=0.001, T(169)%=0.004, T(170)%=0.003, T(171)%=0.001, T(172)%=0.004, T(173)%=0.001, T(174)%=0.003, T(175)%=0.007, T(176)%=0.005, T(177)%=0.003, T(178)%=0.003, T(179)%=0.006, T(180)%=0.008, T(181)%=0.004, T(182)%=0.008, T(183)%=0.001, T(184)%=0.007, T(185)%=0.005, T(186)%=0.001, T(187)%=0.007, T(188)%=0.003, T(189)%=0.003, T(190)%=0.004, T(191)%=0.001, T(192)%=0.002, T(193)%=0.003, T(194)%=0.001, T(195)%=0.001, T(196)%=0.001, T(197)%=0.005, T(198)%=0.007, T(199)%=0.004, T(200)%=0.003, T(201)%=0.008, T(202)%=0.005, T(203)%=0.004, T(204)%=0.008, T(205)%=0.003, T(206)%=0.003, T(207)%=0.008, T(208)%=0.001, T(209)%=0.005, T(210)%=0.008, T(211)%=0.007, T(212)%=0.006, T(213)%=0.004, T(214)%=0.003, T(215)%=0.008, T(216)%=0.007, T(217)%=0.001, T(218)%=0.005, T(219)%=0.003, )stats(N = 1126, NW = 1124, WS = 4999, WQ = 1117178, T0 = 1, Tmax = 5000

T(1)=7, T(2)=7, T(3)=7, T(4)=6, T(5)=5, T(6)=7, T(7)=6, T(8)=8, T(9)=2, T(10)=2, T(11)=7, T(12)=4, T(13)=7, T(14)=3, T(15)=4, T(16)=2, T(17)=7, T(18)=5, T(19)=7, T(20)=3, T(21)=4, T(22)=2, T(23)=2, T(24)=6, T(25)=3, T(26)=2, T(27)=6, T(28)=1, T(29)=8, T(30)=8, T(31)=6, T(32)=3, T(33)=7, T(34)=4, T(35)=2, T(36)=4, T(37)=8, T(38)=4, T(39)=7, T(40)=2, T(41)=4, T(42)=5, T(43)=3, T(44)=4, T(45)=8, T(46)=3, T(47)=4, T(48)=4, T(49)=4, T(50)=7, T(51)=8, T(52)=6, T(53)=5, T(54)=1, T(55)=4, T(56)=5, T(57)=3, T(58)=7, T(59)=8, T(60)=1, T(61)=5, T(62)=8, T(63)=6, T(64)=1, T(65)=8, T(66)=6, T(67)=3, T(68)=6, T(69)=2, T(70)=1, T(71)=8, T(72)=2, T(73)=4, T(74)=7, T(75)=6, T(76)=2, T(77)=4, T(78)=3, T(79)=6, T(80)=8, T(81)=3, T(82)=4, T(83)=2, T(84)=4, T(85)=7, T(86)=2, T(87)=1, T(88)=7, T(89)=4, T(90)=8, T(91)=8, T(92)=6, T(93)=1, T(94)=1, T(95)=1, T(96)=1, T(97)=1, T(98)=4, T(99)=5, T(100)=4, T(101)=6, T(102)=5, T(103)=5, T(104)=5, T(105)=2, T(106)=2, T(107)=7, T(108)=6, T(109)=1, T(110)=1, T(111)=6, T(112)=5, T(113)=6, T(114)=5, T(115)=4, T(116)=7, T(117)=5, T(118)=2, T(119)=2, T(120)=2, T(121)=6, T(122)=8, T(123)=8, T(124)=2, T(125)=7, T(126)=8, T(127)=5, T(128)=5, T(129)=4, T(130)=6, T(131)=4, T(132)=6, T(133)=3, T(134)=5, T(135)=7, T(136)=1, T(137)=8, T(138)=7, T(139)=8, T(140)=7, T(141)=1, T(142)=6, T(143)=8, T(144)=6, T(145)=6, T(146)=2, T(147)=2, T(148)=1, T(149)=8, T(150)=7, T(151)=5, T(152)=4, T(153)=5, T(154)=6, T(155)=3, T(156)=5, T(157)=3, T(158)=6, T(159)=7, T(160)=2, T(161)=4, T(162)=7, T(163)=4, T(164)=8, T(165)=7, T(166)=2, T(167)=7, T(168)=3, T(169)=1, T(170)=4, T(171)=5, T(172)=4, T(173)=7, T(174)=1, T(175)=4, T(176)=7, T(177)=2, T(178)=3, T(179)=8, T(180)=7, T(181)=5, T(182)=4, T(183)=2, T(184)=6, T(185)=6, T(186)=5, T(187)=7, T(188)=7, T(189)=5, T(190)=2, T(191)=7, T(192)=1, T(193)=5, T(194)=4, T(195)=8, T(196)=7, T(197)=7, T(198)=5, T(199)=7, T(200)=6, T(201)=1, T(202)=5, T(203)=7, T(204)=7, T(205)=5, T(206)=6, T(207)=1, T(208)=2, T(209)=1, T(210)=2, T(211)=2, T(212)=1, T(213)=8, T(214)=2, T(215)=6, T(216)=5, T(217)=3, T(218)=7, T(219)=8, T(220)=3, T(221)=4, T(222)=4, T(223)=3, T(224)=3, T(225)=1, T(226)=1, T(227)=2, T(228)=2, T(229)=5, T(230)=8, T(231)=4, T(232)=8, T(233)=5, T(234)=7, T(235)=1, T(236)=6, T(237)=7, T(238)=6, T(239)=1, T(240)=2, T(241)=7, T(242)=2, T(243)=3, T(244)=1, T(245)=3, T(246)=3, T(247)=1, T(248)=2, T(249)=8, T(250)=4, T(251)=2, T(252)=4, T(253)=1, T(254)=5, T(255)=5, T(256)=5, T(257)=3, T(258)=7, T(259)=5, T(260)=5, T(261)=7, T(262)=3, T(263)=2, T(264)=6, T(265)=1, T(266)=7, T(267)=8, T(268)=8, T(269)=6, T(270)=5, T(271)=1, T(272)=3, T(273)=5, T(274)=7, T(275)=8, T(276)=3, T(277)=5, T(278)=5, T(279)=8, T(280)=4, T(281)=8, T(282)=7, T(283)=1, T(284)=1, T(285)=2, T(286)=7, T(287)=3, T(288)=4, T(289)=4, T(290)=8, T(291)=1, T(292)=2, T(293)=7, T(294)=4, T(295)=7, T(296)=4, T(297)=8, T(298)=1, T(299)=3, T(300)=8, T(301)=7, T(302)=3, T(303)=6, T(304)=6, T(305)=6, T(306)=7, T(307)=4, T(308)=3, T(309)=5, T(310)=2, T(311)=8, T(312)=8, T(313)=5, T(314)=1, T(315)=1, T(316)=6, T(317)=2, T(318)=4, T(319)=1, T(320)=2, T(321)=3, T(322)=4, T(323)=5, T(324)=3, T(325)=8, T(326)=6, T(327)=7, T(328)=5, T(329)=5, T(330)=4, T(331)=6, T(332)=8, T(333)=2, T(334)=7, T(335)=3, T(336)=1, T(337)=1, T(338)=3, T(339)=6, T(340)=1, T(341)=7, T(342)=3, T(343)=5, T(344)=1, T(345)=4, T(346)=3, T(347)=7, T(348)=8, T(349)=3, T(350)=1, T(351)=6, T(352)=3, T(353)=3, T(354)=7, T(355)=7, T(356)=6, T(357)=4, T(358)=4, T(359)=8, T(360)=1, T(361)=5, T(362)=5, T(363)=6, T(364)=2, T(365)=3, T(366)=3, T(367)=2, T(368)=6, T(369)=6, T(370)=2, T(371)=4, T(372)=4, T(373)=1, T(374)=8, T(375)=8, T(376)=1, T(377)=8, T(378)=1, T(379)=3, T(380)=7, T(381)=7, T(382)=7, T(383)=8, T(384)=8, T(385)=5, T(386)=2, T(387)=1, T(388)=4, T(389)=7, T(390)=4, T(391)=2, T(392)=3, T(393)=3, T(394)=3, T(395)=7, T(396)=1, T(397)=8, T(398)=1, T(399)=5, T(400)=5, T(401)=5, T(402)=6, T(403)=6, T(404)=1, T(405)=4, T(406)=5, T(407)=7, T(408)=2, T(409)=6, T(410)=8, T(411)=4, T(412)=6, T(413)=3, T(414)=3, T(415)=4, T(416)=8, T(417)=3, T(418)=7, T(419)=2, T(420)=5, T(421)=5, T(422)=5, T(423)=1, T(424)=6, T(425)=1, T(426)=4, T(427)=1, T(428)=5, T(429)=3, T(430)=4, T(431)=4, T(432)=5, T(433)=2, T(434)=1, T(435)=7, T(436)=7, T(437)=5, T(438)=2, T(439)=7, T(440)=4, T(441)=2, T(442)=1, T(443)=2, T(444)=3, T(445)=7, T(446)=7, T(447)=6, T(448)=6, T(449)=7, T(450)=2, T(451)=3, T(452)=2, T(453)=7, T(454)=2, T(455)=1, T(456)=7, T(457)=4, T(458)=5, T(459)=5, T(460)=6, T(461)=6, T(462)=3, T(463)=4, T(464)=4, T(465)=6, T(466)=5, T(467)=7, T(468)=3, T(469)=1, T(470)=2, T(471)=1, T(472)=1, T(473)=7, T(474)=3, T(475)=2, T(476)=3, T(477)=5, T(478)=5, T(479)=8, T(480)=2, T(481)=4, T(482)=2, T(483)=3, T(484)=4, T(485)=2, T(486)=1, T(487)=4, T(488)=4, T(489)=5, T(490)=4, T(491)=7, T(492)=3, T(493)=3, T(494)=3, T(495)=5, T(496)=8, T(497)=2, T(498)=8, T(499)=7, T(500)=7, T(501)=7, T(502)=1, T(503)=4, T(504)=2, T(505)=2, T(506)=8, T(507)=7, T(508)=3, T(509)=4, T(510)=1, T(511)=1, T(512)=7, T(513)=7, T(514)=6, T(515)=2, T(516)=2, T(517)=3, T(518)=8, T(519)=2, T(520)=8, T(521)=3, T(522)=3, T(523)=5, T(524)=1, T(525)=2, T(526)=6, T(527)=4, T(528)=3, T(529)=7, T(530)=2, T(531)=5, T(532)=1, T(533)=3, T(534)=3, T(535)=1, T(536)=2, T(537)=7, T(538)=1, T(539)=1, T(540)=5, T(541)=4, T(542)=1, T(543)=7, T(544)=3, T(545)=1, T(546)=3, T(547)=6, T(548)=8, T(549)=2, T(550)=8, T(551)=6, T(552)=3, T(553)=4, T(554)=1, T(555)=8, T(556)=2, T(557)=3, T(558)=6, T(559)=1, T(560)=1, T(561)=7, T(562)=4, T(563)=6, T(564)=2, T(565)=8, T(566)=5, T(567)=7, T(568)=7, T(569)=7, T(570)=4, T(571)=5, T(572)=4, T(573)=2, T(574)=1, T(575)=2, T(576)=1, T(577)=2, T(578)=7, T(579)=1, T(580)=5, T(581)=5, T(582)=1, T(583)=6, T(584)=3, T(585)=5, T(586)=2, T(587)=6, T(588)=1, T(589)=7, T(590)=2, T(591)=6, T(592)=6, T(593)=1, T(594)=3, T(595)=4, T(596)=5, T(597)=4, T(598)=1, T(599)=4, T(600)=8, T(601)=8, T(602)=3, T(603)=5, T(604)=2, T(605)=1, T(606)=5, T(607)=3, T(608)=1, T(609)=2, T(610)=5, T(611)=6, T(612)=7, T(613)=5, T(614)=4, T(615)=2, T(616)=6, T(617)=3, T(618)=4, T(619)=2, T(620)=5, T(621)=5, T(622)=3, T(623)=1, T(624)=2, T(625)=8, T(626)=6, T(627)=4, T(628)=8, T(629)=5, T(630)=2, T(631)=3, T(632)=7, T(633)=1, T(634)=5, T(635)=8, T(636)=2, T(637)=6, T(638)=2, T(639)=6, T(640)=3, T(641)=3, T(642)=6, T(643)=5, T(644)=3, T(645)=4, T(646)=6, T(647)=5, T(648)=4, T(649)=2, T(650)=1, T(651)=8, T(652)=8, T(653)=1, T(654)=7, T(655)=1, T(656)=5, T(657)=4, T(658)=4, T(659)=7, T(660)=6, T(661)=6, T(662)=7, T(663)=5, T(664)=7, T(665)=3, T(666)=6, T(667)=5, T(668)=2, T(669)=3, T(670)=3, T(671)=6, T(672)=3, T(673)=4, T(674)=6, T(675)=2, T(676)=7, T(677)=5, T(678)=6, T(679)=2, T(680)=1, T(681)=5, T(682)=6, T(683)=2, T(684)=7, T(685)=1, T(686)=3, T(687)=6, T(688)=7, T(689)=8, T(690)=4, T(691)=4, T(692)=6, T(693)=5, T(694)=1, T(695)=1, T(696)=2, T(697)=8, T(698)=7, T(699)=5, T(700)=8, T(701)=4, T(702)=1, T(703)=6, T(704)=7, T(705)=2, T(706)=8, T(707)=6, T(708)=3, T(709)=1, T(710)=7, T(711)=3, T(712)=7, T(713)=5, T(714)=7, T(715)=8, T(716)=4, T(717)=8, T(718)=1, T(719)=6, T(720)=5, T(721)=6, T(722)=2, T(723)=7, T(724)=4, T(725)=3, T(726)=4, T(727)=6, T(728)=3, T(729)=5, T(730)=4, T(731)=7, T(732)=8, T(733)=6, T(734)=2, T(735)=4, T(736)=7, T(737)=7, T(738)=4, T(739)=7, T(740)=4, T(741)=5, T(742)=7, T(743)=2, T(744)=4, T(745)=4, T(746)=4, T(747)=3, T(748)=3, T(749)=7, T(750)=2, T(751)=5, T(752)=6, T(753)=8, T(754)=1, T(755)=6, T(756)=5, T(757)=8, T(758)=3, T(759)=5, T(760)=5, T(761)=1, T(762)=3, T(763)=1, T(764)=8, T(765)=5, T(766)=8, T(767)=8, T(768)=1, T(769)=5, T(770)=5, T(771)=1, T(772)=8, T(773)=1, T(774)=1, T(775)=1, T(776)=1, T(777)=8, T(778)=5, T(779)=4, T(780)=2, T(781)=6, T(782)=4, T(783)=5, T(784)=1, T(785)=5, T(786)=7, T(787)=4, T(788)=5, T(789)=6, T(790)=1, T(791)=7, T(792)=2, T(793)=7, T(794)=1, T(795)=6, T(796)=7, T(797)=5, T(798)=8, T(799)=3, T(800)=8, T(801)=8, T(802)=6, T(803)=2, T(804)=5, T(805)=4, T(806)=3, T(807)=5, T(808)=6, T(809)=8, T(810)=1, T(811)=1, T(812)=2, T(813)=4, T(814)=4, T(815)=6, T(816)=5, T(817)=3, T(818)=8, T(819)=7, T(820)=1, T(821)=8, T(822)=5, T(823)=6, T(824)=5, T(825)=4, T(826)=2, T(827)=1, T(828)=8, T(829)=2, T(830)=6, T(831)=4, T(832)=8, T(833)=3, T(834)=7, T(835)=4, T(836)=3, T(837)=5, T(838)=6, T(839)=6, T(840)=7, T(841)=2, T(842)=3, T(843)=2, T(844)=7, T(845)=4, T(846)=3, T(847)=8, T(848)=4, T(849)=1, T(850)=4, T(851)=3, T(852)=4, T(853)=1, T(854)=1, T(855)=2, T(856)=2, T(857)=4, T(858)=4, T(859)=1, T(860)=5, T(861)=3, T(862)=3, T(863)=1, T(864)=8, T(865)=5, T(866)=2, T(867)=8, T(868)=8, T(869)=6, T(870)=7, T(871)=7, T(872)=6, T(873)=6, T(874)=7, T(875)=8, T(876)=1, T(877)=6, T(878)=7, T(879)=5, T(880)=4, T(881)=3, T(882)=3, T(883)=3, T(884)=4, T(885)=4, T(886)=1, T(887)=4, T(888)=6, T(889)=4, T(890)=2, T(891)=4, T(892)=7, T(893)=6, T(894)=7, T(895)=3, T(896)=6, T(897)=7, T(898)=4, T(899)=3, T(900)=3, T(901)=3, T(902)=4, T(903)=3, T(904)=6, T(905)=6, T(906)=2, T(907)=2, T(908)=2, T(909)=7, T(910)=5, T(911)=8, T(912)=8, T(913)=4, T(914)=7, T(915)=7, T(916)=2, T(917)=6, T(918)=1, T(919)=6, T(920)=3, T(921)=7, T(922)=3, T(923)=3, T(924)=3, T(925)=3, T(926)=4, T(927)=1, T(928)=7, T(929)=6, T(930)=6, T(931)=6, T(932)=5, T(933)=8, T(934)=4, T(935)=6, T(936)=3, T(937)=2, T(938)=8, T(939)=2, T(940)=1, T(941)=2, T(942)=7, T(943)=2, T(944)=2, T(945)=3, T(946)=3, T(947)=2, T(948)=4, T(949)=7, T(950)=6, T(951)=6, T(952)=4, T(953)=1, T(954)=6, T(955)=8, T(956)=5, T(957)=2, T(958)=2, T(959)=1, T(960)=3, T(961)=7, T(962)=4, T(963)=8, T(964)=2, T(965)=2, T(966)=5, T(967)=4, T(968)=5, T(969)=1, T(970)=1, T(971)=8, T(972)=6, T(973)=8, T(974)=5, T(975)=8, T(976)=7, T(977)=5, T(978)=3, T(979)=5, T(980)=8, T(981)=8, T(982)=1, T(983)=2, T(984)=4, T(985)=4, T(986)=6, T(987)=1, T(988)=3, T(989)=1, T(990)=4, T(991)=5, T(992)=2, T(993)=7, T(994)=8, T(995)=5, T(996)=2, T(997)=3, T(998)=1, T(999)=8, T(1000)=2, T(1001)=4, T(1002)=4, T(1003)=8, T(1004)=2, T(1005)=2, T(1006)=5, T(1007)=3, T(1008)=6, T(1009)=8, T(1010)=3, T(1011)=8, T(1012)=8, T(1013)=6, T(1014)=3, T(1015)=7, T(1016)=8, T(1017)=7, T(1018)=3, T(1019)=8, T(1020)=7, T(1021)=6, T(1022)=3, T(1023)=1, T(1024)=2, T(1025)=2, T(1026)=8, T(1027)=6, T(1028)=7, T(1029)=2, T(1030)=1, T(1031)=4, T(1032)=2, T(1033)=1, T(1034)=4, T(1035)=7, T(1036)=5, T(1037)=1, T(1038)=5, T(1039)=4, T(1040)=8, T(1041)=5, T(1042)=1, T(1043)=1, T(1044)=1, T(1045)=4, T(1046)=2, T(1047)=5, T(1048)=2, T(1049)=1, T(1050)=4, T(1051)=5, T(1052)=5, T(1053)=8, T(1054)=4, T(1055)=8, T(1056)=8, T(1057)=1, T(1058)=7, T(1059)=8, T(1060)=2, T(1061)=4, T(1062)=6, T(1063)=1, T(1064)=6, T(1065)=6, T(1066)=2, T(1067)=2, T(1068)=8, T(1069)=4, T(1070)=4, T(1071)=2, T(1072)=2, T(1073)=6, T(1074)=4, T(1075)=1, T(1076)=4, T(1077)=5, T(1078)=3, T(1079)=8, T(1080)=4, T(1081)=2, T(1082)=6, T(1083)=7, T(1084)=5, T(1085)=4, T(1086)=5, T(1087)=8, T(1088)=5, T(1089)=2, T(1090)=6, T(1091)=4, T(1092)=4, T(1093)=6, T(1094)=5, T(1095)=8, T(1096)=7, T(1097)=3, T(1098)=8, T(1099)=8, T(1100)=8, T(1101)=1, T(1102)=8, T(1103)=2, T(1104)=2, T(1105)=4, T(1106)=2, T(1107)=6, T(1108)=1, T(1109)=3, T(1110)=6, T(1111)=4, T(1112)=1, T(1113)=4, T(1114)=8, T(1115)=2, T(1116)=6, T(1117)=4, T(1118)=6, T(1119)=4, T(1120)=8, T(1121)=3, T(1122)=1, T(1123)=3, T(1124)=7, T(1125)=4, T(1126)=5,

T(1)%=0.0014, T(2)%=0.0014, T(3)%=0.0014, T(4)%=0.0012, T(5)%=0.001, T(6)%=0.0014, T(7)%=0.0012, T(8)%=0.0016, T(9)%=4e-04, T(10)%=4e-04, T(11)%=0.0014, T(12)%=8e-04, T(13)%=0.0014, T(14)%=6e-04, T(15)%=8e-04, T(16)%=4e-04, T(17)%=0.0014, T(18)%=0.001, T(19)%=0.0014, T(20)%=6e-04, T(21)%=8e-04, T(22)%=4e-04, T(23)%=4e-04, T(24)%=0.0012, T(25)%=6e-04, T(26)%=4e-04, T(27)%=0.0012, T(28)%=2e-04, T(29)%=0.0016, T(30)%=0.0016, T(31)%=0.0012, T(32)%=6e-04, T(33)%=0.0014, T(34)%=8e-04, T(35)%=4e-04, T(36)%=8e-04, T(37)%=0.0016, T(38)%=8e-04, T(39)%=0.0014, T(40)%=4e-04, T(41)%=8e-04, T(42)%=0.001, T(43)%=6e-04, T(44)%=8e-04, T(45)%=0.0016, T(46)%=6e-04, T(47)%=8e-04, T(48)%=8e-04, T(49)%=8e-04, T(50)%=0.0014, T(51)%=0.0016, T(52)%=0.0012, T(53)%=0.001, T(54)%=2e-04, T(55)%=8e-04, T(56)%=0.001, T(57)%=6e-04, T(58)%=0.0014, T(59)%=0.0016, T(60)%=2e-04, T(61)%=0.001, T(62)%=0.0016, T(63)%=0.0012, T(64)%=2e-04, T(65)%=0.0016, T(66)%=0.0012, T(67)%=6e-04, T(68)%=0.0012, T(69)%=4e-04, T(70)%=2e-04, T(71)%=0.0016, T(72)%=4e-04, T(73)%=8e-04, T(74)%=0.0014, T(75)%=0.0012, T(76)%=4e-04, T(77)%=8e-04, T(78)%=6e-04, T(79)%=0.0012, T(80)%=0.0016, T(81)%=6e-04, T(82)%=8e-04, T(83)%=4e-04, T(84)%=8e-04, T(85)%=0.0014, T(86)%=4e-04, T(87)%=2e-04, T(88)%=0.0014, T(89)%=8e-04, T(90)%=0.0016, T(91)%=0.0016, T(92)%=0.0012, T(93)%=2e-04, T(94)%=2e-04, T(95)%=2e-04, T(96)%=2e-04, T(97)%=2e-04, T(98)%=8e-04, T(99)%=0.001, T(100)%=8e-04, T(101)%=0.0012, T(102)%=0.001, T(103)%=0.001, T(104)%=0.001, T(105)%=4e-04, T(106)%=4e-04, T(107)%=0.0014, T(108)%=0.0012, T(109)%=2e-04, T(110)%=2e-04, T(111)%=0.0012, T(112)%=0.001, T(113)%=0.0012, T(114)%=0.001, T(115)%=8e-04, T(116)%=0.0014, T(117)%=0.001, T(118)%=4e-04, T(119)%=4e-04, T(120)%=4e-04, T(121)%=0.0012, T(122)%=0.0016, T(123)%=0.0016, T(124)%=4e-04, T(125)%=0.0014, T(126)%=0.0016, T(127)%=0.001, T(128)%=0.001, T(129)%=8e-04, T(130)%=0.0012, T(131)%=8e-04, T(132)%=0.0012, T(133)%=6e-04, T(134)%=0.001, T(135)%=0.0014, T(136)%=2e-04, T(137)%=0.0016, T(138)%=0.0014, T(139)%=0.0016, T(140)%=0.0014, T(141)%=2e-04, T(142)%=0.0012, T(143)%=0.0016, T(144)%=0.0012, T(145)%=0.0012, T(146)%=4e-04, T(147)%=4e-04, T(148)%=2e-04, T(149)%=0.0016, T(150)%=0.0014, T(151)%=0.001, T(152)%=8e-04, T(153)%=0.001, T(154)%=0.0012, T(155)%=6e-04, T(156)%=0.001, T(157)%=6e-04, T(158)%=0.0012, T(159)%=0.0014, T(160)%=4e-04, T(161)%=8e-04, T(162)%=0.0014, T(163)%=8e-04, T(164)%=0.0016, T(165)%=0.0014, T(166)%=4e-04, T(167)%=0.0014, T(168)%=6e-04, T(169)%=2e-04, T(170)%=8e-04, T(171)%=0.001, T(172)%=8e-04, T(173)%=0.0014, T(174)%=2e-04, T(175)%=8e-04, T(176)%=0.0014, T(177)%=4e-04, T(178)%=6e-04, T(179)%=0.0016, T(180)%=0.0014, T(181)%=0.001, T(182)%=8e-04, T(183)%=4e-04, T(184)%=0.0012, T(185)%=0.0012, T(186)%=0.001, T(187)%=0.0014, T(188)%=0.0014, T(189)%=0.001, T(190)%=4e-04, T(191)%=0.0014, T(192)%=2e-04, T(193)%=0.001, T(194)%=8e-04, T(195)%=0.0016, T(196)%=0.0014, T(197)%=0.0014, T(198)%=0.001, T(199)%=0.0014, T(200)%=0.0012, T(201)%=2e-04, T(202)%=0.001, T(203)%=0.0014, T(204)%=0.0014, T(205)%=0.001, T(206)%=0.0012, T(207)%=2e-04, T(208)%=4e-04, T(209)%=2e-04, T(210)%=4e-04, T(211)%=4e-04, T(212)%=2e-04, T(213)%=0.0016, T(214)%=4e-04, T(215)%=0.0012, T(216)%=0.001, T(217)%=6e-04, T(218)%=0.0014, T(219)%=0.0016, T(220)%=6e-04, T(221)%=8e-04, T(222)%=8e-04, T(223)%=6e-04, T(224)%=6e-04, T(225)%=2e-04, T(226)%=2e-04, T(227)%=4e-04, T(228)%=4e-04, T(229)%=0.001, T(230)%=0.0016, T(231)%=8e-04, T(232)%=0.0016, T(233)%=0.001, T(234)%=0.0014, T(235)%=2e-04, T(236)%=0.0012, T(237)%=0.0014, T(238)%=0.0012, T(239)%=2e-04, T(240)%=4e-04, T(241)%=0.0014, T(242)%=4e-04, T(243)%=6e-04, T(244)%=2e-04, T(245)%=6e-04, T(246)%=6e-04, T(247)%=2e-04, T(248)%=4e-04, T(249)%=0.0016, T(250)%=8e-04, T(251)%=4e-04, T(252)%=8e-04, T(253)%=2e-04, T(254)%=0.001, T(255)%=0.001, T(256)%=0.001, T(257)%=6e-04, T(258)%=0.0014, T(259)%=0.001, T(260)%=0.001, T(261)%=0.0014, T(262)%=6e-04, T(263)%=4e-04, T(264)%=0.0012, T(265)%=2e-04, T(266)%=0.0014, T(267)%=0.0016, T(268)%=0.0016, T(269)%=0.0012, T(270)%=0.001, T(271)%=2e-04, T(272)%=6e-04, T(273)%=0.001, T(274)%=0.0014, T(275)%=0.0016, T(276)%=6e-04, T(277)%=0.001, T(278)%=0.001, T(279)%=0.0016, T(280)%=8e-04, T(281)%=0.0016, T(282)%=0.0014, T(283)%=2e-04, T(284)%=2e-04, T(285)%=4e-04, T(286)%=0.0014, T(287)%=6e-04, T(288)%=8e-04, T(289)%=8e-04, T(290)%=0.0016, T(291)%=2e-04, T(292)%=4e-04, T(293)%=0.0014, T(294)%=8e-04, T(295)%=0.0014, T(296)%=8e-04, T(297)%=0.0016, T(298)%=2e-04, T(299)%=6e-04, T(300)%=0.0016, T(301)%=0.0014, T(302)%=6e-04, T(303)%=0.0012, T(304)%=0.0012, T(305)%=0.0012, T(306)%=0.0014, T(307)%=8e-04, T(308)%=6e-04, T(309)%=0.001, T(310)%=4e-04, T(311)%=0.0016, T(312)%=0.0016, T(313)%=0.001, T(314)%=2e-04, T(315)%=2e-04, T(316)%=0.0012, T(317)%=4e-04, T(318)%=8e-04, T(319)%=2e-04, T(320)%=4e-04, T(321)%=6e-04, T(322)%=8e-04, T(323)%=0.001, T(324)%=6e-04, T(325)%=0.0016, T(326)%=0.0012, T(327)%=0.0014, T(328)%=0.001, T(329)%=0.001, T(330)%=8e-04, T(331)%=0.0012, T(332)%=0.0016, T(333)%=4e-04, T(334)%=0.0014, T(335)%=6e-04, T(336)%=2e-04, T(337)%=2e-04, T(338)%=6e-04, T(339)%=0.0012, T(340)%=2e-04, T(341)%=0.0014, T(342)%=6e-04, T(343)%=0.001, T(344)%=2e-04, T(345)%=8e-04, T(346)%=6e-04, T(347)%=0.0014, T(348)%=0.0016, T(349)%=6e-04, T(350)%=2e-04, T(351)%=0.0012, T(352)%=6e-04, T(353)%=6e-04, T(354)%=0.0014, T(355)%=0.0014, T(356)%=0.0012, T(357)%=8e-04, T(358)%=8e-04, T(359)%=0.0016, T(360)%=2e-04, T(361)%=0.001, T(362)%=0.001, T(363)%=0.0012, T(364)%=4e-04, T(365)%=6e-04, T(366)%=6e-04, T(367)%=4e-04, T(368)%=0.0012, T(369)%=0.0012, T(370)%=4e-04, T(371)%=8e-04, T(372)%=8e-04, T(373)%=2e-04, T(374)%=0.0016, T(375)%=0.0016, T(376)%=2e-04, T(377)%=0.0016, T(378)%=2e-04, T(379)%=6e-04, T(380)%=0.0014, T(381)%=0.0014, T(382)%=0.0014, T(383)%=0.0016, T(384)%=0.0016, T(385)%=0.001, T(386)%=4e-04, T(387)%=2e-04, T(388)%=8e-04, T(389)%=0.0014, T(390)%=8e-04, T(391)%=4e-04, T(392)%=6e-04, T(393)%=6e-04, T(394)%=6e-04, T(395)%=0.0014, T(396)%=2e-04, T(397)%=0.0016, T(398)%=2e-04, T(399)%=0.001, T(400)%=0.001, T(401)%=0.001, T(402)%=0.0012, T(403)%=0.0012, T(404)%=2e-04, T(405)%=8e-04, T(406)%=0.001, T(407)%=0.0014, T(408)%=4e-04, T(409)%=0.0012, T(410)%=0.0016, T(411)%=8e-04, T(412)%=0.0012, T(413)%=6e-04, T(414)%=6e-04, T(415)%=8e-04, T(416)%=0.0016, T(417)%=6e-04, T(418)%=0.0014, T(419)%=4e-04, T(420)%=0.001, T(421)%=0.001, T(422)%=0.001, T(423)%=2e-04, T(424)%=0.0012, T(425)%=2e-04, T(426)%=8e-04, T(427)%=2e-04, T(428)%=0.001, T(429)%=6e-04, T(430)%=8e-04, T(431)%=8e-04, T(432)%=0.001, T(433)%=4e-04, T(434)%=2e-04, T(435)%=0.0014, T(436)%=0.0014, T(437)%=0.001, T(438)%=4e-04, T(439)%=0.0014, T(440)%=8e-04, T(441)%=4e-04, T(442)%=2e-04, T(443)%=4e-04, T(444)%=6e-04, T(445)%=0.0014, T(446)%=0.0014, T(447)%=0.0012, T(448)%=0.0012, T(449)%=0.0014, T(450)%=4e-04, T(451)%=6e-04, T(452)%=4e-04, T(453)%=0.0014, T(454)%=4e-04, T(455)%=2e-04, T(456)%=0.0014, T(457)%=8e-04, T(458)%=0.001, T(459)%=0.001, T(460)%=0.0012, T(461)%=0.0012, T(462)%=6e-04, T(463)%=8e-04, T(464)%=8e-04, T(465)%=0.0012, T(466)%=0.001, T(467)%=0.0014, T(468)%=6e-04, T(469)%=2e-04, T(470)%=4e-04, T(471)%=2e-04, T(472)%=2e-04, T(473)%=0.0014, T(474)%=6e-04, T(475)%=4e-04, T(476)%=6e-04, T(477)%=0.001, T(478)%=0.001, T(479)%=0.0016, T(480)%=4e-04, T(481)%=8e-04, T(482)%=4e-04, T(483)%=6e-04, T(484)%=8e-04, T(485)%=4e-04, T(486)%=2e-04, T(487)%=8e-04, T(488)%=8e-04, T(489)%=0.001, T(490)%=8e-04, T(491)%=0.0014, T(492)%=6e-04, T(493)%=6e-04, T(494)%=6e-04, T(495)%=0.001, T(496)%=0.0016, T(497)%=4e-04, T(498)%=0.0016, T(499)%=0.0014, T(500)%=0.0014, T(501)%=0.0014, T(502)%=2e-04, T(503)%=8e-04, T(504)%=4e-04, T(505)%=4e-04, T(506)%=0.0016, T(507)%=0.0014, T(508)%=6e-04, T(509)%=8e-04, T(510)%=2e-04, T(511)%=2e-04, T(512)%=0.0014, T(513)%=0.0014, T(514)%=0.0012, T(515)%=4e-04, T(516)%=4e-04, T(517)%=6e-04, T(518)%=0.0016, T(519)%=4e-04, T(520)%=0.0016, T(521)%=6e-04, T(522)%=6e-04, T(523)%=0.001, T(524)%=2e-04, T(525)%=4e-04, T(526)%=0.0012, T(527)%=8e-04, T(528)%=6e-04, T(529)%=0.0014, T(530)%=4e-04, T(531)%=0.001, T(532)%=2e-04, T(533)%=6e-04, T(534)%=6e-04, T(535)%=2e-04, T(536)%=4e-04, T(537)%=0.0014, T(538)%=2e-04, T(539)%=2e-04, T(540)%=0.001, T(541)%=8e-04, T(542)%=2e-04, T(543)%=0.0014, T(544)%=6e-04, T(545)%=2e-04, T(546)%=6e-04, T(547)%=0.0012, T(548)%=0.0016, T(549)%=4e-04, T(550)%=0.0016, T(551)%=0.0012, T(552)%=6e-04, T(553)%=8e-04, T(554)%=2e-04, T(555)%=0.0016, T(556)%=4e-04, T(557)%=6e-04, T(558)%=0.0012, T(559)%=2e-04, T(560)%=2e-04, T(561)%=0.0014, T(562)%=8e-04, T(563)%=0.0012, T(564)%=4e-04, T(565)%=0.0016, T(566)%=0.001, T(567)%=0.0014, T(568)%=0.0014, T(569)%=0.0014, T(570)%=8e-04, T(571)%=0.001, T(572)%=8e-04, T(573)%=4e-04, T(574)%=2e-04, T(575)%=4e-04, T(576)%=2e-04, T(577)%=4e-04, T(578)%=0.0014, T(579)%=2e-04, T(580)%=0.001, T(581)%=0.001, T(582)%=2e-04, T(583)%=0.0012, T(584)%=6e-04, T(585)%=0.001, T(586)%=4e-04, T(587)%=0.0012, T(588)%=2e-04, T(589)%=0.0014, T(590)%=4e-04, T(591)%=0.0012, T(592)%=0.0012, T(593)%=2e-04, T(594)%=6e-04, T(595)%=8e-04, T(596)%=0.001, T(597)%=8e-04, T(598)%=2e-04, T(599)%=8e-04, T(600)%=0.0016, T(601)%=0.0016, T(602)%=6e-04, T(603)%=0.001, T(604)%=4e-04, T(605)%=2e-04, T(606)%=0.001, T(607)%=6e-04, T(608)%=2e-04, T(609)%=4e-04, T(610)%=0.001, T(611)%=0.0012, T(612)%=0.0014, T(613)%=0.001, T(614)%=8e-04, T(615)%=4e-04, T(616)%=0.0012, T(617)%=6e-04, T(618)%=8e-04, T(619)%=4e-04, T(620)%=0.001, T(621)%=0.001, T(622)%=6e-04, T(623)%=2e-04, T(624)%=4e-04, T(625)%=0.0016, T(626)%=0.0012, T(627)%=8e-04, T(628)%=0.0016, T(629)%=0.001, T(630)%=4e-04, T(631)%=6e-04, T(632)%=0.0014, T(633)%=2e-04, T(634)%=0.001, T(635)%=0.0016, T(636)%=4e-04, T(637)%=0.0012, T(638)%=4e-04, T(639)%=0.0012, T(640)%=6e-04, T(641)%=6e-04, T(642)%=0.0012, T(643)%=0.001, T(644)%=6e-04, T(645)%=8e-04, T(646)%=0.0012, T(647)%=0.001, T(648)%=8e-04, T(649)%=4e-04, T(650)%=2e-04, T(651)%=0.0016, T(652)%=0.0016, T(653)%=2e-04, T(654)%=0.0014, T(655)%=2e-04, T(656)%=0.001, T(657)%=8e-04, T(658)%=8e-04, T(659)%=0.0014, T(660)%=0.0012, T(661)%=0.0012, T(662)%=0.0014, T(663)%=0.001, T(664)%=0.0014, T(665)%=6e-04, T(666)%=0.0012, T(667)%=0.001, T(668)%=4e-04, T(669)%=6e-04, T(670)%=6e-04, T(671)%=0.0012, T(672)%=6e-04, T(673)%=8e-04, T(674)%=0.0012, T(675)%=4e-04, T(676)%=0.0014, T(677)%=0.001, T(678)%=0.0012, T(679)%=4e-04, T(680)%=2e-04, T(681)%=0.001, T(682)%=0.0012, T(683)%=4e-04, T(684)%=0.0014, T(685)%=2e-04, T(686)%=6e-04, T(687)%=0.0012, T(688)%=0.0014, T(689)%=0.0016, T(690)%=8e-04, T(691)%=8e-04, T(692)%=0.0012, T(693)%=0.001, T(694)%=2e-04, T(695)%=2e-04, T(696)%=4e-04, T(697)%=0.0016, T(698)%=0.0014, T(699)%=0.001, T(700)%=0.0016, T(701)%=8e-04, T(702)%=2e-04, T(703)%=0.0012, T(704)%=0.0014, T(705)%=4e-04, T(706)%=0.0016, T(707)%=0.0012, T(708)%=6e-04, T(709)%=2e-04, T(710)%=0.0014, T(711)%=6e-04, T(712)%=0.0014, T(713)%=0.001, T(714)%=0.0014, T(715)%=0.0016, T(716)%=8e-04, T(717)%=0.0016, T(718)%=2e-04, T(719)%=0.0012, T(720)%=0.001, T(721)%=0.0012, T(722)%=4e-04, T(723)%=0.0014, T(724)%=8e-04, T(725)%=6e-04, T(726)%=8e-04, T(727)%=0.0012, T(728)%=6e-04, T(729)%=0.001, T(730)%=8e-04, T(731)%=0.0014, T(732)%=0.0016, T(733)%=0.0012, T(734)%=4e-04, T(735)%=8e-04, T(736)%=0.0014, T(737)%=0.0014, T(738)%=8e-04, T(739)%=0.0014, T(740)%=8e-04, T(741)%=0.001, T(742)%=0.0014, T(743)%=4e-04, T(744)%=8e-04, T(745)%=8e-04, T(746)%=8e-04, T(747)%=6e-04, T(748)%=6e-04, T(749)%=0.0014, T(750)%=4e-04, T(751)%=0.001, T(752)%=0.0012, T(753)%=0.0016, T(754)%=2e-04, T(755)%=0.0012, T(756)%=0.001, T(757)%=0.0016, T(758)%=6e-04, T(759)%=0.001, T(760)%=0.001, T(761)%=2e-04, T(762)%=6e-04, T(763)%=2e-04, T(764)%=0.0016, T(765)%=0.001, T(766)%=0.0016, T(767)%=0.0016, T(768)%=2e-04, T(769)%=0.001, T(770)%=0.001, T(771)%=2e-04, T(772)%=0.0016, T(773)%=2e-04, T(774)%=2e-04, T(775)%=2e-04, T(776)%=2e-04, T(777)%=0.0016, T(778)%=0.001, T(779)%=8e-04, T(780)%=4e-04, T(781)%=0.0012, T(782)%=8e-04, T(783)%=0.001, T(784)%=2e-04, T(785)%=0.001, T(786)%=0.0014, T(787)%=8e-04, T(788)%=0.001, T(789)%=0.0012, T(790)%=2e-04, T(791)%=0.0014, T(792)%=4e-04, T(793)%=0.0014, T(794)%=2e-04, T(795)%=0.0012, T(796)%=0.0014, T(797)%=0.001, T(798)%=0.0016, T(799)%=6e-04, T(800)%=0.0016, T(801)%=0.0016, T(802)%=0.0012, T(803)%=4e-04, T(804)%=0.001, T(805)%=8e-04, T(806)%=6e-04, T(807)%=0.001, T(808)%=0.0012, T(809)%=0.0016, T(810)%=2e-04, T(811)%=2e-04, T(812)%=4e-04, T(813)%=8e-04, T(814)%=8e-04, T(815)%=0.0012, T(816)%=0.001, T(817)%=6e-04, T(818)%=0.0016, T(819)%=0.0014, T(820)%=2e-04, T(821)%=0.0016, T(822)%=0.001, T(823)%=0.0012, T(824)%=0.001, T(825)%=8e-04, T(826)%=4e-04, T(827)%=2e-04, T(828)%=0.0016, T(829)%=4e-04, T(830)%=0.0012, T(831)%=8e-04, T(832)%=0.0016, T(833)%=6e-04, T(834)%=0.0014, T(835)%=8e-04, T(836)%=6e-04, T(837)%=0.001, T(838)%=0.0012, T(839)%=0.0012, T(840)%=0.0014, T(841)%=4e-04, T(842)%=6e-04, T(843)%=4e-04, T(844)%=0.0014, T(845)%=8e-04, T(846)%=6e-04, T(847)%=0.0016, T(848)%=8e-04, T(849)%=2e-04, T(850)%=8e-04, T(851)%=6e-04, T(852)%=8e-04, T(853)%=2e-04, T(854)%=2e-04, T(855)%=4e-04, T(856)%=4e-04, T(857)%=8e-04, T(858)%=8e-04, T(859)%=2e-04, T(860)%=0.001, T(861)%=6e-04, T(862)%=6e-04, T(863)%=2e-04, T(864)%=0.0016, T(865)%=0.001, T(866)%=4e-04, T(867)%=0.0016, T(868)%=0.0016, T(869)%=0.0012, T(870)%=0.0014, T(871)%=0.0014, T(872)%=0.0012, T(873)%=0.0012, T(874)%=0.0014, T(875)%=0.0016, T(876)%=2e-04, T(877)%=0.0012, T(878)%=0.0014, T(879)%=0.001, T(880)%=8e-04, T(881)%=6e-04, T(882)%=6e-04, T(883)%=6e-04, T(884)%=8e-04, T(885)%=8e-04, T(886)%=2e-04, T(887)%=8e-04, T(888)%=0.0012, T(889)%=8e-04, T(890)%=4e-04, T(891)%=8e-04, T(892)%=0.0014, T(893)%=0.0012, T(894)%=0.0014, T(895)%=6e-04, T(896)%=0.0012, T(897)%=0.0014, T(898)%=8e-04, T(899)%=6e-04, T(900)%=6e-04, T(901)%=6e-04, T(902)%=8e-04, T(903)%=6e-04, T(904)%=0.0012, T(905)%=0.0012, T(906)%=4e-04, T(907)%=4e-04, T(908)%=4e-04, T(909)%=0.0014, T(910)%=0.001, T(911)%=0.0016, T(912)%=0.0016, T(913)%=8e-04, T(914)%=0.0014, T(915)%=0.0014, T(916)%=4e-04, T(917)%=0.0012, T(918)%=2e-04, T(919)%=0.0012, T(920)%=6e-04, T(921)%=0.0014, T(922)%=6e-04, T(923)%=6e-04, T(924)%=6e-04, T(925)%=6e-04, T(926)%=8e-04, T(927)%=2e-04, T(928)%=0.0014, T(929)%=0.0012, T(930)%=0.0012, T(931)%=0.0012, T(932)%=0.001, T(933)%=0.0016, T(934)%=8e-04, T(935)%=0.0012, T(936)%=6e-04, T(937)%=4e-04, T(938)%=0.0016, T(939)%=4e-04, T(940)%=2e-04, T(941)%=4e-04, T(942)%=0.0014, T(943)%=4e-04, T(944)%=4e-04, T(945)%=6e-04, T(946)%=6e-04, T(947)%=4e-04, T(948)%=8e-04, T(949)%=0.0014, T(950)%=0.0012, T(951)%=0.0012, T(952)%=8e-04, T(953)%=2e-04, T(954)%=0.0012, T(955)%=0.0016, T(956)%=0.001, T(957)%=4e-04, T(958)%=4e-04, T(959)%=2e-04, T(960)%=6e-04, T(961)%=0.0014, T(962)%=8e-04, T(963)%=0.0016, T(964)%=4e-04, T(965)%=4e-04, T(966)%=0.001, T(967)%=8e-04, T(968)%=0.001, T(969)%=2e-04, T(970)%=2e-04, T(971)%=0.0016, T(972)%=0.0012, T(973)%=0.0016, T(974)%=0.001, T(975)%=0.0016, T(976)%=0.0014, T(977)%=0.001, T(978)%=6e-04, T(979)%=0.001, T(980)%=0.0016, T(981)%=0.0016, T(982)%=2e-04, T(983)%=4e-04, T(984)%=8e-04, T(985)%=8e-04, T(986)%=0.0012, T(987)%=2e-04, T(988)%=6e-04, T(989)%=2e-04, T(990)%=8e-04, T(991)%=0.001, T(992)%=4e-04, T(993)%=0.0014, T(994)%=0.0016, T(995)%=0.001, T(996)%=4e-04, T(997)%=6e-04, T(998)%=2e-04, T(999)%=0.0016, T(1000)%=4e-04, T(1001)%=8e-04, T(1002)%=8e-04, T(1003)%=0.0016, T(1004)%=4e-04, T(1005)%=4e-04, T(1006)%=0.001, T(1007)%=6e-04, T(1008)%=0.0012, T(1009)%=0.0016, T(1010)%=6e-04, T(1011)%=0.0016, T(1012)%=0.0016, T(1013)%=0.0012, T(1014)%=6e-04, T(1015)%=0.0014, T(1016)%=0.0016, T(1017)%=0.0014, T(1018)%=6e-04, T(1019)%=0.0016, T(1020)%=0.0014, T(1021)%=0.0012, T(1022)%=6e-04, T(1023)%=2e-04, T(1024)%=4e-04, T(1025)%=4e-04, T(1026)%=0.0016, T(1027)%=0.0012, T(1028)%=0.0014, T(1029)%=4e-04, T(1030)%=2e-04, T(1031)%=8e-04, T(1032)%=4e-04, T(1033)%=2e-04, T(1034)%=8e-04, T(1035)%=0.0014, T(1036)%=0.001, T(1037)%=2e-04, T(1038)%=0.001, T(1039)%=8e-04, T(1040)%=0.0016, T(1041)%=0.001, T(1042)%=2e-04, T(1043)%=2e-04, T(1044)%=2e-04, T(1045)%=8e-04, T(1046)%=4e-04, T(1047)%=0.001, T(1048)%=4e-04, T(1049)%=2e-04, T(1050)%=8e-04, T(1051)%=0.001, T(1052)%=0.001, T(1053)%=0.0016, T(1054)%=8e-04, T(1055)%=0.0016, T(1056)%=0.0016, T(1057)%=2e-04, T(1058)%=0.0014, T(1059)%=0.0016, T(1060)%=4e-04, T(1061)%=8e-04, T(1062)%=0.0012, T(1063)%=2e-04, T(1064)%=0.0012, T(1065)%=0.0012, T(1066)%=4e-04, T(1067)%=4e-04, T(1068)%=0.0016, T(1069)%=8e-04, T(1070)%=8e-04, T(1071)%=4e-04, T(1072)%=4e-04, T(1073)%=0.0012, T(1074)%=8e-04, T(1075)%=2e-04, T(1076)%=8e-04, T(1077)%=0.001, T(1078)%=6e-04, T(1079)%=0.0016, T(1080)%=8e-04, T(1081)%=4e-04, T(1082)%=0.0012, T(1083)%=0.0014, T(1084)%=0.001, T(1085)%=8e-04, T(1086)%=0.001, T(1087)%=0.0016, T(1088)%=0.001, T(1089)%=4e-04, T(1090)%=0.0012, T(1091)%=8e-04, T(1092)%=8e-04, T(1093)%=0.0012, T(1094)%=0.001, T(1095)%=0.0016, T(1096)%=0.0014, T(1097)%=6e-04, T(1098)%=0.0016, T(1099)%=0.0016, T(1100)%=0.0016, T(1101)%=2e-04, T(1102)%=0.0016, T(1103)%=4e-04, T(1104)%=4e-04, T(1105)%=8e-04, T(1106)%=4e-04, T(1107)%=0.0012, T(1108)%=2e-04, T(1109)%=6e-04, T(1110)%=0.0012, T(1111)%=8e-04, T(1112)%=2e-04, T(1113)%=8e-04, T(1114)%=0.0016, T(1115)%=4e-04, T(1116)%=0.0012, T(1117)%=8e-04, T(1118)%=0.0012, T(1119)%=8e-04, T(1120)%=0.0016, T(1121)%=6e-04, T(1122)%=2e-04, T(1123)%=6e-04, T(1124)%=0.0014, T(1125)%=8e-04, T(1126)%=0.001, )

Comparing the results I can see that the people in line don’t vary too much, but they seem to all be waiting the same amount in line, the way I expected it to work. In the larger system the values are lower in percent, as most everybody spends around 2-10 minutes in line, the results are just skewed by dividing it by the total number of minutes at the end of the simulation

**Question 3**

Clock = 96 -> 98 (timeDiff = 2)

Event = A (Next = D)

Future events = (A, 102)

state(LS = 1, LQ = 20, prevST = 4, ST = 4)

stats(N = 29, NW = 28, WS = 98, WQ = 966, T0 = 0, Tmax = 98)

Clock = 98 -> 100 (timeDiff = 2)

Event = D (Next = E)

Future events = (D, 103)

state(LS = 1, LQ = 19, prevST = 4, ST = 5)

stats(N = 29, NW = 28, WS = 100, WQ = 1004, T0 = 0, Tmax = 100)

Clock = 100 -> 102 (timeDiff = 2)

Event = E (Next = A)

Future events = no new events generated

state(LS = 1, LQ = 19, prevST = 4, ST = 5)

stats(N = 29, NW = 28, WS = 100, WQ = 1004, T0 = 0, Tmax = 100)

As the system is run, the St Value increases. ST = round(random.serviceTime() \* prevST / avgST), this would make sense as average service time is lowered.

I changed the behaviour of avgST to take the last ST value, half it, and make it the start number for a number generator. The previous ST value is then multiplied by 2 and set as the high range of the random function. It creates 100 random numbers then takes the median of those numbers and set that to avgST. I think this gives a better value than a static 7.5 because it dynamically changes based on the last time.

Clock = 74 -> 76 (timeDiff = 2)

Event = A (Next = A)

Future events = (A, 76)

state(LS = 1, LQ = 2, prevST = 8, ST = 16)

stats(N = 20, NW = 17, WS = 74, WQ = 136, T0 = 2, Tmax = 76)

Clock = 76 -> 84 (timeDiff = 8)

Event = A (Next = D)

Future events = (A, 84)

state(LS = 1, LQ = 3, prevST = 8, ST = 16)

stats(N = 21, NW = 18, WS = 82, WQ = 160, T0 = 2, Tmax = 84)

Clock = 84 -> 84 (timeDiff = 0)

Event = D (Next = A)

Future events = (D, 139)

state(LS = 1, LQ = 2, prevST = 16, ST = 55)

stats(N = 21, NW = 18, WS = 82, WQ = 160, T0 = 2, Tmax = 84)