# Linear midpoint balance at 8: iteration1

--- Average Times per Task (Seconds) ---

Task01: 0.39 sec

Task02: 1.47 sec

Task03: 1.10 sec

Task04: 1.19 sec

Task05: 1.70 sec

Task06: 2.55 sec

Task07: 2.10 sec

Task08: 1.52 sec

Task09: 1.54 sec

Task10: 3.01 sec

Task11: 2.65 sec

Task12: 3.11 sec

Task13: 3.18 sec

Task14: 2.31 sec

Task15: 1.64 sec

Task16: 1.40 sec

Task17: 5.36 sec

Task18: 4.88 sec

Task19: 5.25 sec

Task20: 4.06 sec

Task21: 3.76 sec

Task22: 2.54 sec

Task23: 1.64 sec

Task24: 1.30 sec

Task25: 2.78 sec

Task26: 5.20 sec

Task27: 7.15 sec

Task28: 2.27 sec

Task29: 2.05 sec

Task30: 1.56 sec

Calculating learning rates (exponent b) for each TaskXX...

C:\Users\tternghaa's\AppData\Roaming\Python\Python310\site-packages\openpyxl\styles\stylesheet.py:237: UserWarning: Workbook contains no default style, apply openpyxl's default

warn("Workbook contains no default style, apply openpyxl's default")

Loading previous state (if any)...

Performing ILP-based balancing (all times in seconds)...

Comparing current balancing scenarios...

--- Comparison Results ---

Old Cycle Times (by workstation) [seconds]: [25.52, 28.64, 26.5]

New Cycle Times (by workstation) [seconds]: [27.83, 26.34, 26.5]

Old Total Time (Bottleneck) [seconds]: 28.64

New Total Time (Bottleneck) [seconds]: 27.83

--- Task Changes ---

Workstation 1:

Added tasks: [14]

Workstation 2:

Removed tasks: [14]

--- Metrics ---

Time Saved per Hour [seconds/hour]: 105.39

Setup Time Cost [seconds]: 60.00

Learning Penalty [seconds]: 43.96

Time to Net Benefit [hours]: 0.99

--- New Scenario Workstation Allocation ---

Workstation 1: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14]

Workstation 2: [15, 16, 17, 18, 19, 20, 21]

Workstation 3: [22, 23, 24, 25, 26, 27, 28, 29, 30]

Saving the new scenario as the current baseline...

# Linear midpoint balance at 8: iteration2

--- Average Times per Task (Seconds) ---

Task01: 0.39 sec

Task02: 1.35 sec

Task03: 1.14 sec

Task04: 1.59 sec

Task05: 1.81 sec

Task06: 2.76 sec

Task07: 1.80 sec

Task08: 1.53 sec

Task09: 1.38 sec

Task10: 3.04 sec

Task11: 2.66 sec

Task12: 3.11 sec

Task13: 3.35 sec

Task14: 2.36 sec

Task15: 1.54 sec

Task16: 1.41 sec

Task17: 5.29 sec

Task18: 4.82 sec

Task19: 4.70 sec

Task20: 4.01 sec

Task21: 3.50 sec

Task22: 2.38 sec

Task23: 1.71 sec

Task24: 1.37 sec

Task25: 2.65 sec

Task26: 5.80 sec

Task27: 6.36 sec

Task28: 2.31 sec

Task29: 1.93 sec

Task30: 1.62 sec

Calculating learning rates (exponent b) for each TaskXX...

C:\Users\tternghaa's\AppData\Roaming\Python\Python310\site-packages\openpyxl\styles\stylesheet.py:237: UserWarning: Workbook contains no default style, apply openpyxl's default

warn("Workbook contains no default style, apply openpyxl's default")

Loading previous state (if any)...

Performing ILP-based balancing (all times in seconds)...

Comparing current balancing scenarios...

--- Comparison Results ---

Old Cycle Times (by workstation) [seconds]: [25.9, 27.64, 26.13]

New Cycle Times (by workstation) [seconds]: [25.9, 27.64, 26.13]

Old Total Time (Bottleneck) [seconds]: 27.64

New Total Time (Bottleneck) [seconds]: 27.64

--- Task Changes ---

No tasks moved between workstations.

--- Metrics ---

Time Saved per Hour [seconds/hour]: 0.00

Setup Time Cost [seconds]: 0.00

Learning Penalty [seconds]: 0.00

Time to Net Benefit: Never (no net benefit)

--- New Scenario Workstation Allocation ---

Workstation 1: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13]

Workstation 2: [14, 15, 16, 17, 18, 19, 20, 21]

Workstation 3: [22, 23, 24, 25, 26, 27, 28, 29, 30]

Saving the new scenario as the current baseline...

# Linear midpoint balance at 8: iteration3

--- Average Times per Task (Seconds) ---

Task01: 0.38 sec

Task02: 1.34 sec

Task03: 1.14 sec

Task04: 1.47 sec

Task05: 2.01 sec

Task06: 2.43 sec

Task07: 1.79 sec

Task08: 1.39 sec

Task09: 1.47 sec

Task10: 2.73 sec

Task11: 2.72 sec

Task12: 3.18 sec

Task13: 3.35 sec

Task14: 2.45 sec

Task15: 1.53 sec

Task16: 1.49 sec

Task17: 5.50 sec

Task18: 4.95 sec

Task19: 4.82 sec

Task20: 4.11 sec

Task21: 3.28 sec

Task22: 2.36 sec

Task23: 1.73 sec

Task24: 1.31 sec

Task25: 2.89 sec

Task26: 5.11 sec

Task27: 6.55 sec

Task28: 2.62 sec

Task29: 1.87 sec

Task30: 1.57 sec

Calculating learning rates (exponent b) for each TaskXX...

C:\Users\tternghaa's\AppData\Roaming\Python\Python310\site-packages\openpyxl\styles\stylesheet.py:237: UserWarning: Workbook contains no default style, apply openpyxl's default

warn("Workbook contains no default style, apply openpyxl's default")

Loading previous state (if any)...

Performing ILP-based balancing (all times in seconds)...

Comparing current balancing scenarios...

--- Comparison Results ---

Old Cycle Times (by workstation) [seconds]: [25.41, 28.13, 26.0]

New Cycle Times (by workstation) [seconds]: [27.86, 25.68, 26.0]

Old Total Time (Bottleneck) [seconds]: 28.13

New Total Time (Bottleneck) [seconds]: 27.86

--- Task Changes ---

Workstation 1:

Added tasks: [14]

Workstation 2:

Removed tasks: [14]

--- Metrics ---

Time Saved per Hour [seconds/hour]: 35.27

Setup Time Cost [seconds]: 60.00

Learning Penalty [seconds]: 44.90

Time to Net Benefit [hours]: 2.97

--- New Scenario Workstation Allocation ---

Workstation 1: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14]

Workstation 2: [15, 16, 17, 18, 19, 20, 21]

Workstation 3: [22, 23, 24, 25, 26, 27, 28, 29, 30]

Saving the new scenario as the current baseline...

# Linear midpoint balance at 8: iteration4

--- Average Times per Task (Seconds) ---

Task01: 0.41 sec

Task02: 1.47 sec

Task03: 1.10 sec

Task04: 1.86 sec

Task05: 1.77 sec

Task06: 2.84 sec

Task07: 1.77 sec

Task08: 1.48 sec

Task09: 1.52 sec

Task10: 2.80 sec

Task11: 2.70 sec

Task12: 3.28 sec

Task13: 3.45 sec

Task14: 2.61 sec

Task15: 1.50 sec

Task16: 1.26 sec

Task17: 5.78 sec

Task18: 5.19 sec

Task19: 4.74 sec

Task20: 3.91 sec

Task21: 3.98 sec

Task22: 2.36 sec

Task23: 1.76 sec

Task24: 1.30 sec

Task25: 2.88 sec

Task26: 5.12 sec

Task27: 6.86 sec

Task28: 2.52 sec

Task29: 1.96 sec

Task30: 1.67 sec

Calculating learning rates (exponent b) for each TaskXX...

C:\Users\tternghaa's\AppData\Roaming\Python\Python310\site-packages\openpyxl\styles\stylesheet.py:237: UserWarning: Workbook contains no default style, apply openpyxl's default

warn("Workbook contains no default style, apply openpyxl's default")

Loading previous state (if any)...

Performing ILP-based balancing (all times in seconds)...

Comparing current balancing scenarios...

--- Comparison Results ---

Old Cycle Times (by workstation) [seconds]: [26.45, 28.97, 26.43]

New Cycle Times (by workstation) [seconds]: [26.45, 28.97, 26.43]

Old Total Time (Bottleneck) [seconds]: 28.97

New Total Time (Bottleneck) [seconds]: 28.97

--- Task Changes ---

No tasks moved between workstations.

--- Metrics ---

Time Saved per Hour [seconds/hour]: 0.00

Setup Time Cost [seconds]: 0.00

Learning Penalty [seconds]: 0.00

Time to Net Benefit: Never (no net benefit)

--- New Scenario Workstation Allocation ---

Workstation 1: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13]

Workstation 2: [14, 15, 16, 17, 18, 19, 20, 21]

Workstation 3: [22, 23, 24, 25, 26, 27, 28, 29, 30]

Saving the new scenario as the current baseline...

# Linear midpoint balance at 8: iteration5

--- Average Times per Task (Seconds) ---

Task01: 0.45 sec

Task02: 1.50 sec

Task03: 1.21 sec

Task04: 1.40 sec

Task05: 1.84 sec

Task06: 2.71 sec

Task07: 1.93 sec

Task08: 1.41 sec

Task09: 1.31 sec

Task10: 2.91 sec

Task11: 2.41 sec

Task12: 3.22 sec

Task13: 3.31 sec

Task14: 2.35 sec

Task15: 1.88 sec

Task16: 1.40 sec

Task17: 5.68 sec

Task18: 4.79 sec

Task19: 4.89 sec

Task20: 4.55 sec

Task21: 3.52 sec

Task22: 2.45 sec

Task23: 1.71 sec

Task24: 1.28 sec

Task25: 2.83 sec

Task26: 5.66 sec

Task27: 7.05 sec

Task28: 2.66 sec

Task29: 1.93 sec

Task30: 1.71 sec

Calculating learning rates (exponent b) for each TaskXX...

C:\Users\tternghaa's\AppData\Roaming\Python\Python310\site-packages\openpyxl\styles\stylesheet.py:237: UserWarning: Workbook contains no default style, apply openpyxl's default

warn("Workbook contains no default style, apply openpyxl's default")

Loading previous state (if any)...

Performing ILP-based balancing (all times in seconds)...

Comparing current balancing scenarios...

--- Comparison Results ---

Old Cycle Times (by workstation) [seconds]: [25.6, 29.06, 27.28]

New Cycle Times (by workstation) [seconds]: [27.95, 26.71, 27.28]

Old Total Time (Bottleneck) [seconds]: 29.06

New Total Time (Bottleneck) [seconds]: 27.95

--- Task Changes ---

Workstation 1:

Added tasks: [14]

Workstation 2:

Removed tasks: [14]

--- Metrics ---

Time Saved per Hour [seconds/hour]: 143.76

Setup Time Cost [seconds]: 60.00

Learning Penalty [seconds]: 44.87

Time to Net Benefit [hours]: 0.73

--- New Scenario Workstation Allocation ---

Workstation 1: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14]

Workstation 2: [15, 16, 17, 18, 19, 20, 21]

Workstation 3: [22, 23, 24, 25, 26, 27, 28, 29, 30]

Saving the new scenario as the current baseline...