Analysis and results

# All the experiments combined

# 

*Figure 16 - Opp+min\_min*



*Figure 17 – Max\_min+FastTrack*



*Figure 18 Opp+FastTrack*

### Opp+min\_min

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_1

ScheduleSim Experiment Results

Min\_Min,Opp,219 <-make, 0.6797077922077922 <-,util 61.927472527472524,

ScheduleSim Experiment Results

Min\_Min,Opp,221 <-make, 0.674002574002574 <-,util 51.68848167539267,151.63076923076923,

ScheduleSim Experiment Results

Min\_Min,Opp,216 <-make, 0.6902896642527979 <-,util 42.74104683195592,110.0,157.27906976744185,

ScheduleSim Experiment Results

Min\_Min,Opp,226 <-make, 0.659565764631844 <-,util 48.079320113314445,104.09375,132.96875,172.63636363636363,

ScheduleSim Experiment Results

Min\_Min,Opp,224 <-make, 0.6647936507936508 <-,util 47.07183908045977,97.3076923076923,117.11538461538461,143.30769230769232,176.69

230769230768,

ScheduleSim Experiment Results

Min\_Min,Opp,244 <-make, 0.6106997084548105 <-,util 101.21470588235294,13.772727272727273,28.19047619047619,47.27272727272727,71.09

52380952381,99.18181818181819,

ScheduleSim Experiment Results

Min\_Min,Opp,438 <-make, 0.34080702896192644 <-,util 52.36,126.09375,186.1578947368421,222.77777777777777,265.2105263157895,317.22222

222222223,380.1578947368421,

ScheduleSim Experiment Results

Min\_Min,Opp,224 <-make, 0.6644126984126983 <-,util 43.77258566978193,82.69444444444444,98.5,108.8125,124.3125,141.0,160.3125,182.6470

5882352942,

ScheduleSim Experiment Results

Min\_Min,Opp,221 <-make, 0.6746782496782497 <-,util 40.93511450381679,67.25287356321839,95.26666666666667,105.5,116.85714285714286,1

31.33333333333334,147.78571428571428,164.07142857142858,184.06666666666666,

ScheduleSim Experiment Results

Min\_Min,Opp,182 <-make, 0.8176424668227947 <-,util 25.074235807860262,46.86776859504132,56.92307692307692,66.3076923076923,74.5384

6153846153,86.53846153846153,99.76923076923077,114.92307692307692,131.230769230

76923,149.3846153846154,

SUCCESS

BUILD SUCCESSFUL (total time: 2 seconds)

### Opp+Max\_min

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_1

ScheduleSim Experiment Results

Max\_Min,Opp,228 <-make, 0.6541796631316282 <-,util 77.3546255506608,

ScheduleSim Experiment Results

Max\_Min,Opp,533 <-make, 0.28027019796682723 <-,util 176.96915167095116,331.83076923076925,

ScheduleSim Experiment Results

Max\_Min,Opp,217 <-make, 0.686435124508519 <-,util 56.868852459016395,150.7674418604651,107.04651162790698,

ScheduleSim Experiment Results

Max\_Min,Opp,173 <-make, 0.8601395730706075 <-,util 49.73446327683616,129.78125,104.21875,67.60606060606061,

ScheduleSim Experiment Results

Max\_Min,Opp,167 <-make, 0.8903486394557824 <-,util 61.554597701149426,111.96153846153847,94.46153846153847,69.73076923076923,39.5

3846153846154,

ScheduleSim Experiment Results

Max\_Min,Opp,223 <-make, 0.6682397959183674 <-,util 56.748520710059175,157.56,166.33333333333334,149.77272727272728,127.8095238095

2381,101.13636363636364,

ScheduleSim Experiment Results

Max\_Min,Opp,213 <-make, 0.6994659546061416 <-,util 48.42727272727273,112.39285714285714,161.89473684210526,149.88888888888889,132

.05263157894737,113.61111111111111,91.21052631578948,

ScheduleSim Experiment Results

Max\_Min,Opp,226 <-make, 0.6592825676526117 <-,util 56.21405750798722,87.69047619047619,177.375,162.0,152.3125,137.4375,116.75,100.88

235294117646,

ScheduleSim Experiment Results

Max\_Min,Opp,185 <-make, 0.8040706605222735 <-,util 45.35036496350365,37.98684210526316,144.93333333333334,137.42857142857142,126.

14285714285714,114.13333333333334,99.28571428571429,82.14285714285714,65.53333

333333333,

ScheduleSim Experiment Results

Max\_Min,Opp,228 <-make, 0.654086088583905 <-,util 60.62,50.12621359223301,182.0,170.76923076923077,162.3846153846154,157.92307692

307693,139.15384615384616,126.07692307692308,114.61538461538461,97.0,

SUCCESS

BUILD SUCCESSFUL (total time: 4 seconds)

### Opp+FastTrack

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_1

ScheduleSim Experiment Results

FastTrack,Opp,311 <-make, 0.4800137362637364 <-,util 71.44370860927152,

ScheduleSim Experiment Results

FastTrack,Opp,566 <-make, 0.2642101284958428 <-,util 181.74742268041237,333.2307692307692,

ScheduleSim Experiment Results

FastTrack,Opp,469 <-make, 0.31834346504559274 <-,util 104.92602739726027,354.48837209302326,232.65116279069767,

ScheduleSim Experiment Results

FastTrack,Opp,563 <-make, 0.26540020263424513 <-,util 160.0280112044818,415.40625,397.65625,271.72727272727275,

ScheduleSim Experiment Results

FastTrack,Opp,290 <-make, 0.5146048109965635 <-,util 50.174418604651166,123.73076923076923,131.57692307692307,104.38461538461539,76

.03846153846153,

ScheduleSim Experiment Results

FastTrack,Opp,323 <-make, 0.4619929453262787 <-,util 61.733333333333334,179.2608695652174,154.76190476190476,152.13636363636363,136

.52380952380952,120.4090909090909,

ScheduleSim Experiment Results

FastTrack,Opp,565 <-make, 0.264449772841999 <-,util 150.37951807228916,309.75,395.3157894736842,446.6666666666667,389.210526315789

5,320.3888888888889,239.94736842105263,

ScheduleSim Experiment Results

FastTrack,Opp,323 <-make, 0.4619929453262786 <-,util 62.68976897689769,89.37254901960785,142.25,160.1875,158.6875,141.3125,125.6875,11

7.0,

ScheduleSim Experiment Results

FastTrack,Opp,353 <-make, 0.42332526230831313 <-,util 50.527272727272724,60.921052631578945,172.93333333333334,216.57142857142858,29

8.92857142857144,254.8,203.85714285714286,147.85714285714286,82.8,

ScheduleSim Experiment Results

FastTrack,Opp,323 <-make, 0.46155202821869484 <-,util 66.08597285067873,58.86507936507937,189.76923076923077,120.46153846153847,183.

0,147.46153846153845,158.07692307692307,124.07692307692308,119.46153846153847,

125.76923076923077,

SUCCESS

BUILD SUCCESSFUL total time: 2 seconds

### Max\_min+Max\_min

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_1

ScheduleSim Experiment Results

Max\_Min,Max\_Min,162 <-make, 0.9187116564417178 <-,util 53.59777777777778,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,164 <-make, 0.9058874458874459 <-,util 47.932467532467534,85.87692307692308,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,163 <-make, 0.9128484320557492 <-,util 44.26027397260274,107.74418604651163,77.32558139534883,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,162 <-make, 0.9167397020157757 <-,util 41.75852272727273,116.40625,98.28125,73.54545454545455,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,164 <-make, 0.9074891774891777 <-,util 40.328530259366,120.61538461538461,108.96153846153847,92.0,70.73076923076923,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,163 <-make, 0.9133710801393727 <-,util 39.21449275362319,124.13636363636364,112.71428571428571,103.04545454545455,85.

52380952380952,69.68181818181819,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,162 <-make, 0.9178790534618756 <-,util 39.13939393939394,84.78571428571429,117.73684210526316,108.88888888888889,96.5

2631578947368,82.61111111111111,68.36842105263158,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,163 <-make, 0.9120644599303136 <-,util 39.43037974683544,62.60526315789474,118.0,112.9375,103.625,93.0,82.25,66.05882352

941177,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,163 <-make, 0.9126742160278746 <-,util 40.34146341463415,42.44776119402985,123.0,115.42857142857143,108.7857142857142

9,99.46666666666667,89.35714285714286,77.92857142857143,65.93333333333334,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,164 <-make, 0.9069264069264071 <-,util 45.28699551569507,31.376,122.3076923076923,119.0,112.46153846153847,104.5384615

3846153,96.84615384615384,87.07692307692308,73.61538461538461,67.692307692307,

SUCCESS

BUILD SUCCESSFUL total time: 1 second

### Max\_min+FastTrack

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_1

ScheduleSim Experiment Results

FastTrack,Max\_Min,226 <-make, 0.6589993706733794 <-,util 56.07743362831859,

ScheduleSim Experiment Results

FastTrack,Max\_Min,226 <-make, 0.65921963499056 <-,util 49.75835475578406,92.6,

ScheduleSim Experiment Results

FastTrack,Max\_Min,227 <-make, 0.656046365914787 <-,util 46.561307901907355,107.81395348837209,82.6046511627907,

ScheduleSim Experiment Results

FastTrack,Max\_Min,226 <-make, 0.6591881686595342 <-,util 45.11581920903955,103.9375,106.46875,79.60606060606061,

ScheduleSim Experiment Results

FastTrack,Max\_Min,227 <-make, 0.6567982456140351 <-,util 43.540462427745666,102.61538461538461,115.73076923076923,95.8076923076923,78.9

6153846153847,

ScheduleSim Experiment Results

FastTrack,Max\_Min,226 <-make, 0.6587476400251729 <-,util 42.328445747800586,108.54166666666667,103.0952380952381,109.81818181818181,92.

52380952380952,75.86363636363636,

ScheduleSim Experiment Results

FastTrack,Max\_Min,227 <-make, 0.6564223057644111 <-,util 42.694189602446485,85.62068965517241,98.05263157894737,111.83333333333333,104.

57894736842105,84.11111111111111,77.05263157894737,

ScheduleSim Experiment Results

FastTrack,Max\_Min,226 <-make, 0.6590308370044053 <-,util 42.381107491856675,60.75,91.6875,116.25,114.1875,98.25,79.5625,76.23529411764706,

ScheduleSim Experiment Results

FastTrack,Max\_Min,226 <-make, 0.6597860289490246 <-,util 44.36363636363637,42.93589743589744,107.13333333333334,106.42857142857143,114.

78571428571429,103.26666666666667,91.92857142857143,78.42857142857143,78.53333

333333333,

ScheduleSim Experiment Results

FastTrack,Max\_Min,226 <-make, 0.658936438011328 <-,util 47.28636363636364,36.388888888888886,119.38461538461539,85.3076923076923,120.5

3846153846153,110.46153846153847,101.3076923076923,89.84615384615384,76.0,77.53

846153846153,

SUCCESS

BUILD SUCCESSFUL total time: 3 seconds

### FastTrack+FastTrack

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_1

ScheduleSim Experiment Results

FastTrack,FastTrack,176 <-make, 0.845318805488297 <-,util 53.99777282850779,

ScheduleSim Experiment Results

FastTrack,FastTrack,178 <-make, 0.835634477254589 <-,util 47.6839378238342,90.6923076923077,

ScheduleSim Experiment Results

FastTrack,FastTrack,177 <-make, 0.8400882825040129 <-,util 44.42739726027397,102.02325581395348,88.0,

ScheduleSim Experiment Results

FastTrack,FastTrack,177 <-make, 0.8408105939004815 <-,util 43.04829545454545,99.375,102.5,79.6969696969697,

ScheduleSim Experiment Results

FastTrack,FastTrack,174 <-make, 0.8542448979591837 <-,util 41.497126436781606,83.88461538461539,112.26923076923077,107.1923076923077,73.1

5384615384616,

ScheduleSim Experiment Results

FastTrack,FastTrack,175 <-make, 0.8511363636363636 <-,util 41.11695906432749,85.04166666666667,109.04761904761905,96.86363636363636,107.8

5714285714286,69.86363636363636,

ScheduleSim Experiment Results

FastTrack,FastTrack,178 <-make, 0.8364325618515563 <-,util 41.44311377245509,72.38461538461539,89.63157894736842,112.33333333333333,102.1

5789473684211,100.27777777777777,67.15789473684211,

ScheduleSim Experiment Results

FastTrack,FastTrack,175 <-make, 0.851055194805195 <-,util 41.78328173374613,54.529411764705884,76.75,123.4375,90.3125,116.375,94.8125,65.23

529411764706,

ScheduleSim Experiment Results

FastTrack,FastTrack,179 <-make, 0.8318650793650795 <-,util 44.11913357400722,37.12328767123287,86.46666666666667,102.21428571428571,112.2

1428571428571,93.33333333333333,112.92857142857143,89.5,62.733333333333334,

ScheduleSim Experiment Results

FastTrack,FastTrack,173 <-make, 0.8607963875205253 <-,util 45.99047619047619,34.85401459854015,92.84615384615384,74.92307692307692,131.0,9

4.76923076923077,107.15384615384616,108.15384615384616,85.92307692307692,61.53

846153846154, SUCCESS

BUILD SUCCESSFUL total time: 1 second

## APPENDIX IX – Experiment 2 visuals and Results



*Figure 19 - FastTrack+FastTrack*



*Figure 20 - Max\_min+Max\_min*



*Figure 21 - Opp+FastTrack*



*Figure 22 - Opp+Max\_min*



*Figure 23 - Opp+min\_min*

### Opp+min\_min

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_2

ScheduleSim Experiment Results

Min,Opp,65 <-make, 0.4452838241570638 <-,util 5.026415094339622,

ScheduleSim Experiment Results

Min,Opp,65 <-make, 0.4453179684165603 <-,util 3.032520325203252,9.939024390243903,

ScheduleSim Experiment Results

Min,Opp,65 <-make, 0.44524967989756753 <-,util 2.8929577464788734,7.1,10.113333333333333,

ScheduleSim Experiment Results

Min,Opp,65 <-make, 0.4452326077678192 <-,util 2.6063218390804597,5.75,8.636363636363637,10.140845070422536,

ScheduleSim Experiment Results

Min,Opp,65 <-make, 0.4452411438326931 <-,util 2.2915451895043732,5.166666666666667,7.388888888888889,9.944444444444445,10.442

028985507246,

ScheduleSim Experiment Results

Min,Opp,65 <-make, 0.4450704225352116 <-,util 2.817910447761194,4.25,6.25,8.071428571428571,10.1875,10.104477611940299,

ScheduleSim Experiment Results

Min,Opp,65 <-make, 0.445224071702945 <-,util 2.5861027190332324,3.4166666666666665,5.083333333333333,6.416666666666667,7.8,9.

333333333333334,10.916666666666666,10.069230769230769,

ScheduleSim Experiment Results

Min,Opp,65 <-make, 0.44513871105420416 <-,util 2.56508875739645,3.3,4.6,6.0,6.9,8.4,9.8,11.0,10.069230769230769,

ScheduleSim Experiment Results

Min,Opp,65 <-make, 0.445394793000427 <-,util 2.8384146341463414,3.5833333333333335,4.25,5.5,6.5,7.625,9.0,10.125,11.3,10.0390625,

SUCCESS

BUILD SUCCESSFUL (total time: 3 seconds)

### Opp+Max\_min

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_2

ScheduleSim Experiment Results

Max,Opp,64 <-make, 0.45193499458288194 <-,util 5.2781954887218046,

ScheduleSim Experiment Results

Max,Opp,64 <-make, 0.4520736728060673 <-,util 4.14247311827957,9.341463414634147,

ScheduleSim Experiment Results

Max,Opp,64 <-make, 0.45214301191766004 <-,util 3.906515580736544,9.233333333333333,9.373333333333333,

ScheduleSim Experiment Results

Max,Opp,64 <-make, 0.45203033586132174 <-,util 2.924198250728863,9.75,9.090909090909092,9.67605633802817,

ScheduleSim Experiment Results

Max,Opp,64 <-make, 0.45196966413867806 <-,util 3.2682215743440235,6.055555555555555,6.0,4.888888888888889,9.072463768115941,

ScheduleSim Experiment Results

Max,Opp,64 <-make, 0.45206500541711825 <-,util 3.6339285714285716,9.5625,9.4375,9.0,7.8125,9.559701492537313,

ScheduleSim Experiment Results

Max,Opp,64 <-make, 0.45204767063922 <-,util 2.625748502994012,9.666666666666666,9.583333333333334,9.333333333333334,9.2,8.25,

7.5,9.623076923076923,

ScheduleSim Experiment Results

Max,Opp,64 <-make, 0.4521170097508125 <-,util 2.5150602409638556,6.6,6.0,6.0,6.0,5.7,4.7,4.0,9.592307692307692,

ScheduleSim Experiment Results

Max,Opp,64 <-make, 0.45214301191766 <-,util 3.513595166163142,9.7,9.625,9.6,9.3,9.25,8.5,7.875,7.4,9.65625,

SUCCESS

BUILD SUCCESSFUL (total time: 7 seconds)

### Opp+FastTrack

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_2

ScheduleSim Experiment Results

Opp,FastTrack,65 <-make, 0.4451899274434485 <-,util 5.584269662921348,

ScheduleSim Experiment Results

Opp,FastTrack,65 <-make, 0.4450277422108409 <-,util 4.053763440860215,9.487804878048781,

ScheduleSim Experiment Results

Opp,FastTrack,65 <-make, 0.44527528809218964 <-,util 3.8477011494252875,9.733333333333333,9.46,

ScheduleSim Experiment Results

Opp,FastTrack,65 <-make, 0.44531796841656 <-,util 3.4770114942528734,8.5,9.363636363636363,9.528169014084508,

ScheduleSim Experiment Results

Opp,FastTrack,65 <-make, 0.4452240717029451 <-,util 3.415204678362573,7.333333333333333,10.222222222222221,8.833333333333334,9.5652

17391304348,

ScheduleSim Experiment Results

Opp,FastTrack,65 <-make, 0.4450874946649598 <-,util 3.6451612903225805,7.3125,9.6875,9.785714285714286,8.375,9.58955223880597,

ScheduleSim Experiment Results

FastTrack,Opp,65 <-make, 0.4451643192488264 <-,util 3.1921921921921923,5.5,3.1666666666666665,7.0,7.0,5.666666666666667,4.58333333333

3333,9.438461538461539,

ScheduleSim Experiment Results

FastTrack,Opp,65 <-make, 0.4453521126760563 <-,util 2.5545722713864305,5.8,3.0,5.8,7.0,6.7,5.3,4.5,9.646153846153846,

ScheduleSim Experiment Results

FastTrack,Opp,65 <-make, 0.4450533504054633 <-,util 3.5424242424242425,9.6,7.5,7.2,10.4,10.0,9.3,8.25,7.7,9.6875,

SUCCESS

BUILD SUCCESSFUL (total time: 2 seconds)

### Max\_min+Max\_min

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_2

ScheduleSim Experiment Results

Max,Max,62 <-make, 0.4664520456069751 <-,util 3.166355140186916,

ScheduleSim Experiment Results

Max,Max,62 <-make, 0.46637156270959074 <-,util 1.7903225806451613,6.286585365853658,

ScheduleSim Experiment Results

Max,Max,62 <-make, 0.46656829868097494 <-,util 1.725212464589235,3.3333333333333335,6.546666666666667,

ScheduleSim Experiment Results

Max,Max,62 <-make, 0.4664252179745138 <-,util 1.710144927536232,3.0416666666666665,3.5,6.71830985915493,

ScheduleSim Experiment Results

Max,Max,62 <-make, 0.46664878157835893 <-,util 1.7055393586005831,2.7777777777777777,3.3333333333333335,3.388888888888889,6.82

6086956521739,

ScheduleSim Experiment Results

Max,Max,62 <-make, 0.46646993069528275 <-,util 1.6923076923076923,2.5625,3.1875,3.5,3.25,6.940298507462686,

ScheduleSim Experiment Results

Max,Max,62 <-make, 0.4666219539458976 <-,util 1.685459940652819,2.3333333333333335,2.9166666666666665,3.1666666666666665,3.5,3

.5,3.0,7.061538461538461,

ScheduleSim Experiment Results

Max,Max,62 <-make, 0.4663536776212833 <-,util 1.6736526946107784,2.4,2.6,3.2,3.3,3.5,3.4,3.0,7.061538461538461,

ScheduleSim Experiment Results

Max,Max,62 <-make, 0.46654147104851335 <-,util 1.6838905775075987,2.090909090909091,2.375,3.1,3.2,3.5,3.5,3.25,3.2,7.109375,

SUCCESS

BUILD SUCCESSFUL (total time: 8 seconds)

### Max\_min+FastTrack

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_2

ScheduleSim Experiment Results

FastTrack,Max\_Min,62 <-make, 0.46635367762128327 <-,util 3.292134831460674,

ScheduleSim Experiment Results

FastTrack,Max\_Min,62 <-make, 0.4664073328862062 <-,util 1.8556149732620322,6.439024390243903,

ScheduleSim Experiment Results

FastTrack,Max\_Min,62 <-make, 0.46654147104851335 <-,util 1.8356940509915014,3.5,6.673333333333333,

ScheduleSim Experiment Results

FastTrack,Max\_Min,62 <-make, 0.46660406885759 <-,util 1.8401162790697674,2.5833333333333335,3.9545454545454546,6.823943661971831,

ScheduleSim Experiment Results

FastTrack,Max\_Min,62 <-make, 0.4665057008718981 <-,util 1.8411764705882352,2.2222222222222223,3.5,4.055555555555555,6.898550724637682,

ScheduleSim Experiment Results

FastTrack,Max\_Min,62 <-make, 0.46630002235636037 <-,util 1.8023598820058997,2.125,3.125,3.9285714285714284,4.0625,6.985074626865671,

ScheduleSim Experiment Results

FastTrack,Max\_Min,62 <-make, 0.4663894477978986 <-,util 1.8053892215568863,3.0,2.0,3.1666666666666665,3.9,4.0,4.083333333333333,7.07692307

6923077,

ScheduleSim Experiment Results

FastTrack,Max\_Min,62 <-make, 0.46646993069528275 <-,util 1.8036253776435045,3.1,1.7,3.0,3.5,4.0,4.1,4.0,7.076923076923077,

ScheduleSim Experiment Results

FastTrack,Max\_Min,62 <-make, 0.466219539458976 <-,util 1.774390243902439,3.4,2.25,2.2,3.2,3.875,4.0,4.125,4.0,7.125,

SUCCESS

BUILD SUCCESSFUL (total time: 10 seconds)

### FastTrack+FastTrack

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_2

ScheduleSim Experiment Results

FastTrack,FastTrack,63 <-make, 0.45893485915492965 <-,util 3.507518796992481,

ScheduleSim Experiment Results

FastTrack,FastTrack,63 <-make, 0.45916373239436625 <-,util 1.9811320754716981,6.951219512195122,

ScheduleSim Experiment Results

FastTrack,FastTrack,63 <-make, 0.4589348591549297 <-,util 1.839541547277937,4.866666666666666,7.166666666666667,

ScheduleSim Experiment Results

FastTrack,FastTrack,63 <-make, 0.45907570422535227 <-,util 1.8517441860465116,3.75,5.454545454545454,7.183098591549296,

ScheduleSim Experiment Results

FastTrack,FastTrack,63 <-make, 0.45910211267605644 <-,util 1.8727810650887573,2.3333333333333335,4.055555555555555,6.833333333333333,7.217

391304347826,

ScheduleSim Experiment Results

FastTrack,FastTrack,63 <-make, 0.4592077464788733 <-,util 1.894578313253012,1.0625,5.0625,4.642857142857143,6.3125,7.268656716417911,

ScheduleSim Experiment Results

FastTrack,FastTrack,63 <-make, 0.4591901408450705 <-,util 1.8885542168674698,1.0,2.0833333333333335,5.416666666666667,3.6,7.0,5.75,7.3153846

15384615,

ScheduleSim Experiment Results

FastTrack,FastTrack,63 <-make, 0.4592253521126762 <-,util 1.8821752265861027,1.0,1.1,5.3,4.1,5.2,6.7,5.7,7.315384615384615,

ScheduleSim Experiment Results

FastTrack,FastTrack,63 <-make, 0.45938380281690144 <-,util 1.9181818181818182,0.75,1.125,3.3,5.2,2.625,7.2,6.375,5.6,7.34375,

SUCCESS

BUILD SUCCESSFUL (total time: 2 seconds)

## APPENDIX X – Experiment 3 visuals and Results



*Figure 24 - FastTrack+FastTrack*



*Figure 25 - Max\_min+fastTrack*



*Figure 26 - Opp+FastTrack*



*Figure 27 - Opp+min\_min*

### Max\_min+Max\_min

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_3

ScheduleSim Experiment Results

Max\_Min,Max\_Min,64 <-make, 0.8815384615384615 <-,util 8.318352059925093,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,64 <-make, 0.8817413355874891 <-,util 7.08130081300813,11.060975609756097,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,64 <-make, 0.8820794590025357 <-,util 6.9602272727272725,10.833333333333334,11.086666666666666,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,64 <-make, 0.8815553677092137 <-,util 6.860058309037901,10.75,10.590909090909092,11.154929577464788,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,64 <-make, 0.8817244294167372 <-,util 6.79646017699115,11.055555555555555,10.833333333333334,10.0,11.217391304347826,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,64 <-make, 0.8817751479289941 <-,util 6.748502994011976,10.8125,10.625,11.0,9.75,11.26865671641791,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,64 <-make, 0.8817244294167372 <-,util 6.738601823708207,10.666666666666666,11.0,10.666666666666666,11.1,10.08333333333

3334,9.583333333333334,11.3,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,64 <-make, 0.8818089602704987 <-,util 6.728915662650603,9.909090909090908,11.2,10.8,10.6,11.2,9.8,9.4,11.315384615384616,

ScheduleSim Experiment Results

Max\_Min,Max\_Min,64 <-make, 0.8818089602704989 <-,util 6.753012048192771,10.3,11.125,11.2,10.4,11.125,10.5,9.5,9.2,11.3828125,

SUCCESS

BUILD SUCCESSFUL (total time: 8 seconds)

### Opp+Max\_min

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_3

ScheduleSim Experiment Results

Max\_Min,Opp,83 <-make, 0.6821690214547355 <-,util 18.81902985074627,

ScheduleSim Experiment Results

Max\_Min,Opp,83 <-make, 0.6825091575091569 <-,util 18.341463414634145,19.890243902439025,

ScheduleSim Experiment Results

Max\_Min,Opp,83 <-make, 0.682378335949764 <-,util 18.022662889518415,25.066666666666666,19.433333333333334,

ScheduleSim Experiment Results

Max\_Min,Opp,76 <-make, 0.7445982588839731 <-,util 7.344827586206897,13.208333333333334,10.363636363636363,14.732394366197184,

ScheduleSim Experiment Results

Max\_Min,Opp,83 <-make, 0.6821428571428566 <-,util 17.723529411764705,26.555555555555557,24.666666666666668,23.77777777777778,19.0

5072463768116,

ScheduleSim Experiment Results

Max\_Min,Opp,83 <-make, 0.6823783359497642 <-,util 17.65680473372781,25.875,25.4375,24.714285714285715,23.375,18.98507462686567,

ScheduleSim Experiment Results

Max\_Min,Opp,75 <-make, 0.7542943898207053 <-,util 7.105421686746988,16.666666666666668,16.666666666666668,15.75,15.3,14.25,12.25,15.

946153846153846,

ScheduleSim Experiment Results

Max\_Min,Opp,72 <-make, 0.7849465602890261 <-,util 7.213855421686747,16.6,16.8,16.2,15.6,14.9,13.9,12.0,15.946153846153846,

ScheduleSim Experiment Results

Max\_Min,Opp,83 <-make, 0.6822998430141284 <-,util 17.473053892215567,26.0,26.0,26.6,25.0,25.125,24.1,23.375,21.6,18.859375,

SUCCESS

BUILD SUCCESSFUL (total time: 8 seconds)

### FastTrack+FastTrack

run:

ScheduleSim 1.3.0

Running self test... Running Tests:

testing EXPR\_3

ScheduleSim Experiment Results

FastTrack,FastTrack,78 <-make, 0.7252608151342329 <-,util 9.080223880597014,

ScheduleSim Experiment Results

FastTrack,FastTrack,89 <-make, 0.6370329670329671 <-,util 8.764075067024129,12.371951219512194,

ScheduleSim Experiment Results

FastTrack,FastTrack,99 <-make, 0.5729670329670329 <-,util 10.575070821529746,12.633333333333333,12.96,

ScheduleSim Experiment Results

FastTrack,FastTrack,100 <-make, 0.5676096181046677 <-,util 10.741279069767442,11.166666666666666,11.0,13.056338028169014,

ScheduleSim Experiment Results

FastTrack,FastTrack,89 <-make, 0.636947496947497 <-,util 8.576470588235294,9.722222222222221,12.5,11.555555555555555,12.623188405797102,

ScheduleSim Experiment Results

FastTrack,FastTrack,89 <-make, 0.6370085470085468 <-,util 8.789317507418398,5.25,14.0625,10.642857142857142,10.9375,13.208955223880597,

ScheduleSim Experiment Results

FastTrack,FastTRack,100 <-make, 0.5673920139266675 <-,util 11.012012012012011,6.0,7.083333333333333,15.0,10.0,11.75,9.916666666666666,13.3384

61538461539,

ScheduleSim Experiment Results

FastTrack,FastTRack,89 <-make, 0.6368498168498168 <-,util 8.605970149253732,7.0,7.0,15.5,12.7,10.7,11.6,9.8,12.792307692307693,

ScheduleSim Experiment Results

FastTrack,FastTRack,99 <-make, 0.5731538461538462 <-,util 10.736363636363636,12.4,5.75,9.7,14.8,9.625,11.8,11.25,9.4,13.421875,

SUCCESS

BUILD SUCCESSFUL (total time: 6 seconds)

### Max\_min+FastTrack

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_3

ScheduleSim Experiment Results

FastTrack,Max\_Min,82 <-make, 0.6904011650999603 <-,util 10.00945179584121,

ScheduleSim Experiment Results

FastTrack,Max\_Min,82 <-make, 0.6905468025949953 <-,util 9.232432432432432,11.774390243902438,

ScheduleSim Experiment Results

FastTrack,Max\_Min,81 <-make, 0.6990753149289735 <-,util 9.127478753541077,10.566666666666666,11.9,

ScheduleSim Experiment Results

FastTrack,Max\_Min,82 <-make, 0.6903746855554084 <-,util 9.078260869565218,10.708333333333334,10.0,12.02112676056338,

ScheduleSim Experiment Results

FastTrack,Max\_Min,81 <-make, 0.6989145001340124 <-,util 8.96774193548387,12.166666666666666,10.166666666666666,10.0,12.115942028985508,

ScheduleSim Experiment Results

FastTrack,Max\_Min,82 <-make, 0.6904276446445122 <-,util 8.954682779456194,15.1875,10.6875,10.428571428571429,9.0625,12.26865671641791,

ScheduleSim Experiment Results

FastTrack,Max\_Min,82 <-make, 0.6907453991791342 <-,util 8.874251497005988,17.833333333333332,11.083333333333334,10.5,10.4,9.666666666666

666,8.5,12.407692307692308,

ScheduleSim Experiment Results

FastTrack,Max\_Min,82 <-make, 0.6908248378127896 <-,util 8.886904761904763,17.4,13.3,10.6,10.6,10.4,9.0,8.6,12.407692307692308,

ScheduleSim Experiment Results

FastTrack,Max\_Min,82 <-make, 0.6907321594068583 <-,util 8.637462235649547,20.7,14.125,11.0,10.5,9.875,10.3,9.5,8.2,12.453125,

SUCCESS

BUILD SUCCESSFUL (total time: 7 seconds)

### Opp+FastTrack

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_3

ScheduleSim Experiment Results

FastTrack,Opp,93 <-make, 0.6094926350245504 <-,util 19.149812734082396,

ScheduleSim Experiment Results

FastTrack,Opp,94 <-make, 0.603262001156738 <-,util 18.84054054054054,19.902439024390244,

ScheduleSim Experiment Results

FastTrack,Opp,94 <-make, 0.6035049161364952 <-,util 18.519662921348313,25.3,19.486666666666668,

ScheduleSim Experiment Results

FastTrack,Opp,83 <-make, 0.6823129251700679 <-,util 8.296511627906977,16.041666666666668,15.227272727272727,16.014084507042252,

ScheduleSim Experiment Results

FastTrack,Opp,94 <-make, 0.6032272990167725 <-,util 18.12684365781711,27.666666666666668,25.055555555555557,24.22222222222222,19.16

6666666666668,

ScheduleSim Experiment Results

FastTrack,Opp,94 <-make, 0.6032620011567379 <-,util 17.97032640949555,29.9375,26.1875,24.142857142857142,23.3125,19.067164179104477,

ScheduleSim Experiment Results

FastTrack,Opp,140 <-make, 0.40650767672044275 <-,util 9.3003003003003,39.25,15.5,13.583333333333334,11.9,10.0,7.333333333333333,15.84615

3846153847,

ScheduleSim Experiment Results

FastTrack,Opp,140 <-make, 0.4064297404722937 <-,util 9.24702380952381,40.9,20.7,12.4,12.7,11.5,9.2,7.1,15.830769230769231,

ScheduleSim Experiment Results

FastTrack,Opp,93 <-make, 0.6099251812017774 <-,util 17.790419161676645,31.0,28.25,24.6,26.6,24.125,25.1,22.75,22.2,18.7890625,

SUCCESS

BUILD SUCCESSFUL (total time: 10 seconds)

### Opp+min\_min

run:

ScheduleSim 1.3.0 Running self test...

Running Tests:

testing EXPR\_3

ScheduleSim Experiment Results

Min\_Min,Opp,83 <-make, 0.6824568288853998 <-,util 17.796992481203006,

ScheduleSim Experiment Results

Min\_Min,Opp,83 <-make, 0.6825353218210356 <-,util 16.502732240437158,20.701219512195124,

ScheduleSim Experiment Results

Min\_Min,Opp,83 <-make, 0.6824175824175818 <-,util 16.229461756373937,21.933333333333334,20.46,

ScheduleSim Experiment Results

Min\_Min,Opp,74 <-make, 0.7643516483516483 <-,util 6.667630057803469,10.833333333333334,14.272727272727273,17.12676056338028,

ScheduleSim Experiment Results

Min\_Min,Opp,83 <-make, 0.6819204604918886 <-,util 16.179411764705883,19.333333333333332,21.88888888888889,25.27777777777778,19.96

3768115942027,

ScheduleSim Experiment Results

Min\_Min,Opp,83 <-make, 0.682378335949764 <-,util 16.1910447761194,18.5,21.125,23.214285714285715,25.8125,19.78358208955224,

ScheduleSim Experiment Results

Min\_Min,Opp,77 <-make, 0.7345026768103691 <-,util 6.13595166163142,1.4166666666666667,3.1666666666666665,5.333333333333333,7.5,10.

0,13.666666666666666,16.853846153846153,

ScheduleSim Experiment Results

Min\_Min,Opp,162 <-make, 0.3515067754331557 <-,util 52.14242424242424,61.63636363636363,58.1,60.6,61.3,63.3,69.5,67.7,44.73076923076923,

ScheduleSim Experiment Results

Min\_Min,Opp,84 <-make, 0.6744537815126049 <-,util 16.157575757575756,16.3,18.375,19.8,20.8,23.5,24.2,25.875,28.4,19.375,

SUCCESS

BUILD SUCCESSFUL (total time: 5 seconds)