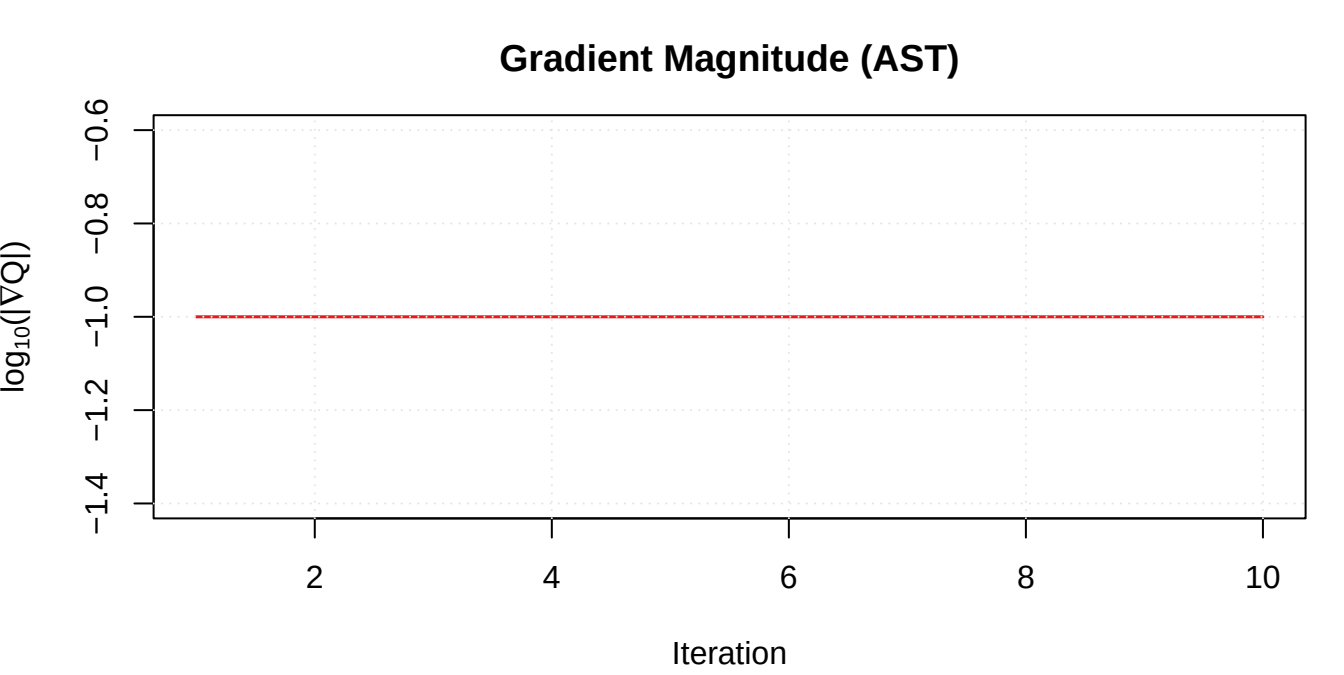
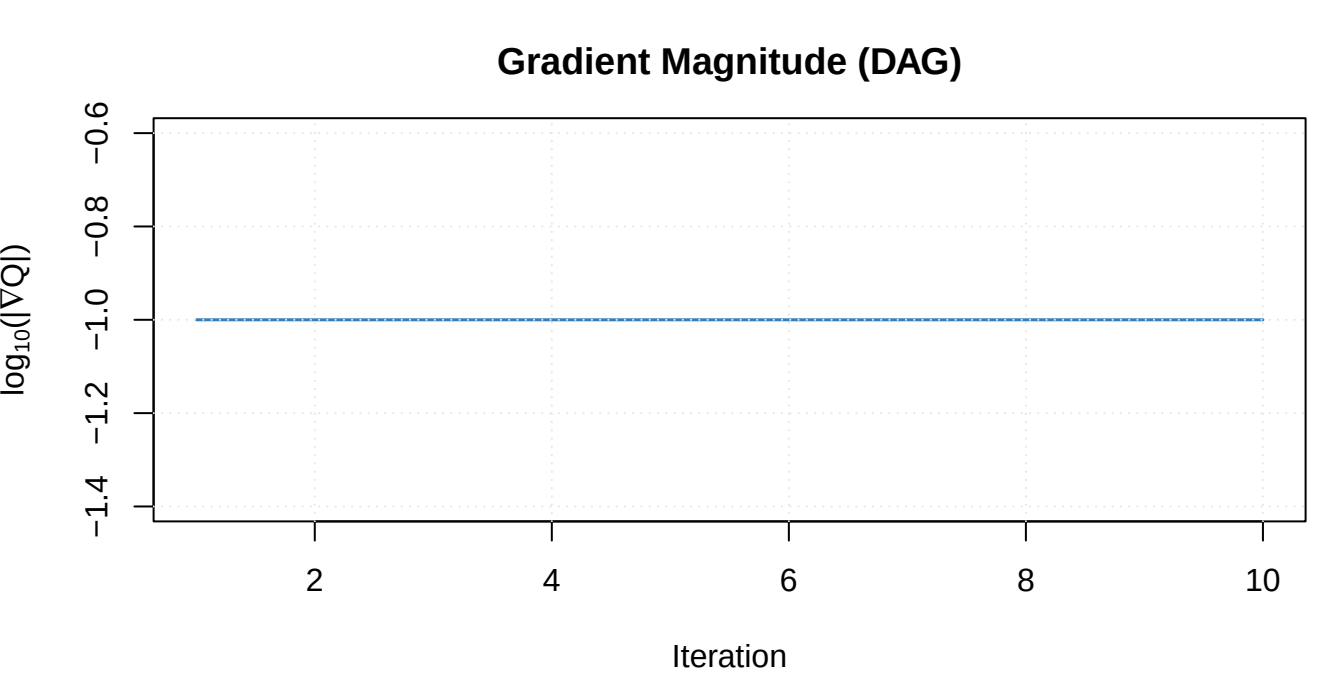
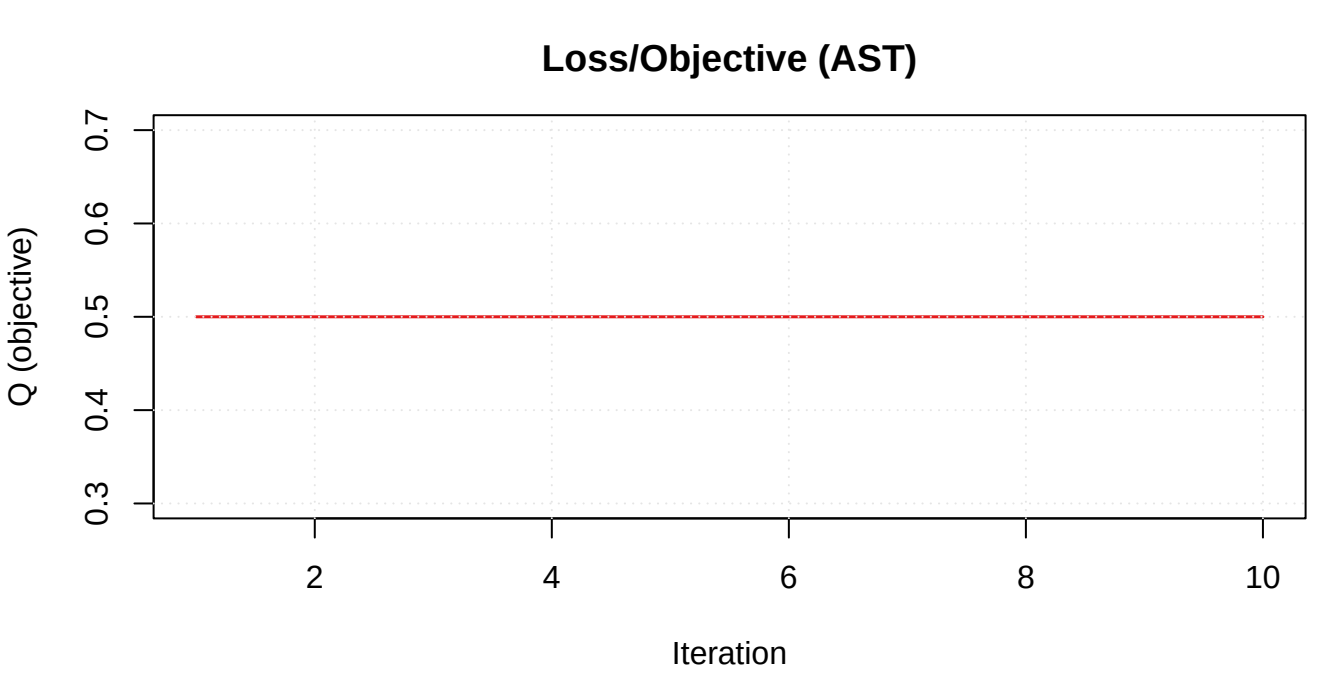
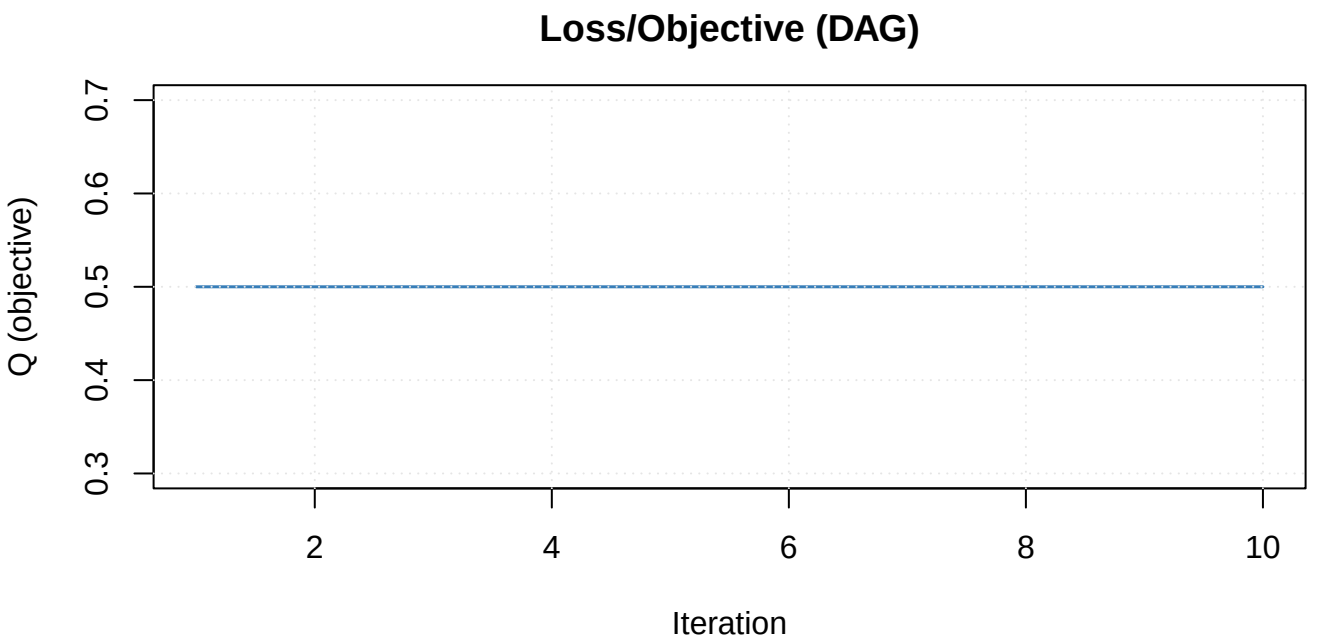
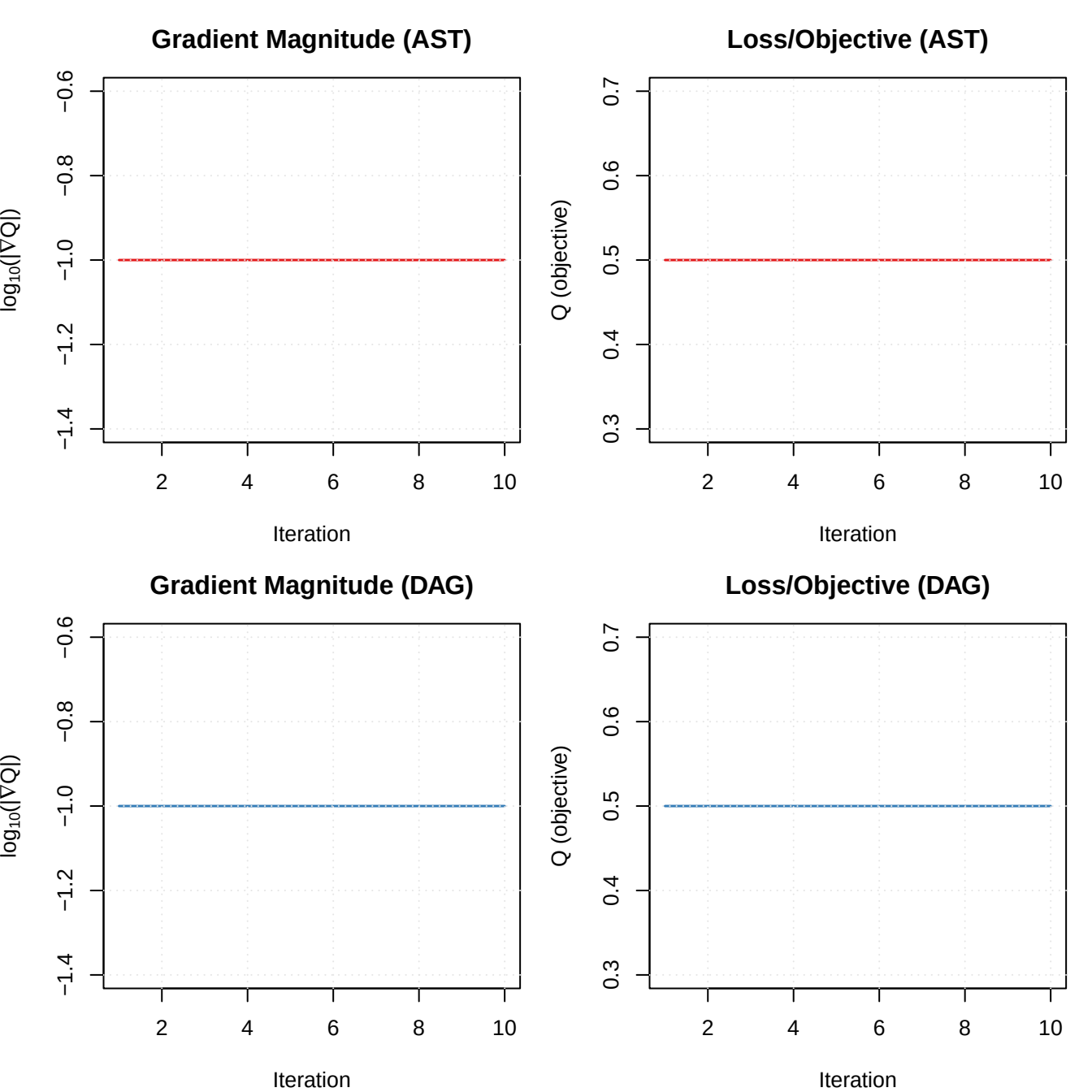
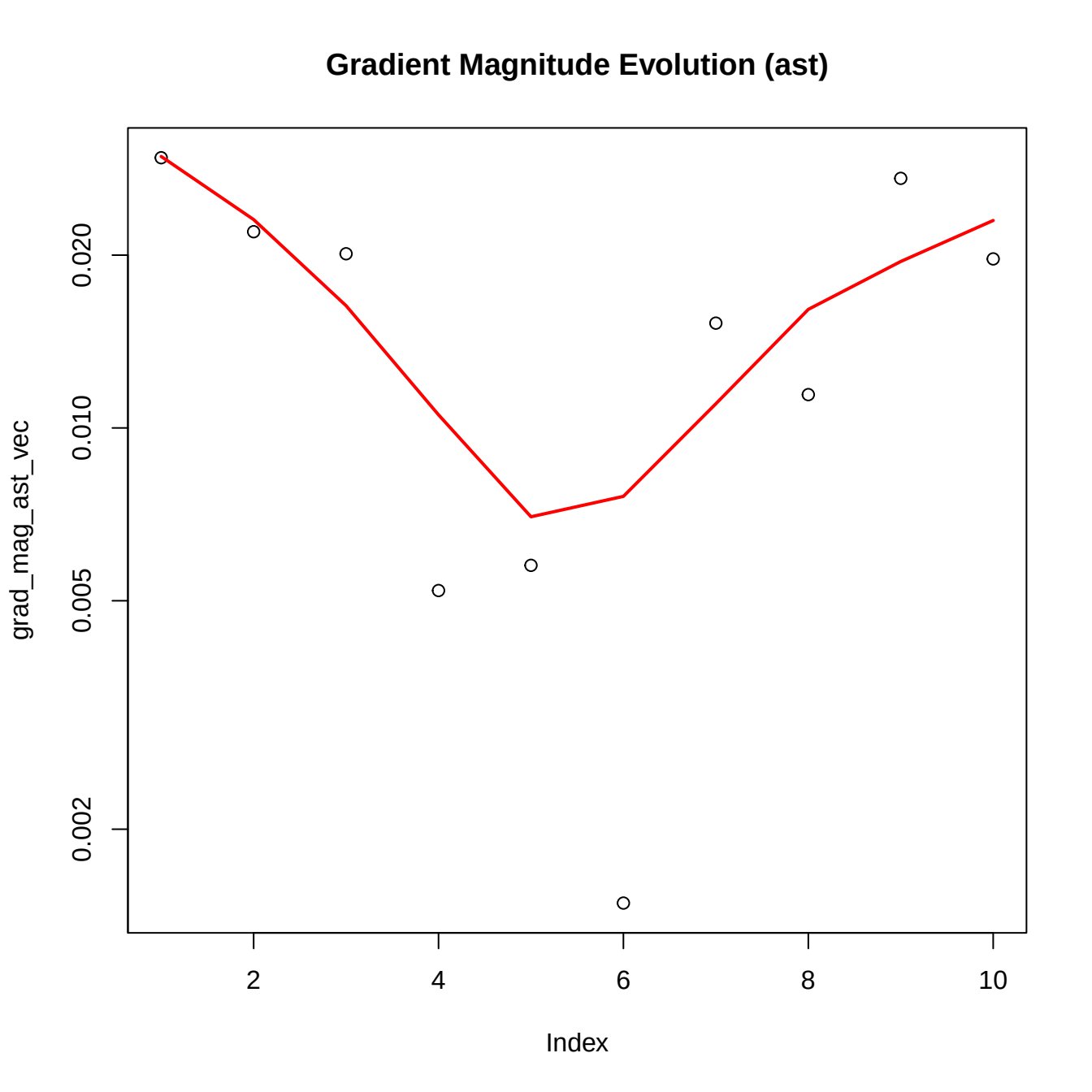

Gradient Magnitude (AST)
log10(|∇Q|)
−0.6
−0.8
−1.0
−1.2
−1.4
2
4
6
8
10
Iteration

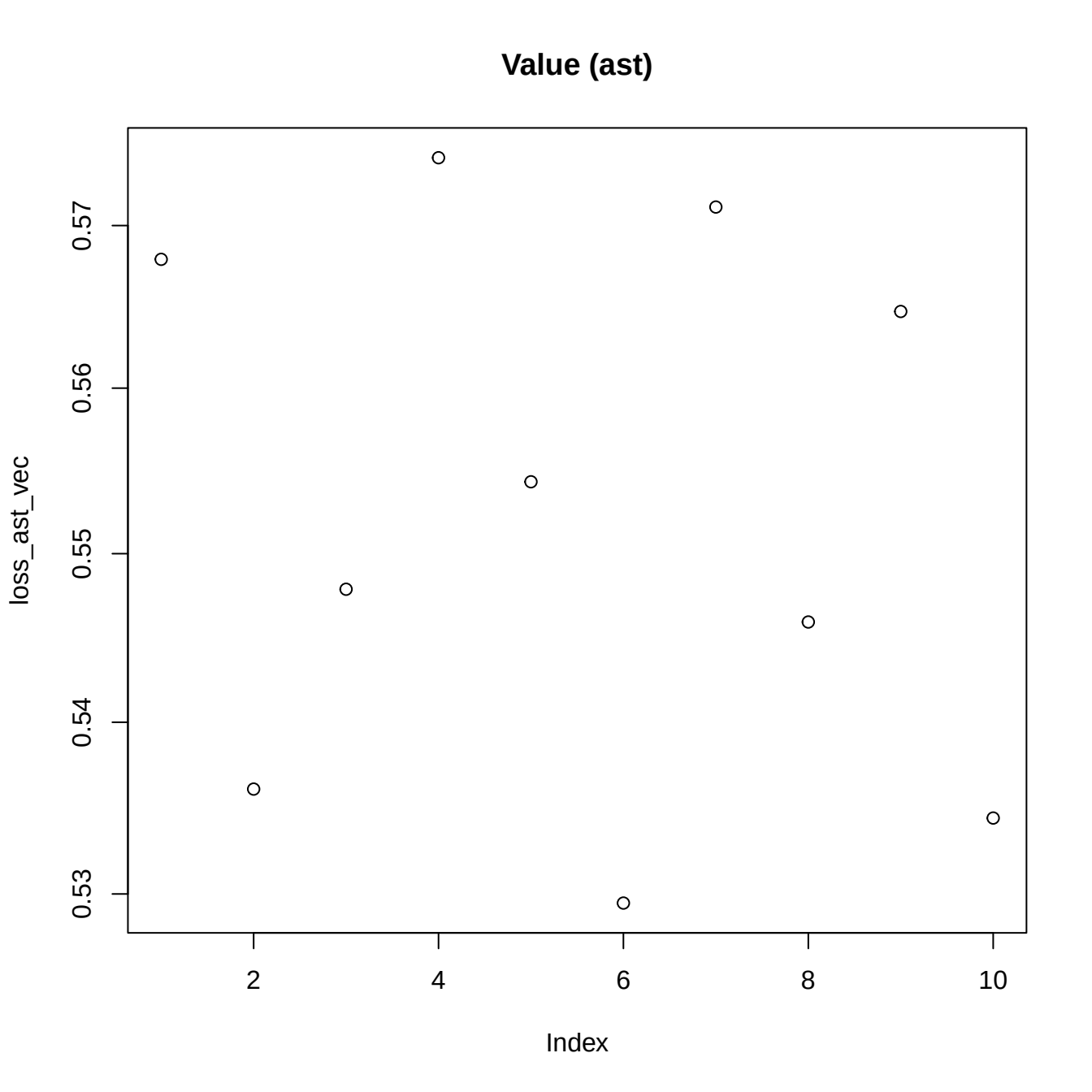

Gradient Magnitude (DAG)
log10(|∇Q|)
−0.6
−0.8
−1.0
−1.2
−1.4
2
4
6
8
10
Iteration

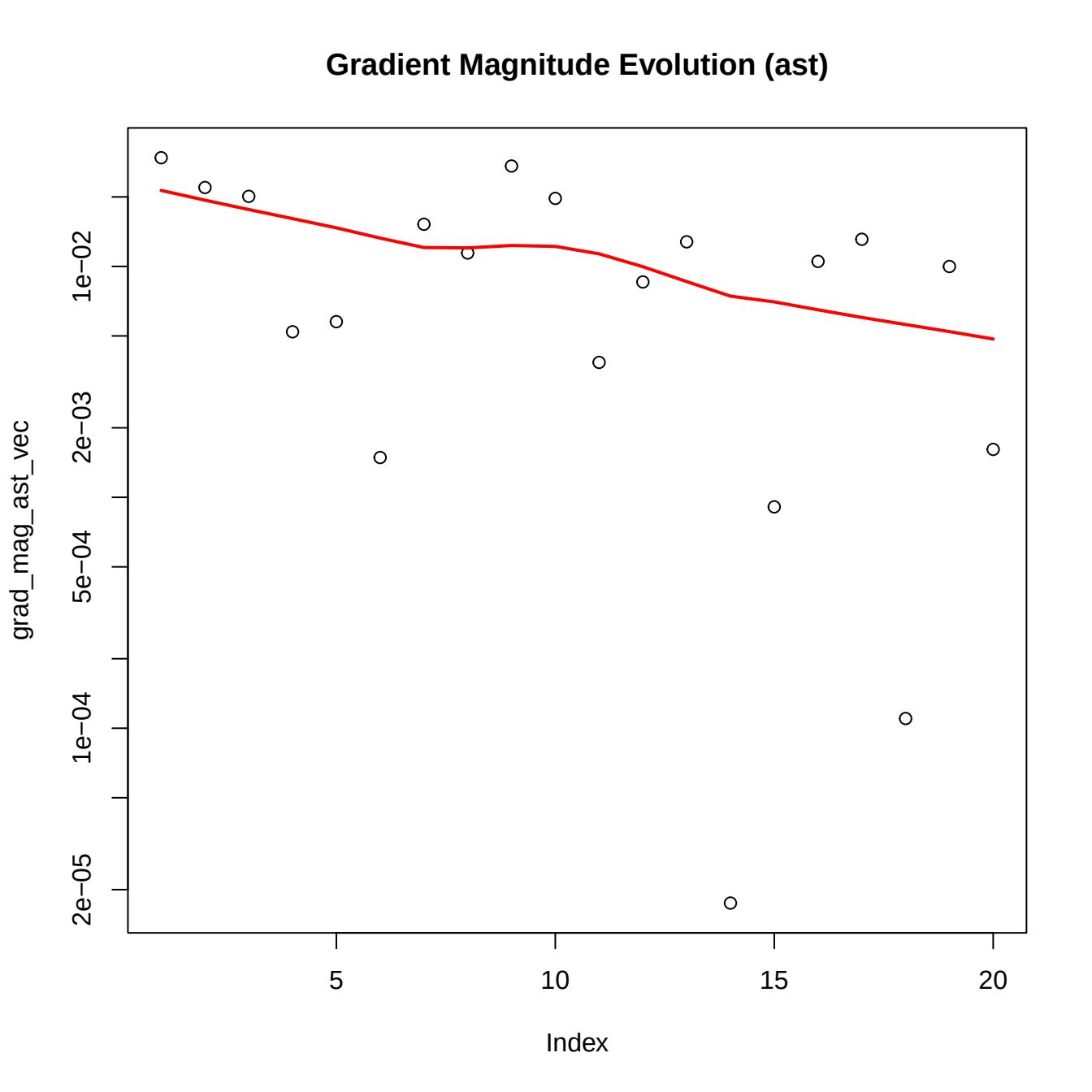

Loss/Objective (AST)
Q (objective)
0.3
0.4
0.5
0.6
0.7
2
4
6
8
10
Iteration

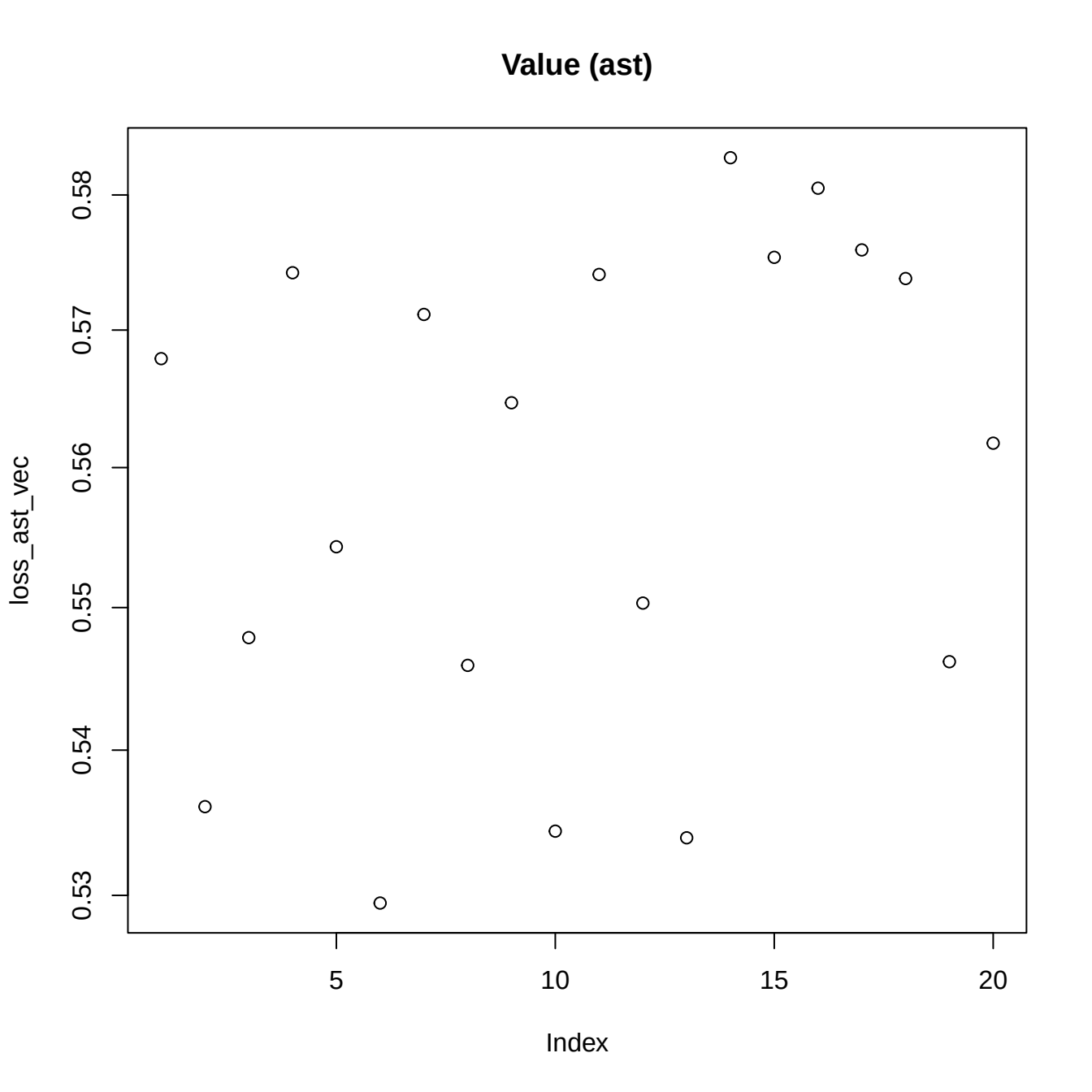

Loss/Objective (DAG)
Q (objective)
0.3
0.4
0.5
0.6
0.7
2
4
6
8
10
Iteration

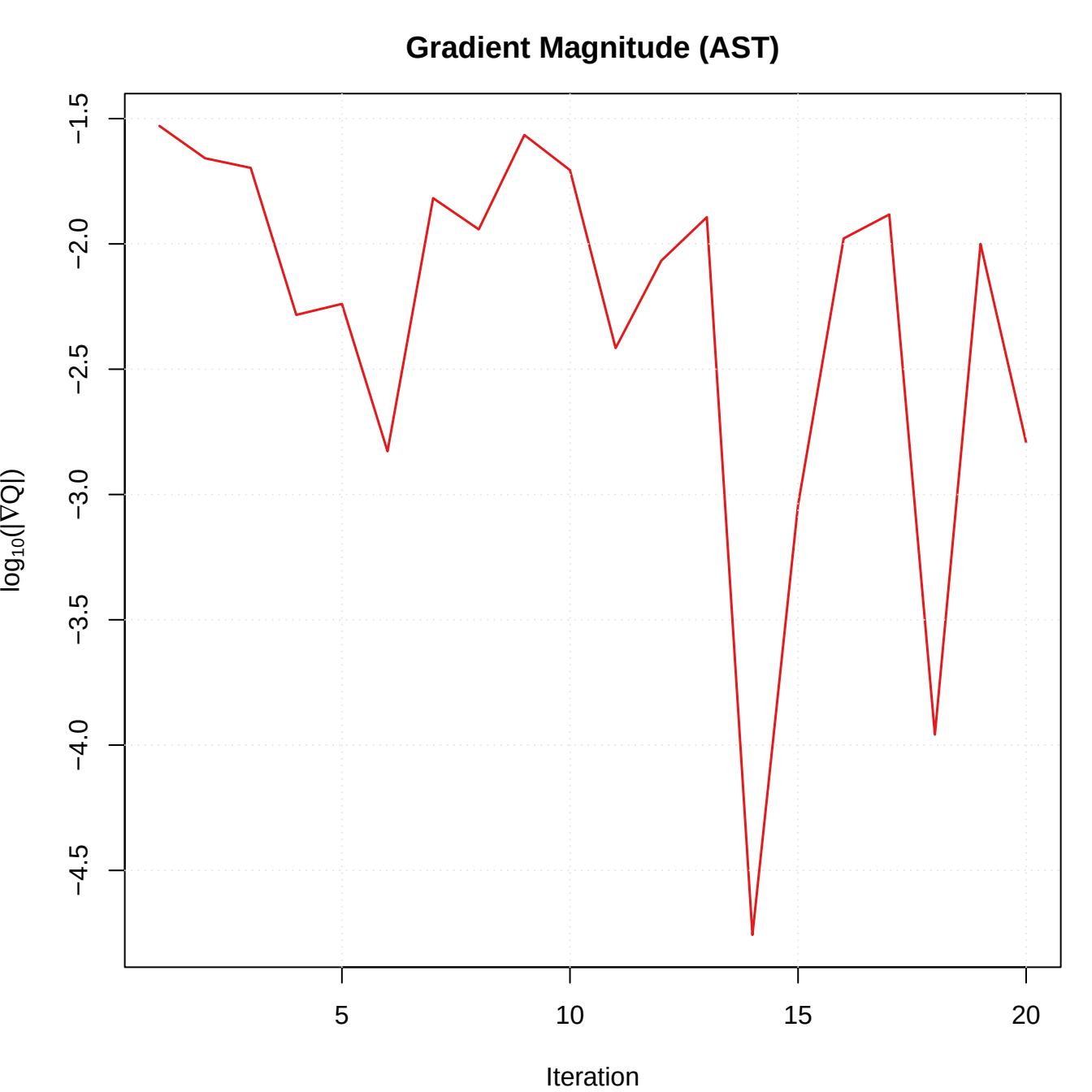

Gradient Magnitude (AST)
log₁₀(|∇Q|)
−0.6
−0.8
−1.0
−1.2
−1.4
2
4
6
8
10
Iteration
Loss/Objective (AST)
Q (objective)
0.7
0.6
0.5
0.4
0.3
2
4
6
8
10
Iteration
Gradient Magnitude (DAG)
log₁₀(|∇Q|)
−0.6
−0.8
−1.0
−1.2
−1.4
2
4
6
8
10
Iteration
Loss/Objective (DAG)
Q (objective)
0.7
0.6
0.5
0.4
0.3
2
4
6
8
10
Iteration

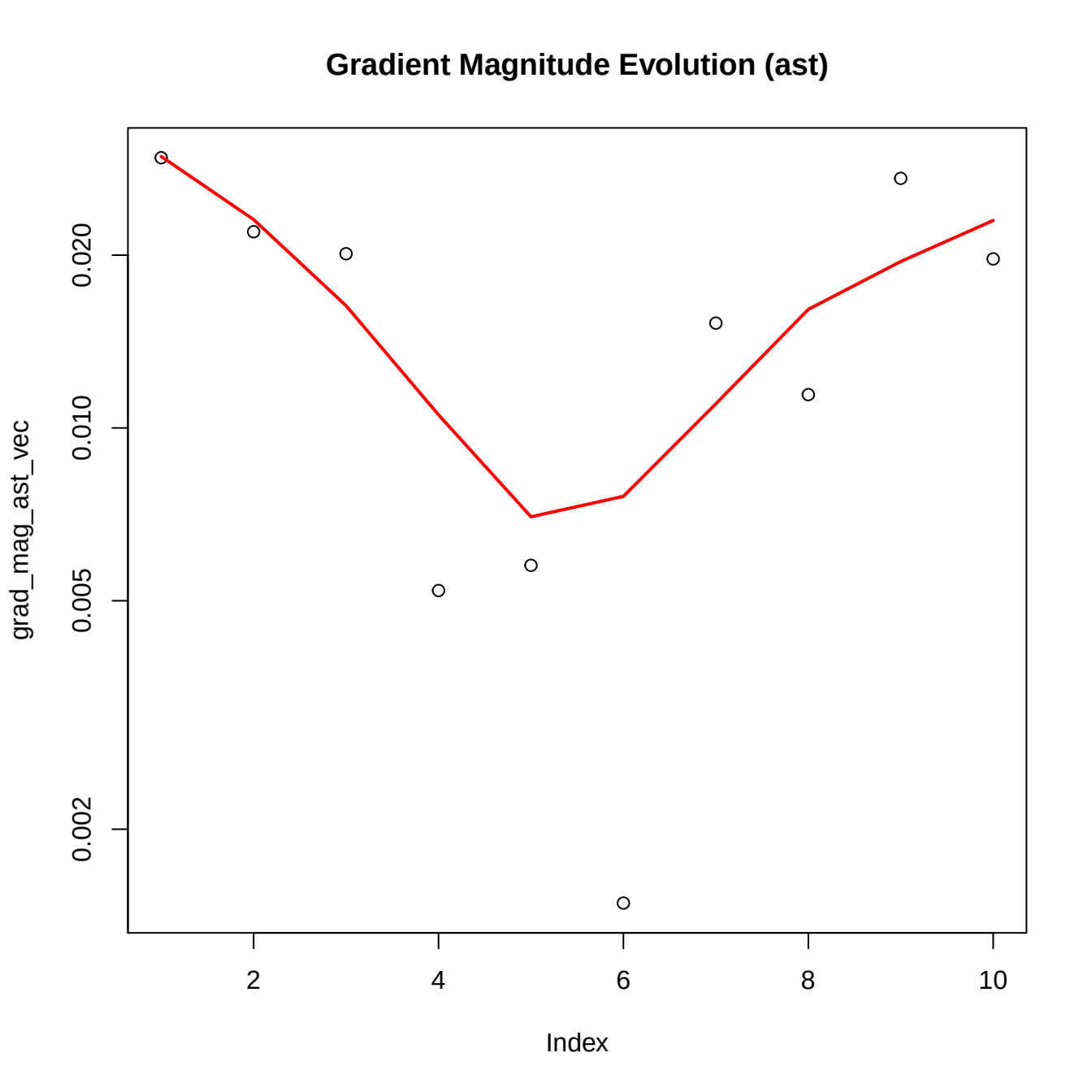

Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.002
0.005
0.010
0.020
2
4
6
8
10
Index

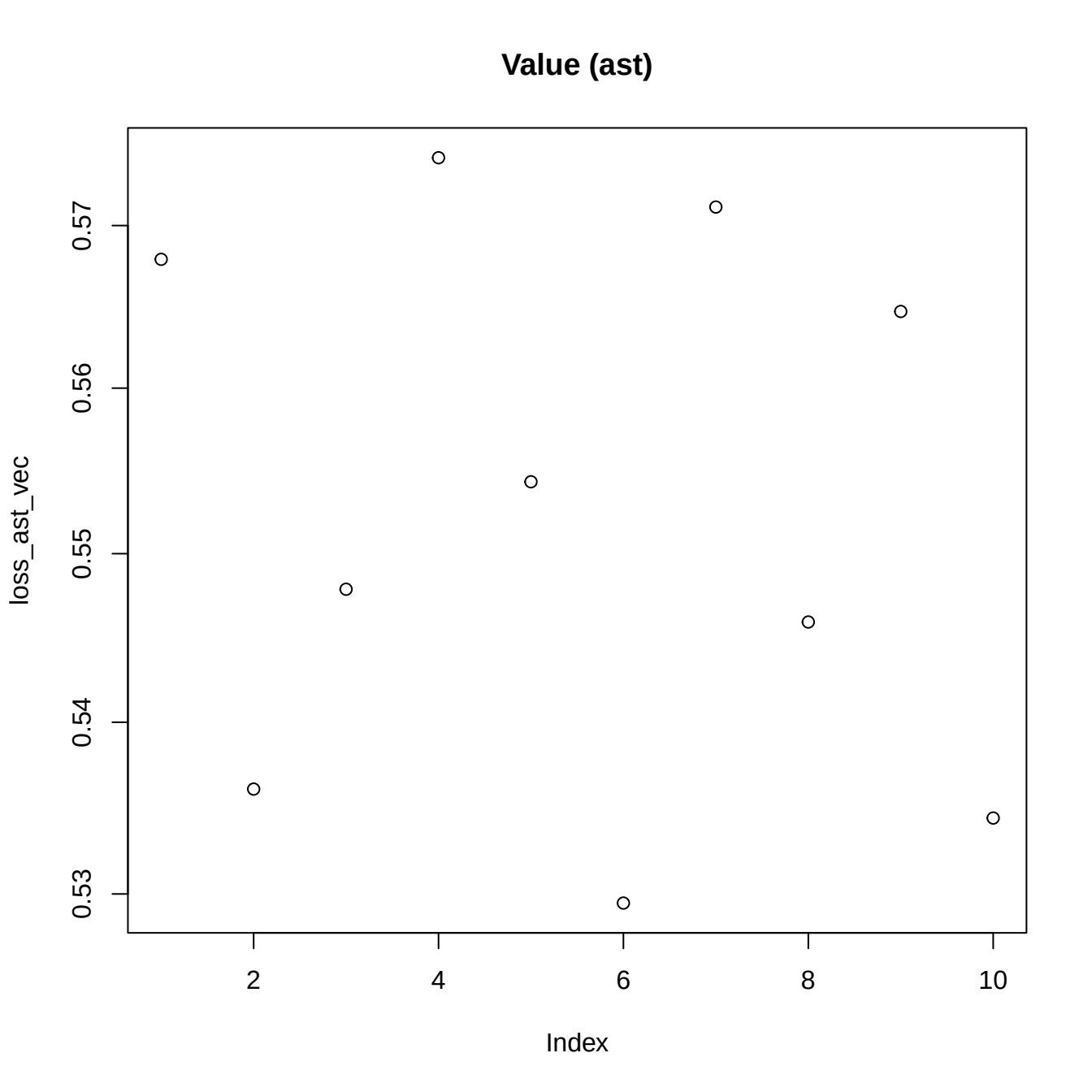

Value (ast)
loss_ast_vec
0.53
0.54
0.55
0.56
0.57
2
4
6
8
10
Index

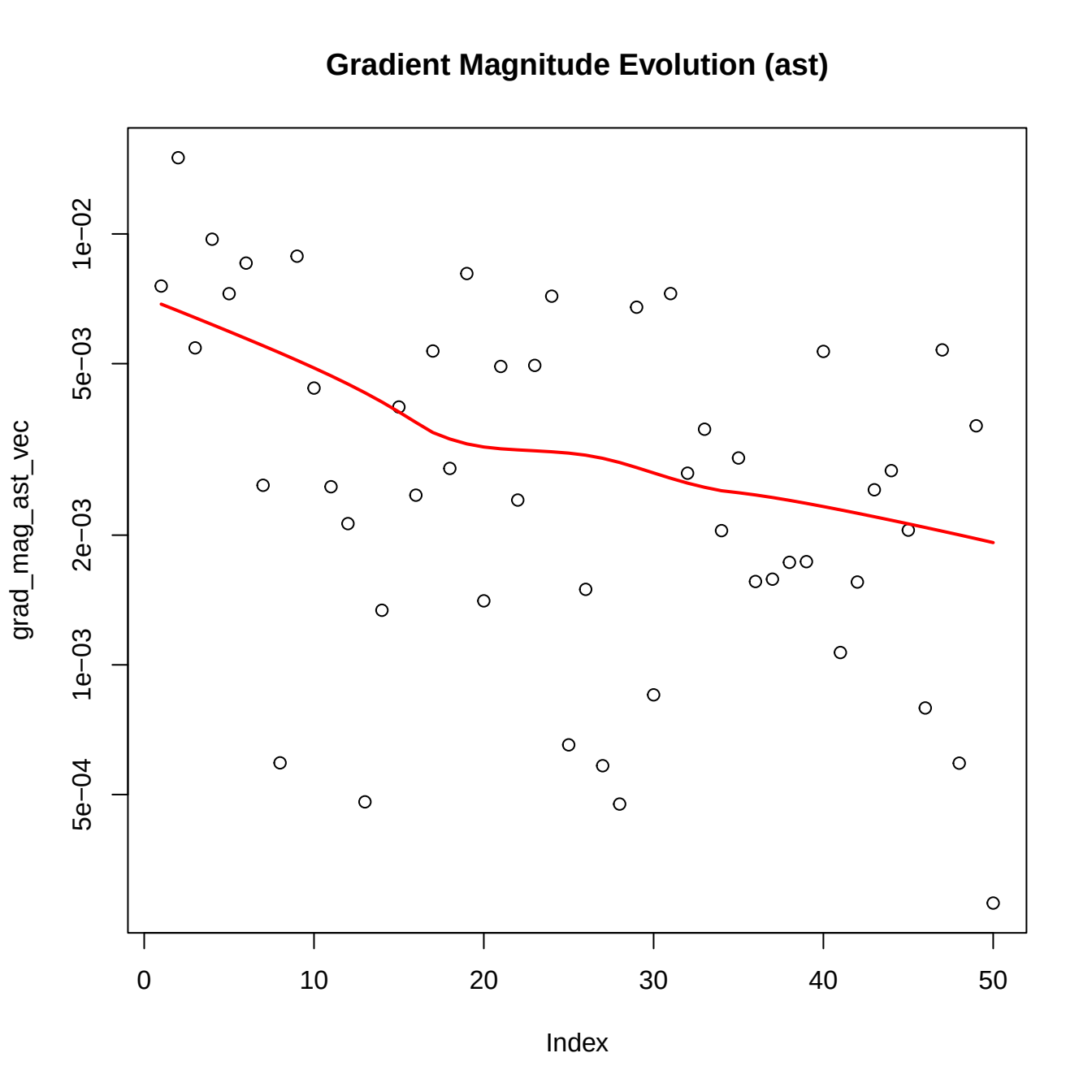

Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
1e−02
2e−03
5e−04
1e−04
2e−05
5
10
15
20
Index

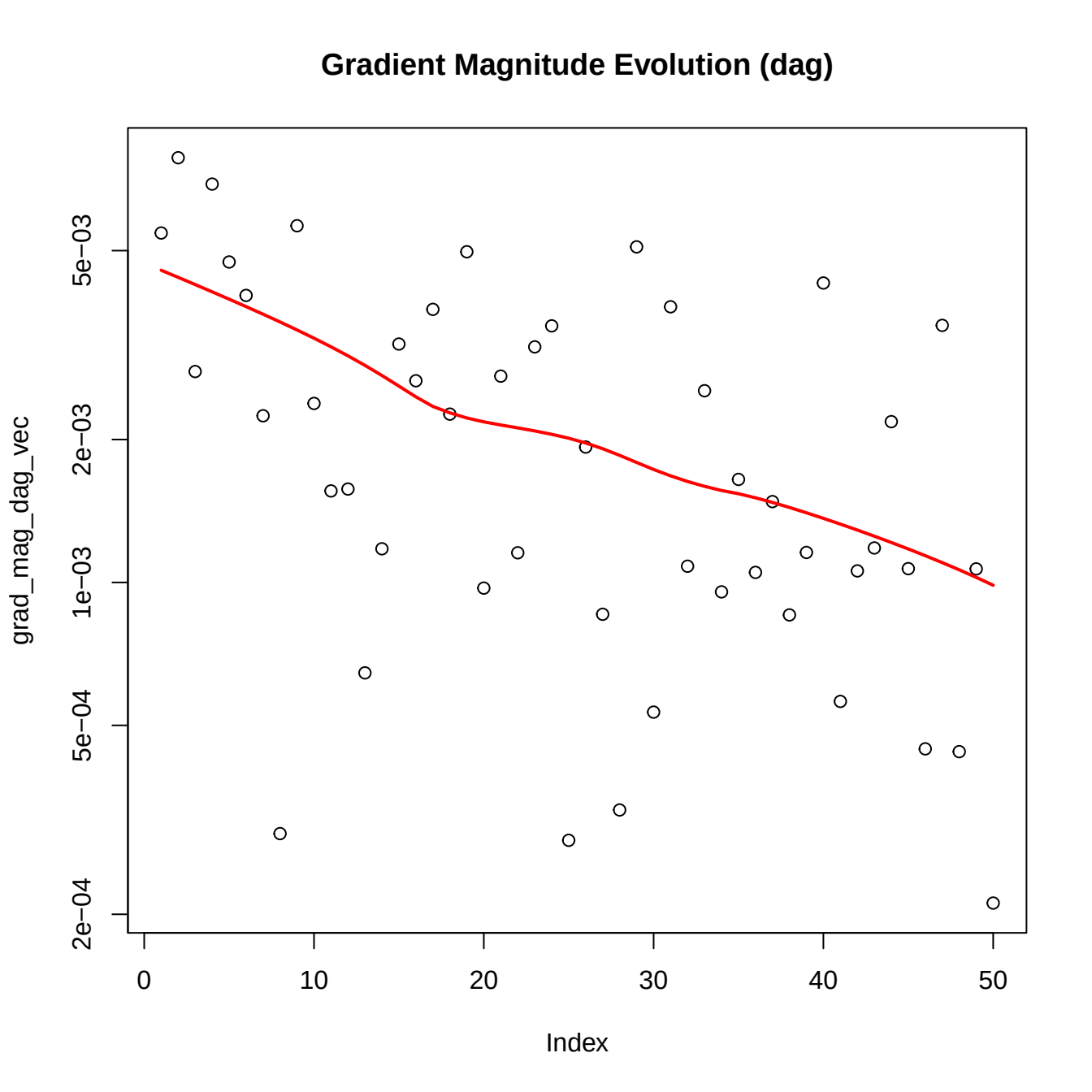

Value (ast)
loss_ast_vec
0.53
0.54
0.55
0.56
0.57
0.58
5
10
15
20
Index

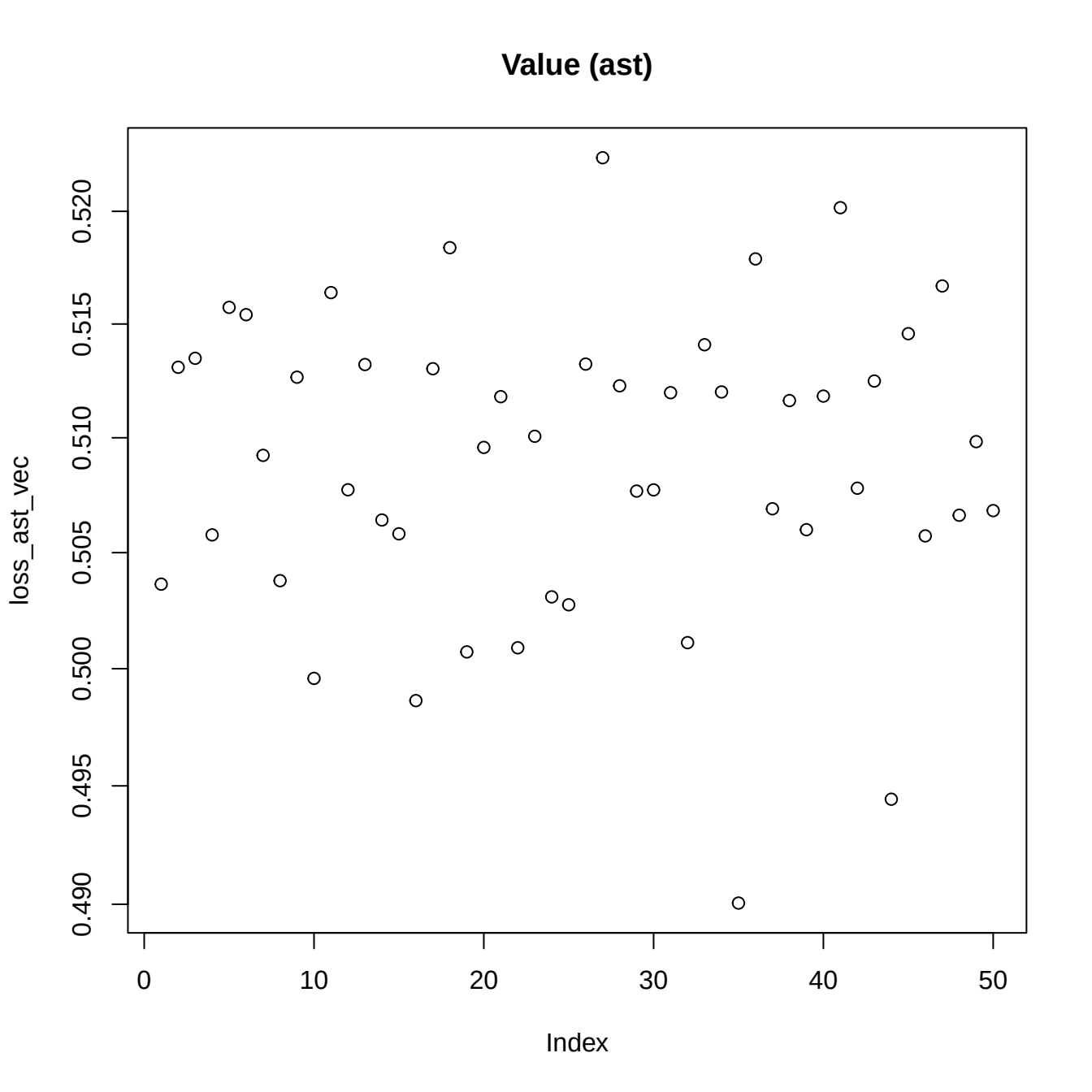

Gradient Magnitude (AST)
log10(|∇Q|)
−1.5
−2.0
−2.5
−3.0
−3.5
−4.0
−4.5
5
10
15
20
Iteration

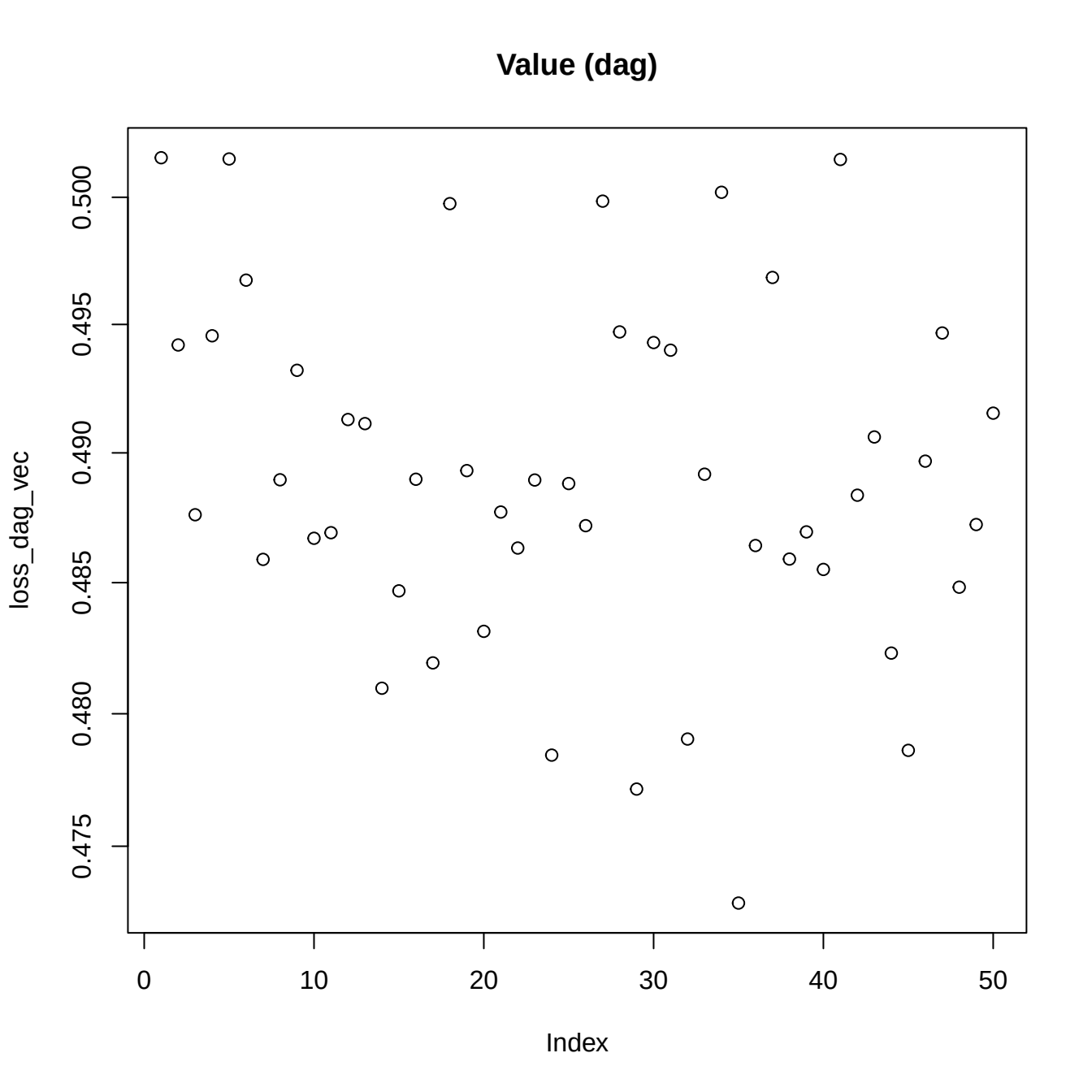

Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.002
0.005
0.010
0.020
2
4
6
8
10
Index

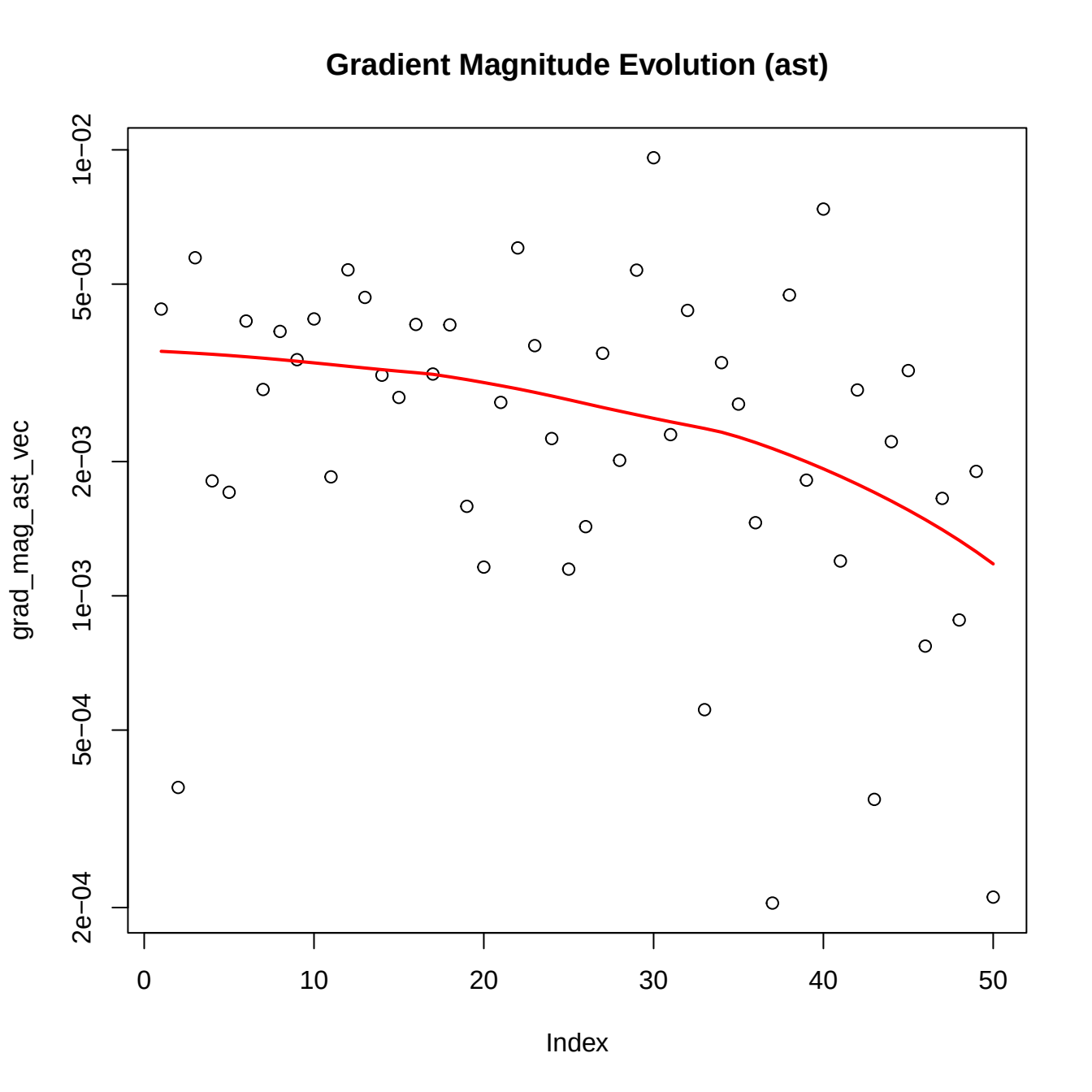

Value (ast)
loss_ast_vec
0.53
0.54
0.55
0.56
0.57
2
4
6
8
10
Index

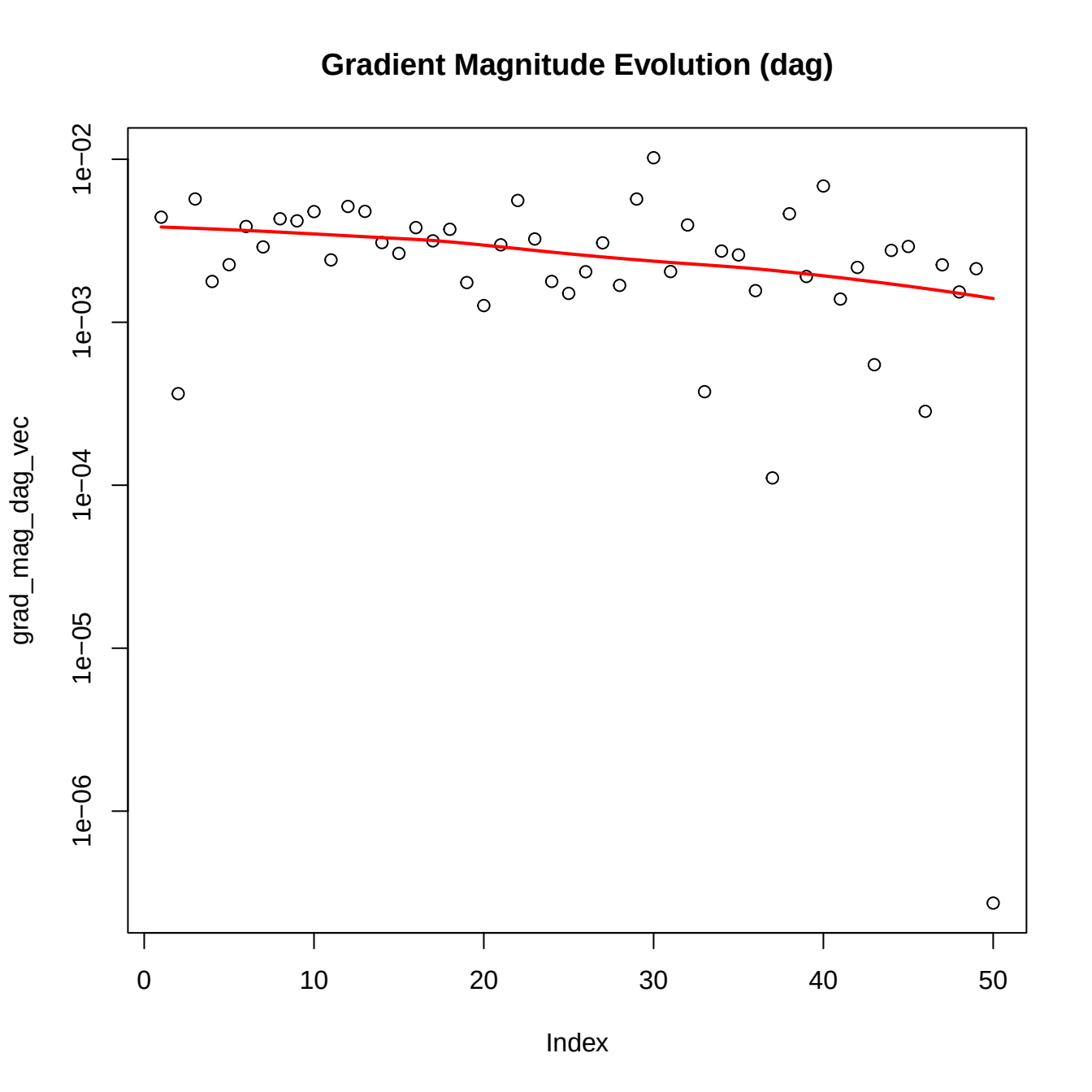

Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
1e−02
5e−03
2e−03
1e−03
5e−04
0
10
20
30
40
50
Index

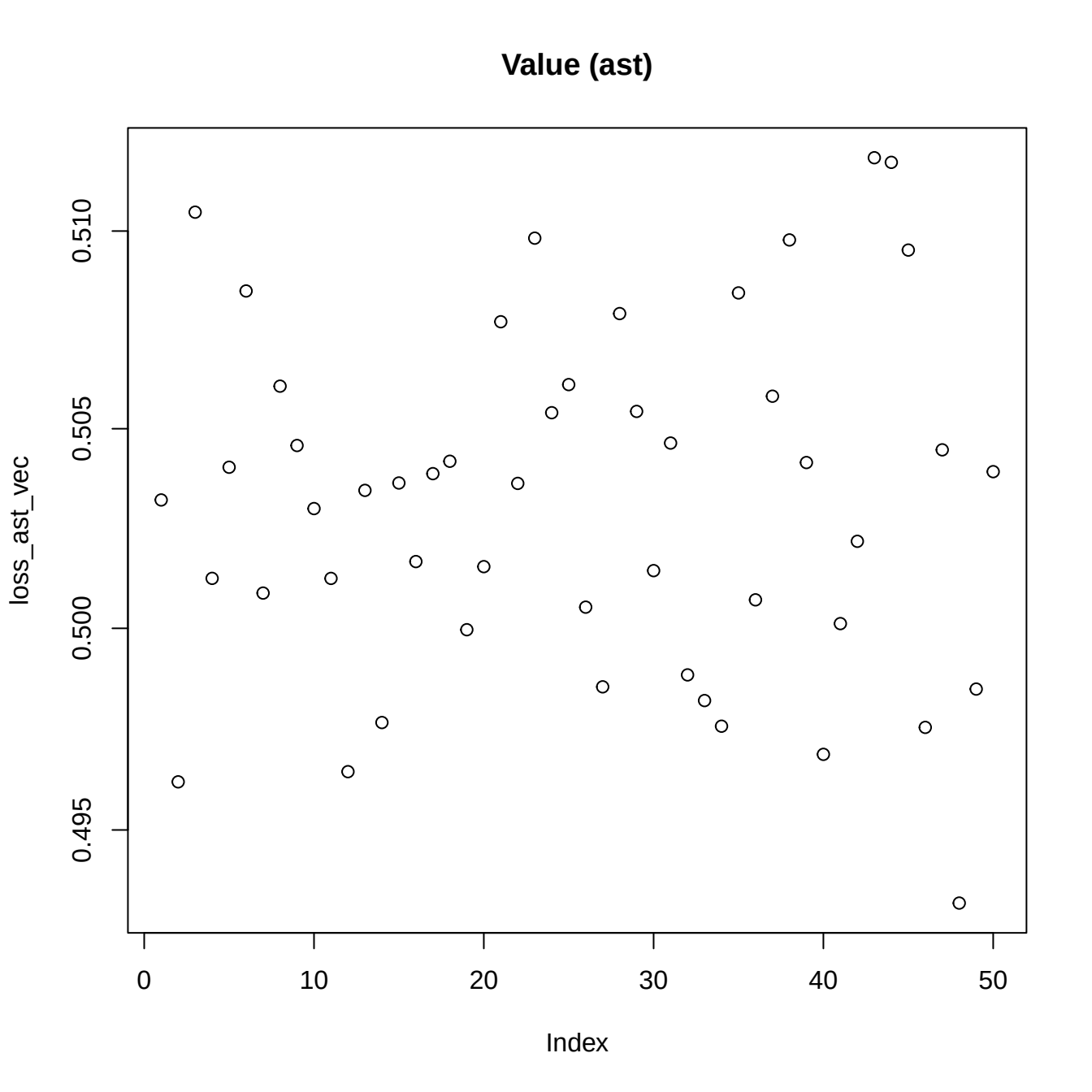

Gradient Magnitude Evolution (dag)
grad_mag_dag_vec
5e−03
2e−03
1e−03
5e−04
2e−04
0
10
20
30
40
50
Index

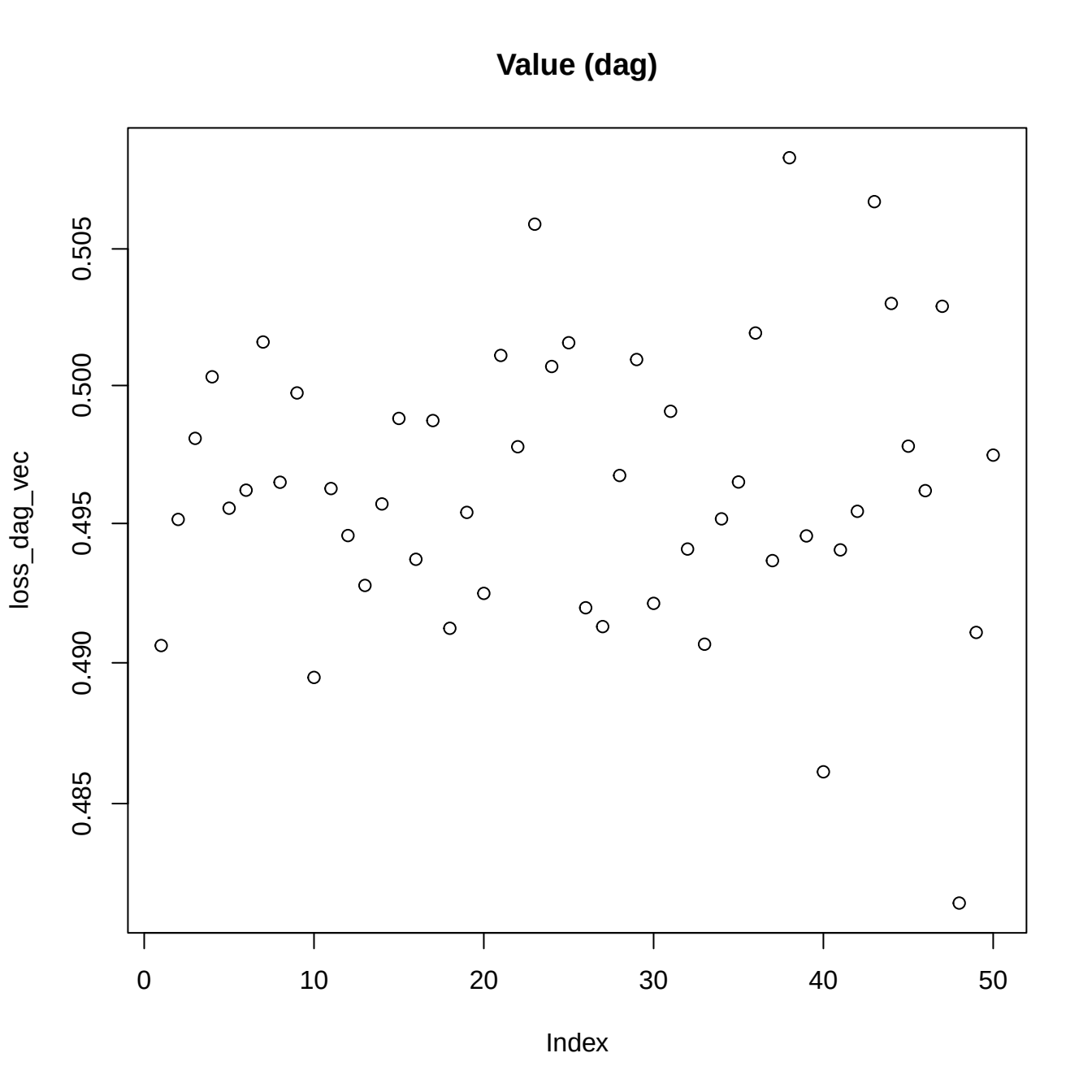

Value (ast)
loss_ast_vec
0.490
0.495
0.500
0.505
0.510
0.515
0.520
0
10
20
30
40
50
Index

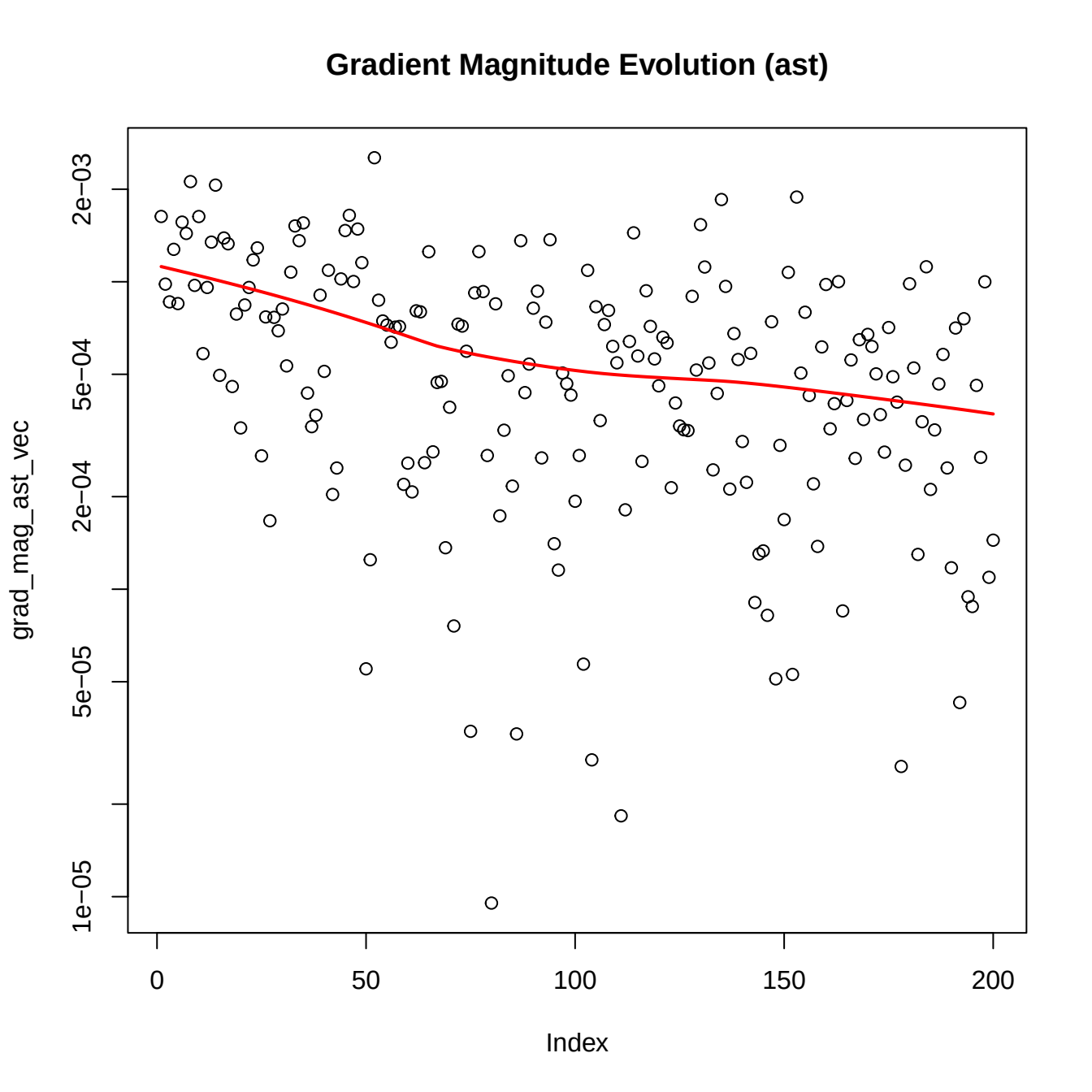

Value (dag)
loss_dag_vec
0.475
0.480
0.485
0.490
0.495
0.500
0
10
20
30
40
50
Index

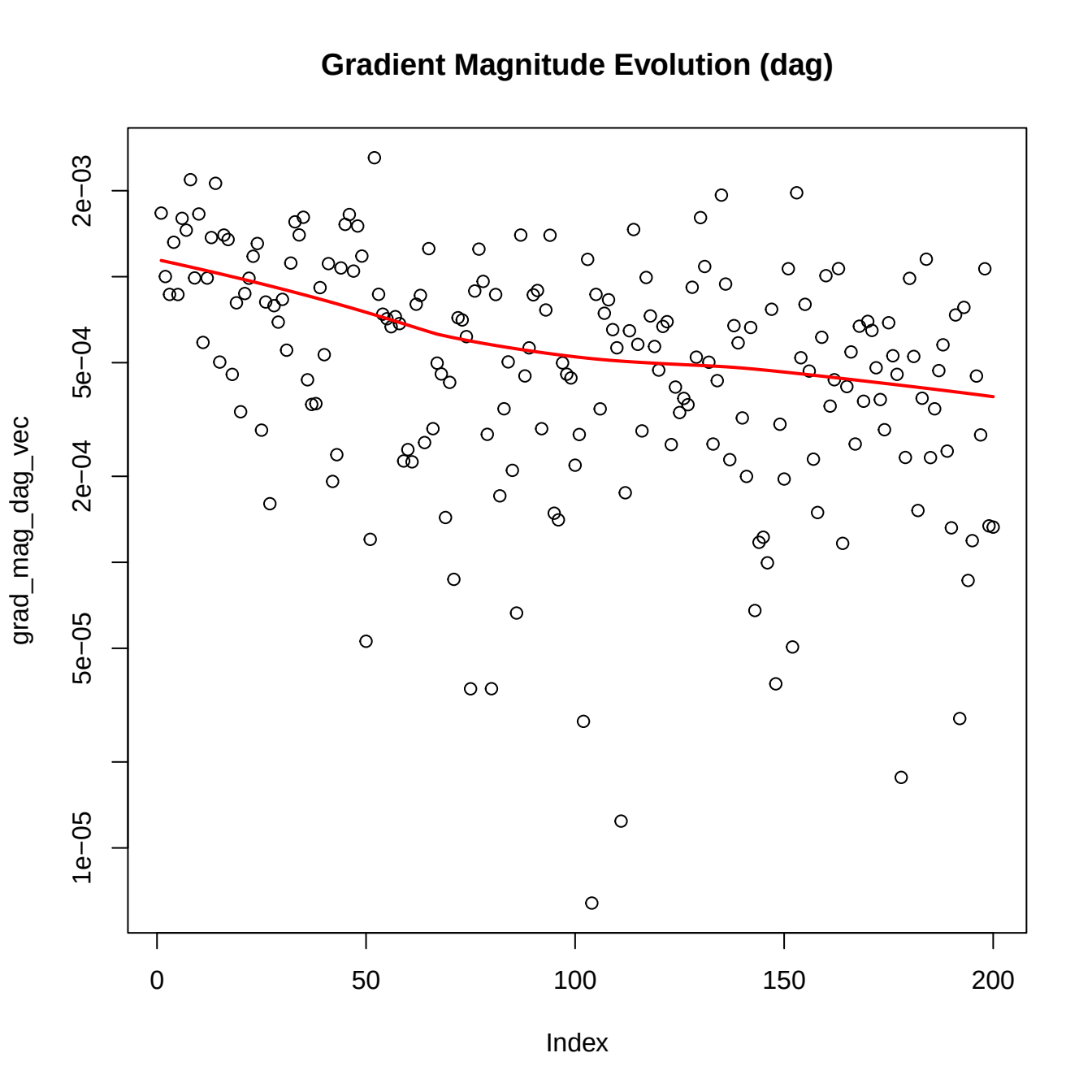

Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
1e−02
5e−03
2e−03
1e−03
5e−04
2e−04
0
10
20
30
40
50
Index

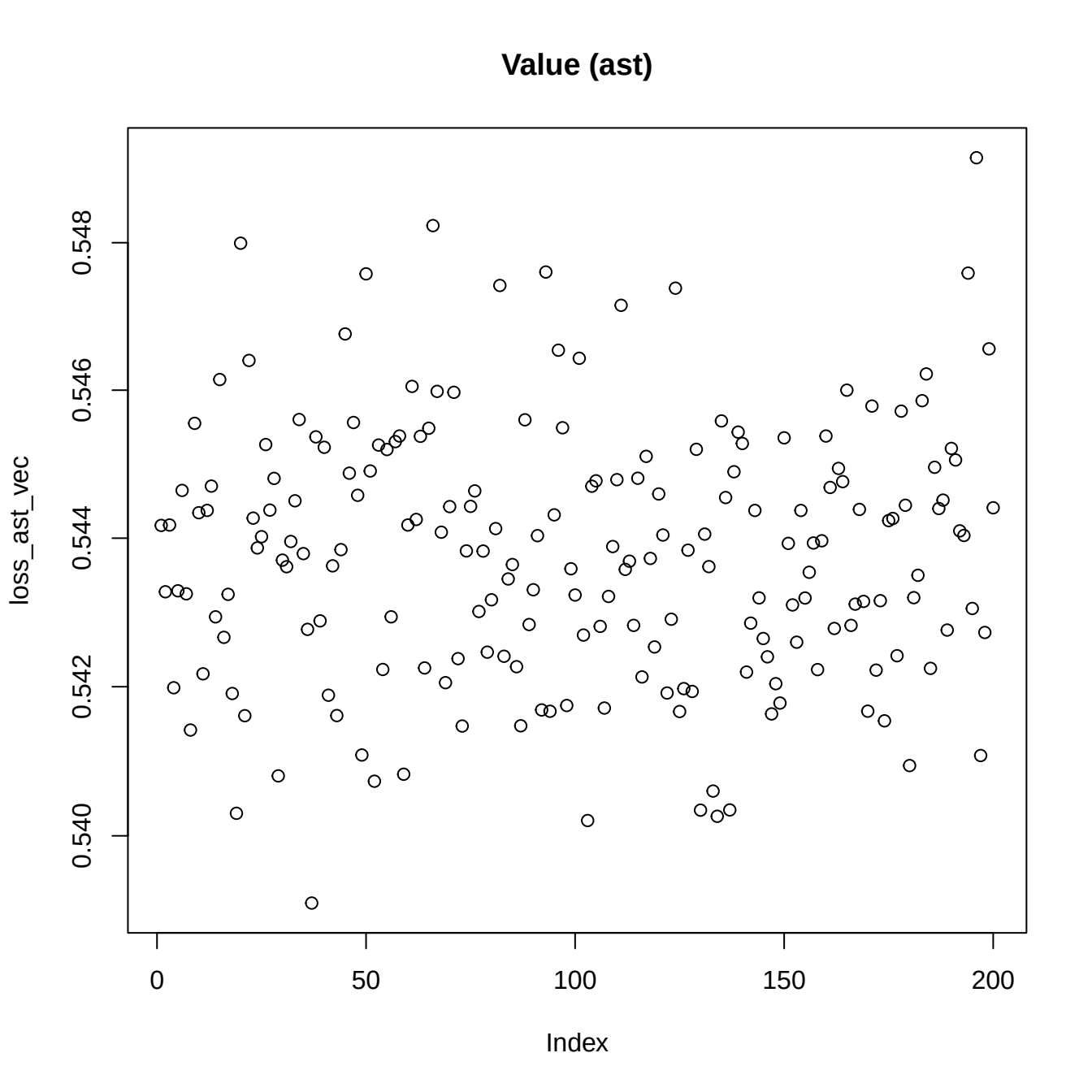

Gradient Magnitude Evolution (dag)
grad_mag_dag_vec
1e−02
1e−03
1e−04
1e−05
1e−06
0
10
20
30
40
50
Index

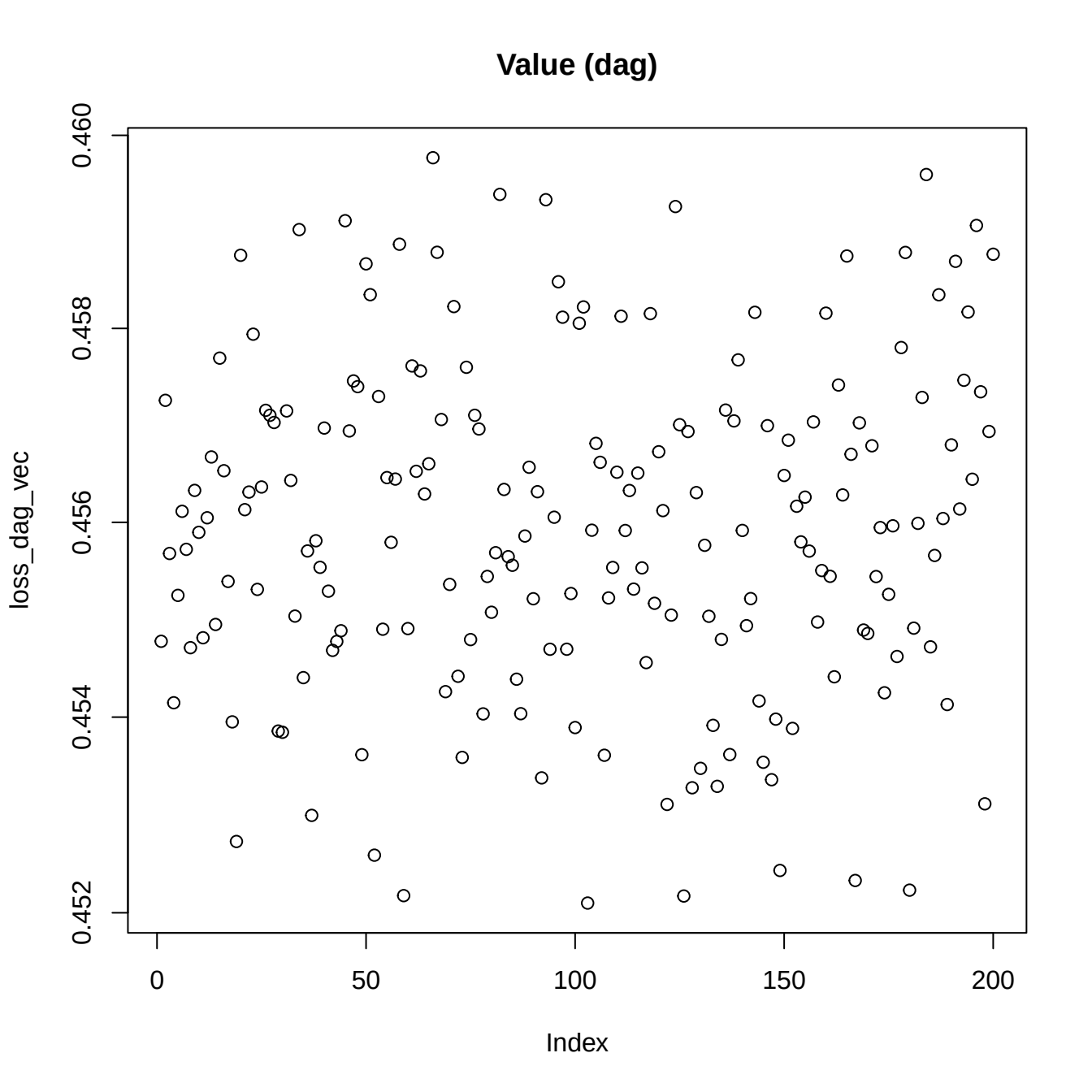

Value (ast)
loss_ast_vec
0.495
0.500
0.505
0.510
0
10
20
30
40
50
Index

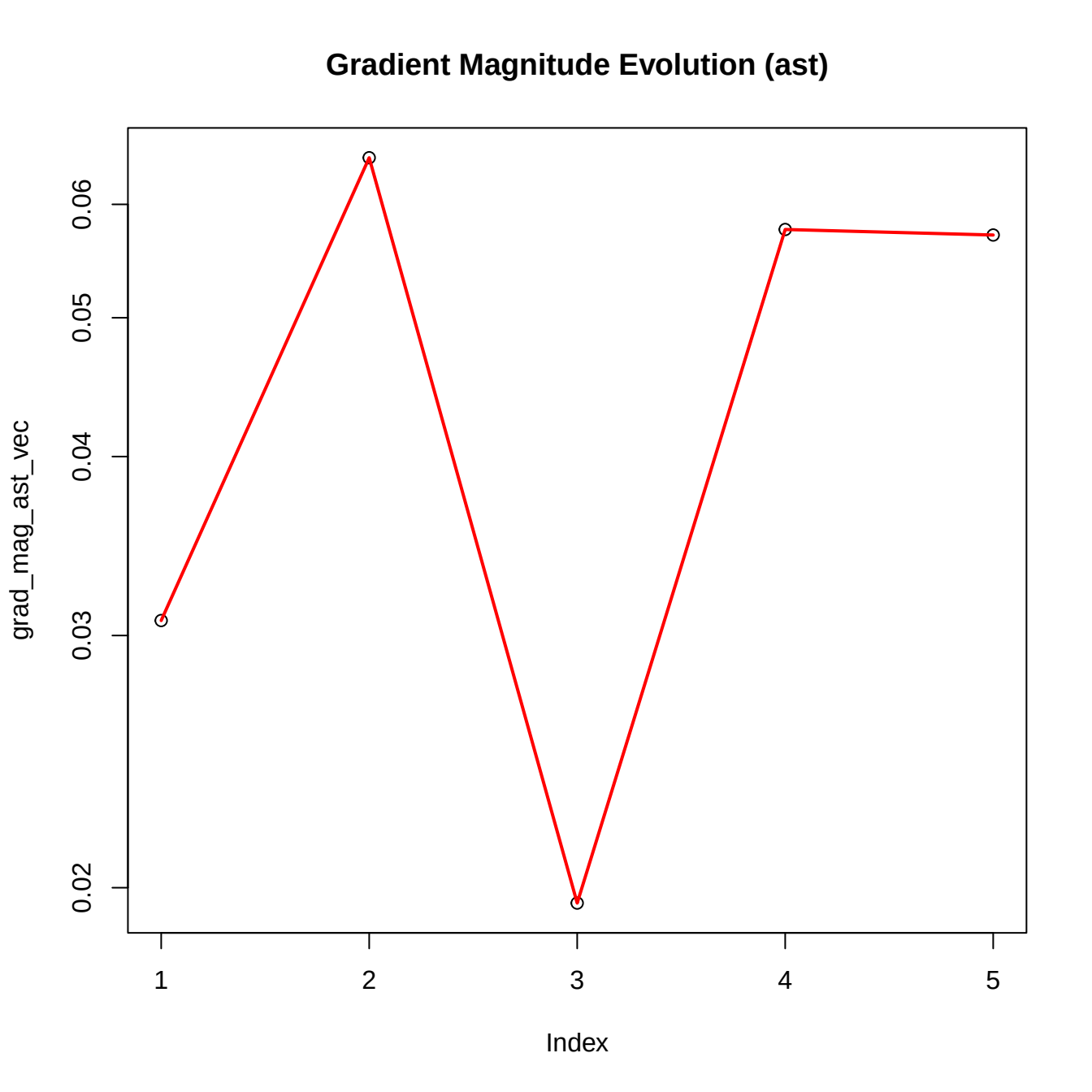

Value (dag)
loss_dag_vec
0.485
0.490
0.495
0.500
0.505
0
10
20
30
40
50
Index

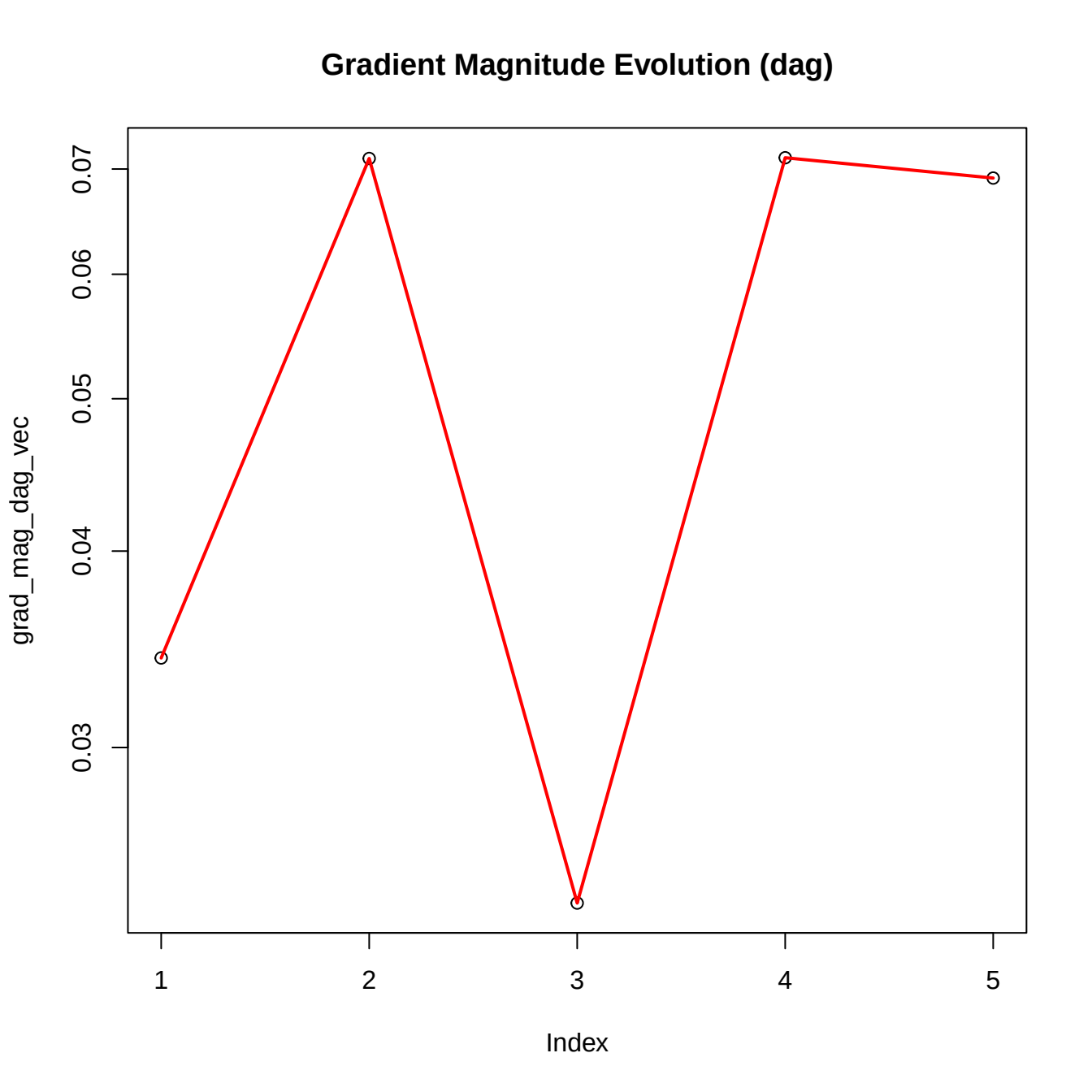

Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
2e−03
5e−04
2e−04
5e−05
1e−05
0
50
100
150
200
Index

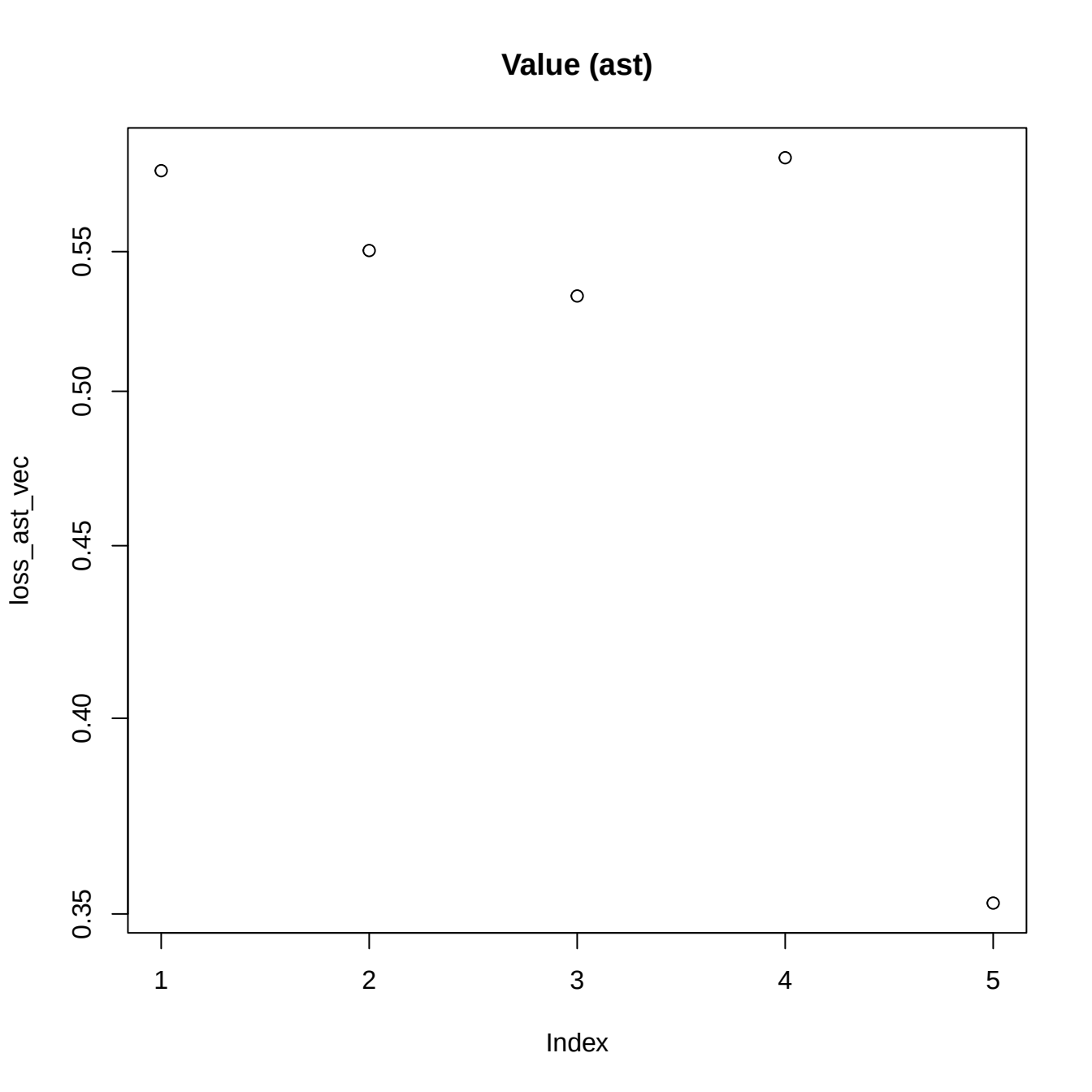

Gradient Magnitude Evolution (dag)
grad_mag_dag_vec
2e−03
5e−04
2e−04
5e−05
1e−05
0
50
100
150
200
Index

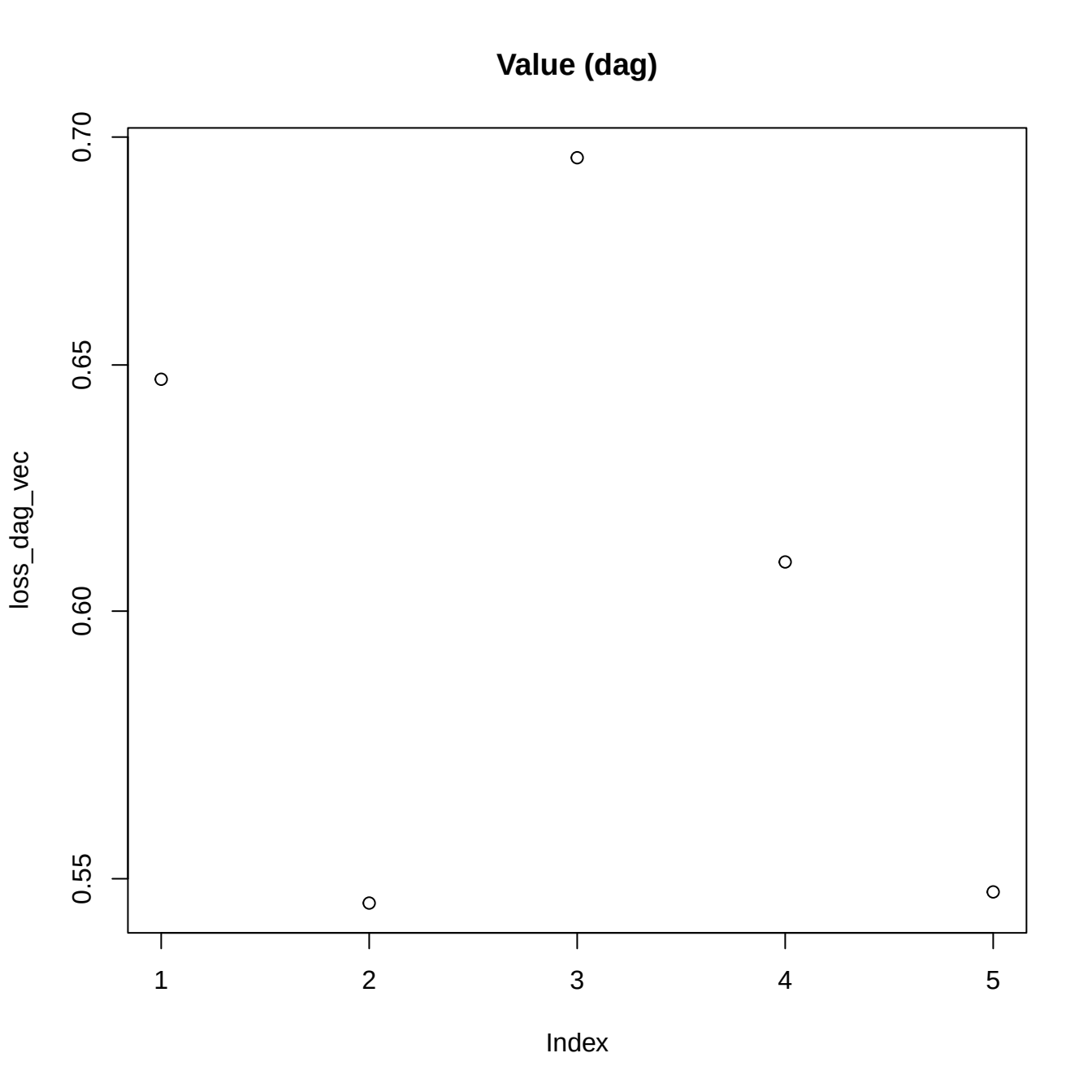

Value (ast)
loss_ast_vec
0.540
0.542
0.544
0.546
0.548
0
50
100
150
200
Index

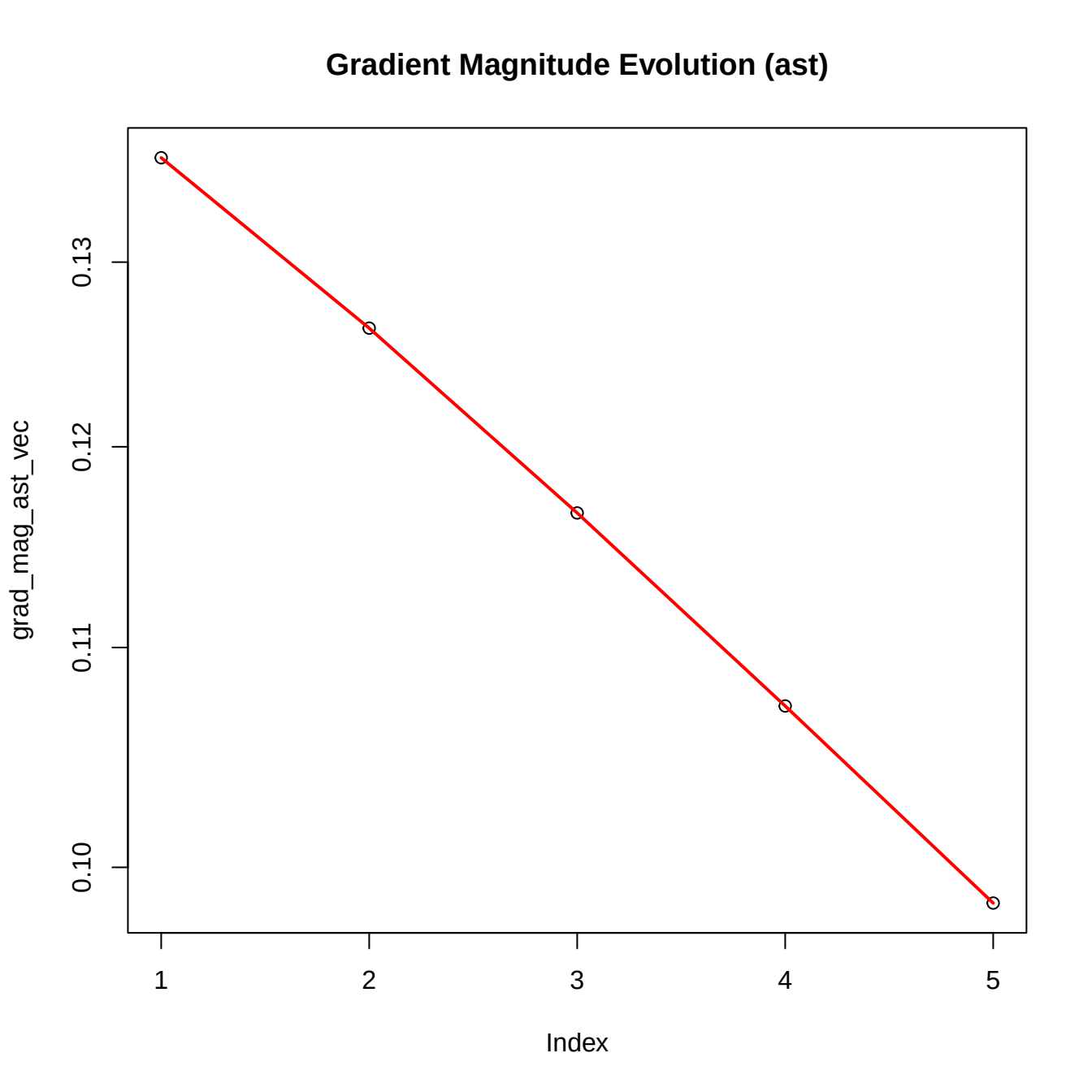

Value (dag)
loss_dag_vec
0.452
0.454
0.456
0.458
0.460
0
50
100
150
200
Index

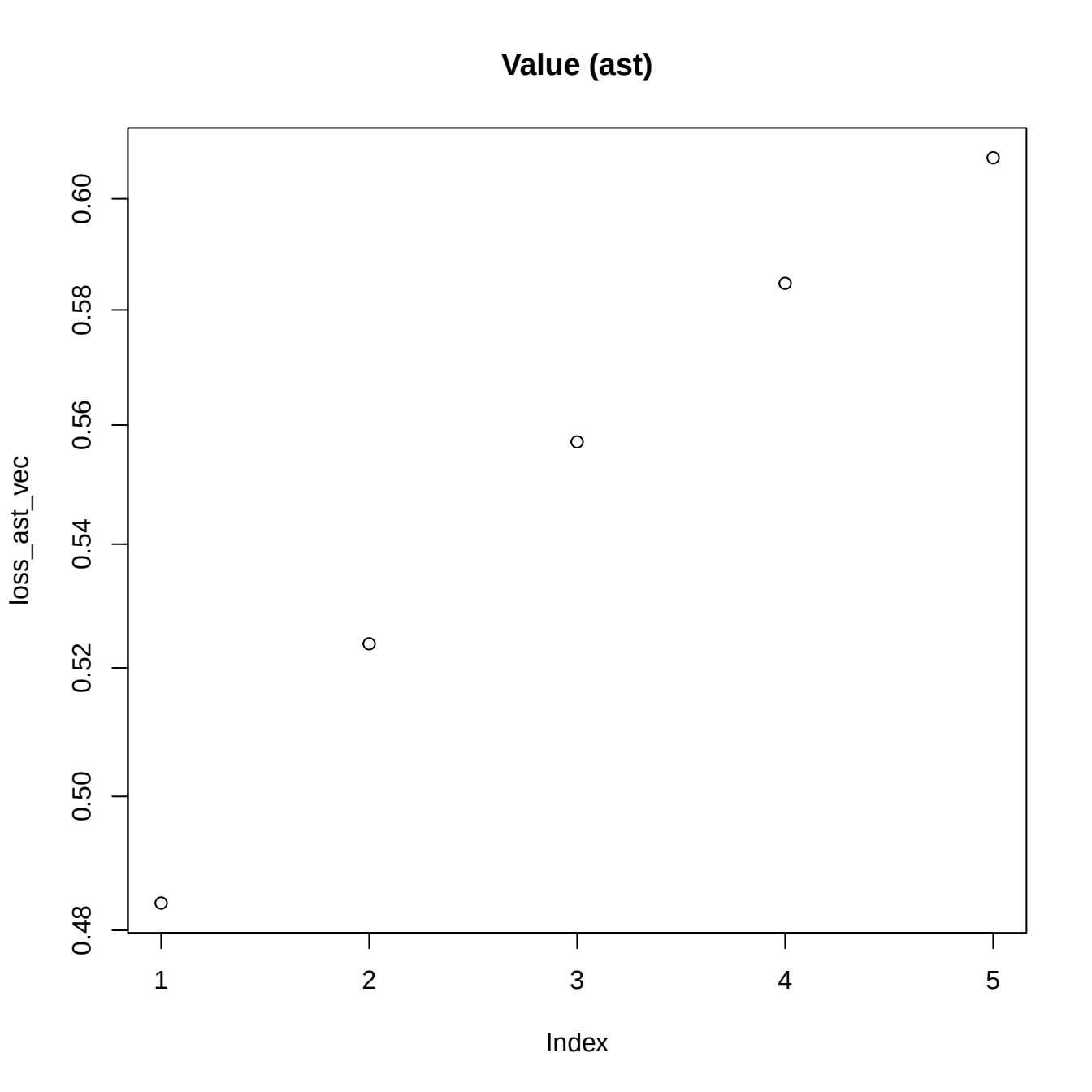

Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.02
0.03
0.04
0.05
0.06
1
2
3
4
5
Index

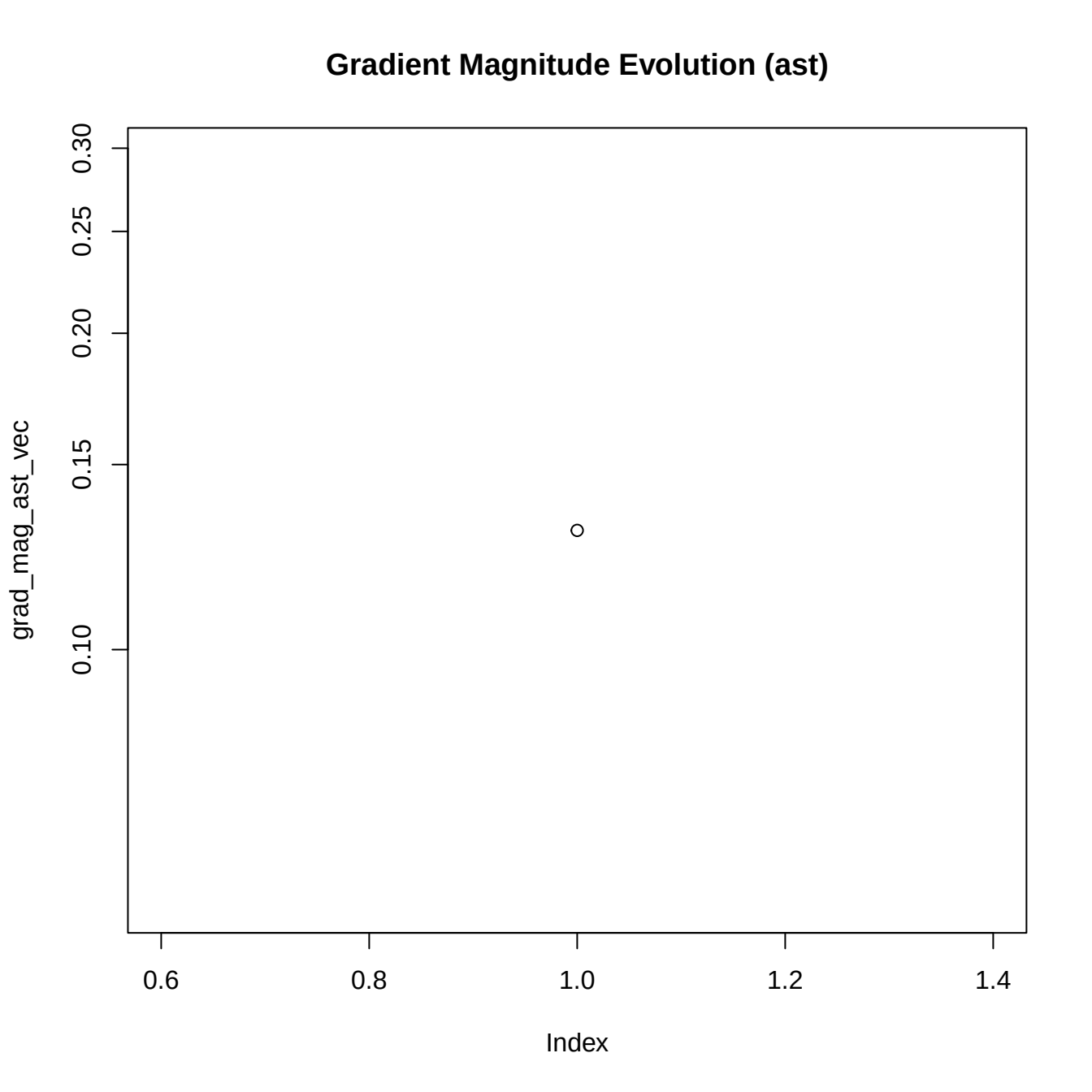

Gradient Magnitude Evolution (dag)
grad_mag_dag_vec
0.03
0.04
0.05
0.06
0.07
1
2
3
4
5
Index

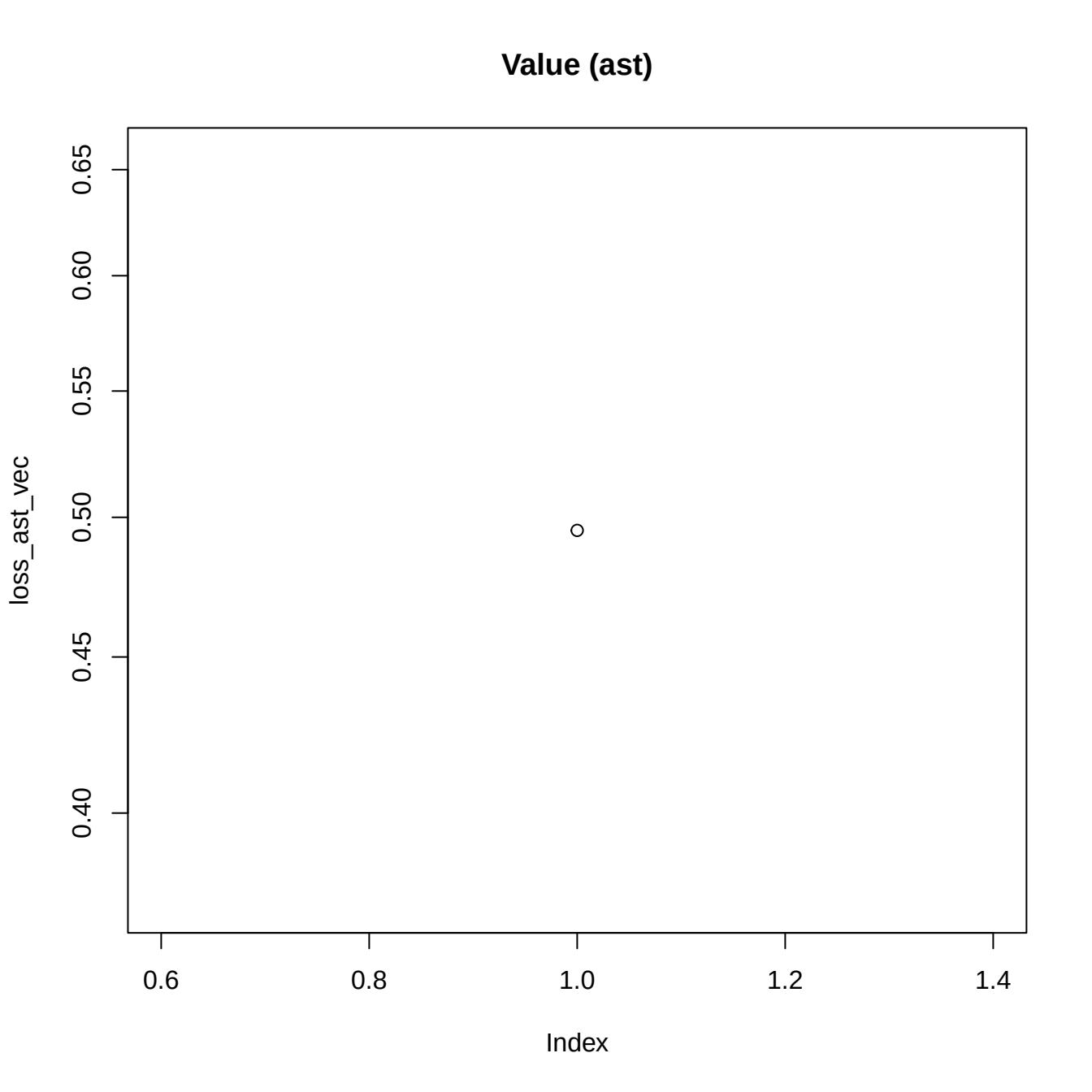

Value (ast)
loss_ast_vec
0.35
0.40
0.45
0.50
0.55
1
2
3
4
5
Index

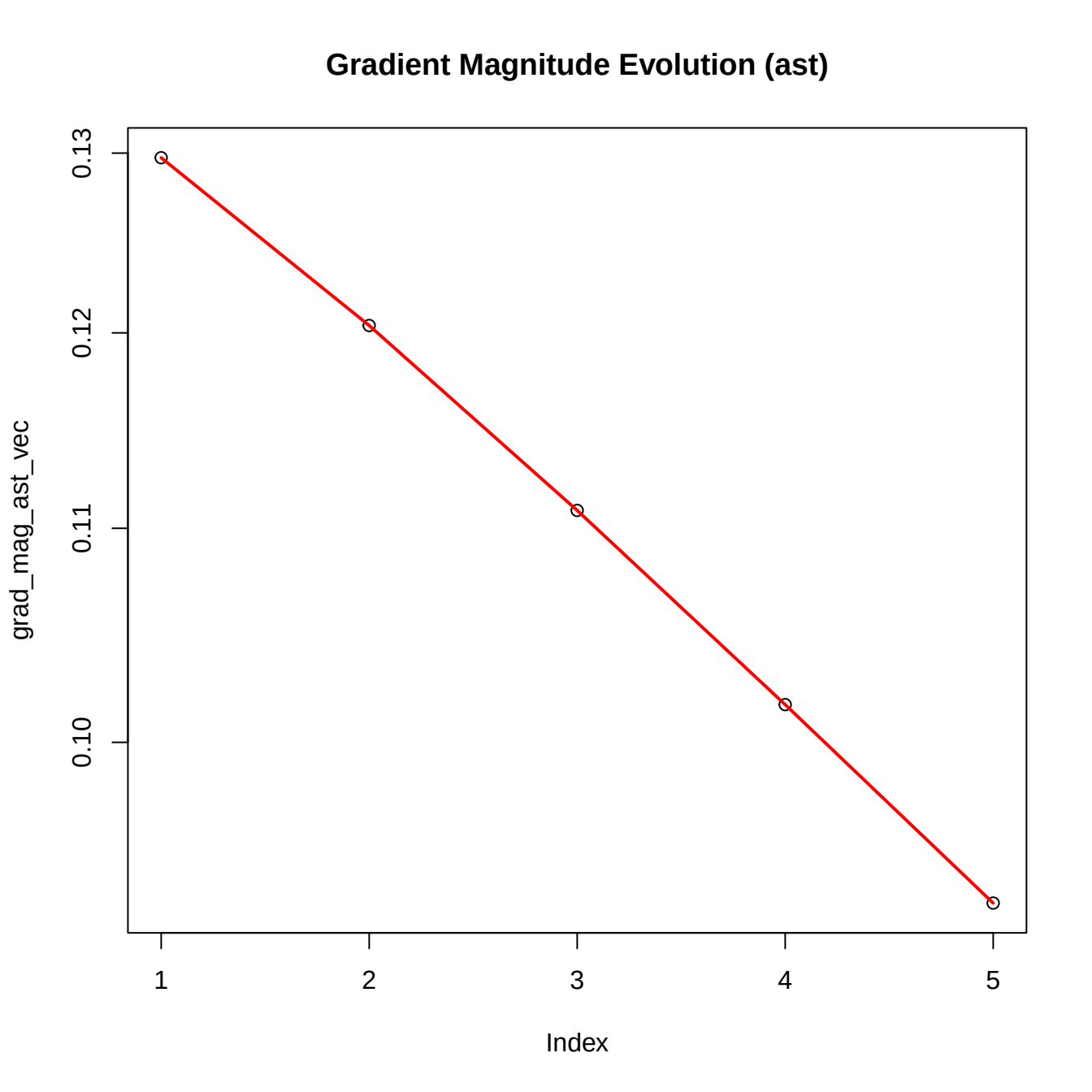

Value (dag)
loss_dag_vec
0.70
0.65
0.60
0.55
1
2
3
4
5
Index

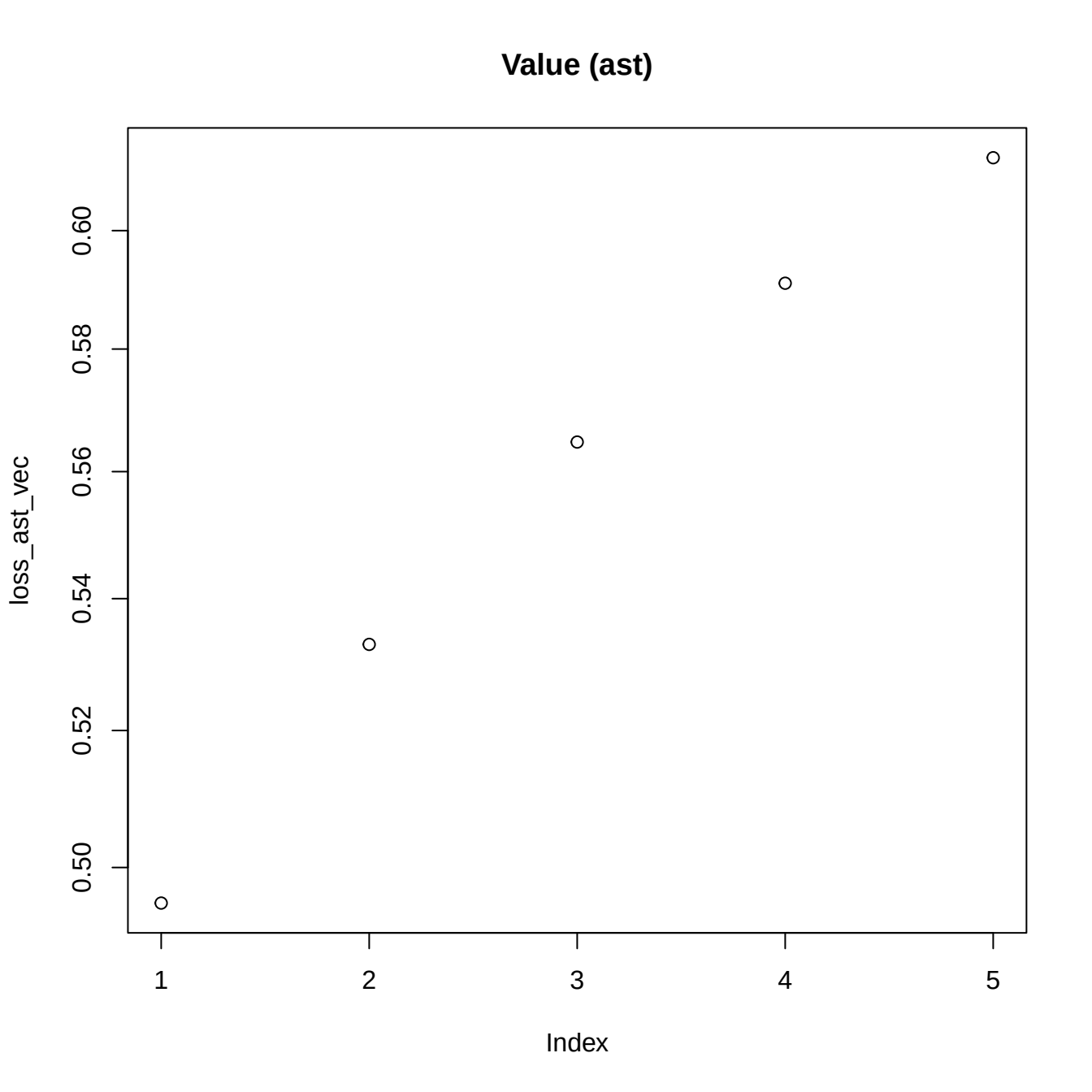

Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.10
0.11
0.12
0.13
1
2
3
4
5
Index

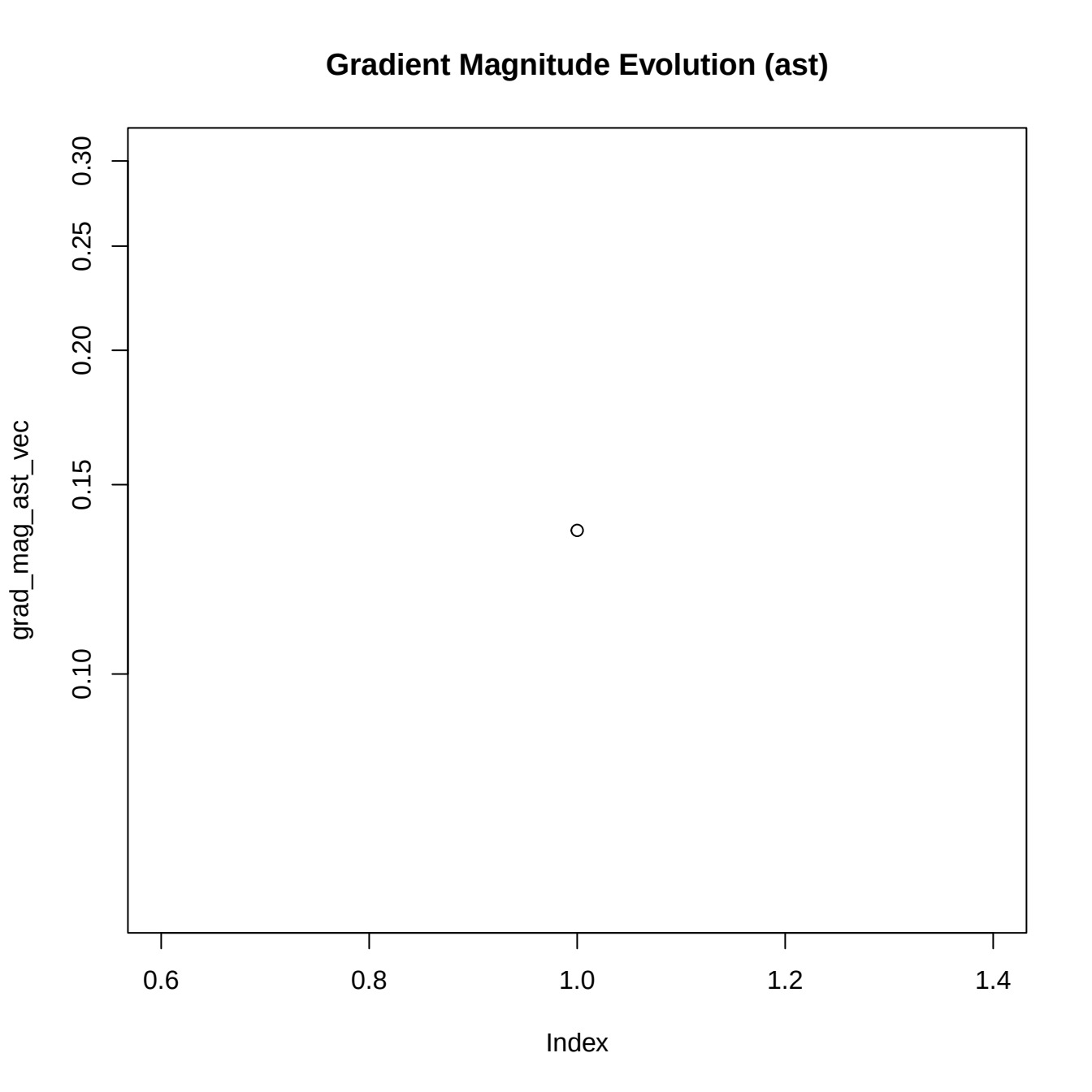

Value (ast)
loss_ast_vec
0.48
0.50
0.52
0.54
0.56
0.58
0.60
1
2
3
4
5
Index

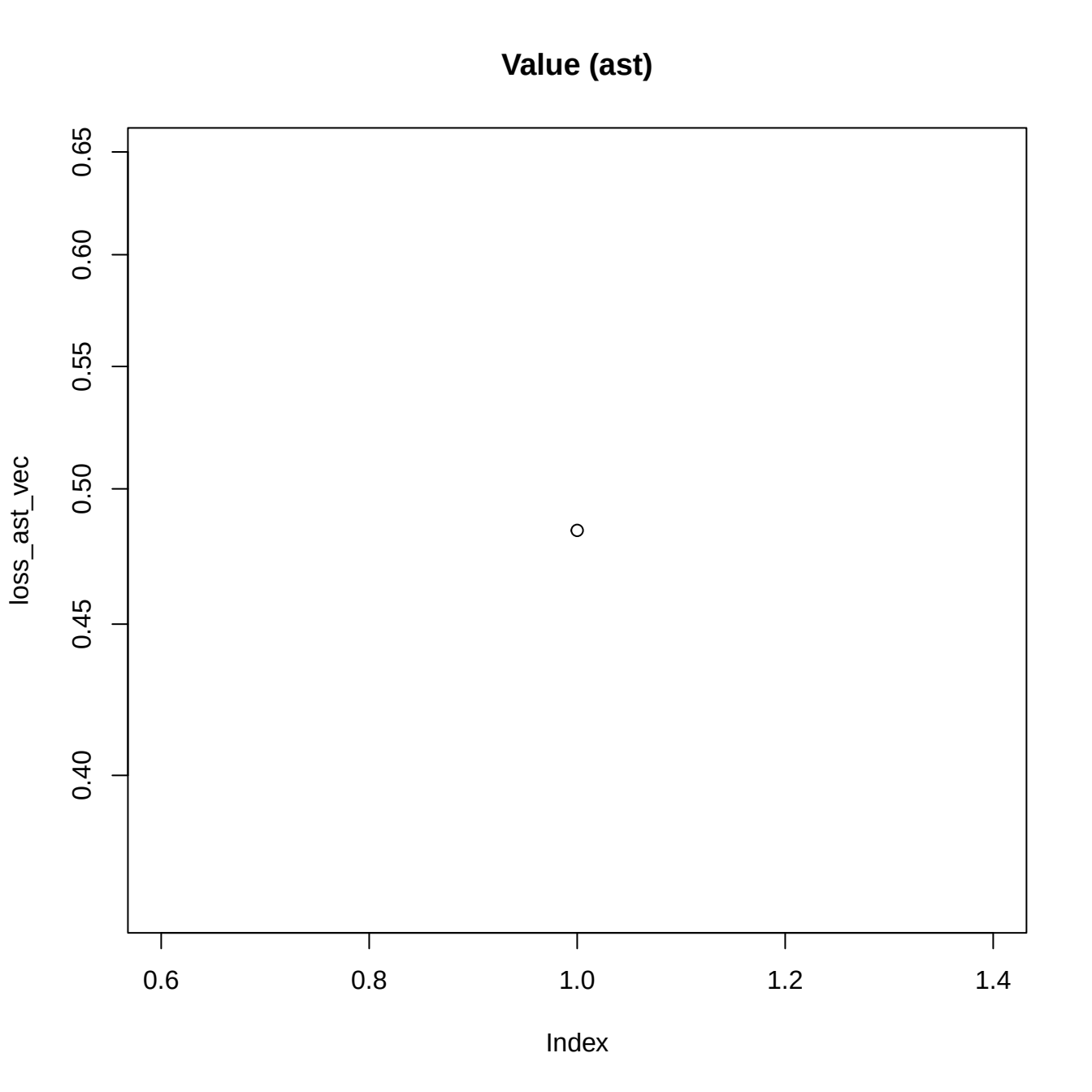

Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.10
0.15
0.20
0.25
0.30
0.6
0.8
1.0
1.2
1.4
Index

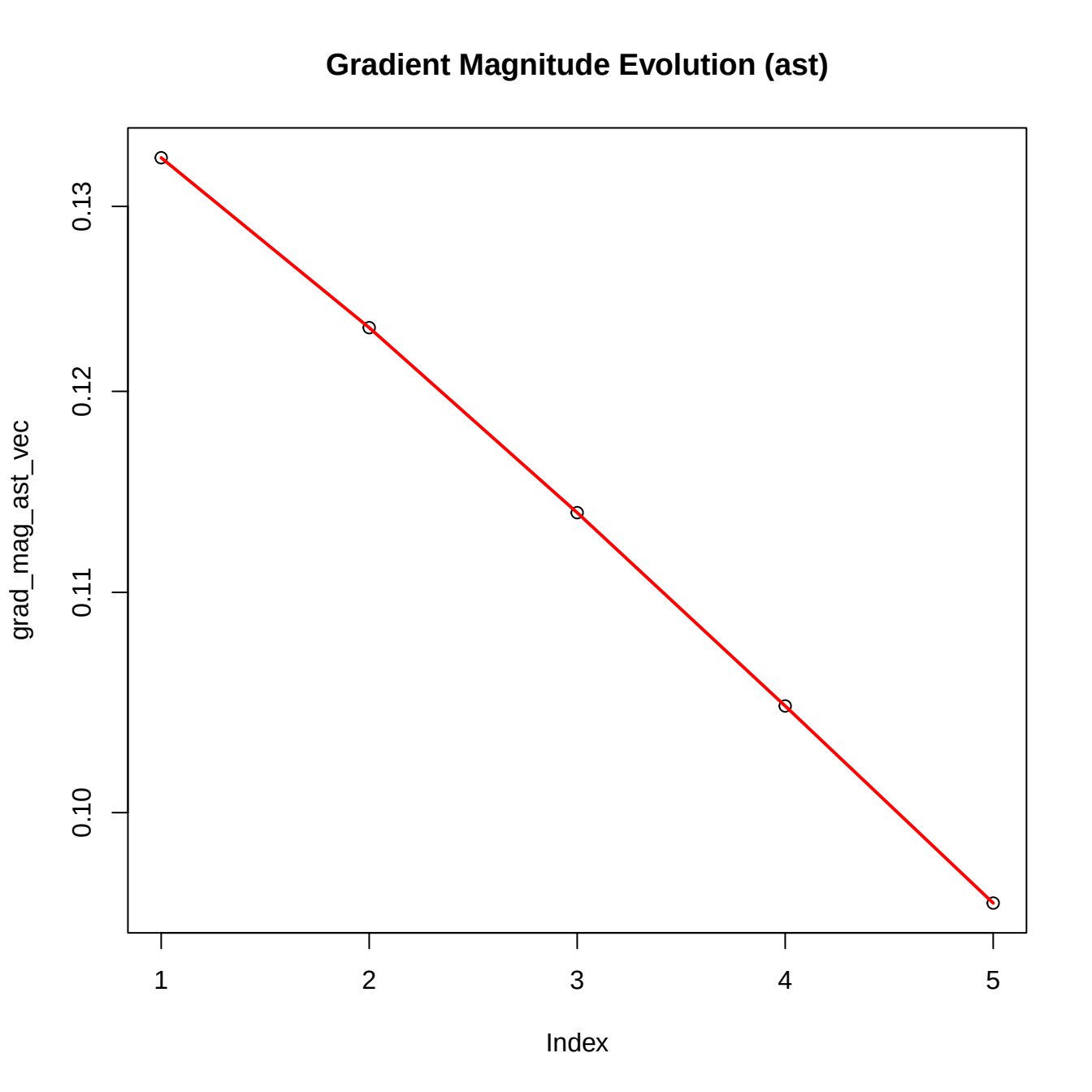

Value (ast)
loss_ast_vec
0.40
0.45
0.50
0.55
0.60
0.65
0.6
0.8
1.0
1.2
1.4
Index

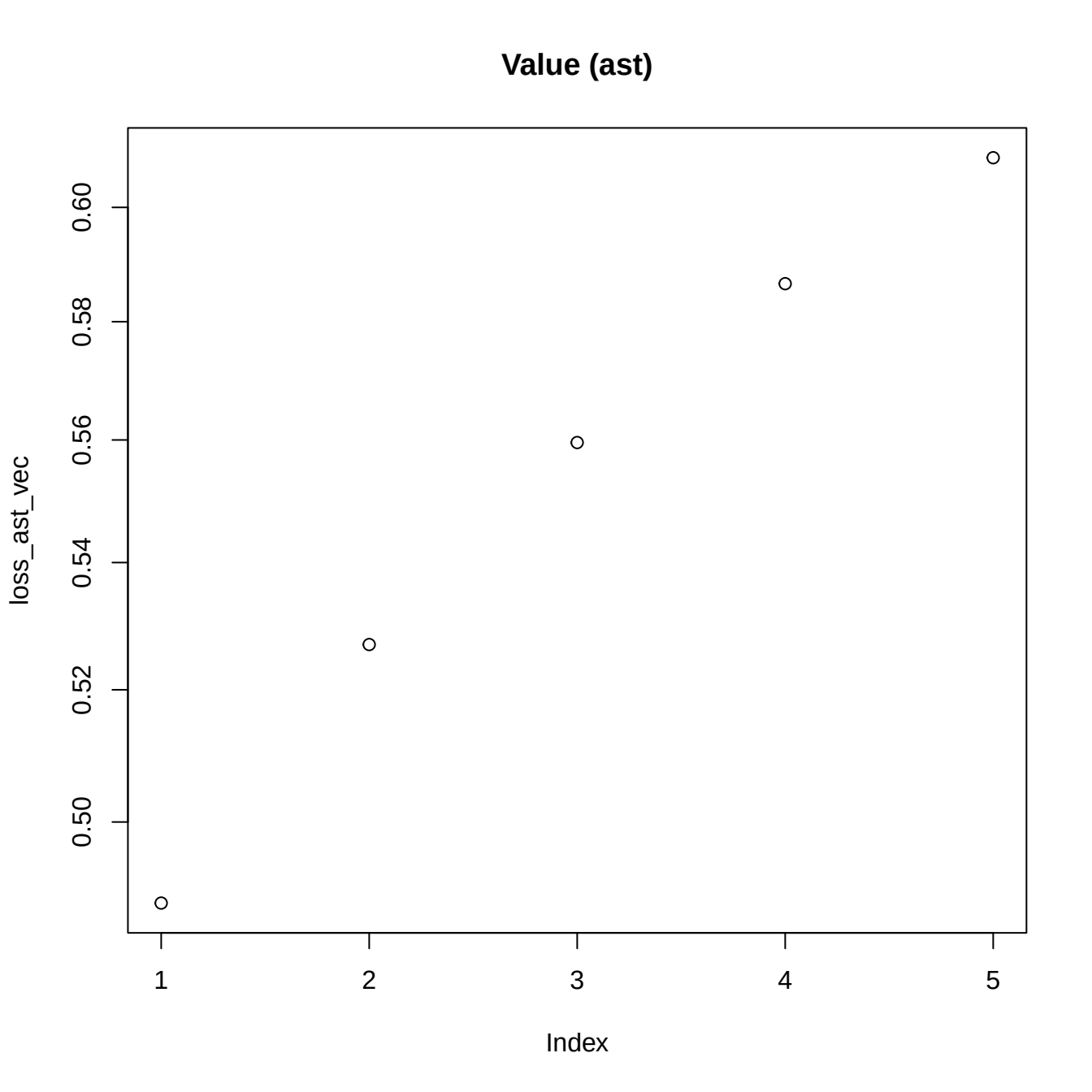

Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.10
0.11
0.12
0.13
1
2
3
4
5
Index

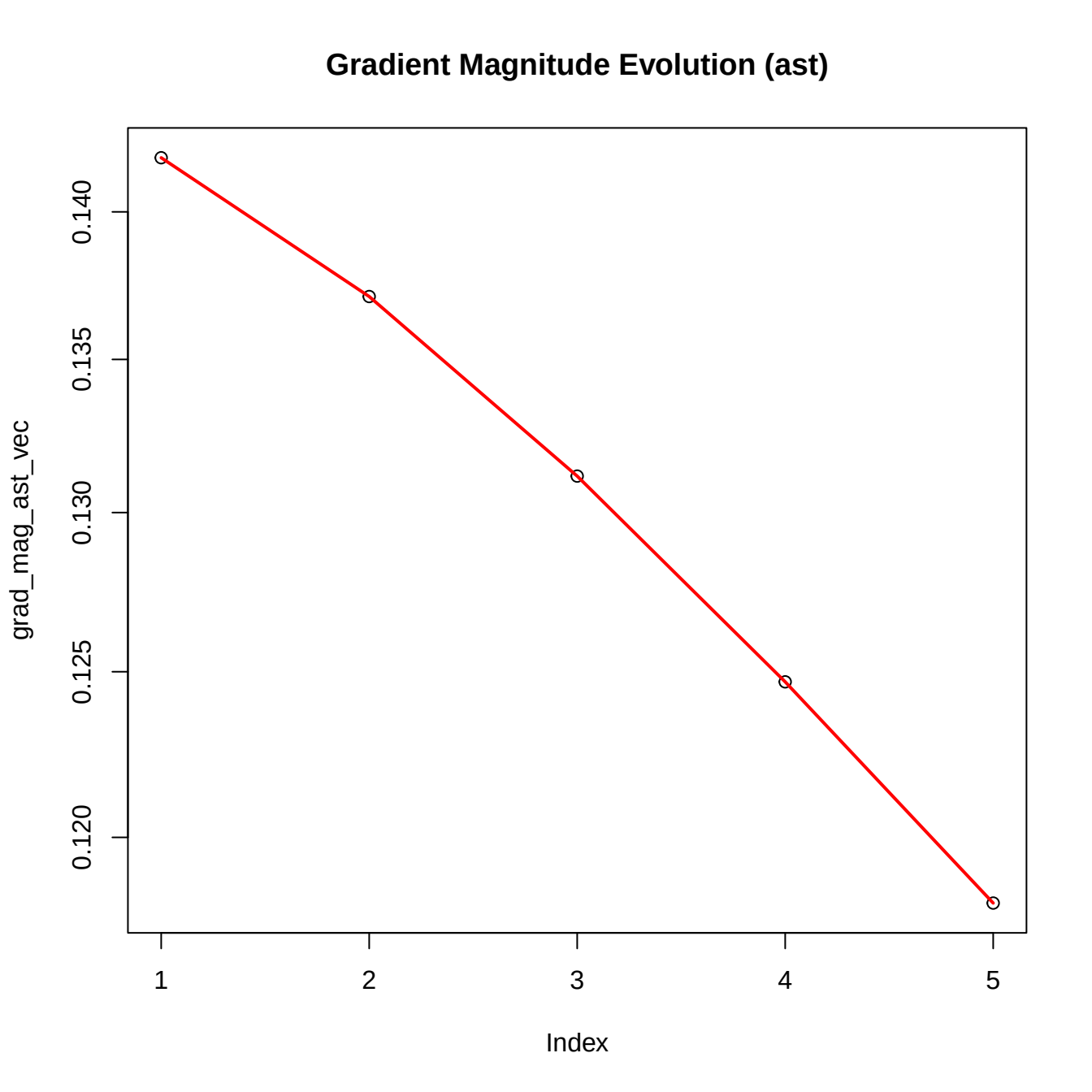

Value (ast)
loss_ast_vec
0.50
0.52
0.54
0.56
0.58
0.60
1
2
3
4
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.10
0.15
0.20
0.25
0.30
0.6
0.8
1.0
1.2
1.4
Index


Value (ast)
loss_ast_vec
0.40
0.45
0.50
0.55
0.60
0.65
0.6
0.8
1.0
1.2
1.4
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.10
0.11
0.12
0.13
1
2
3
4
5
Index


Value (ast)
loss_ast_vec
0.50
0.52
0.54
0.56
0.58
0.60
1
2
3
4
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.120
0.125
0.130
0.135
0.140
1
2
3
4
5
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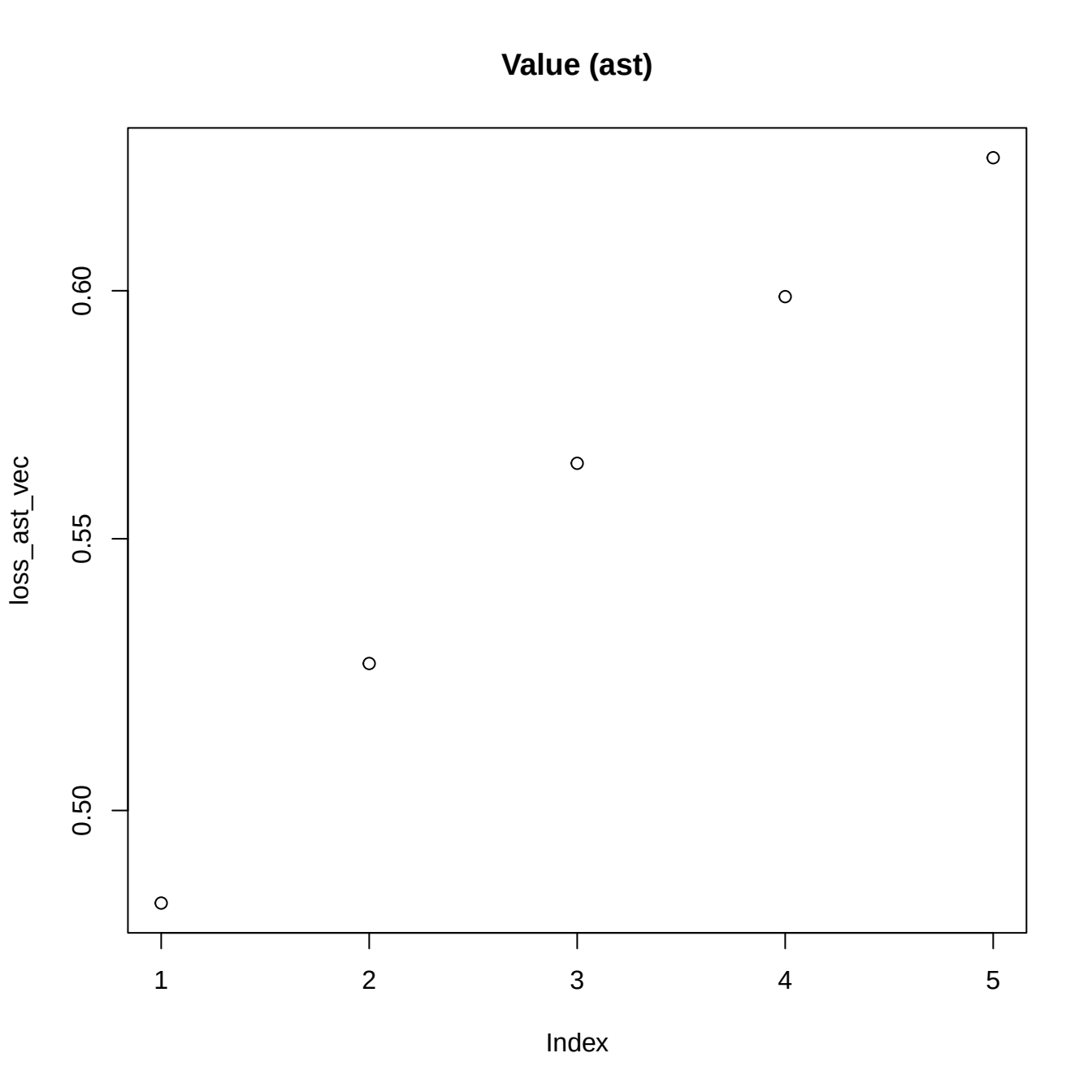
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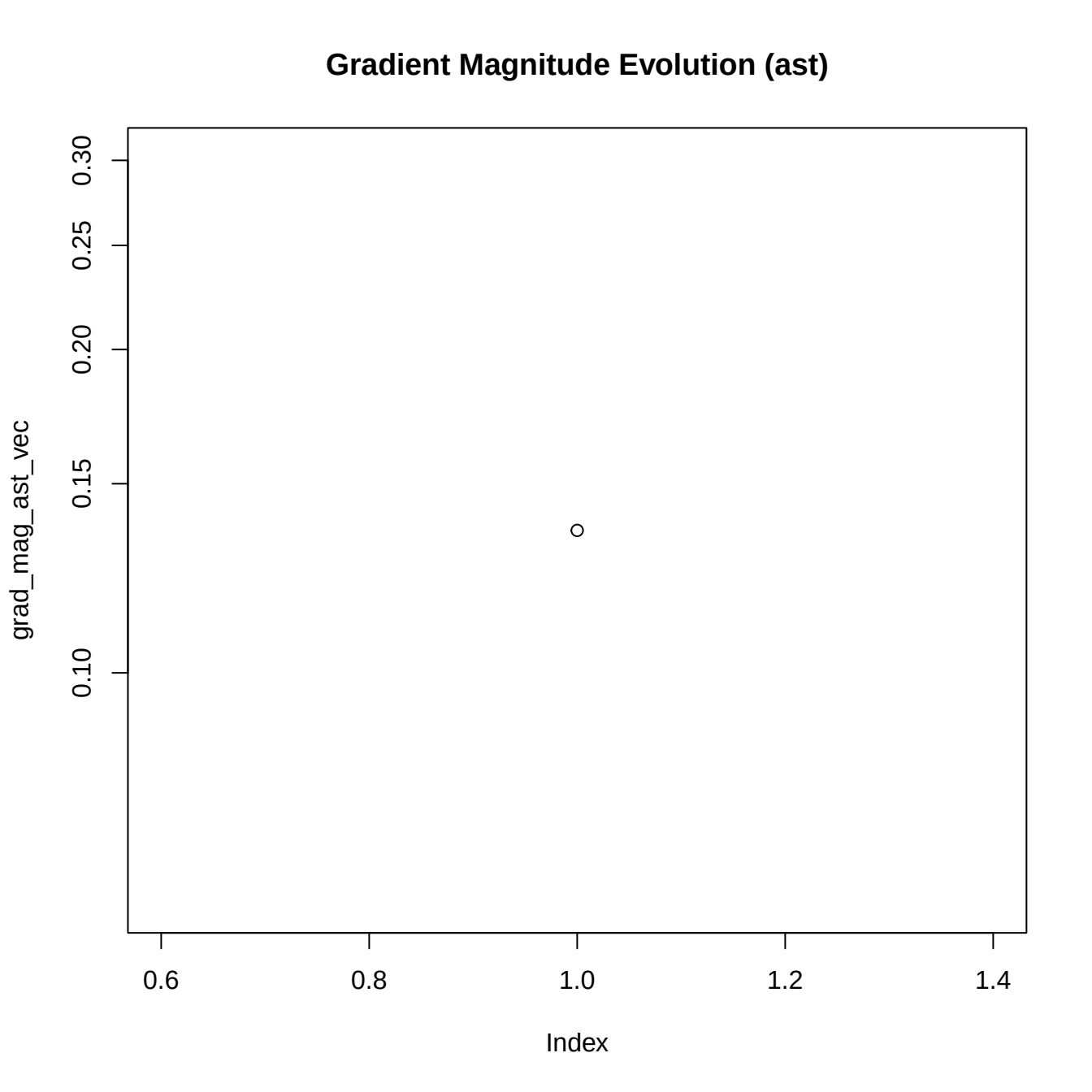
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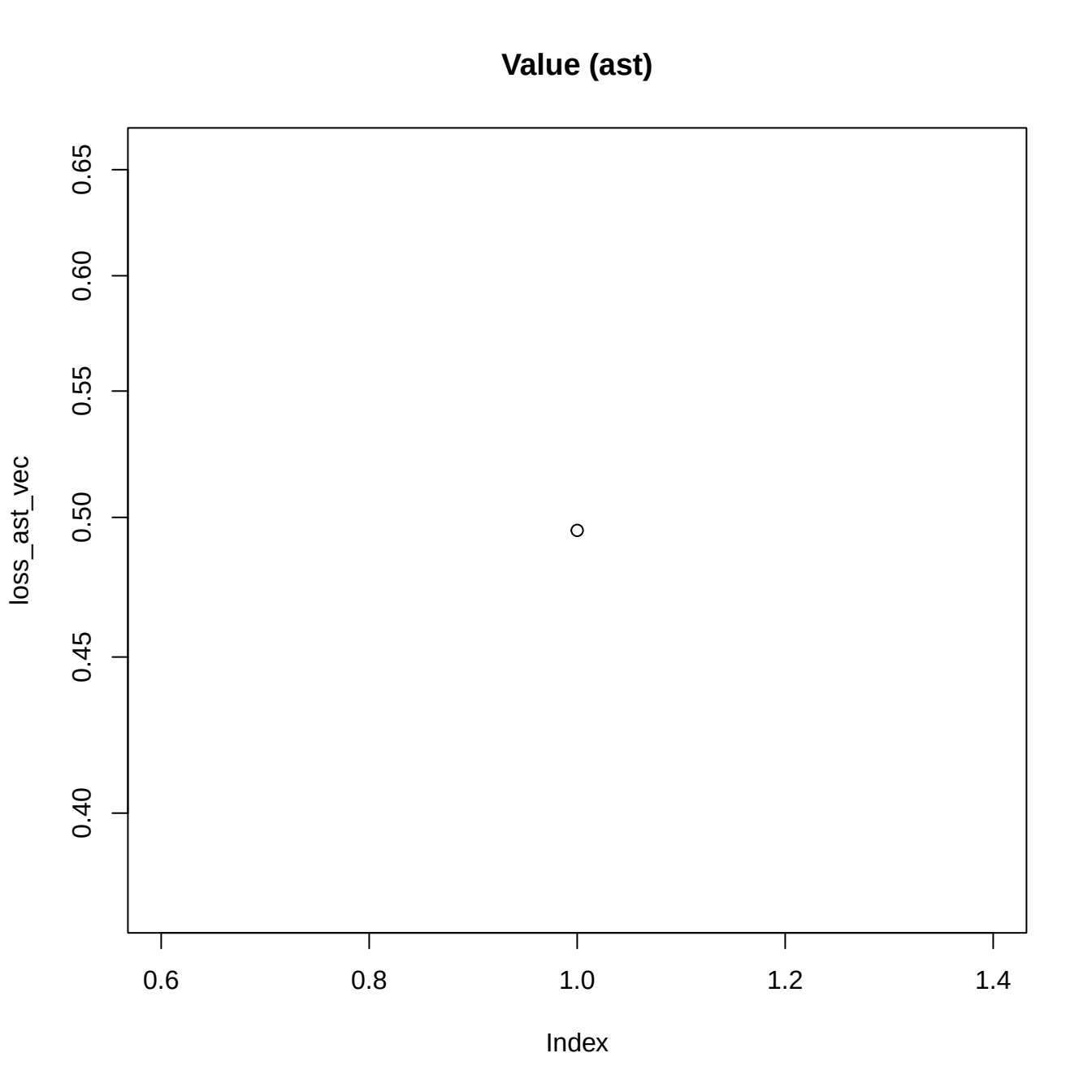
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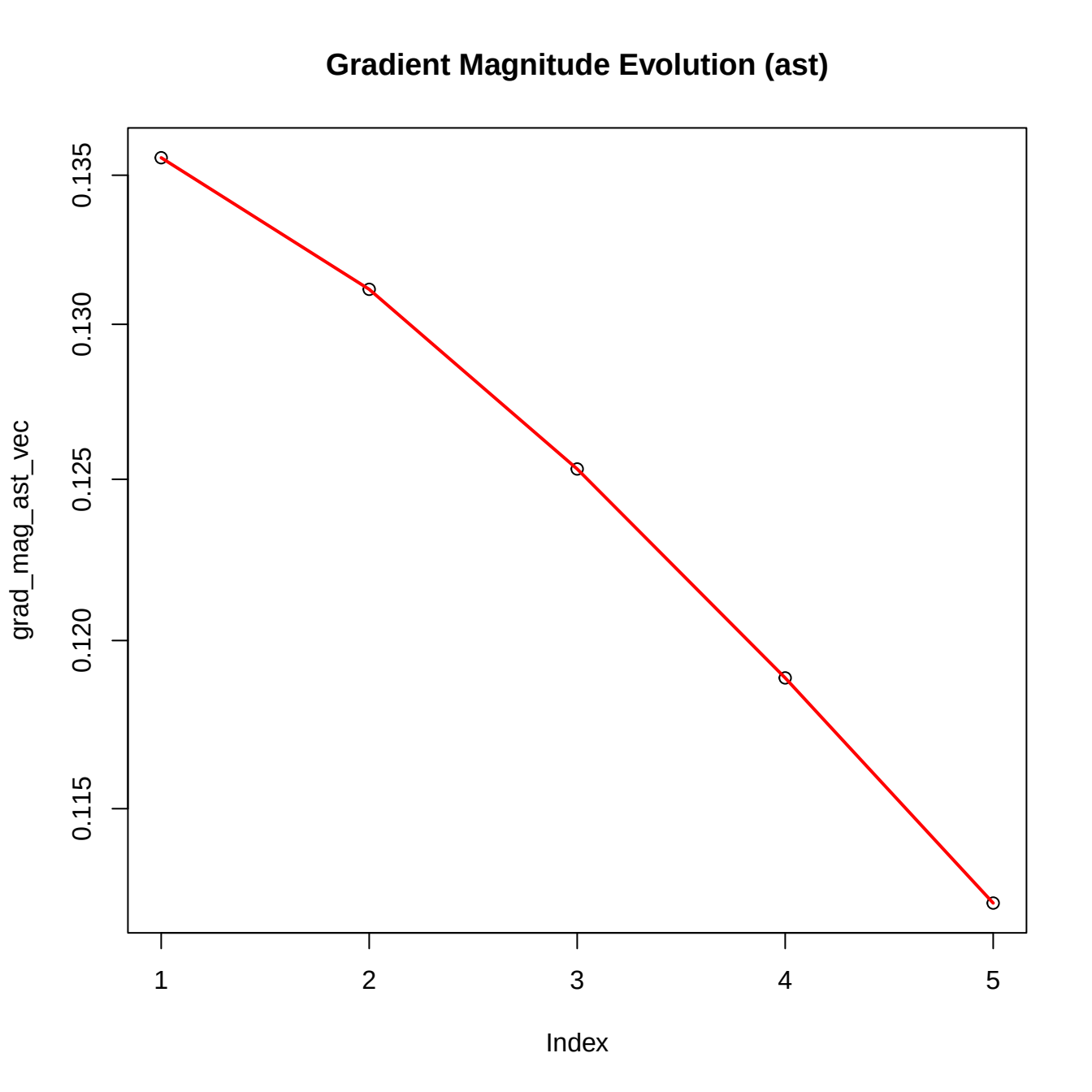
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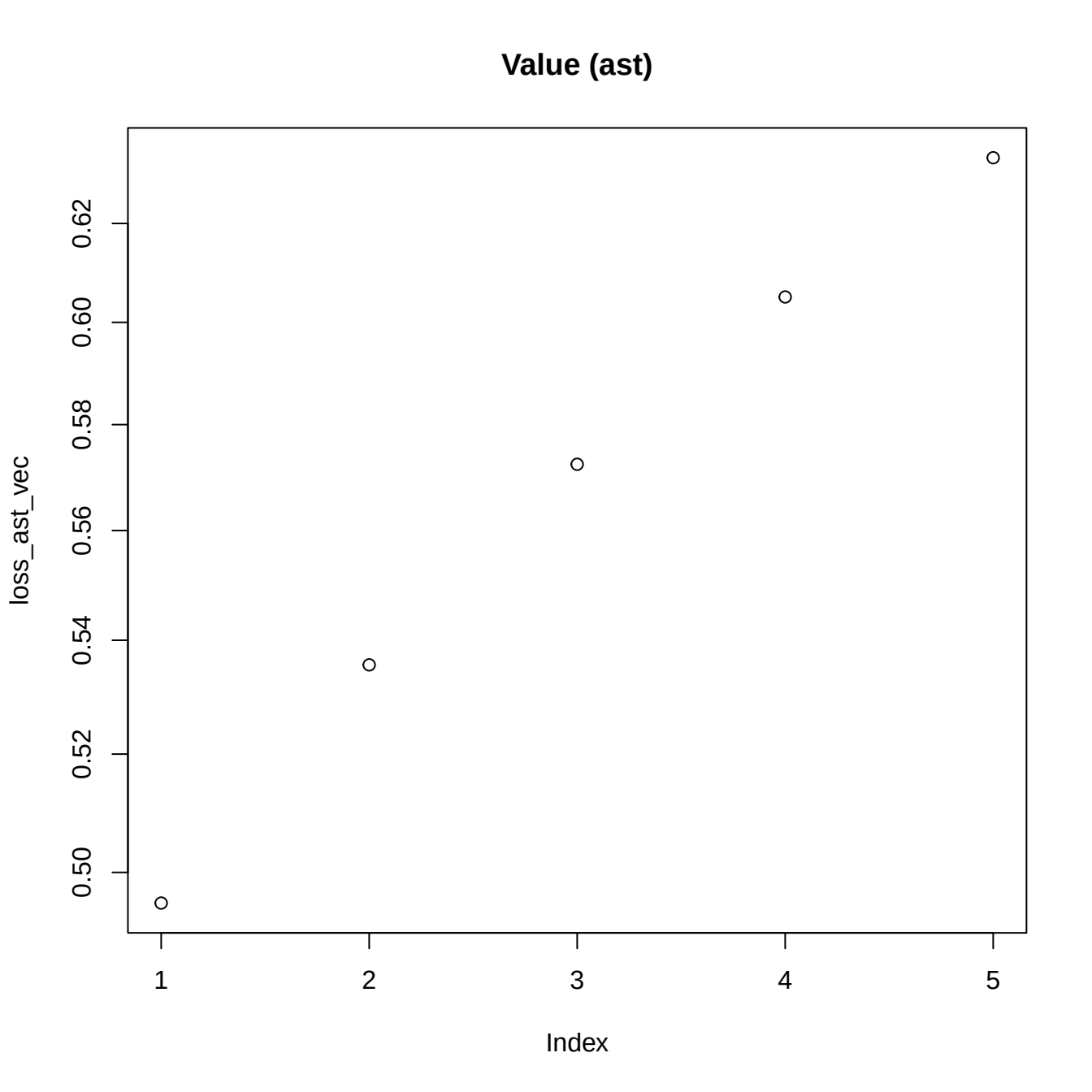
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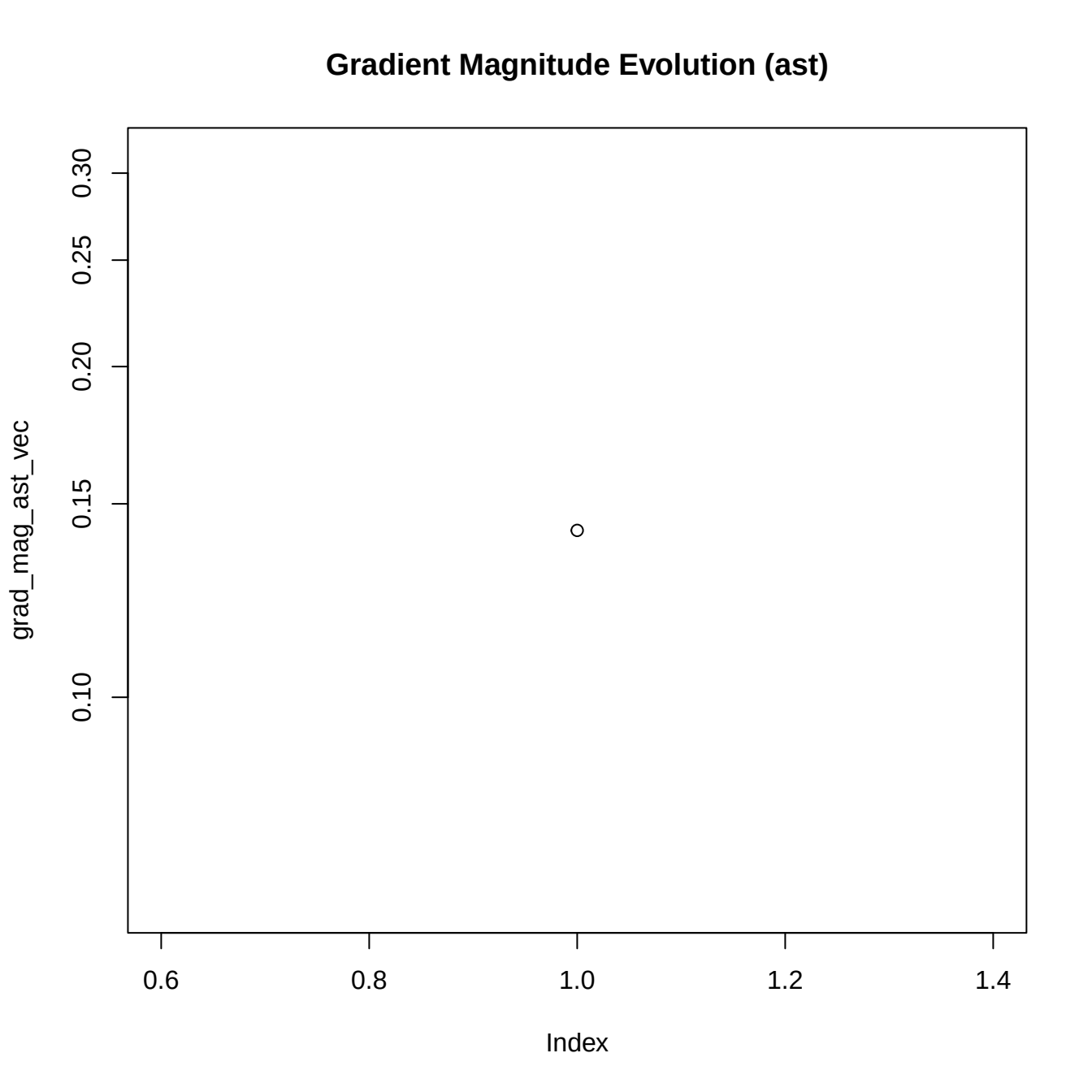
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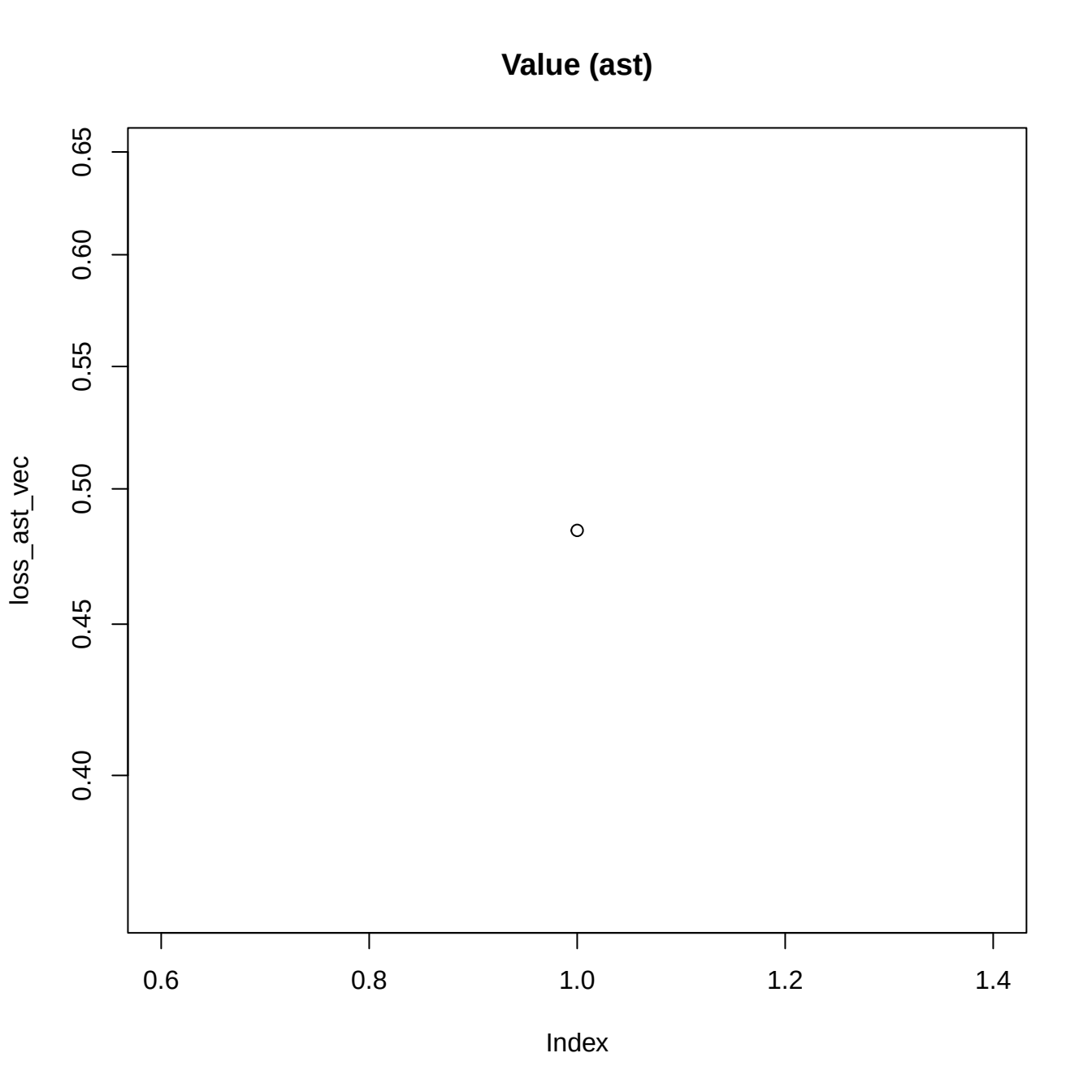
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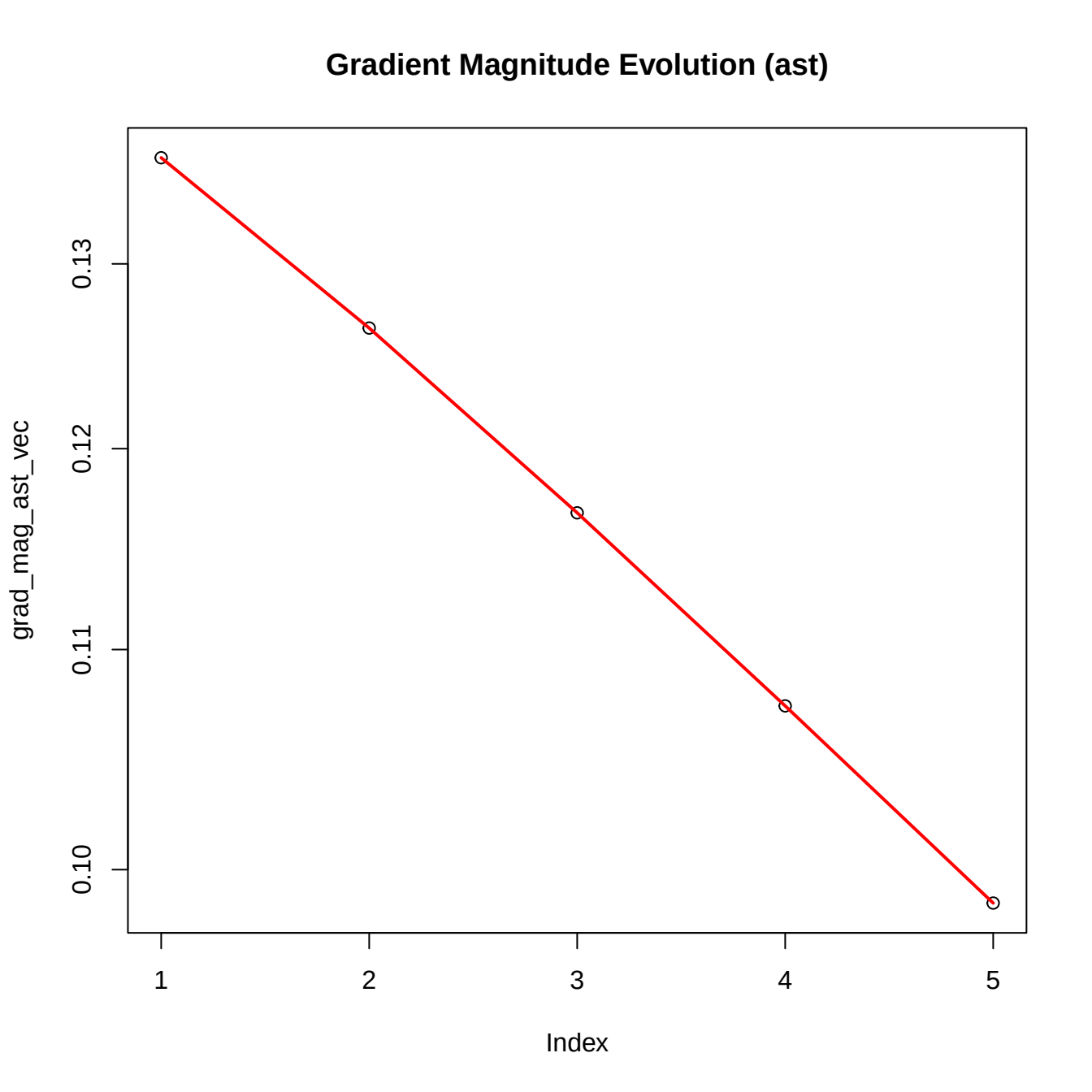
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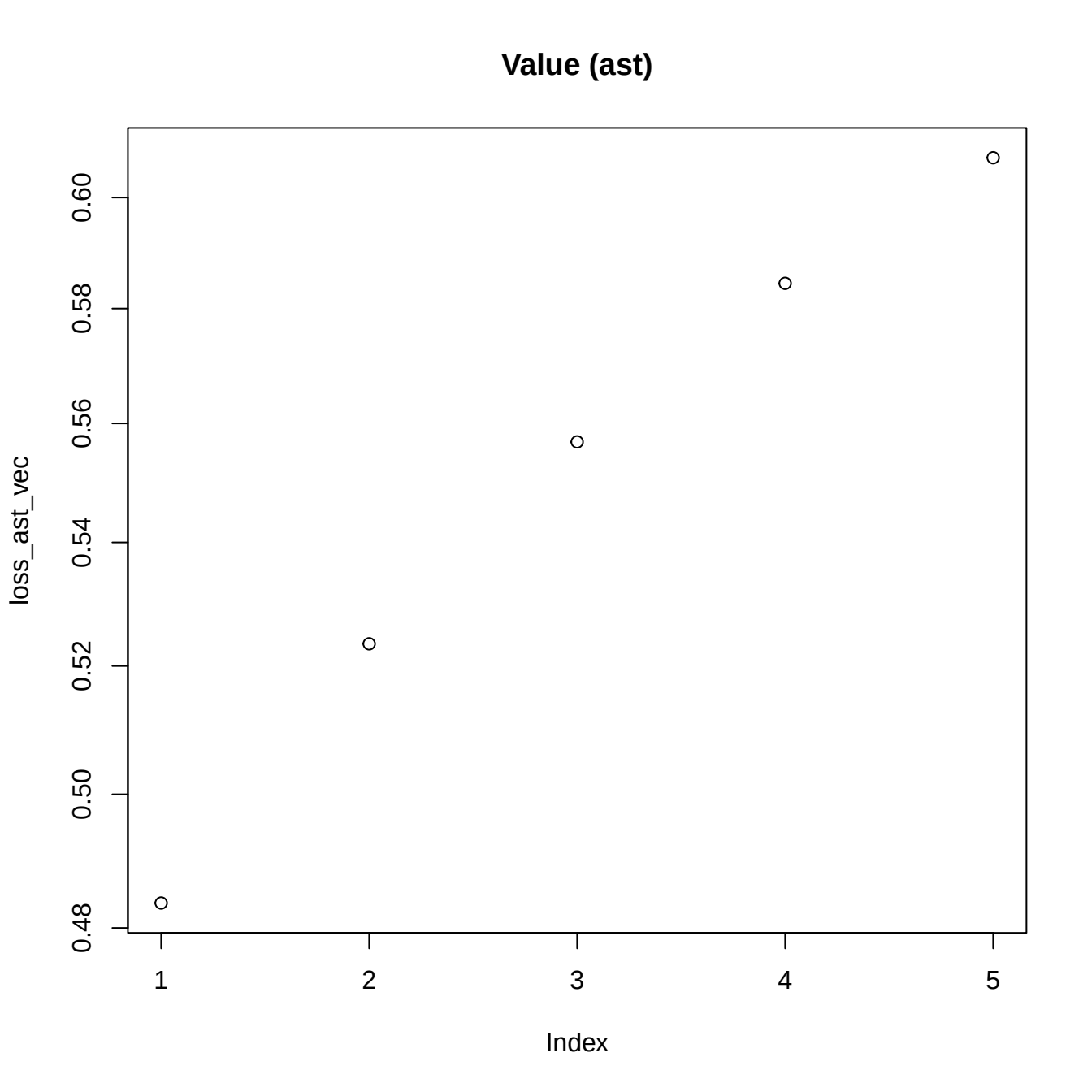
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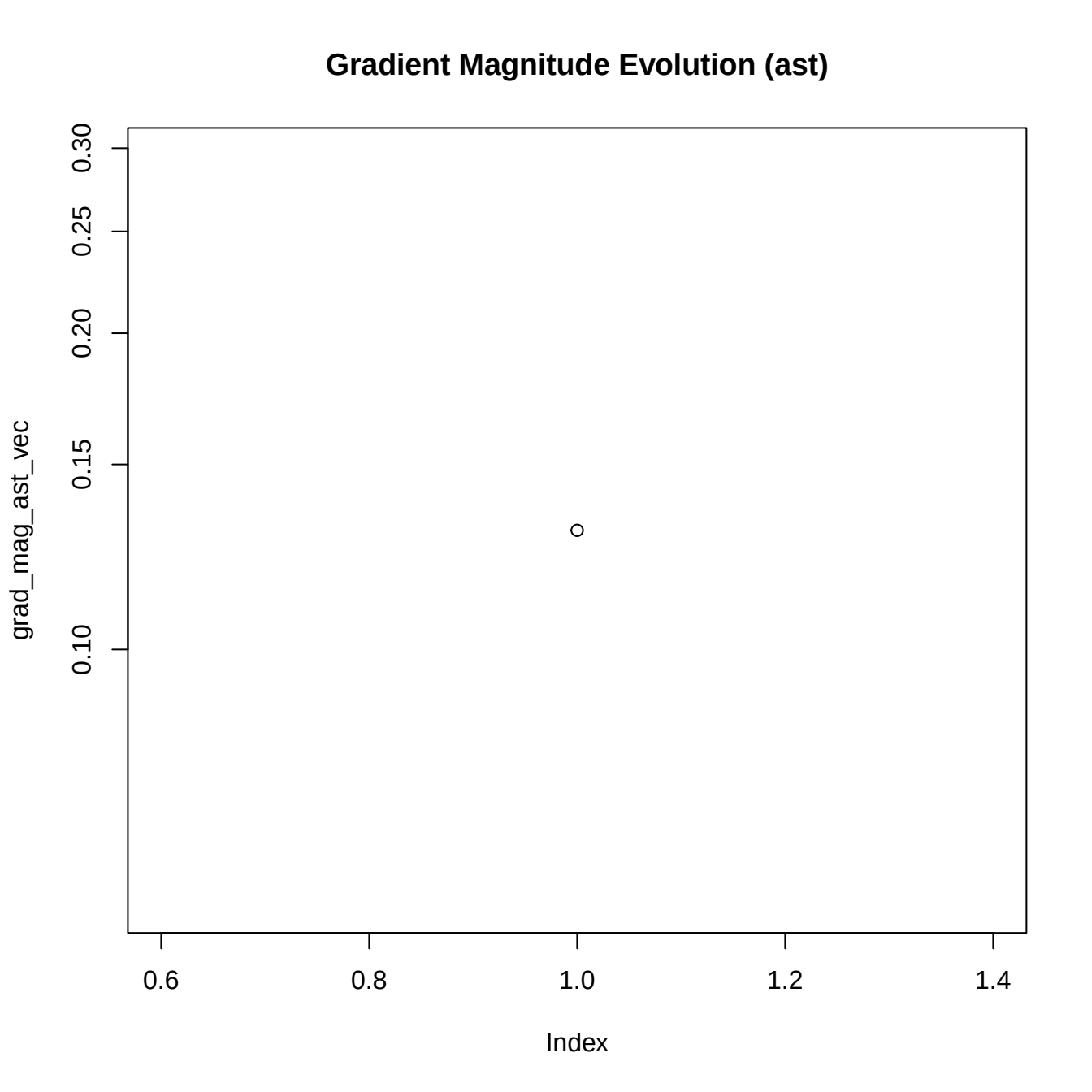
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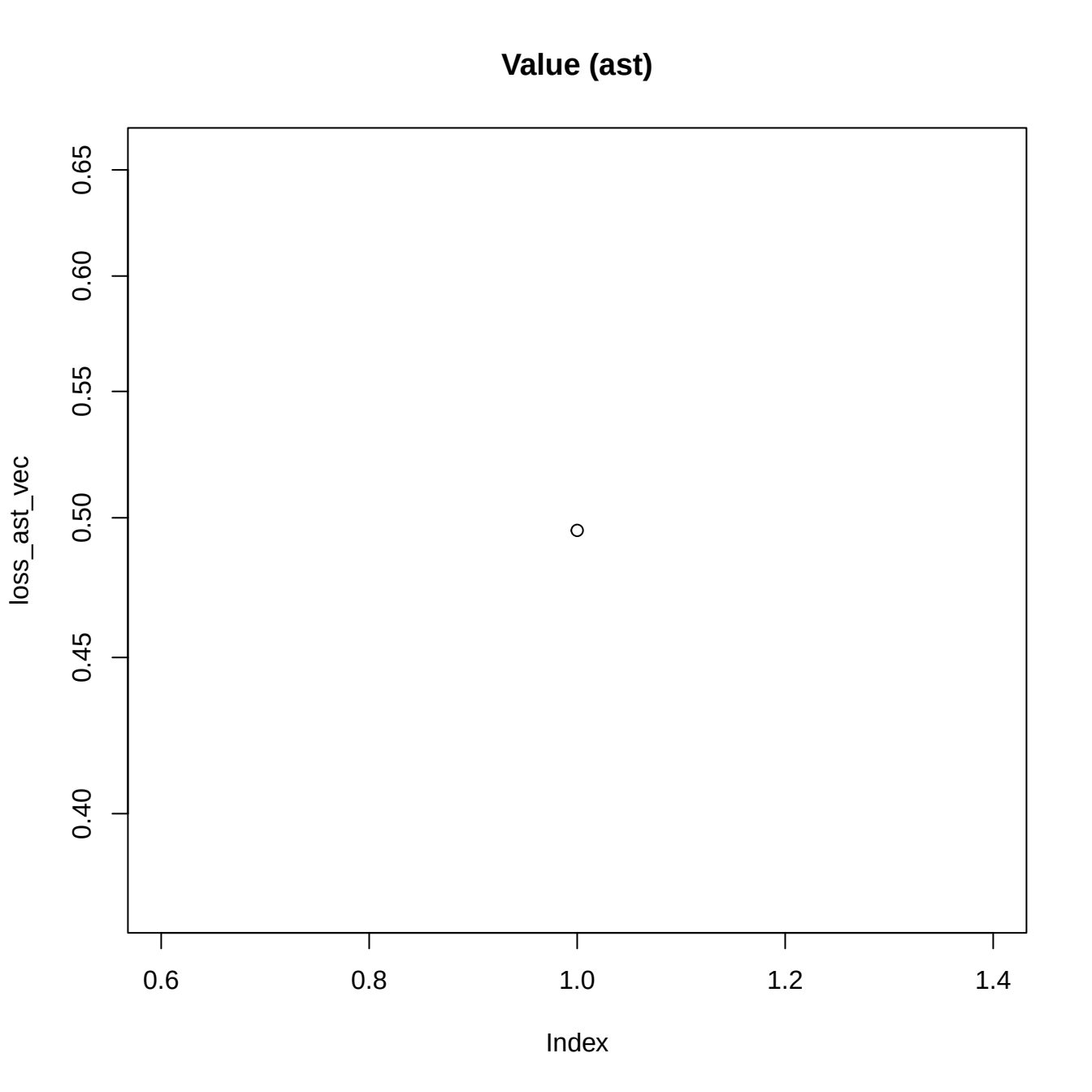
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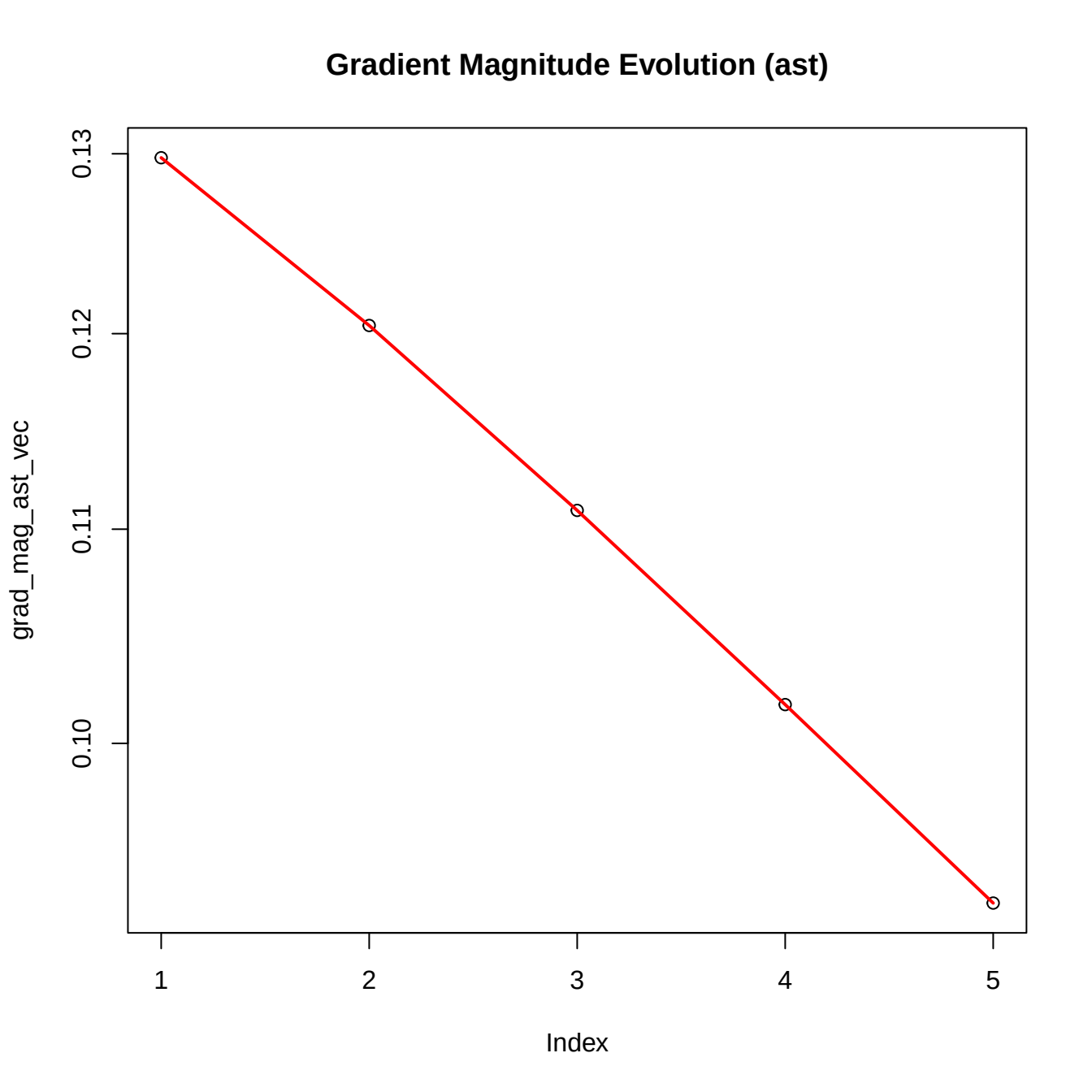
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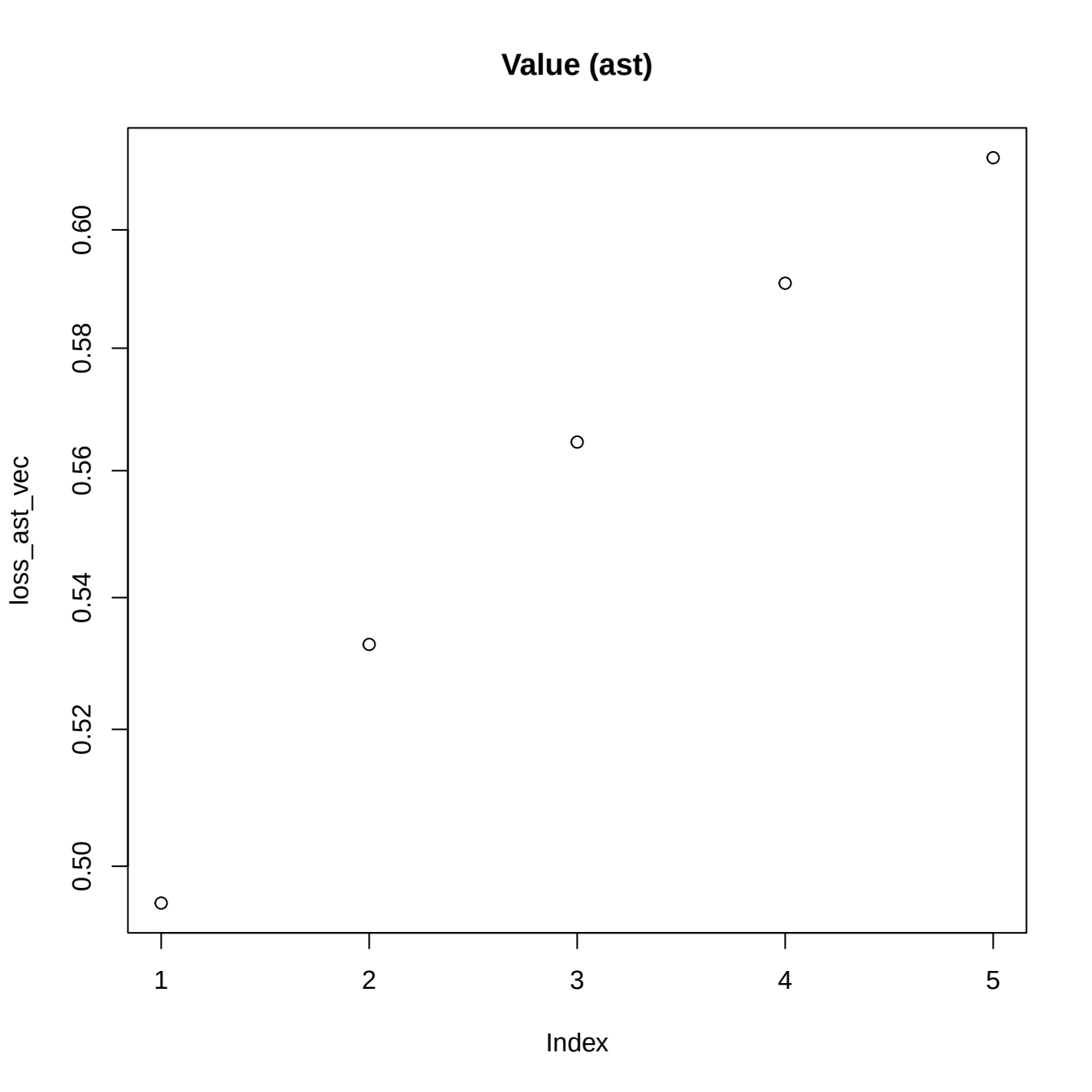
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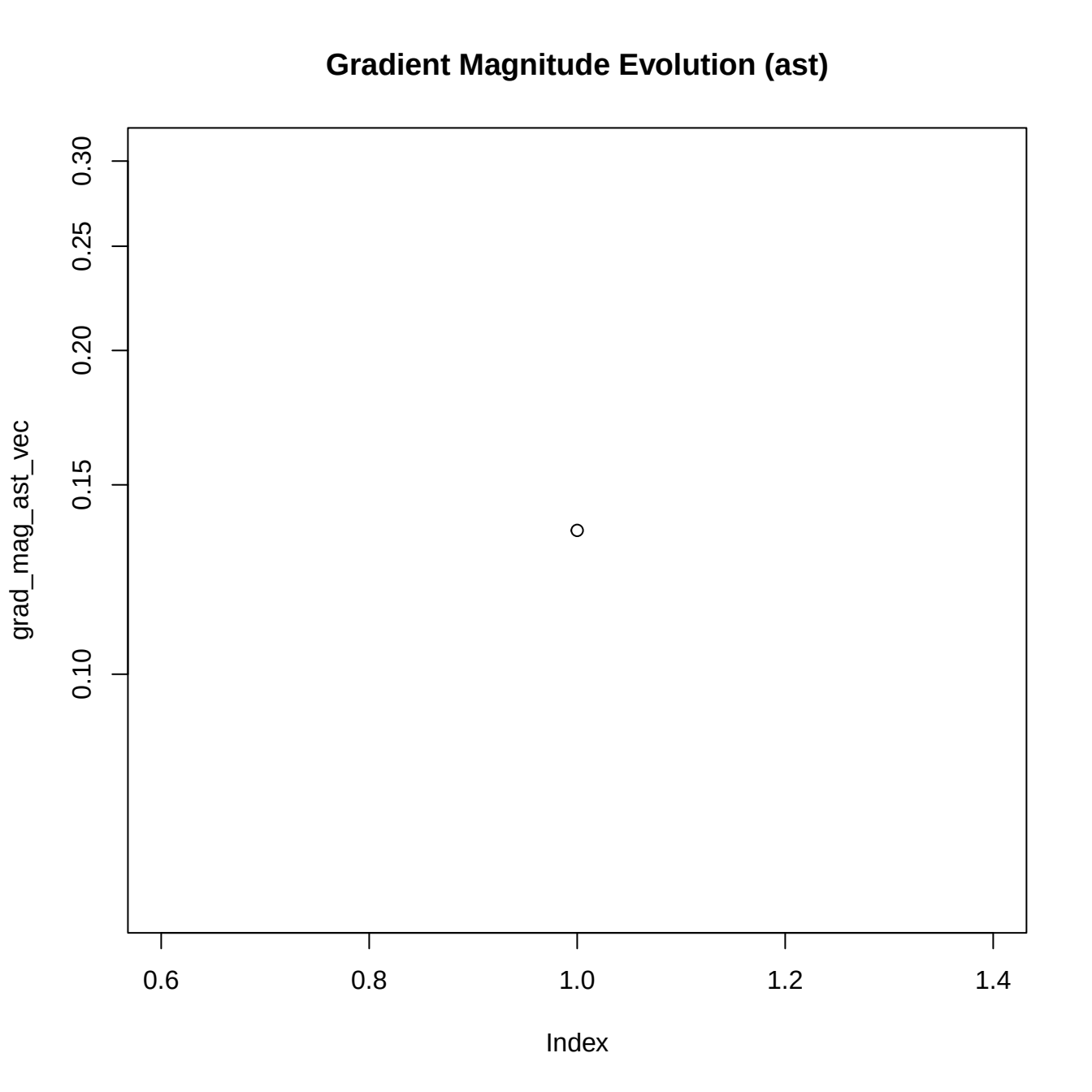
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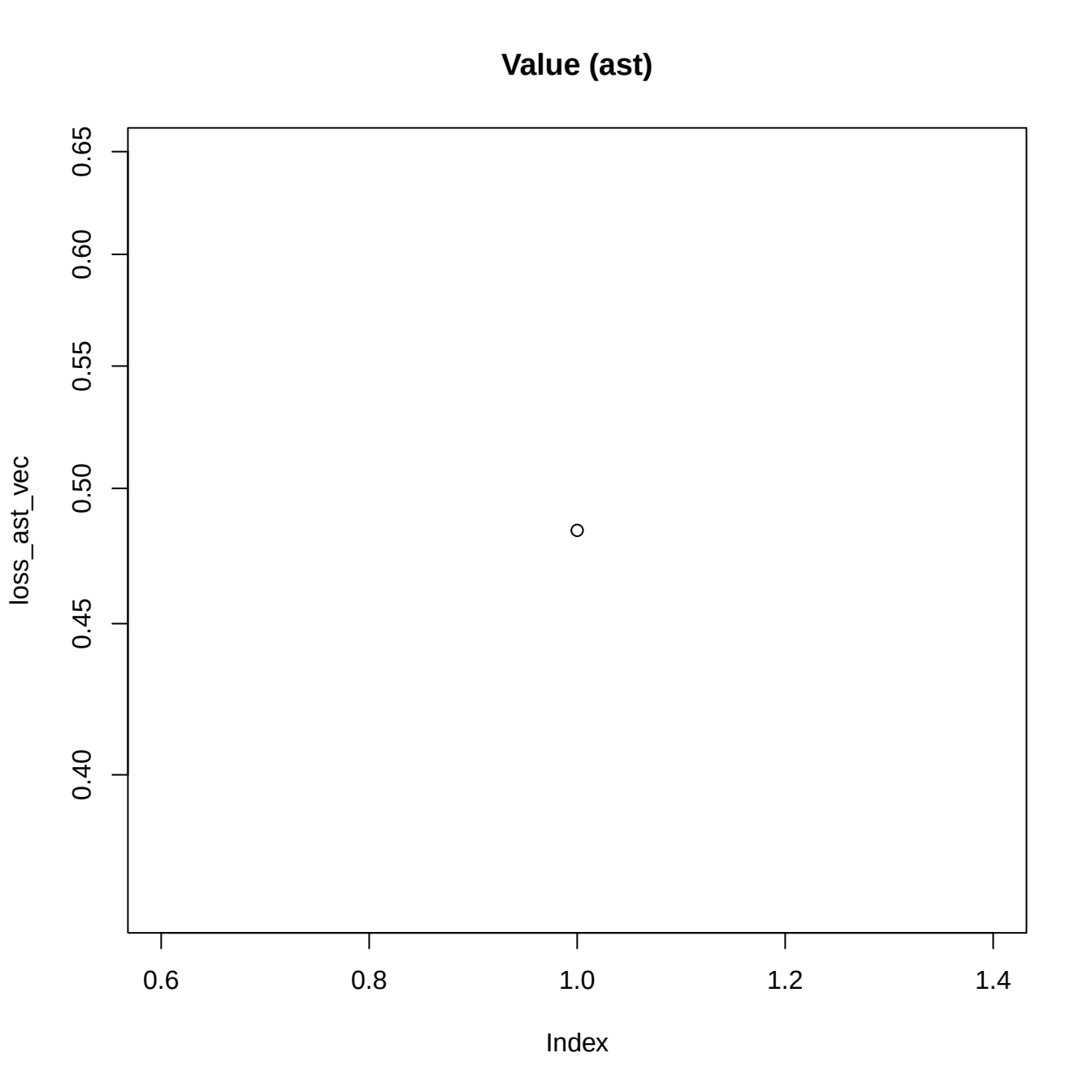
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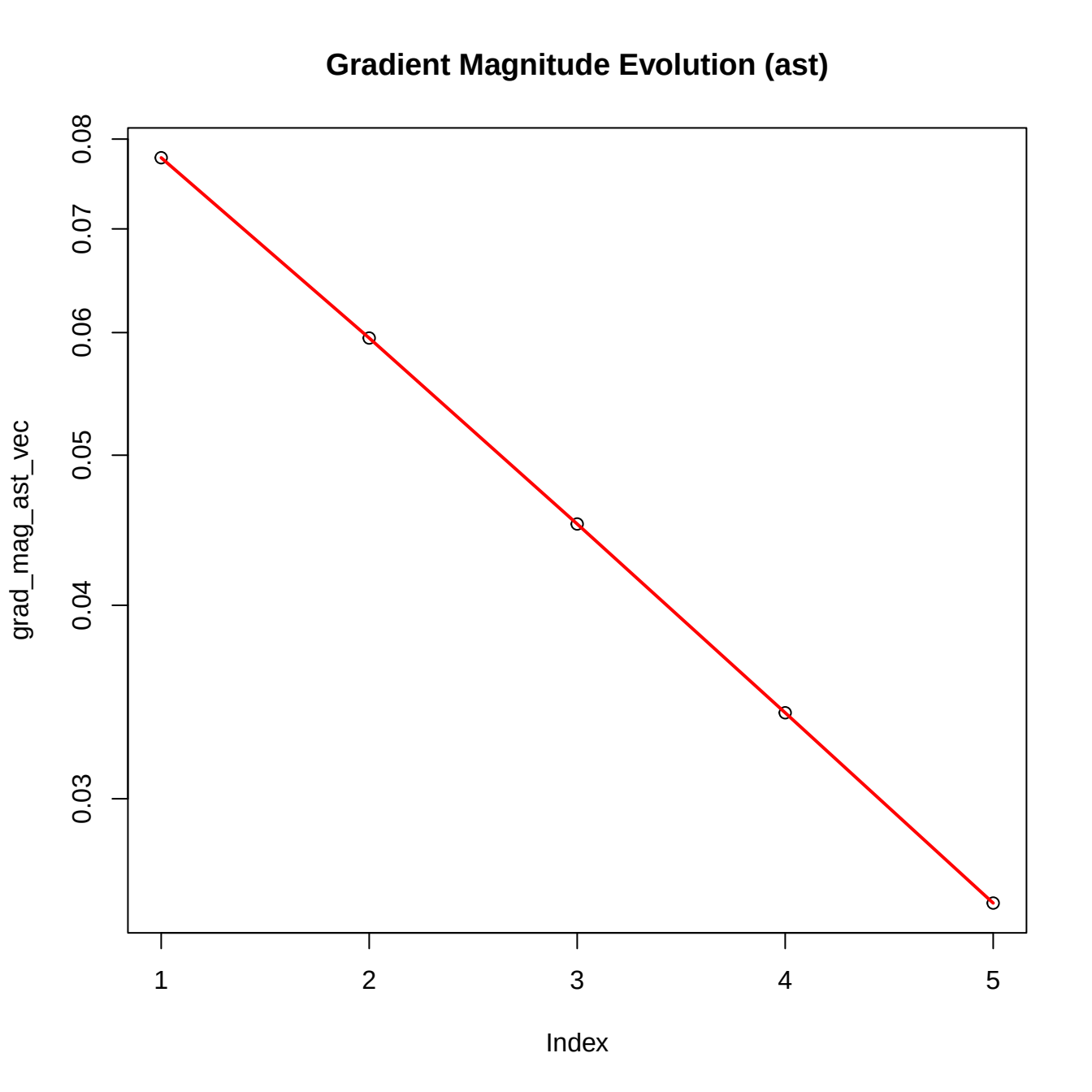
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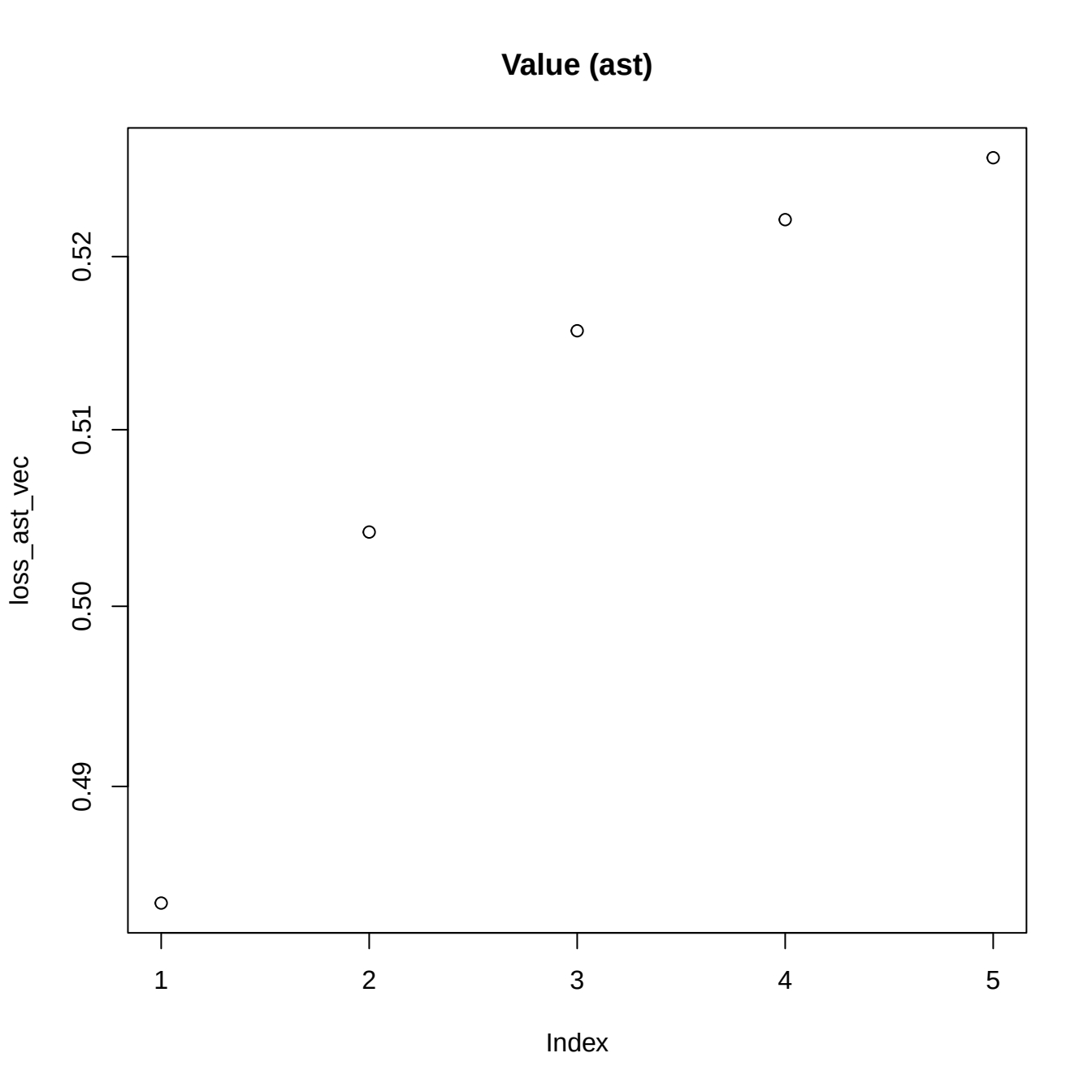
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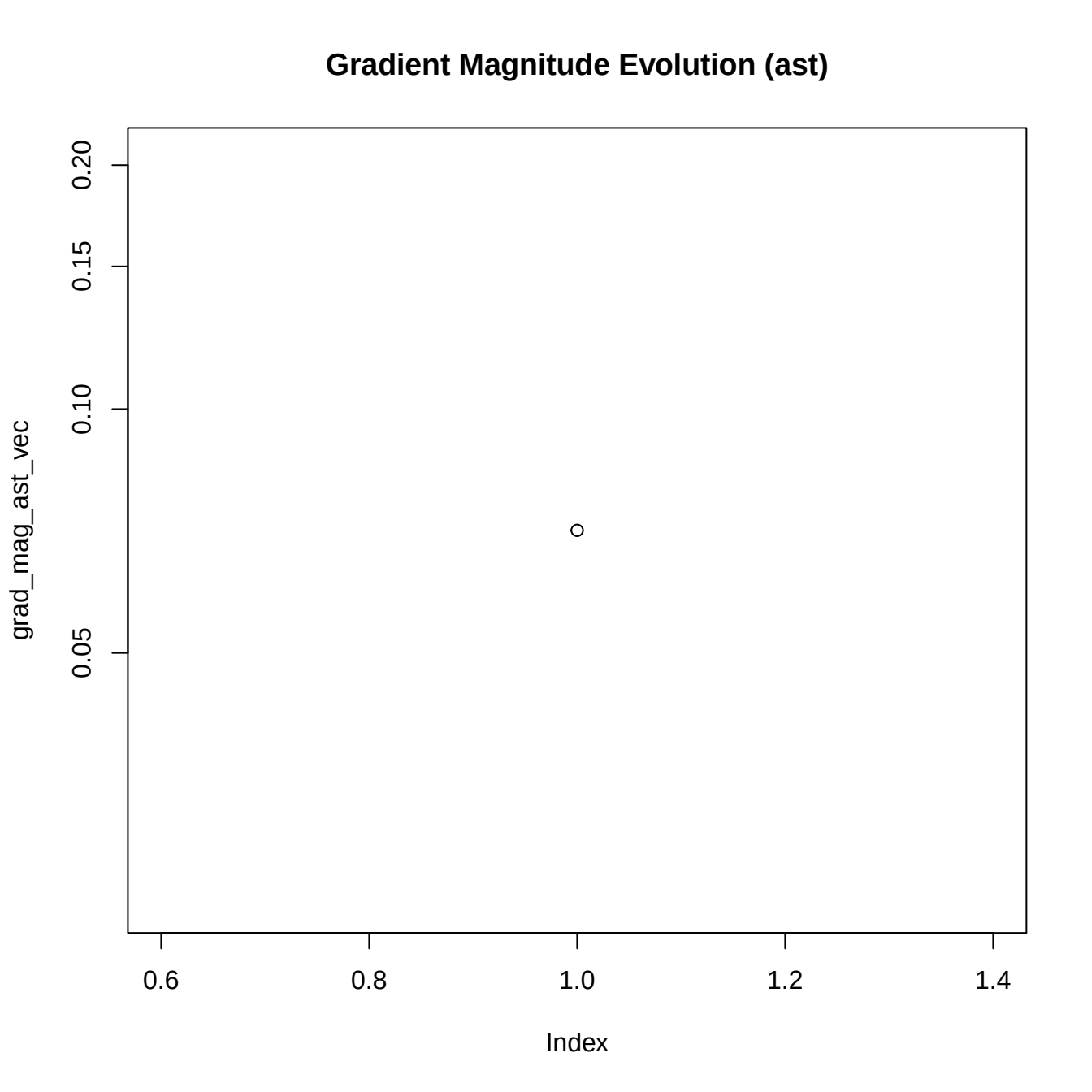
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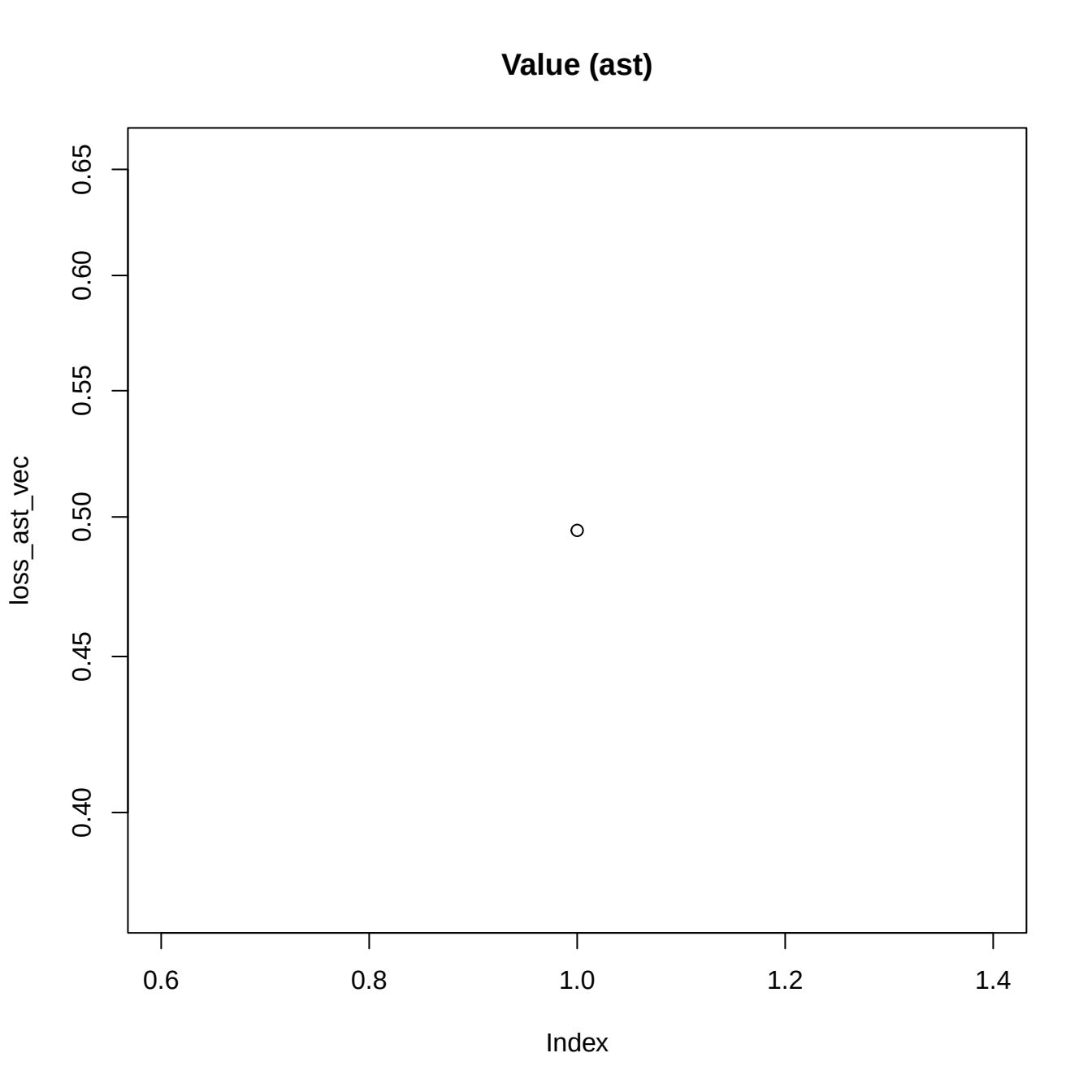
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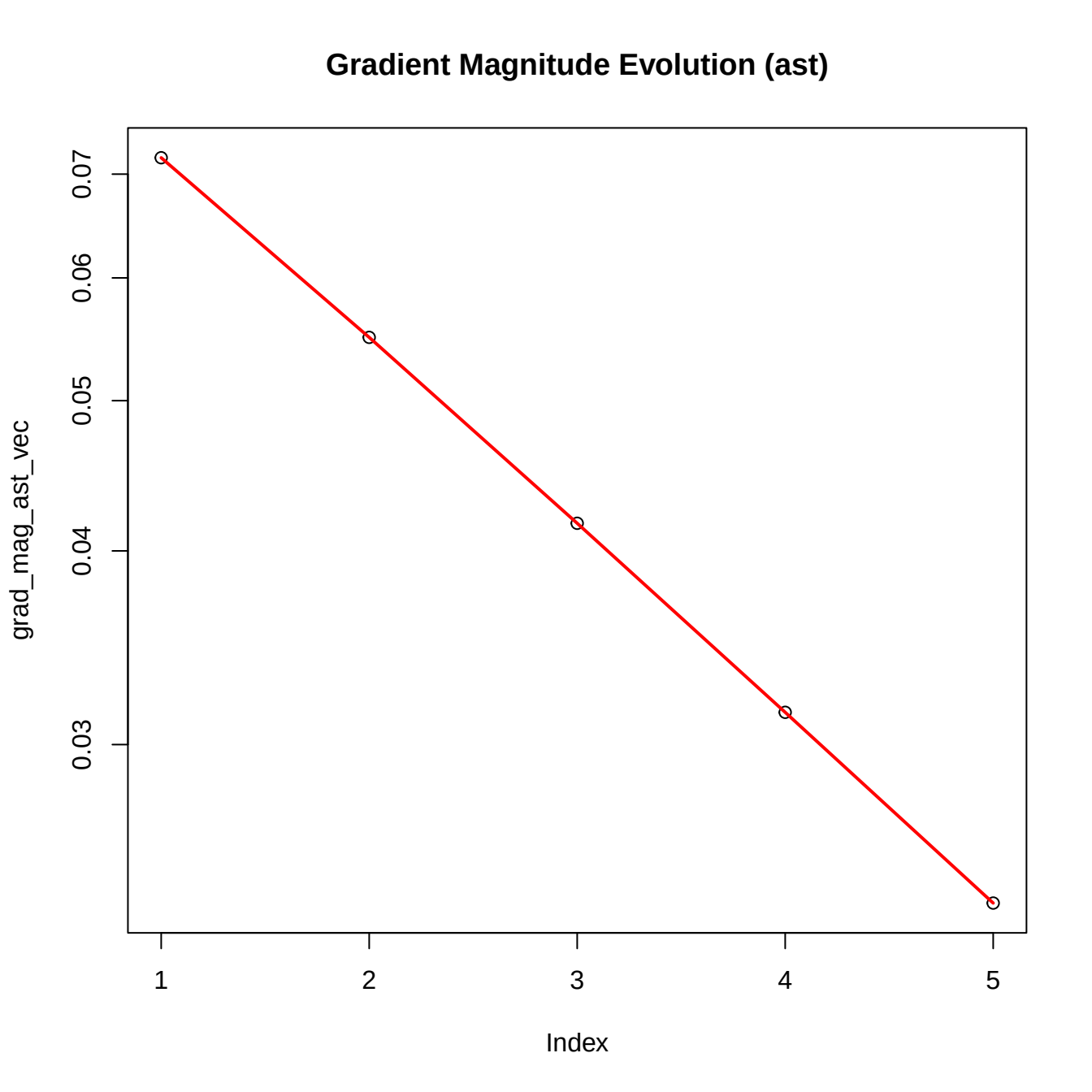
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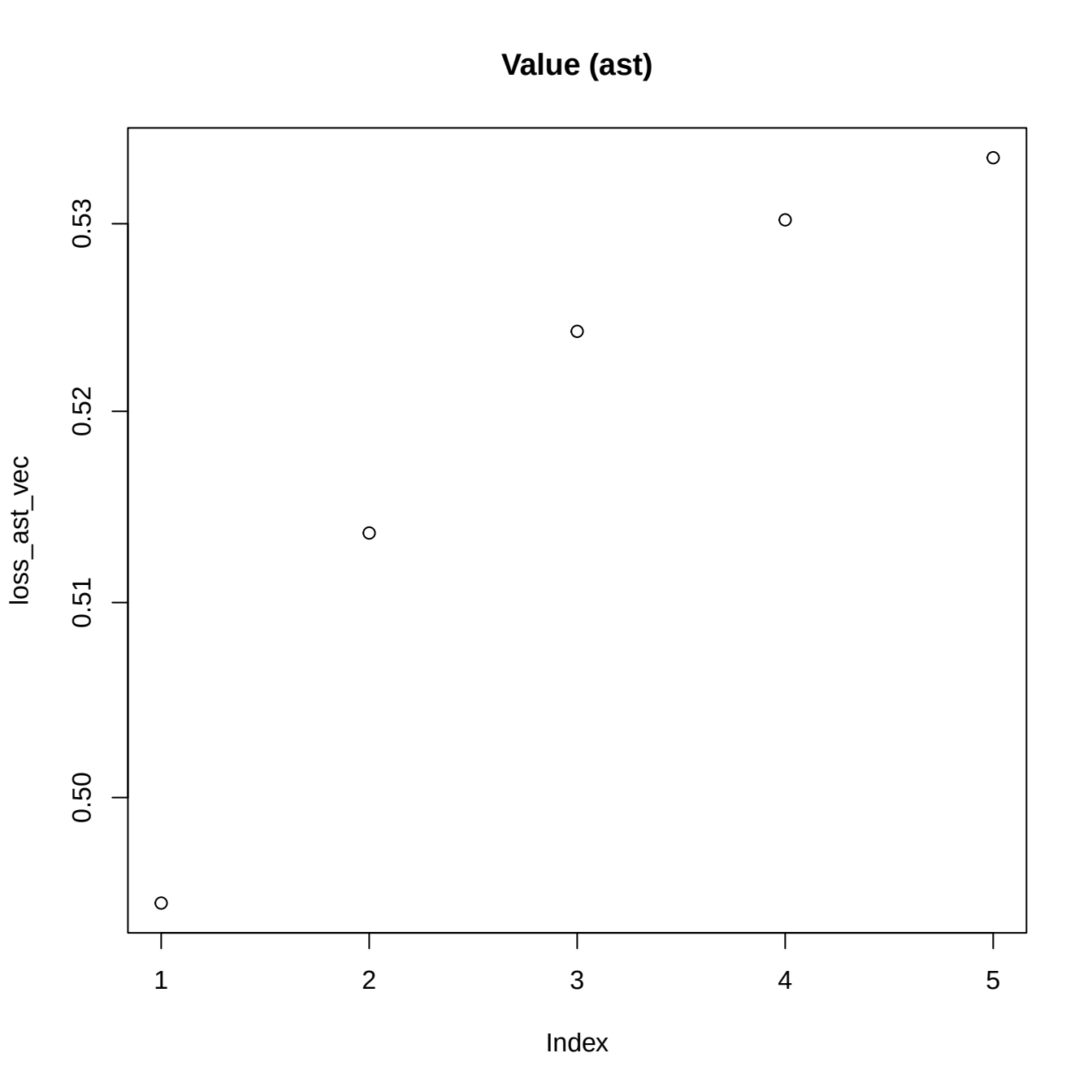
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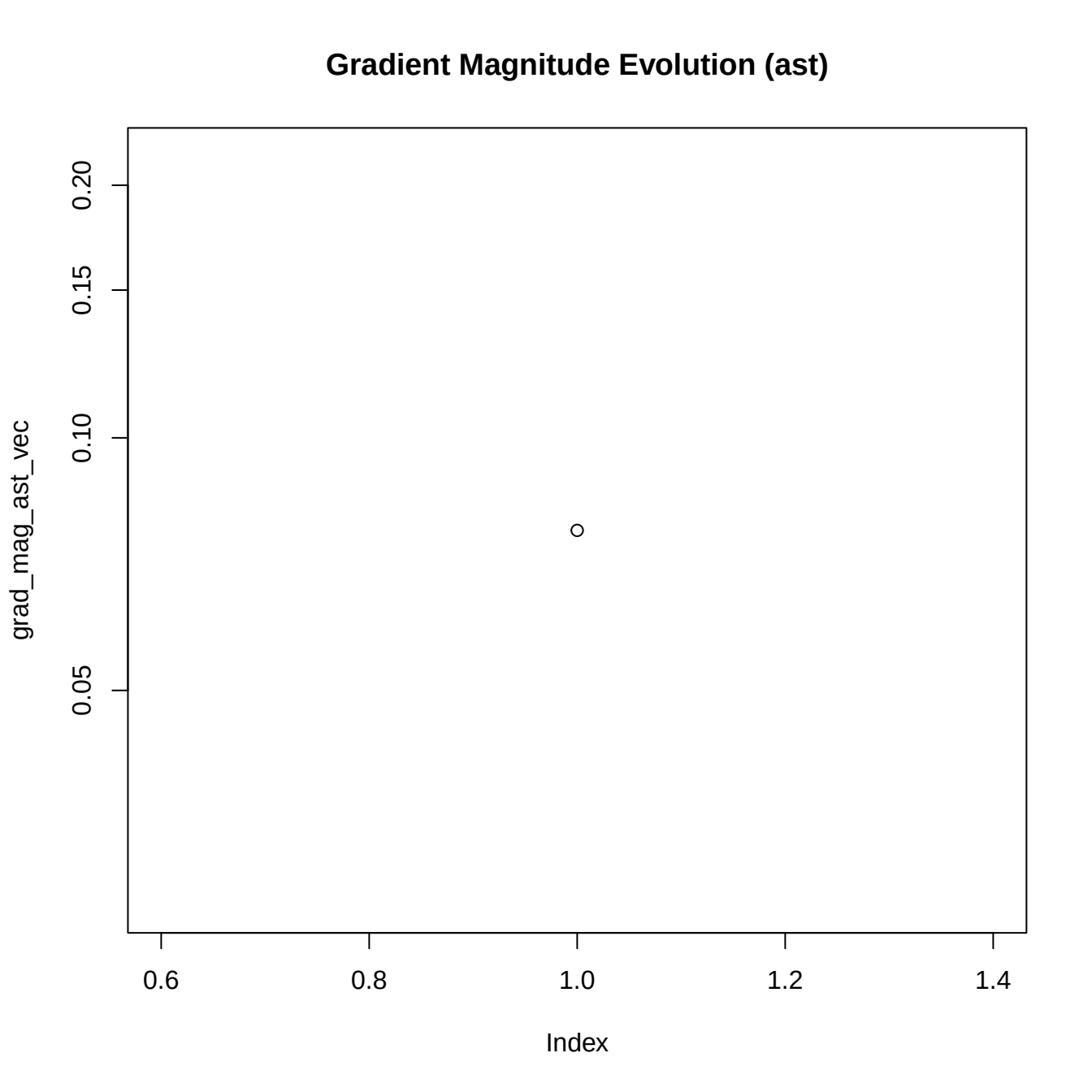
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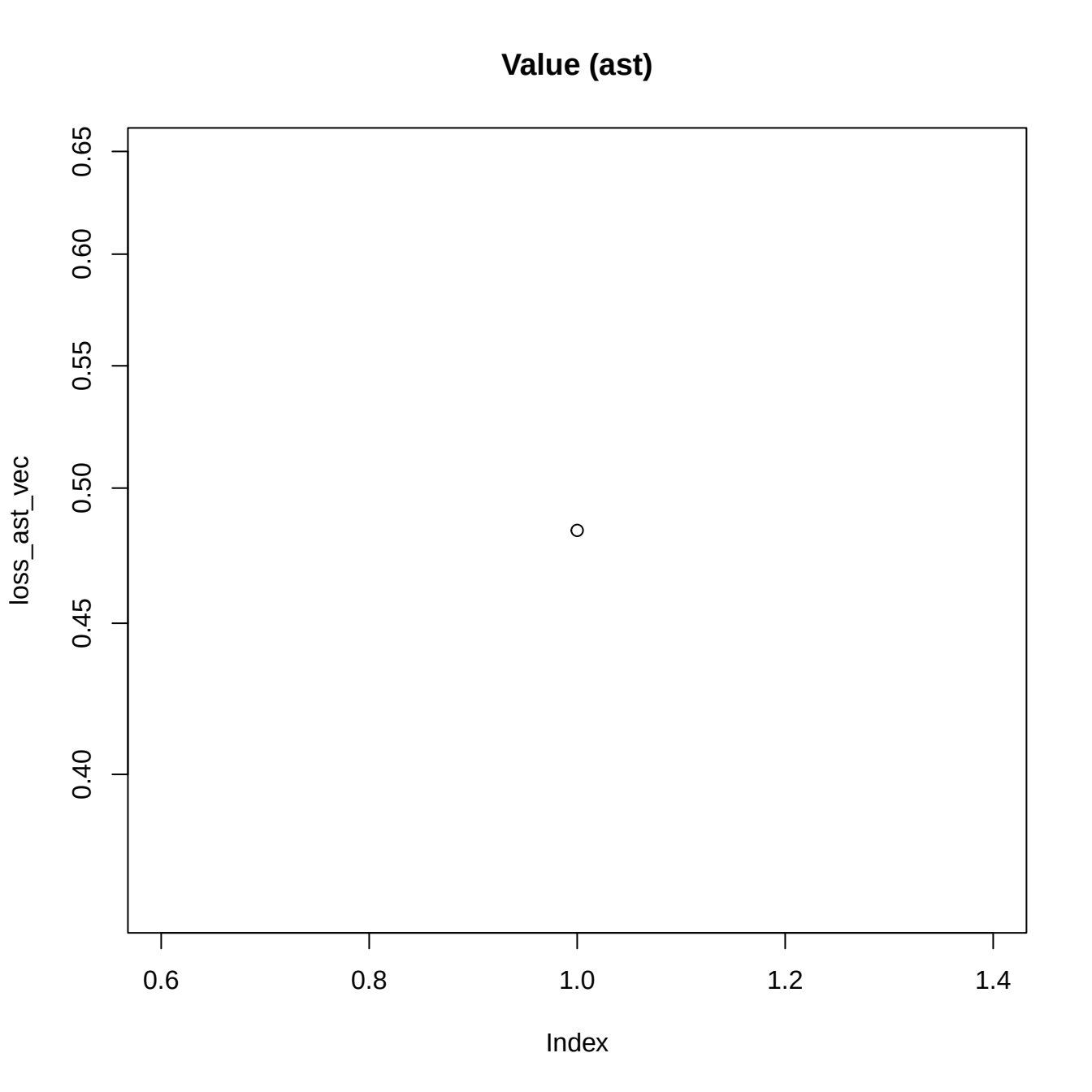
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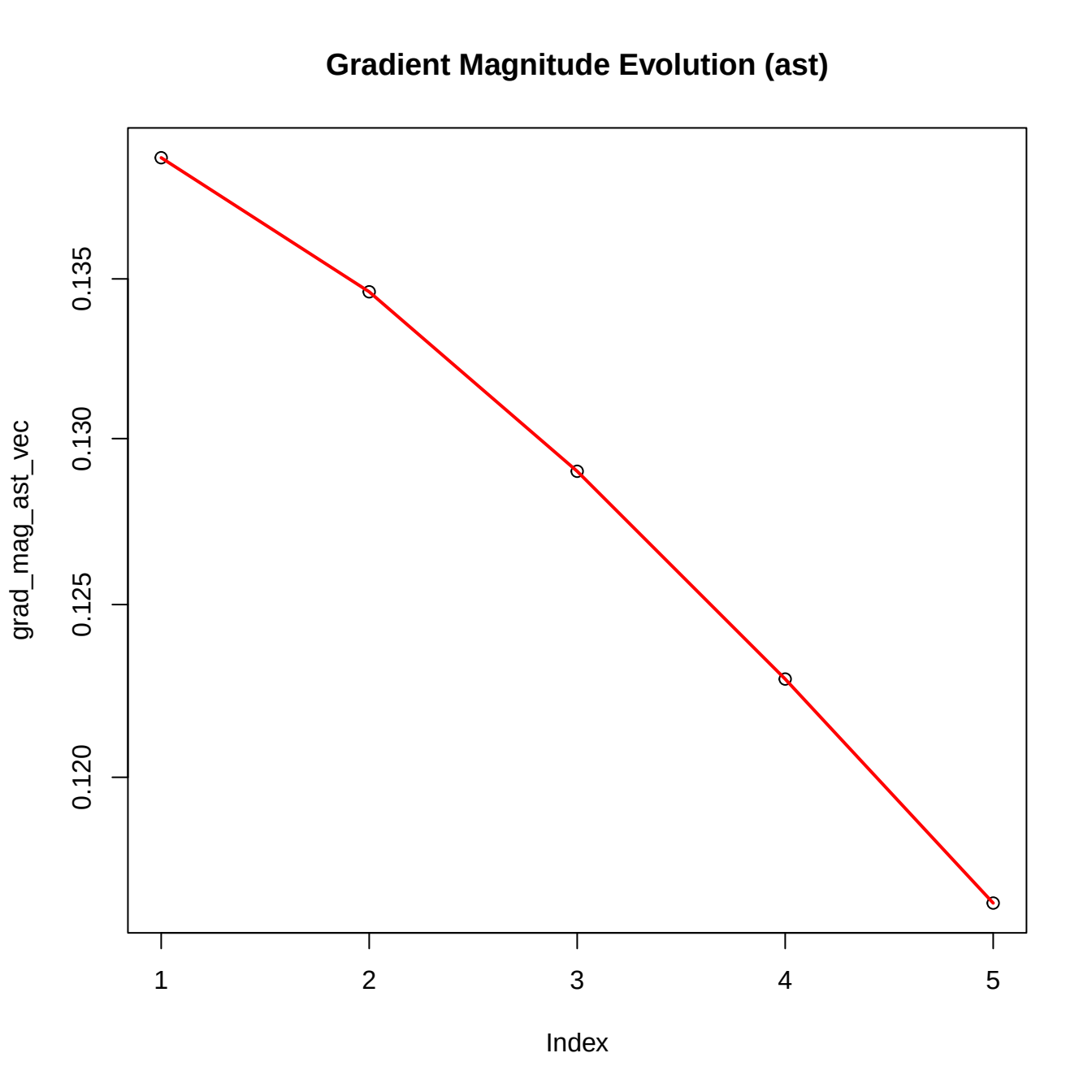
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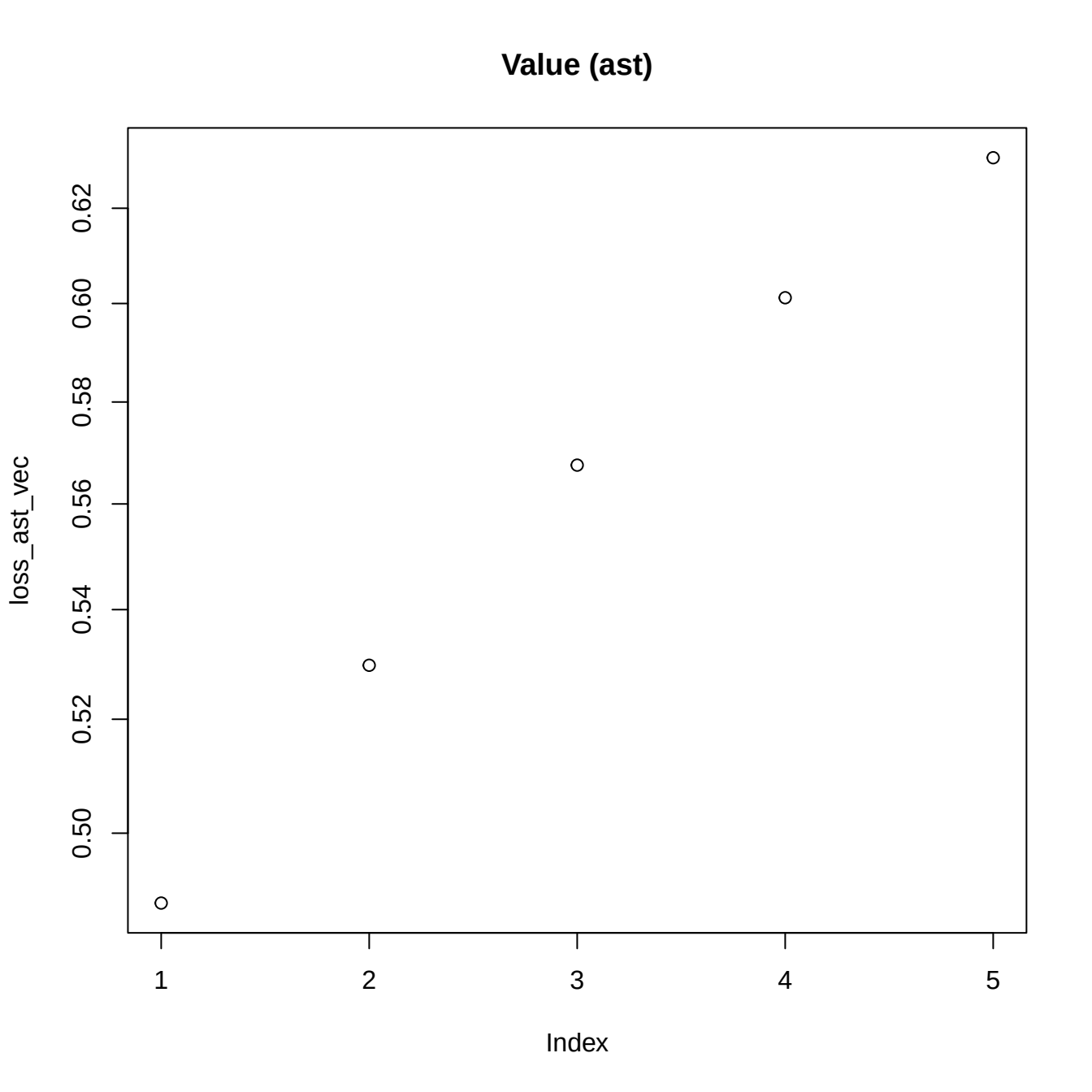
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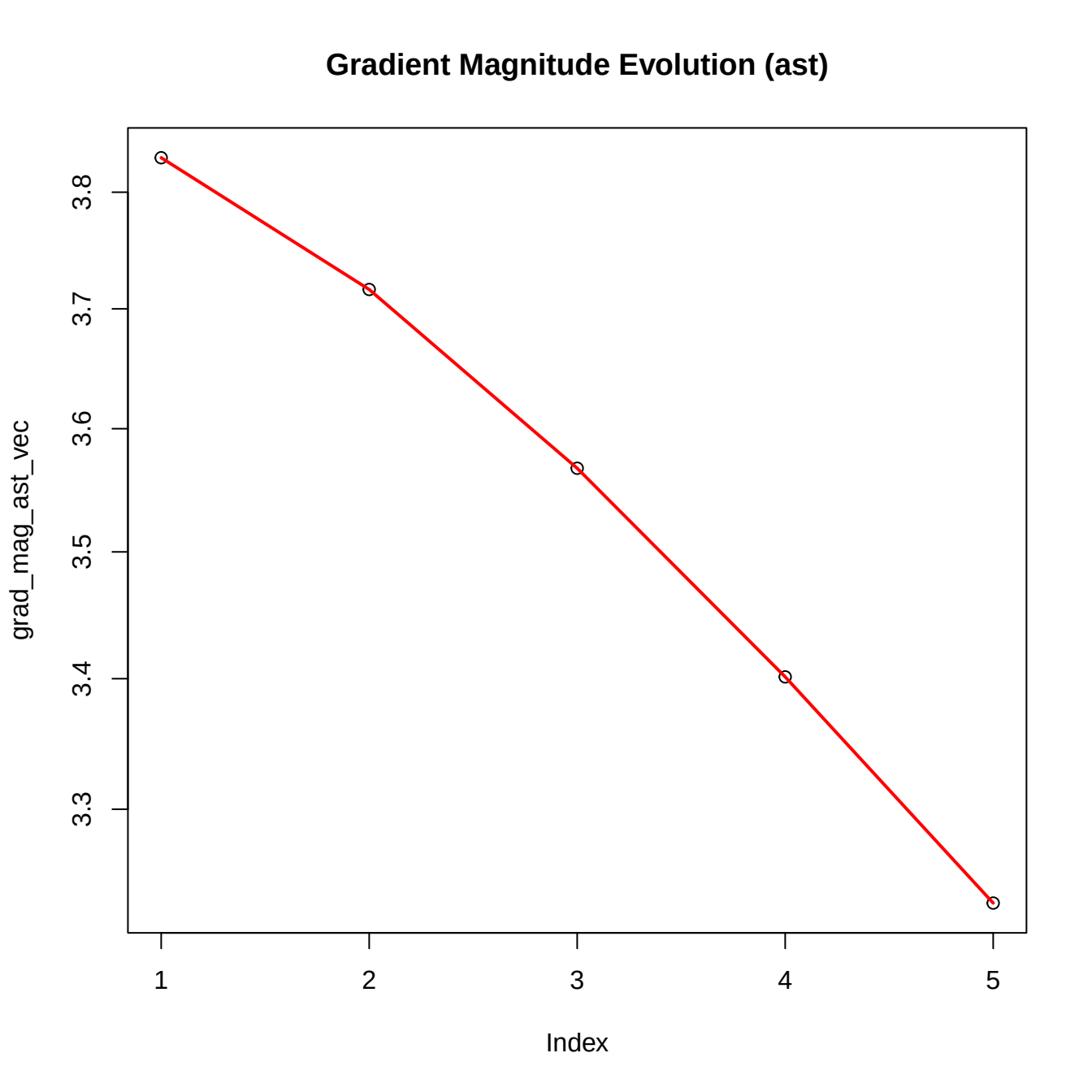
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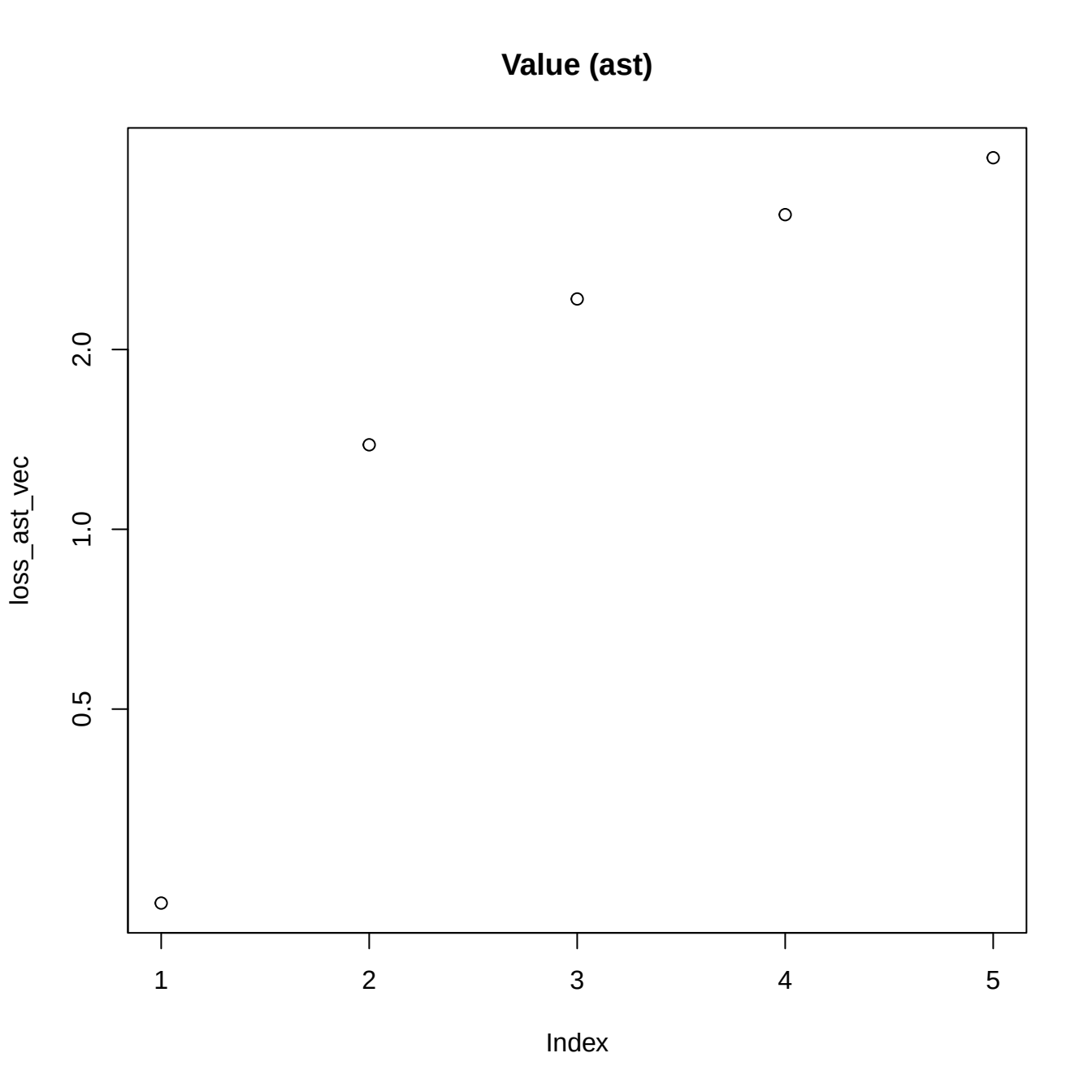
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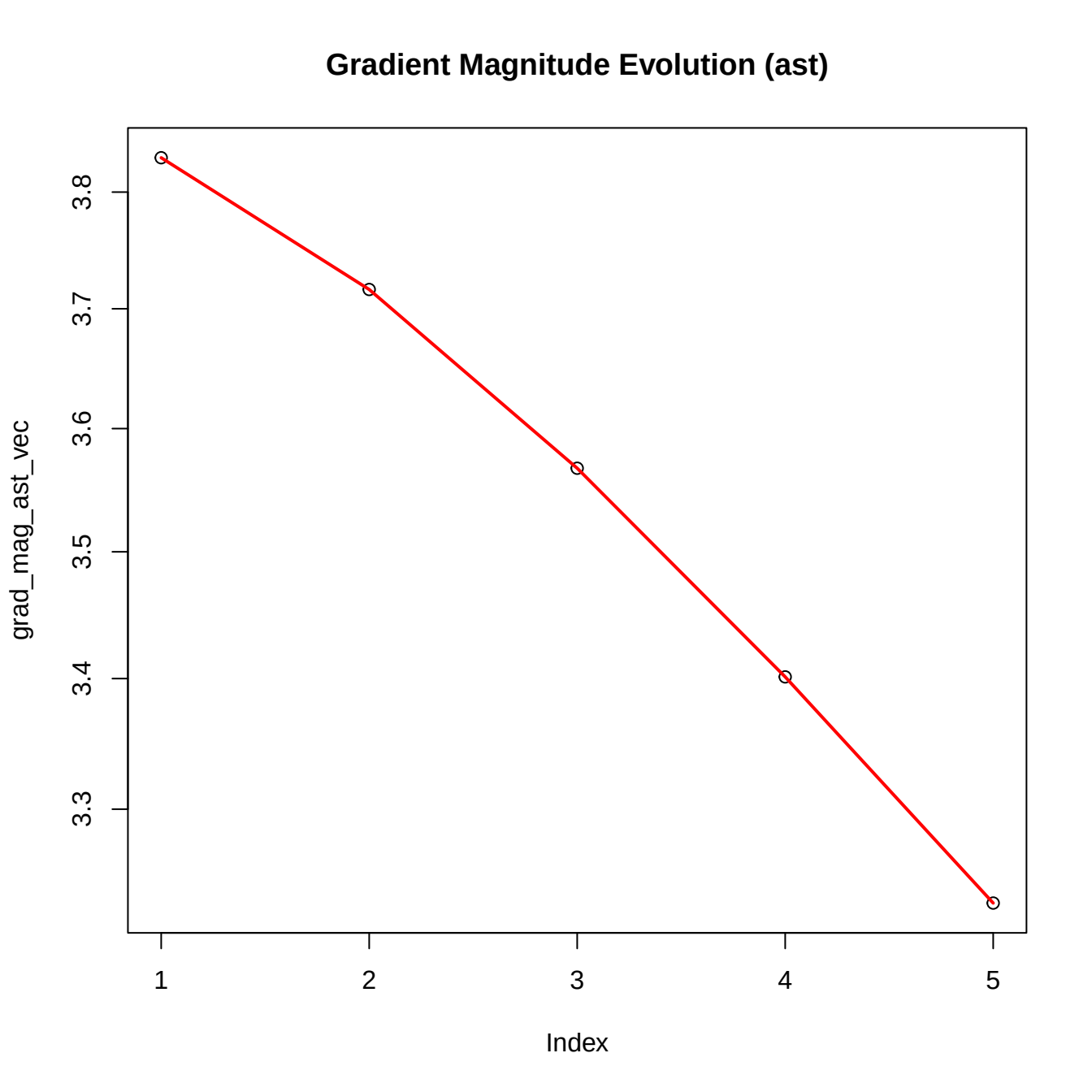
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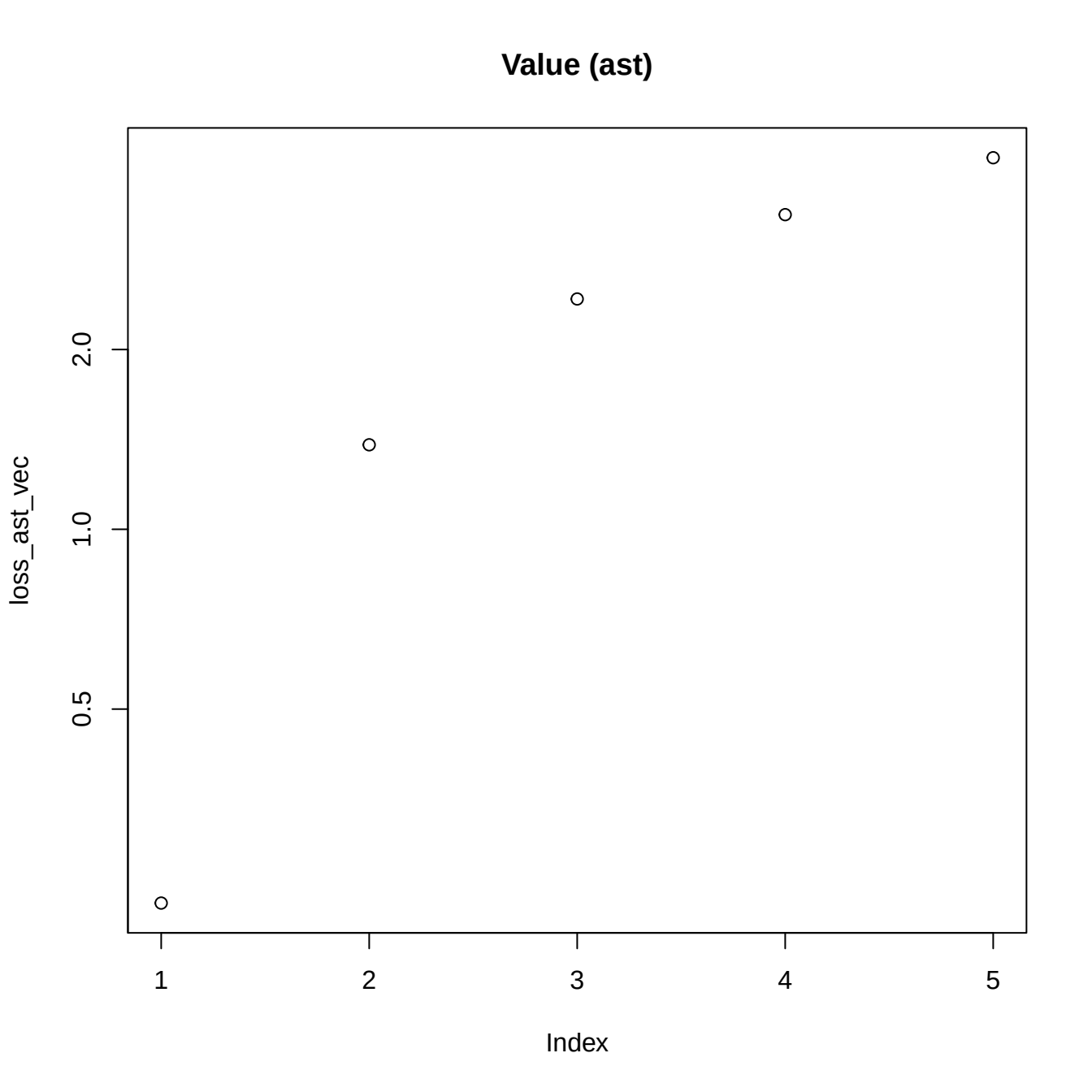
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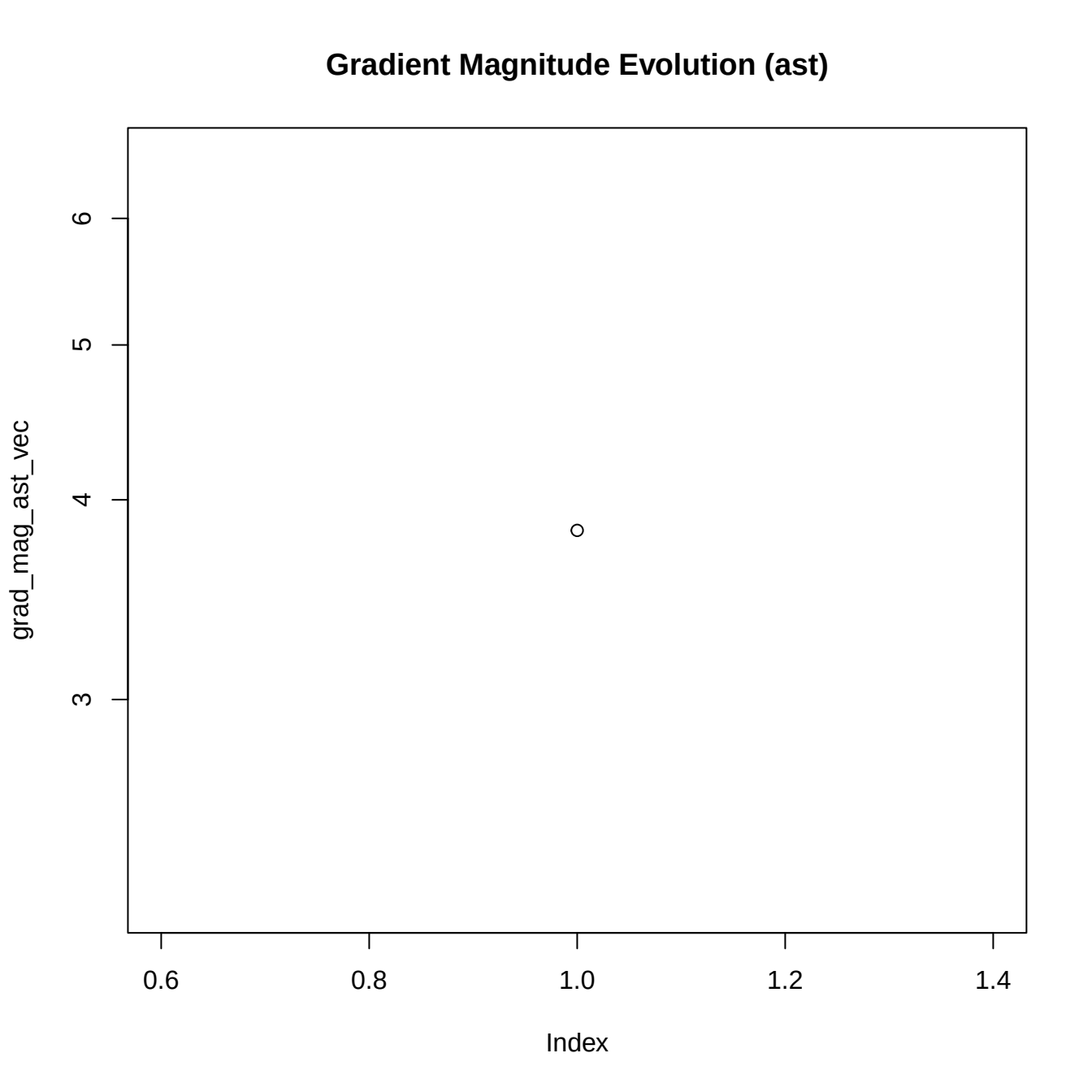
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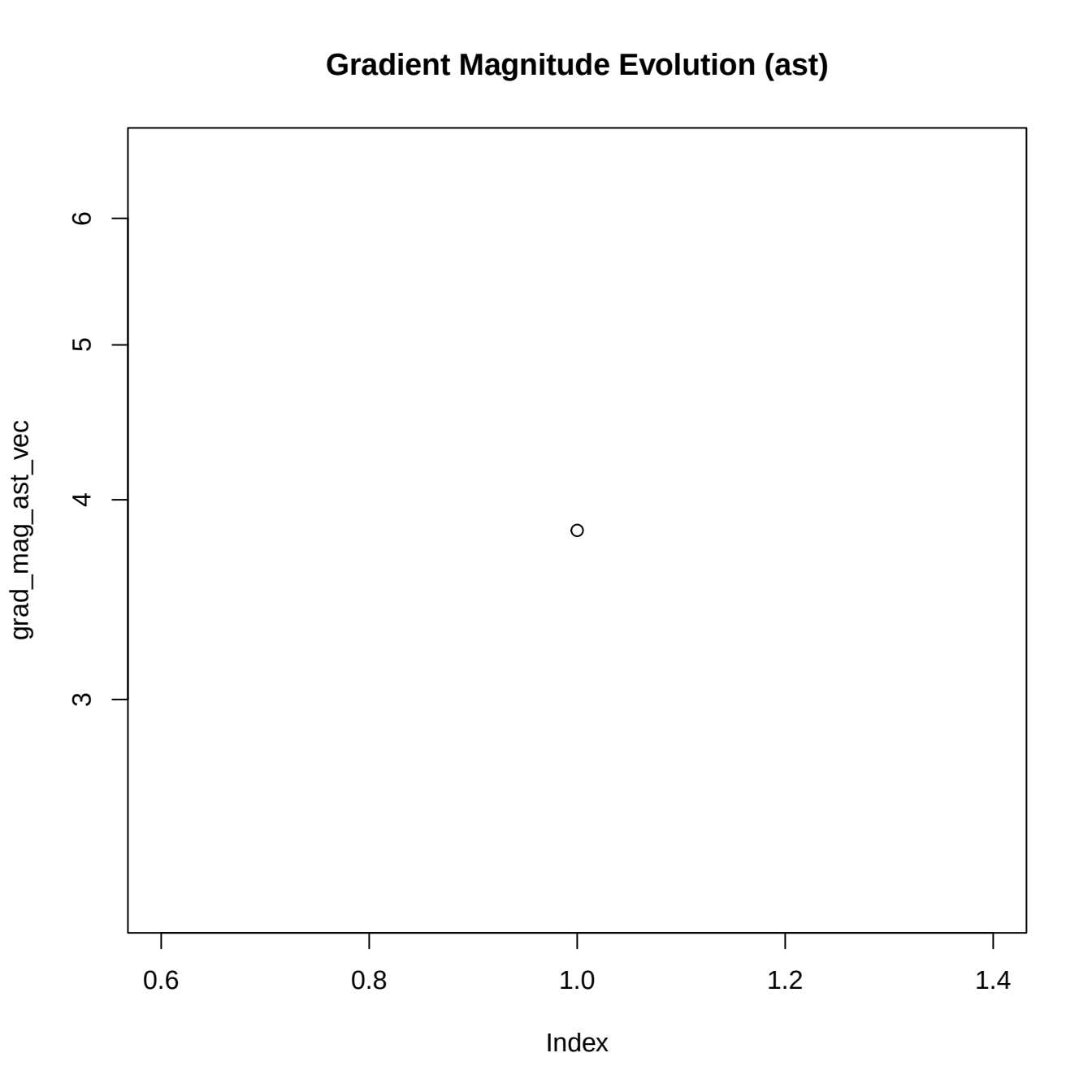
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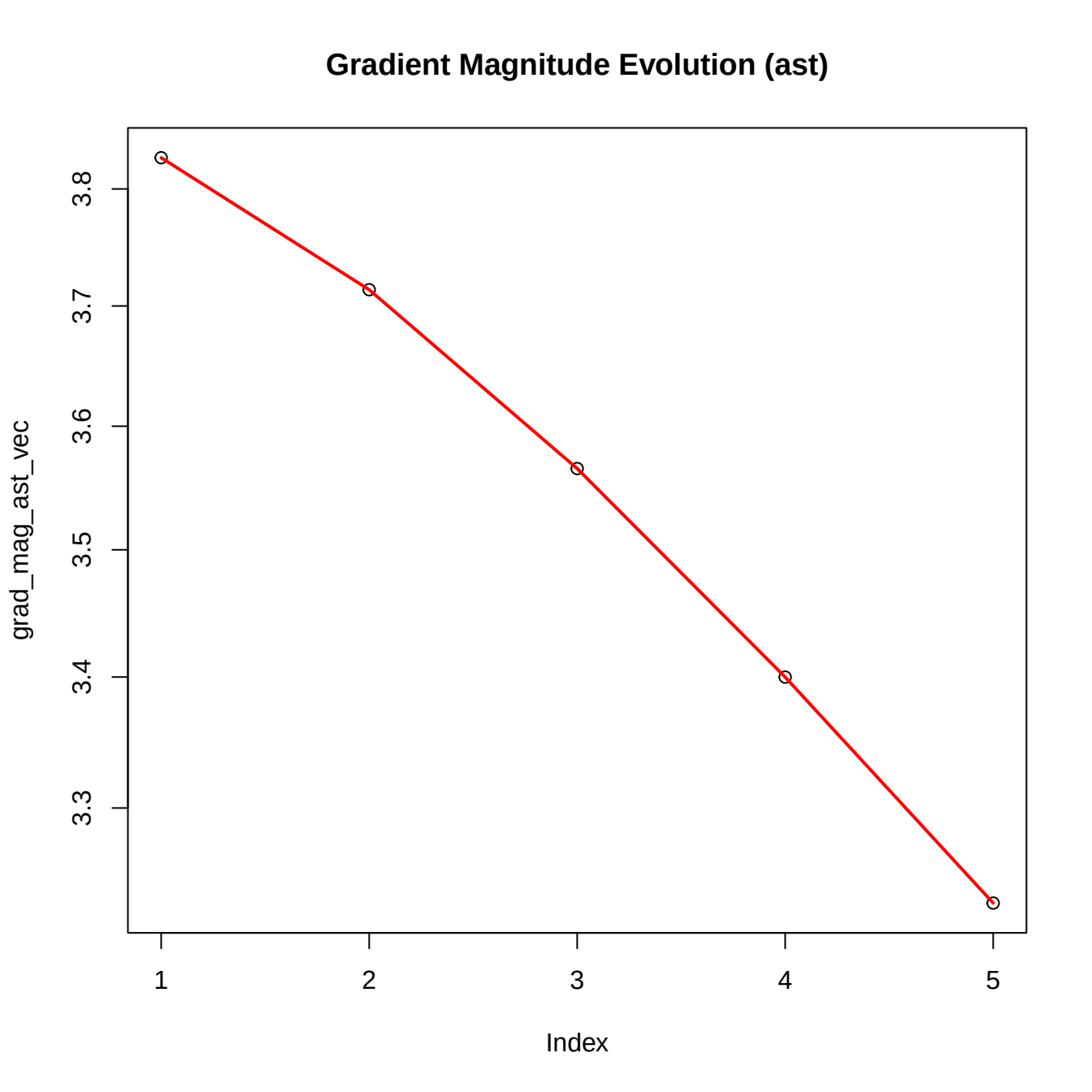
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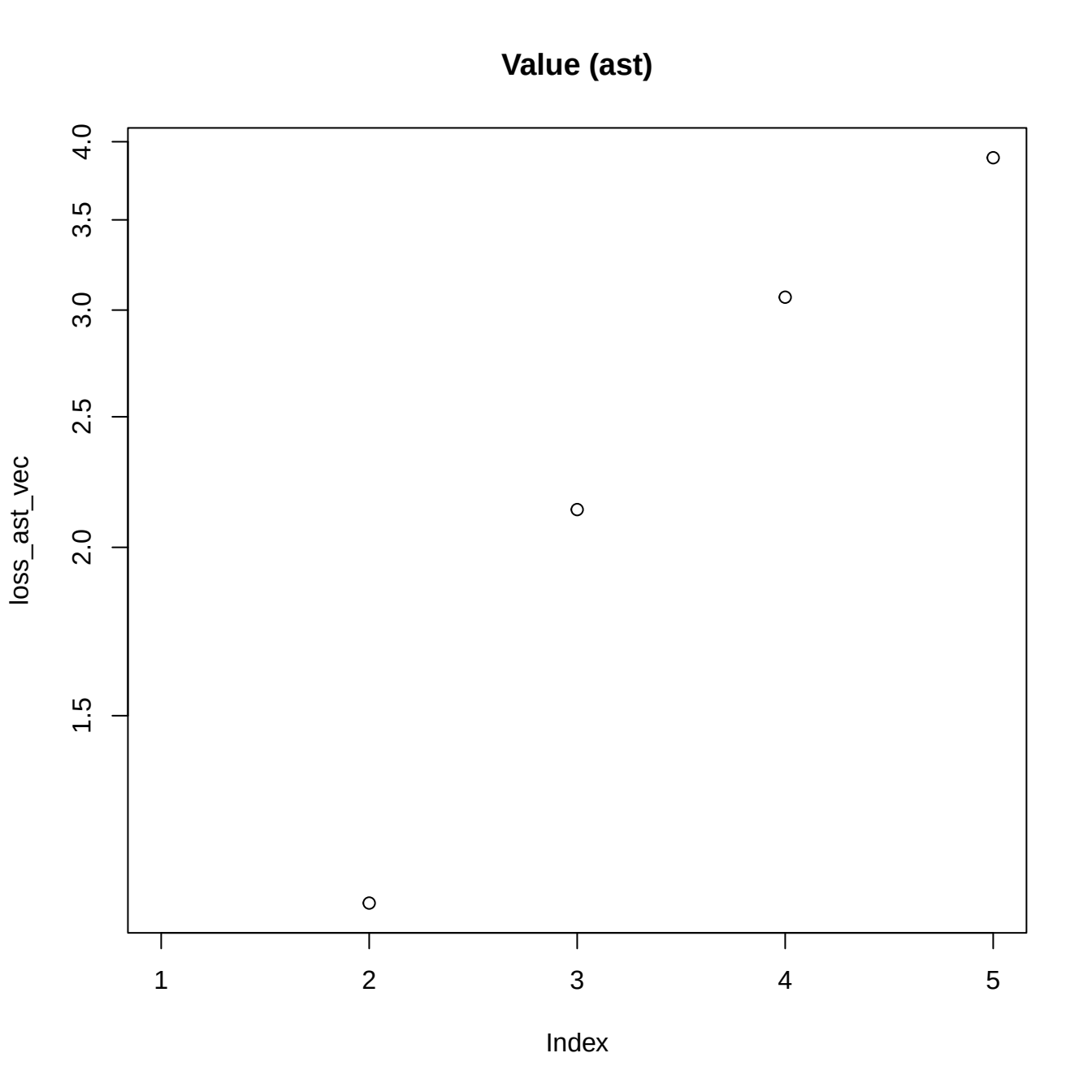
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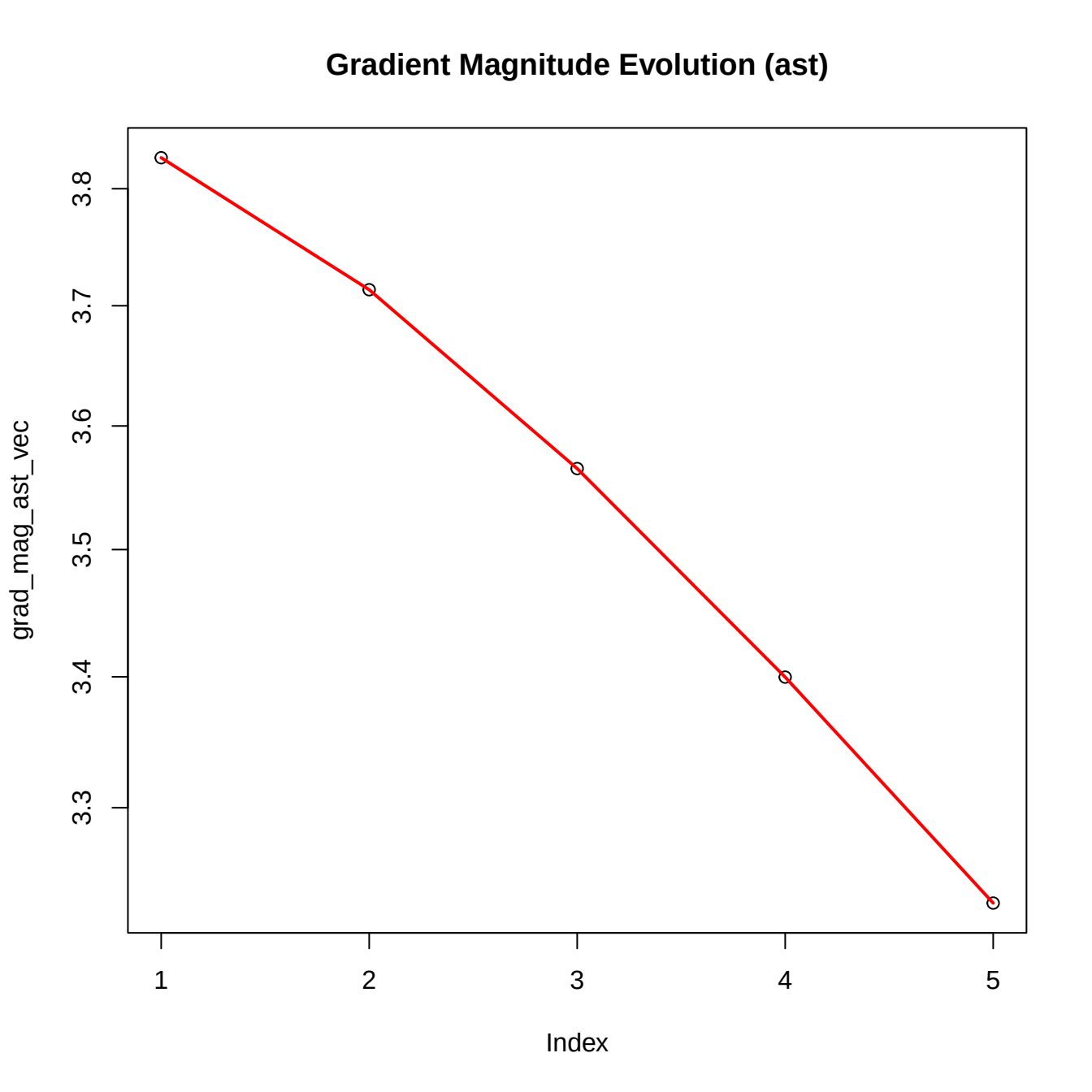
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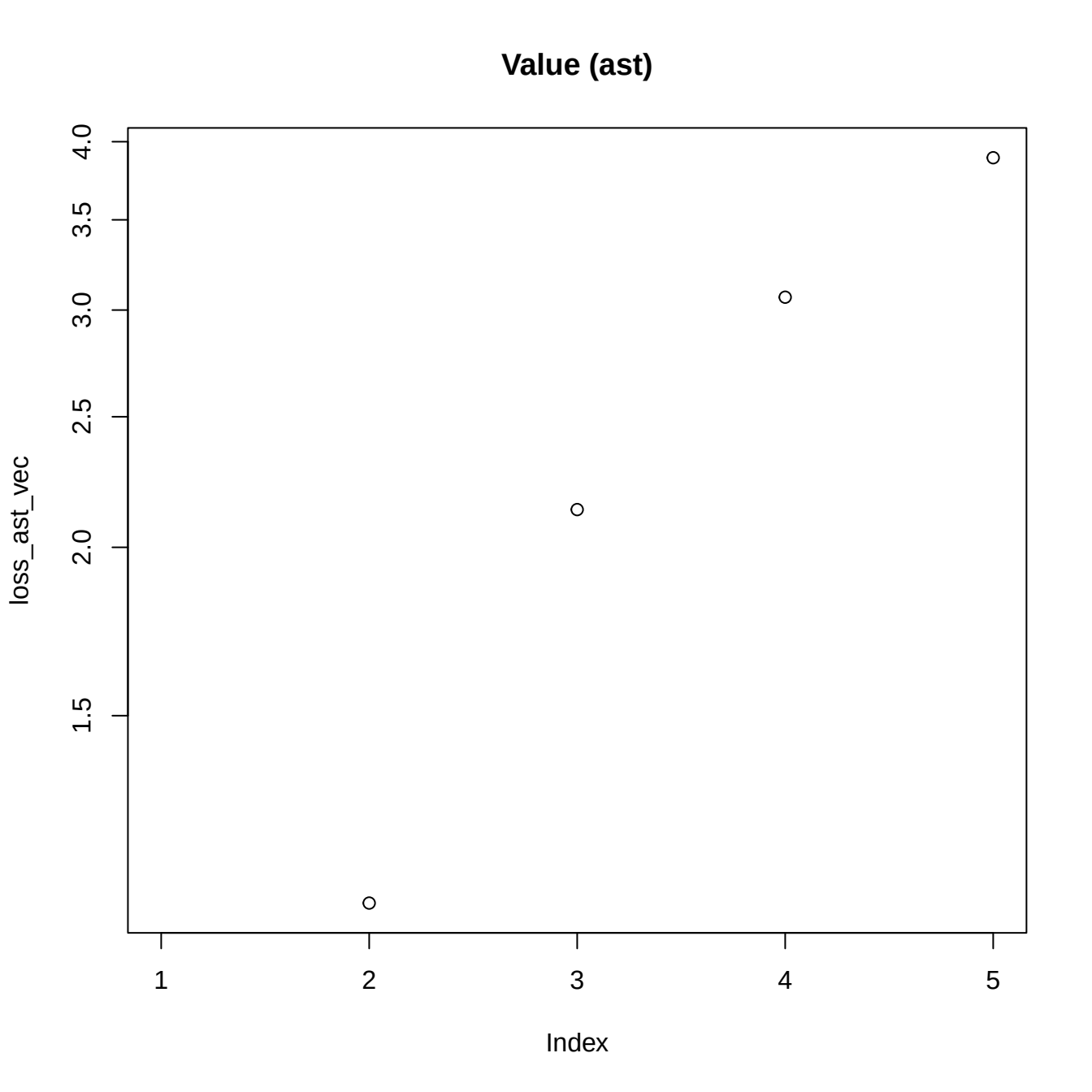
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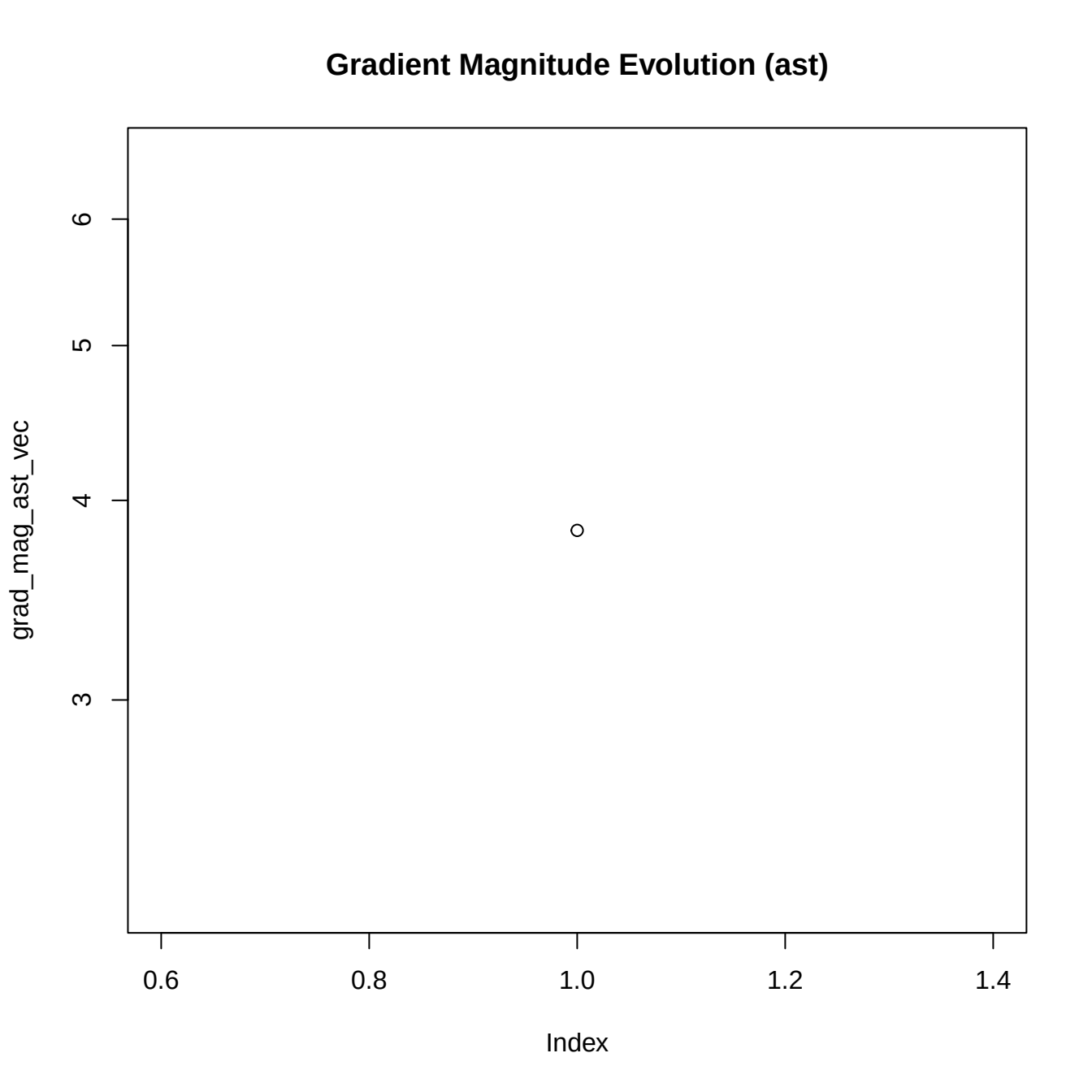
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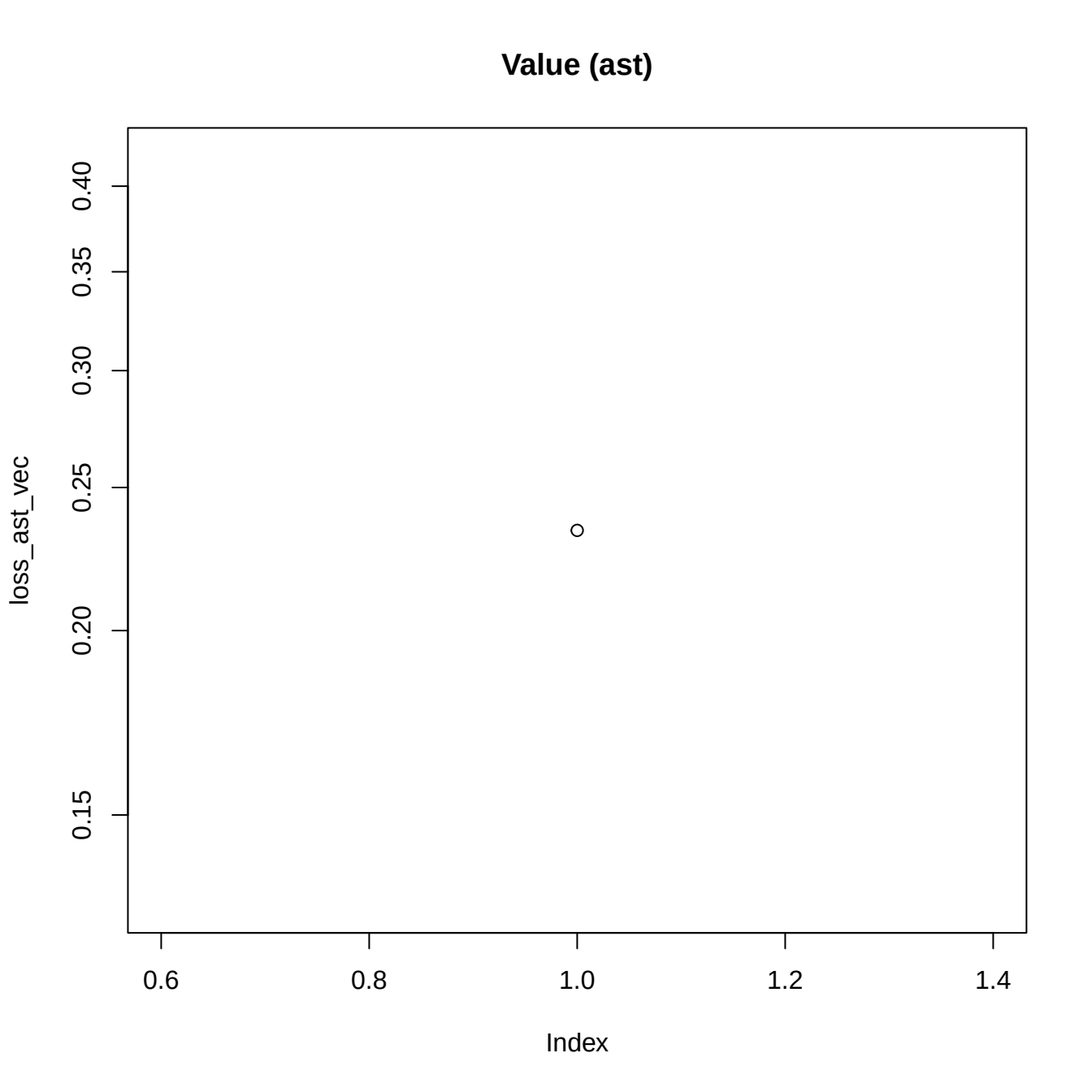
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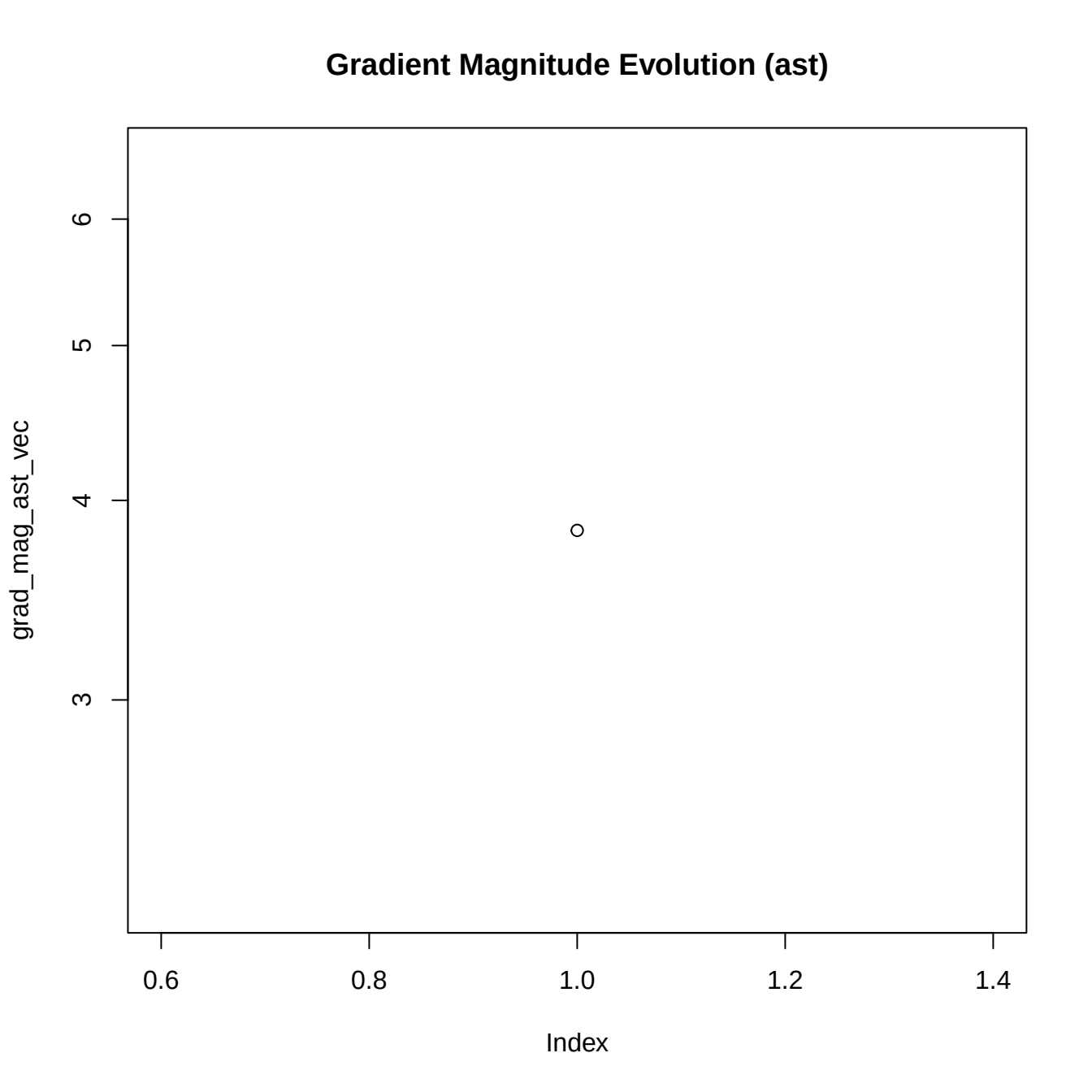
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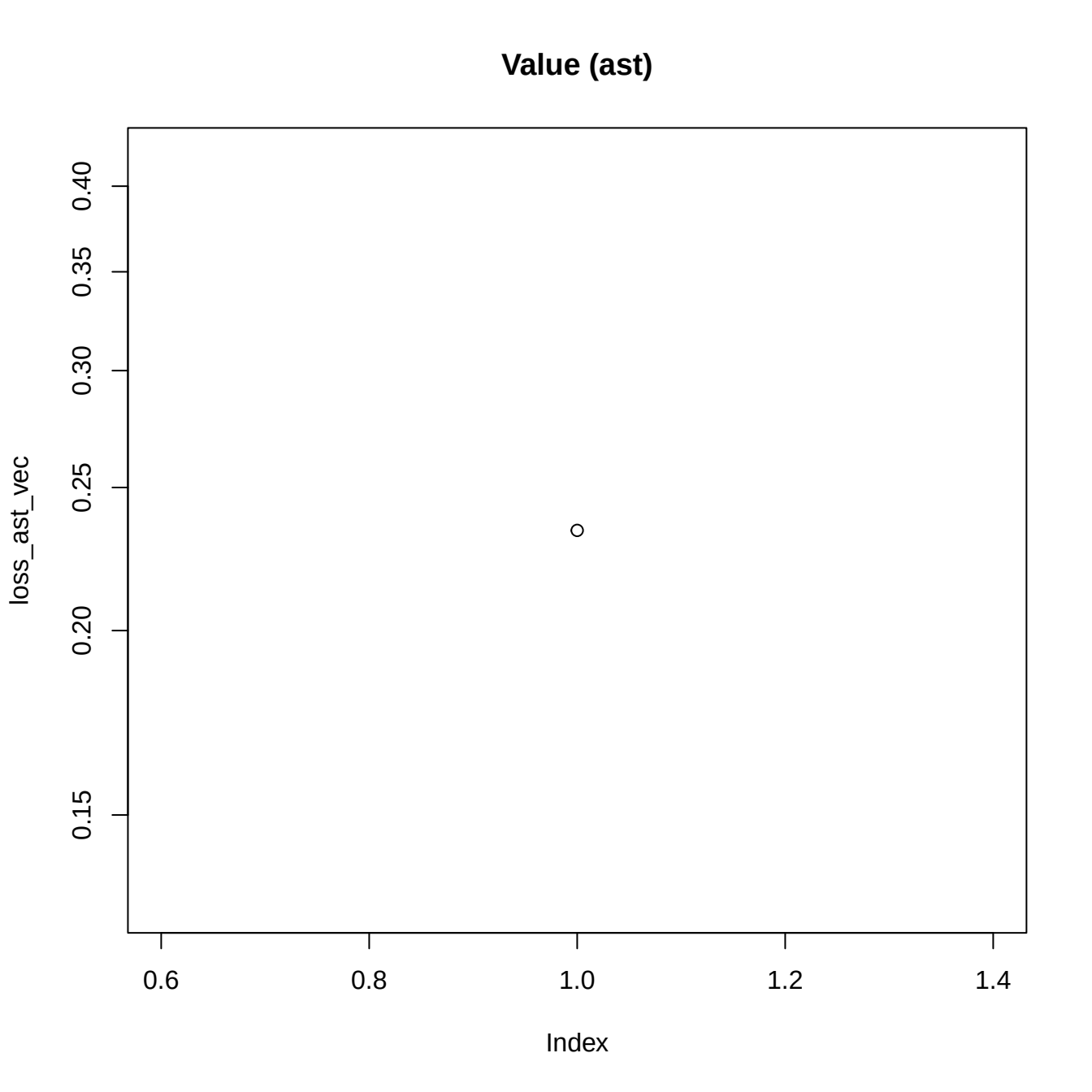
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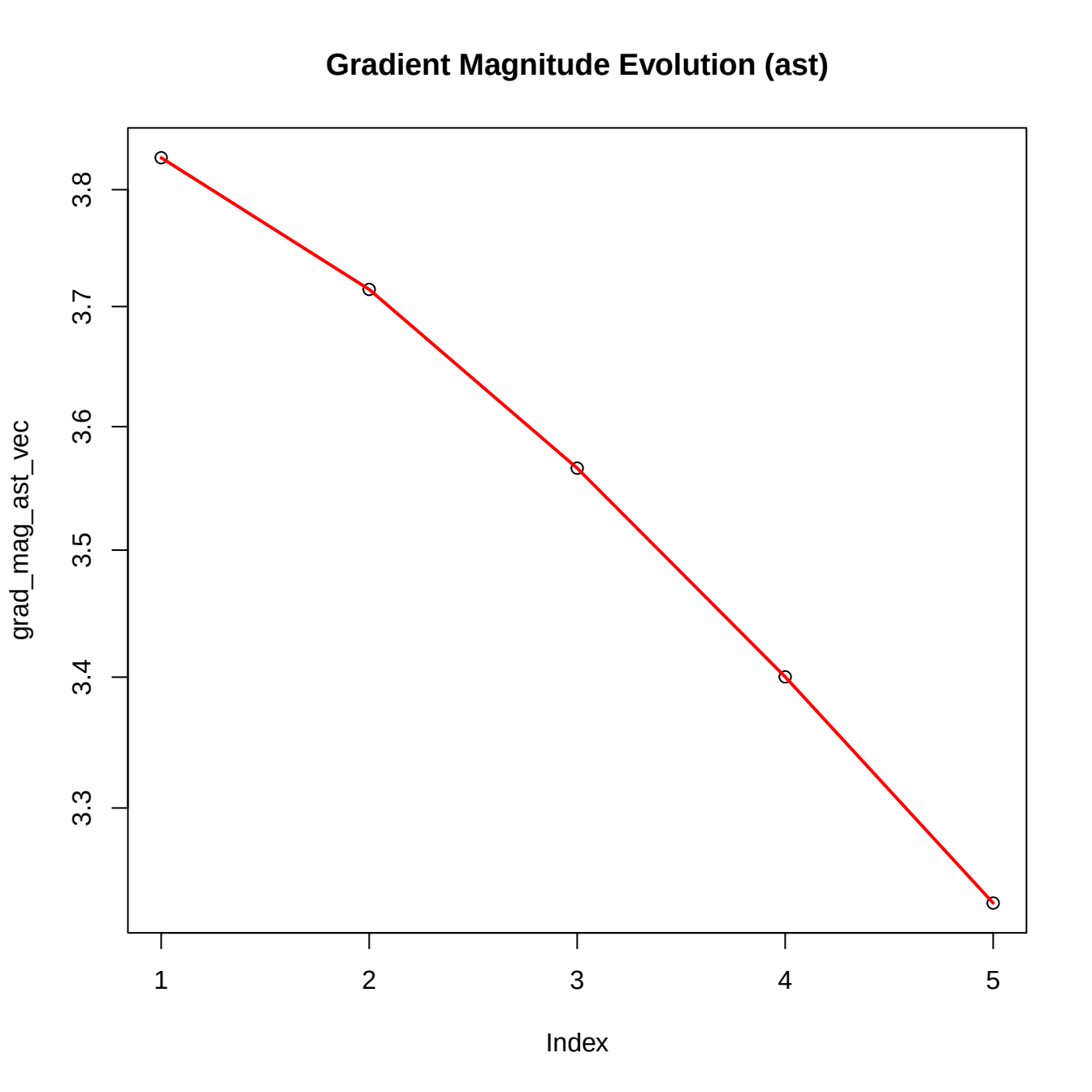
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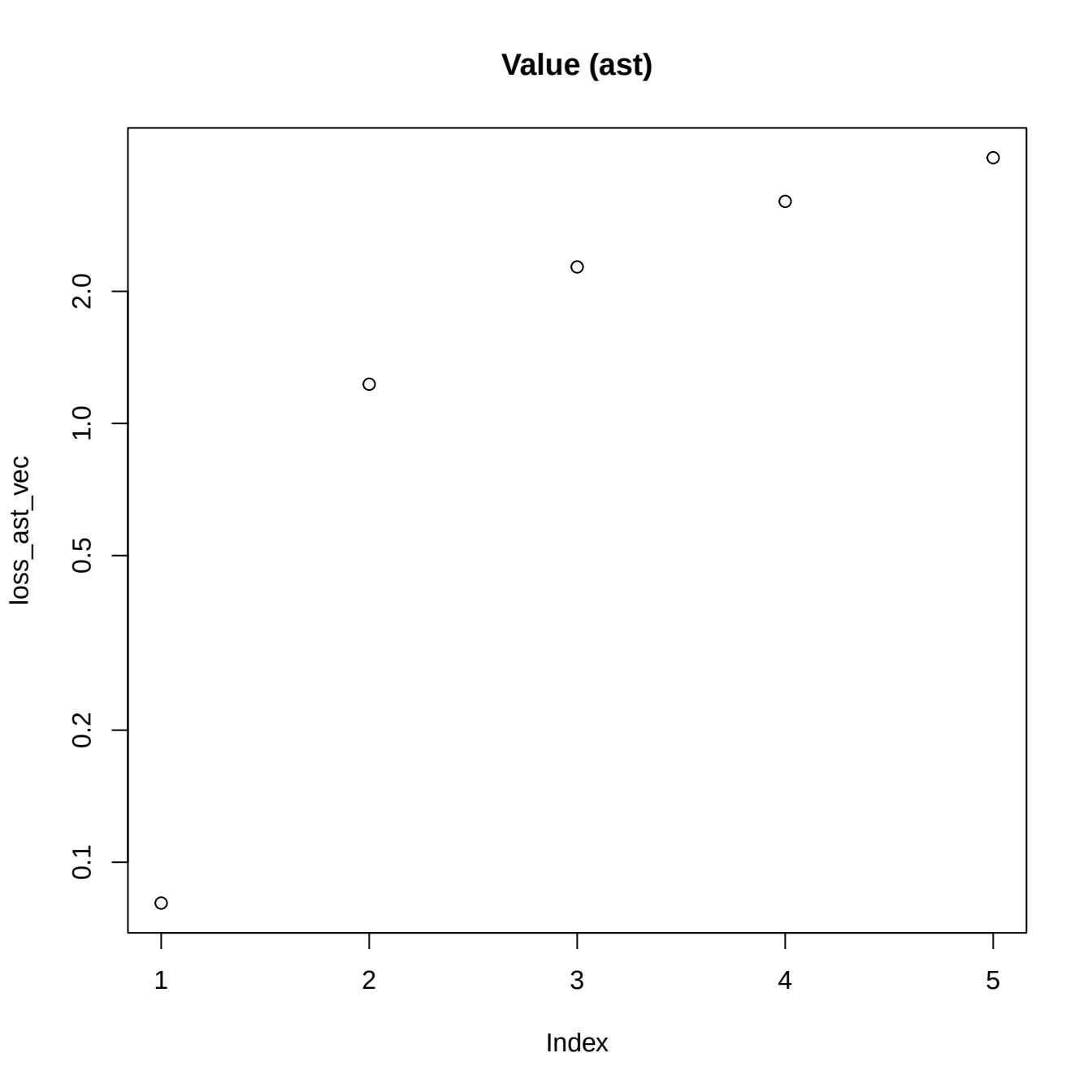
Value (ast)
loss_ast_vec
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0.2
0.5
1.0
2.0
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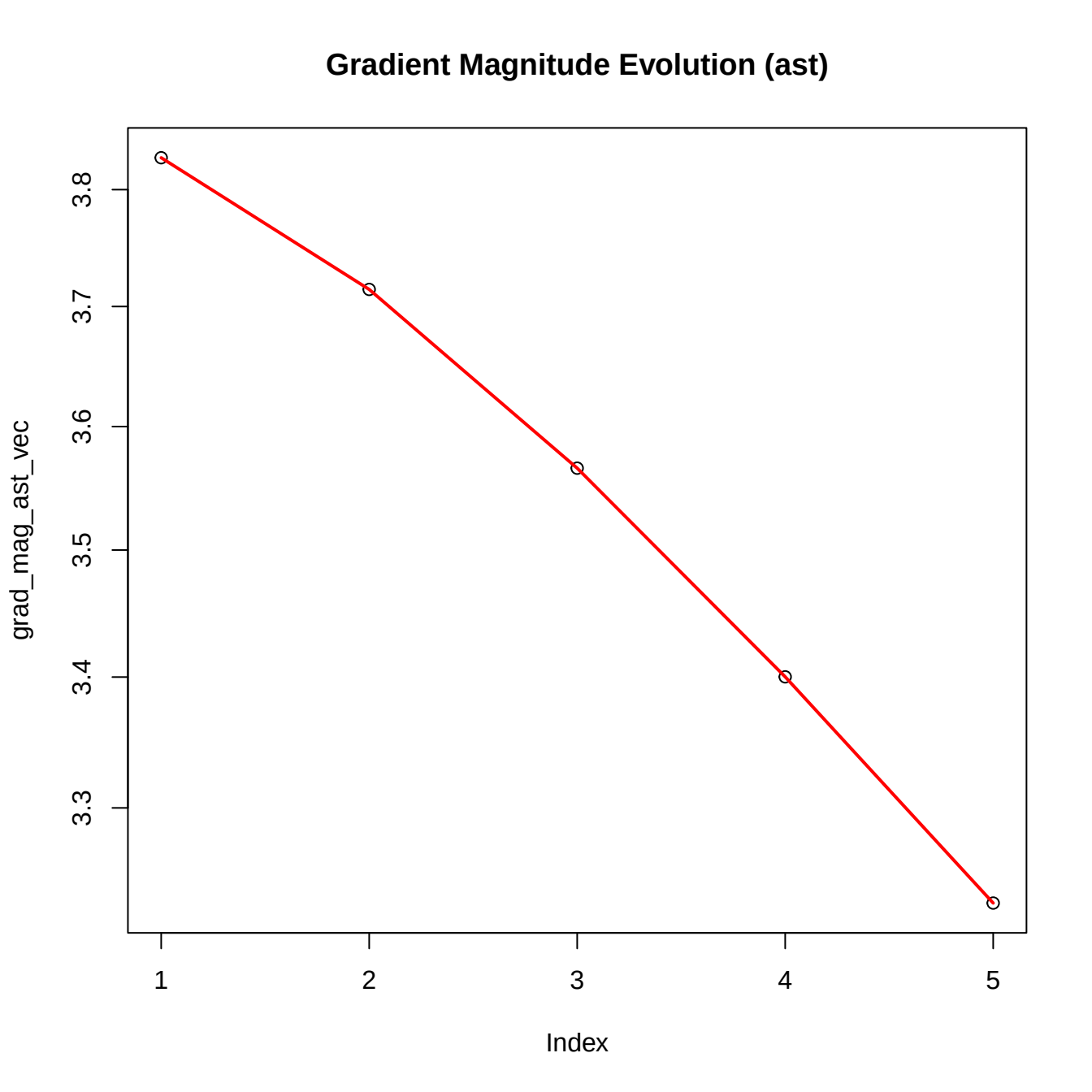
3
4
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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3.4
3.5
3.6
3.7
3.8
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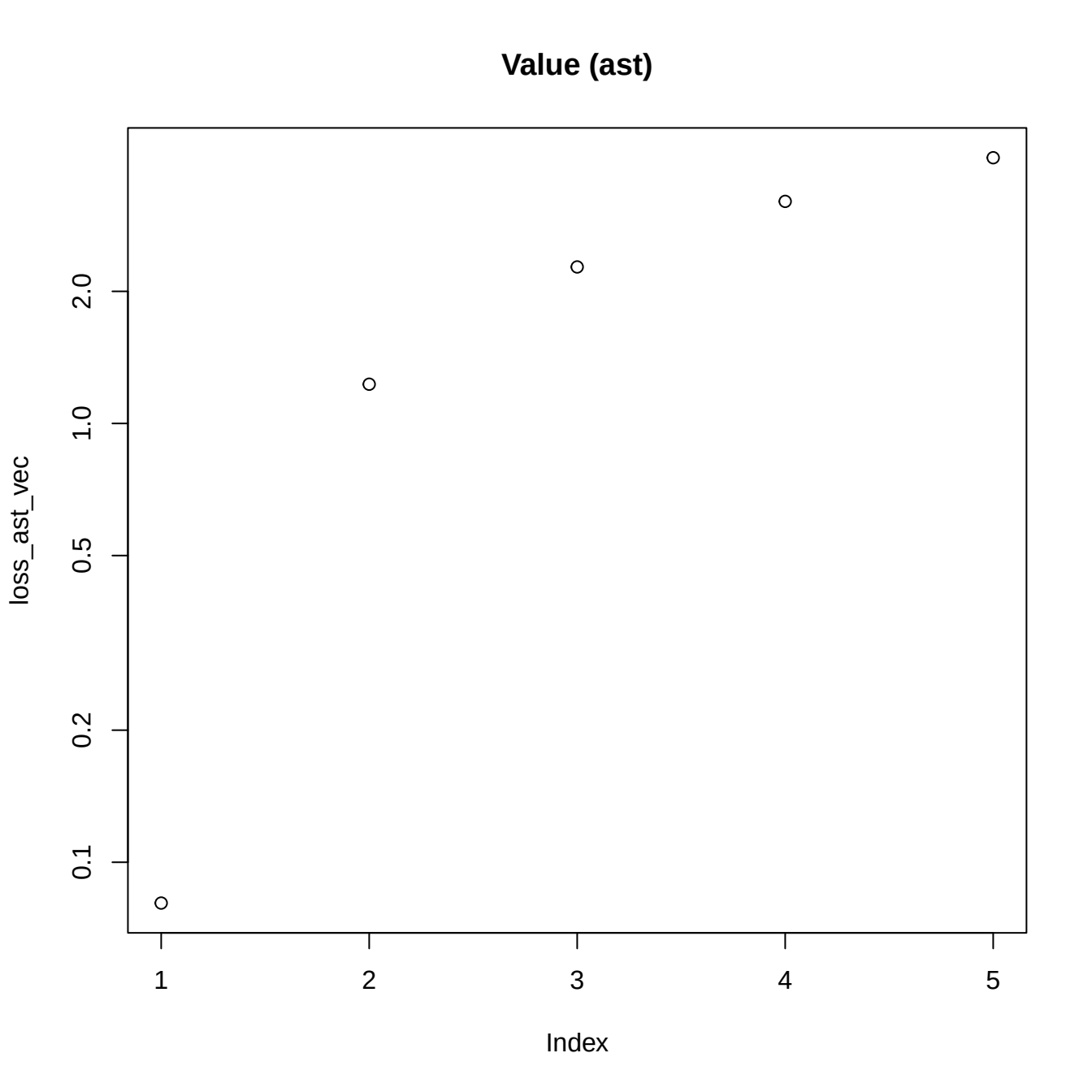
4
5
Index


Value (ast)
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0.2
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2.0
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4
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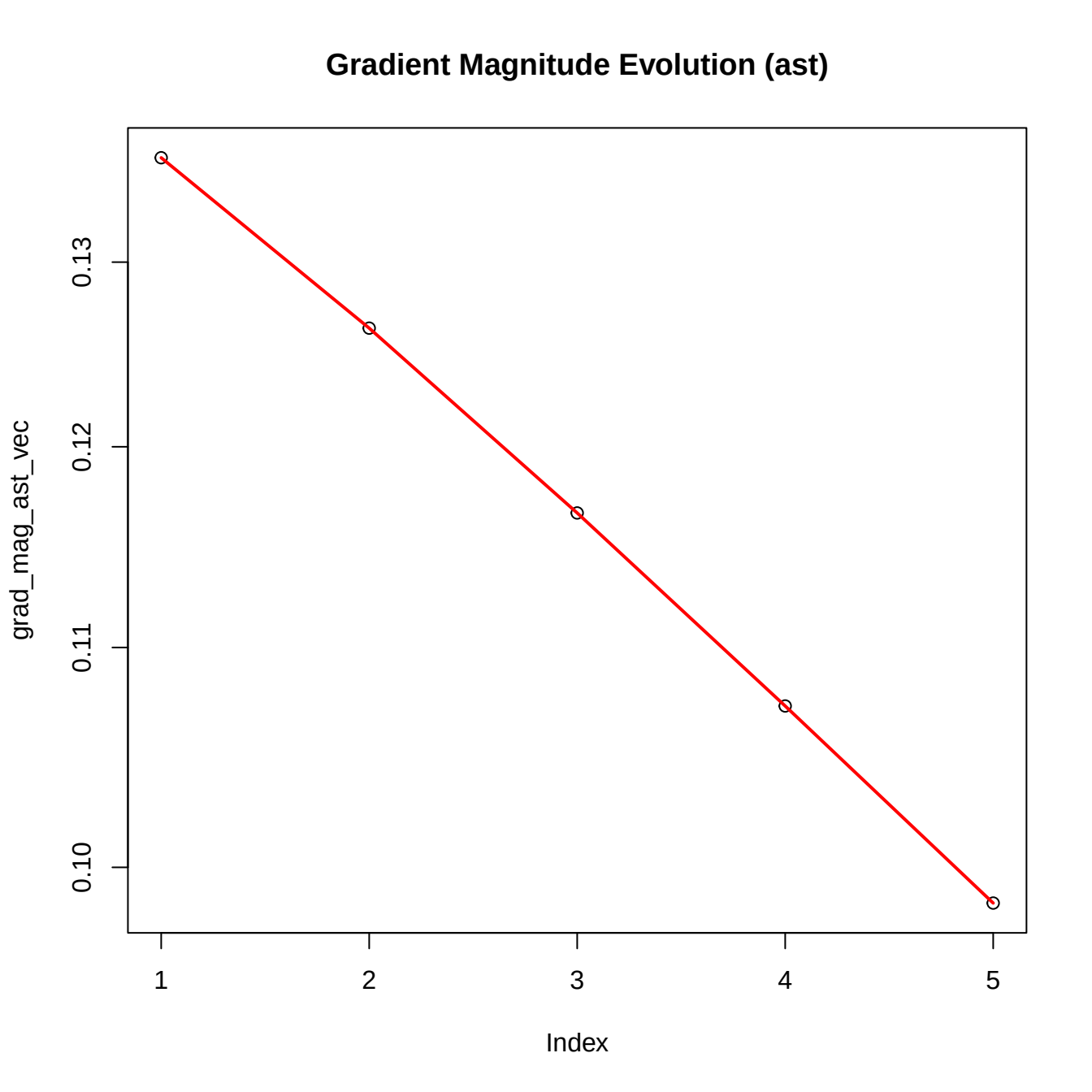
Index


Gradient Magnitude Evolution (ast)
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0.13
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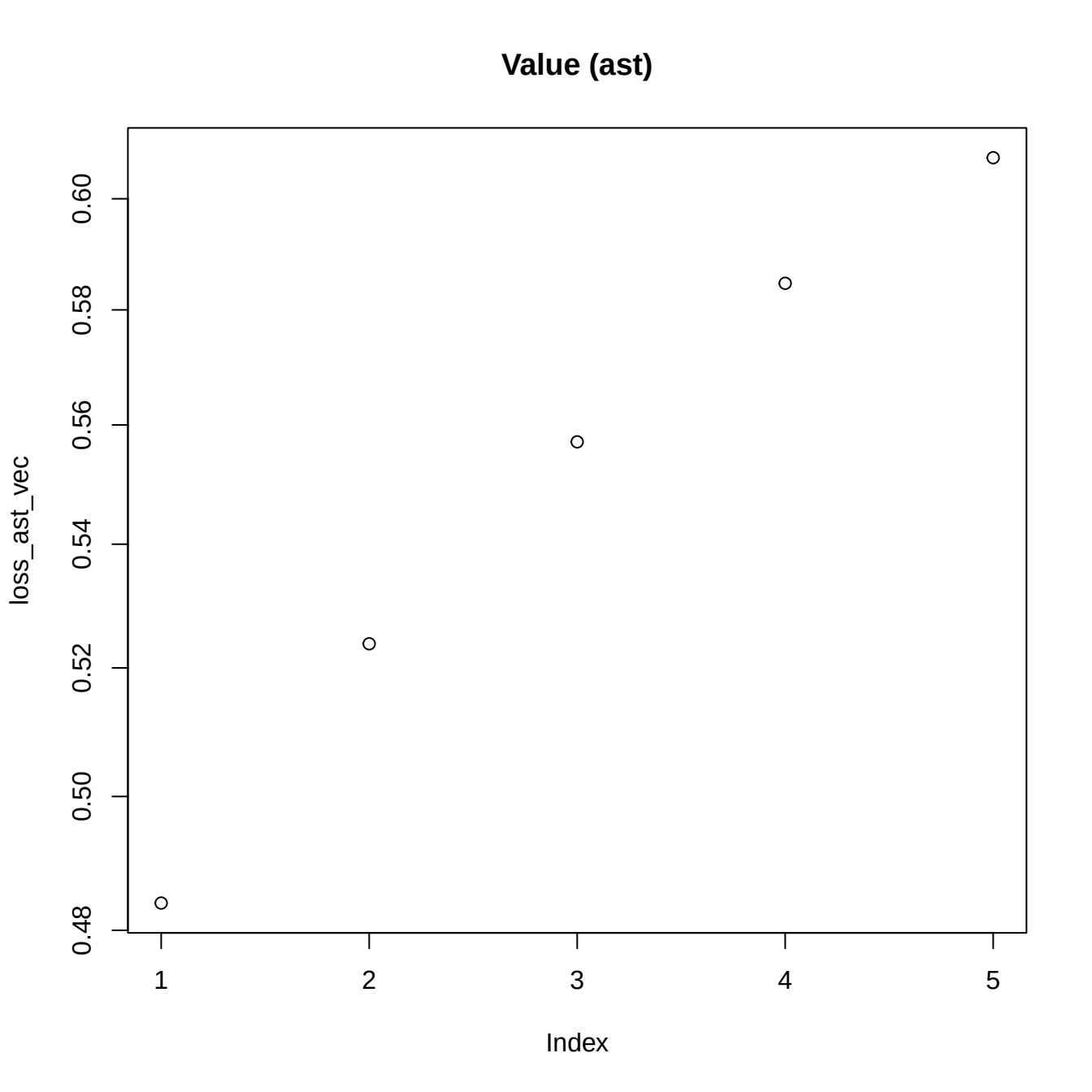
Value (ast)
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0.54
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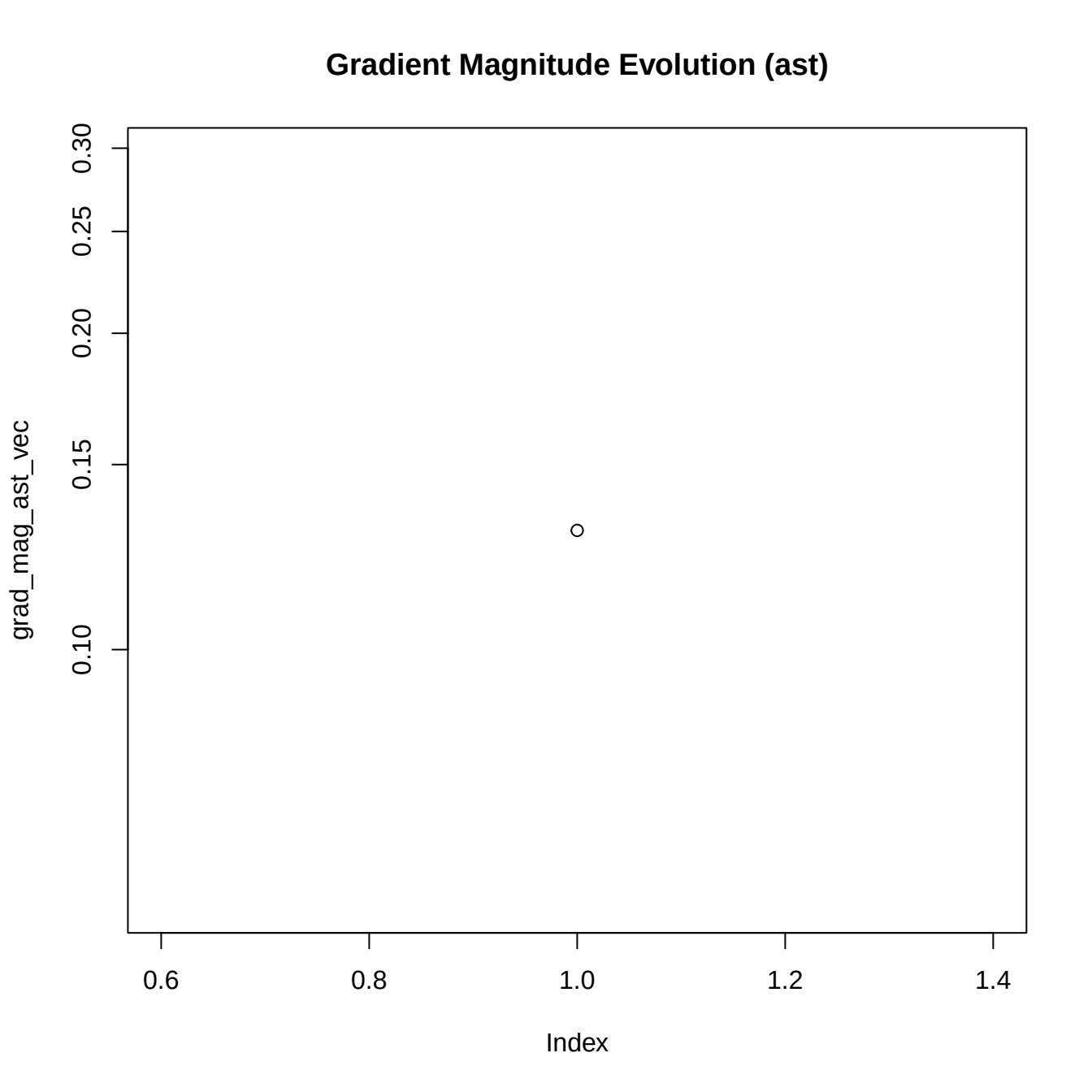
4
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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0.15
0.20
0.25
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0.8
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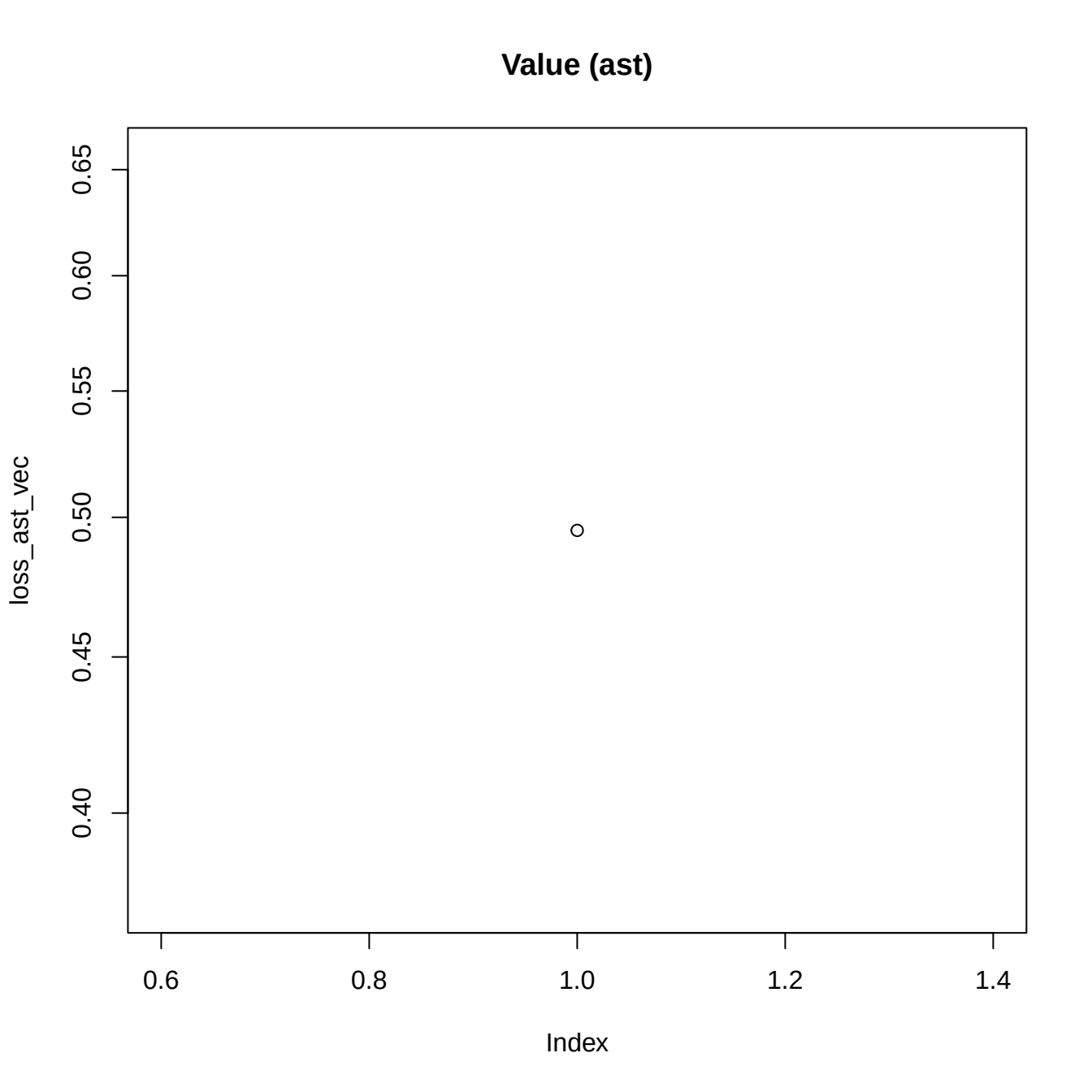
1.2
1.4
Index


Value (ast)
loss_ast_vec
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0.8
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1.2
1.4
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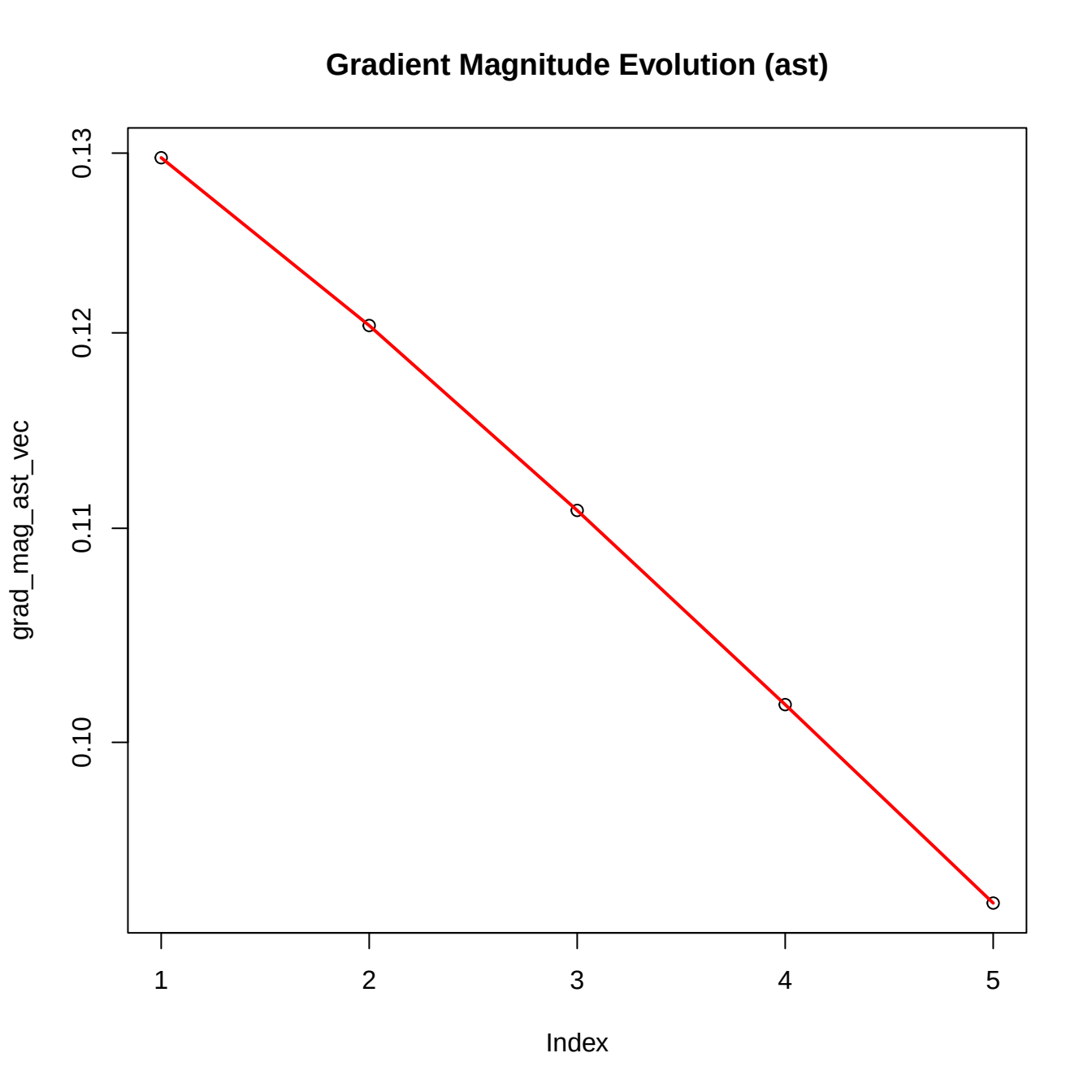
Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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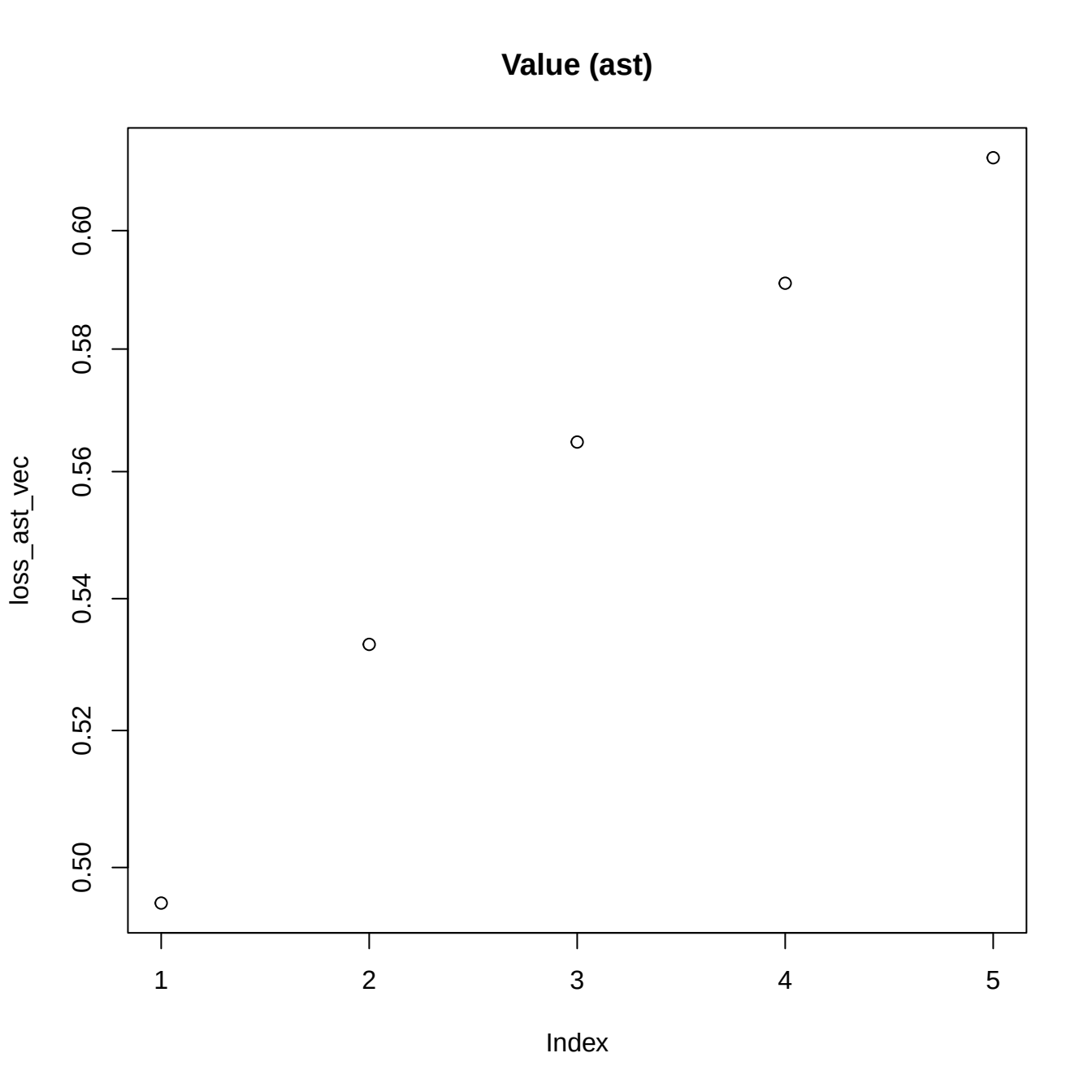
Value (ast)
loss_ast_vec
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0.54
0.56
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0.60
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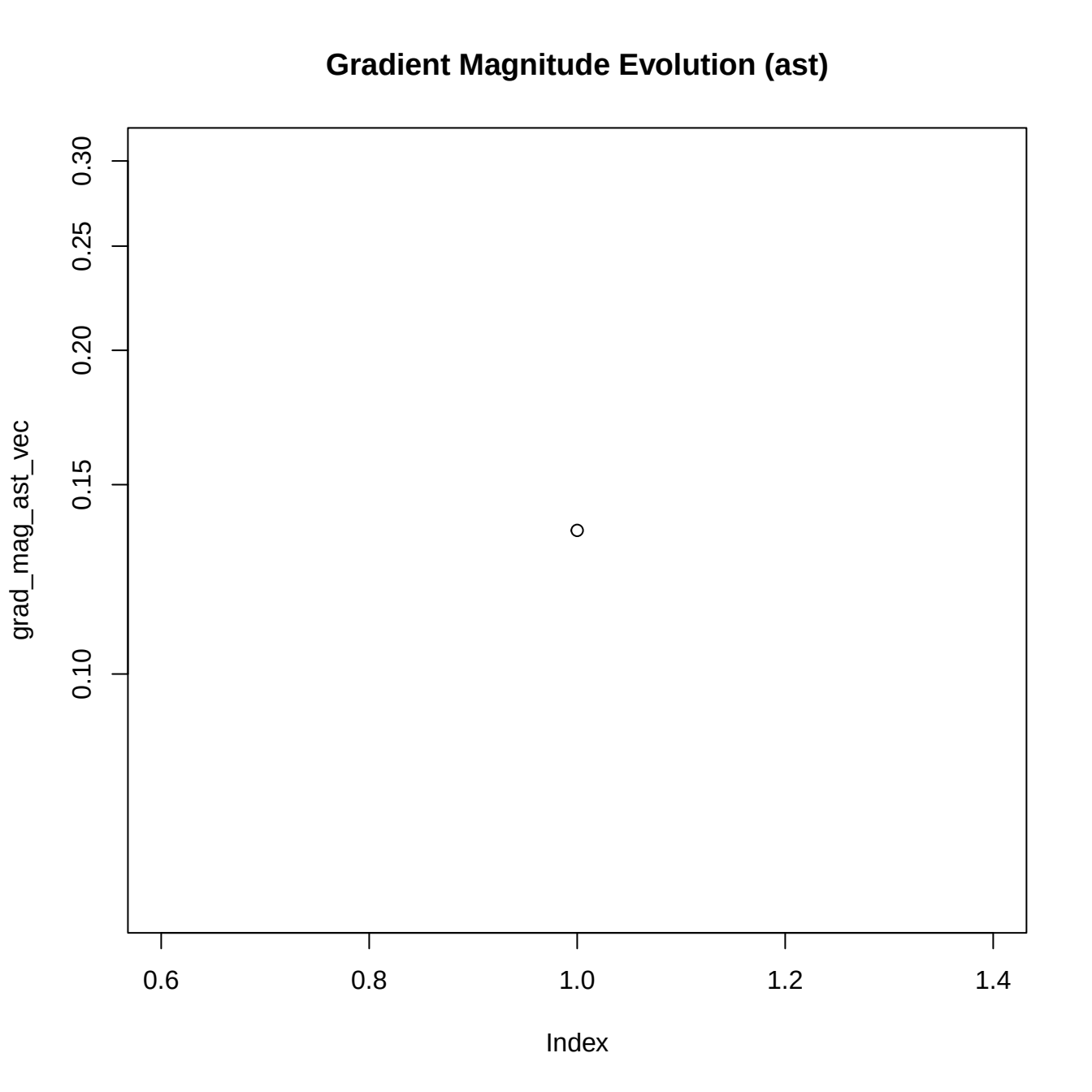
3
4
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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0.20
0.25
0.30
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0.8
1.0
1.2
1.4
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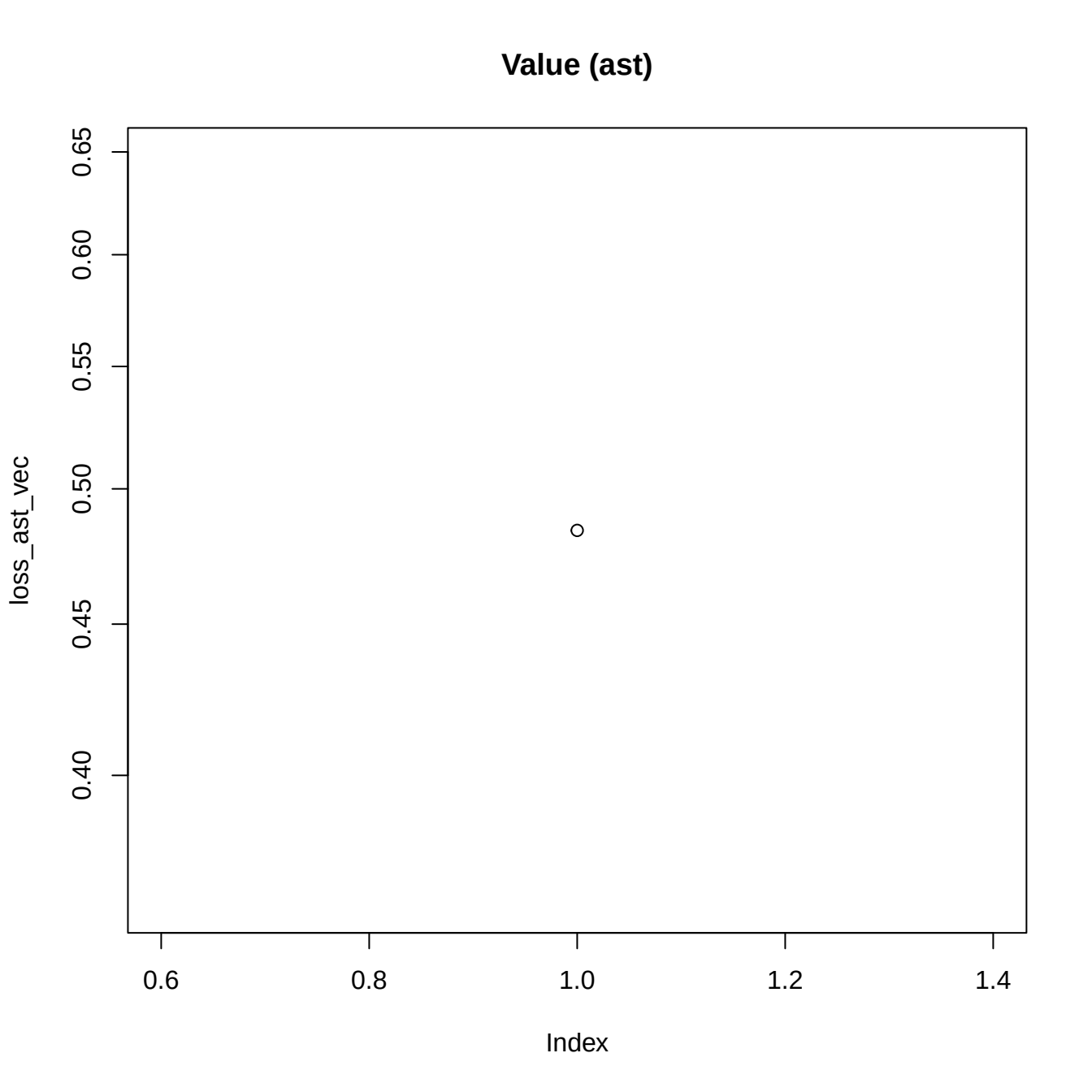
Value (ast)
loss_ast_vec
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0.55
0.60
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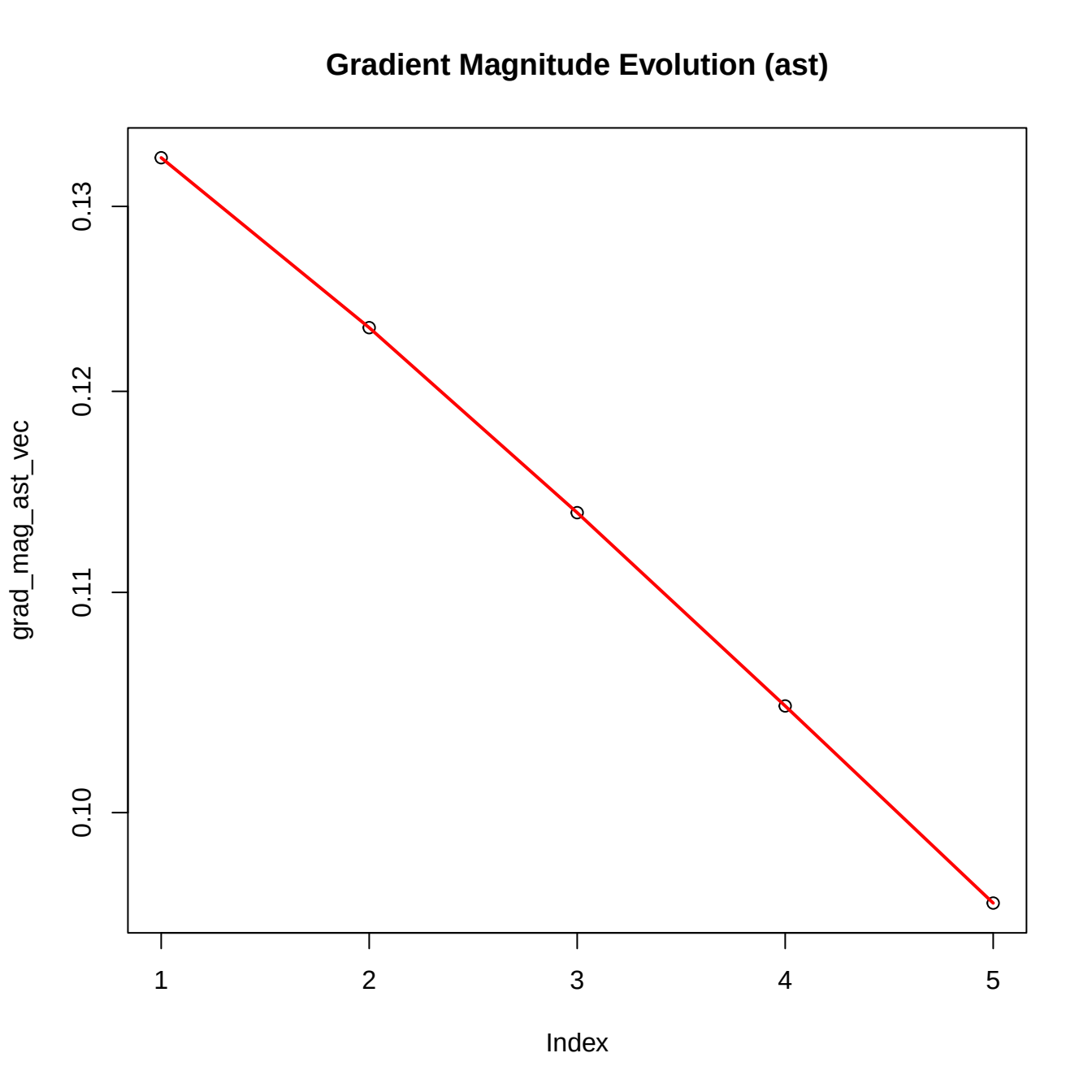
0.8
1.0
1.2
1.4
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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0.11
0.12
0.13
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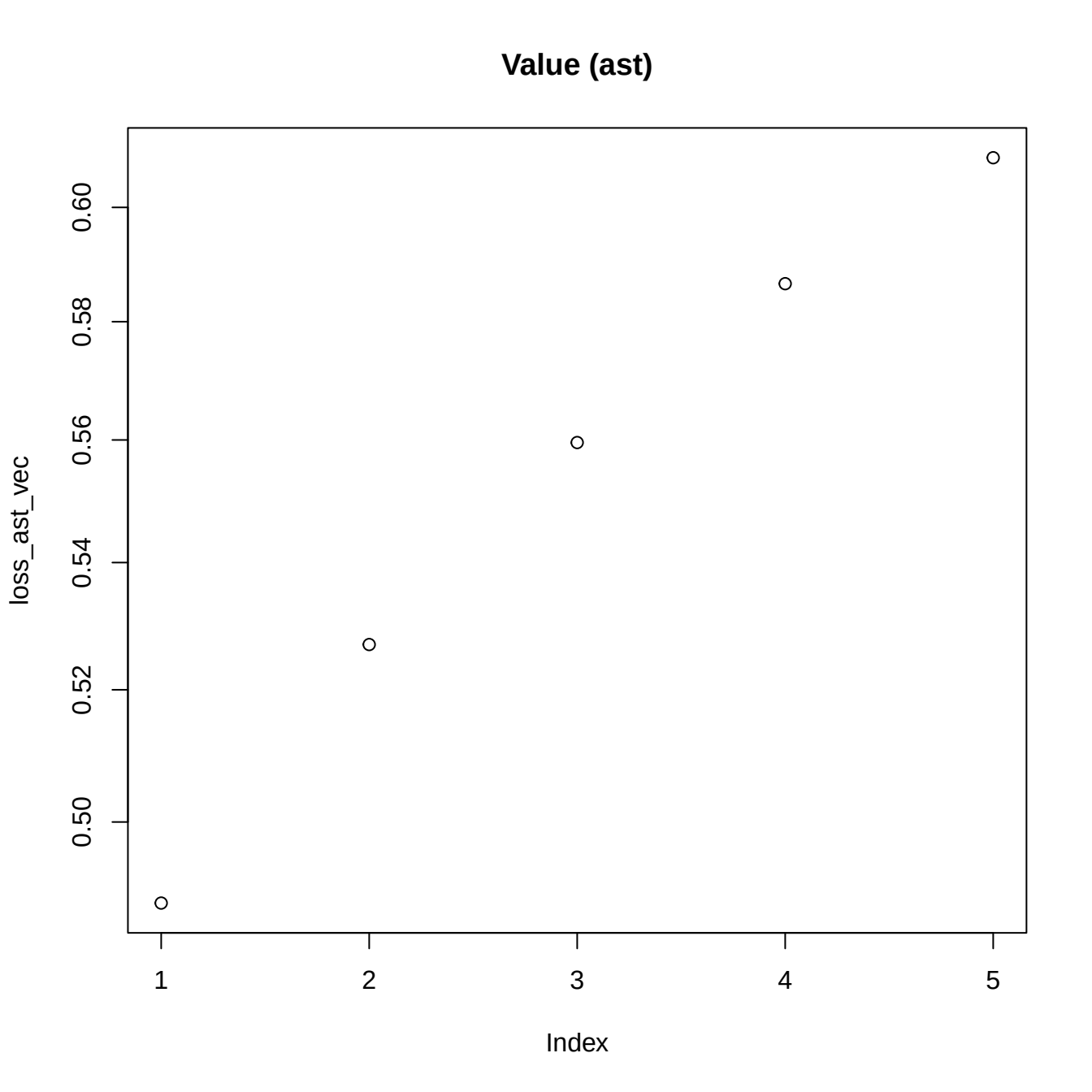
2
3
4
5
Index


Value (ast)
loss_ast_vec
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0.54
0.56
0.58
0.60
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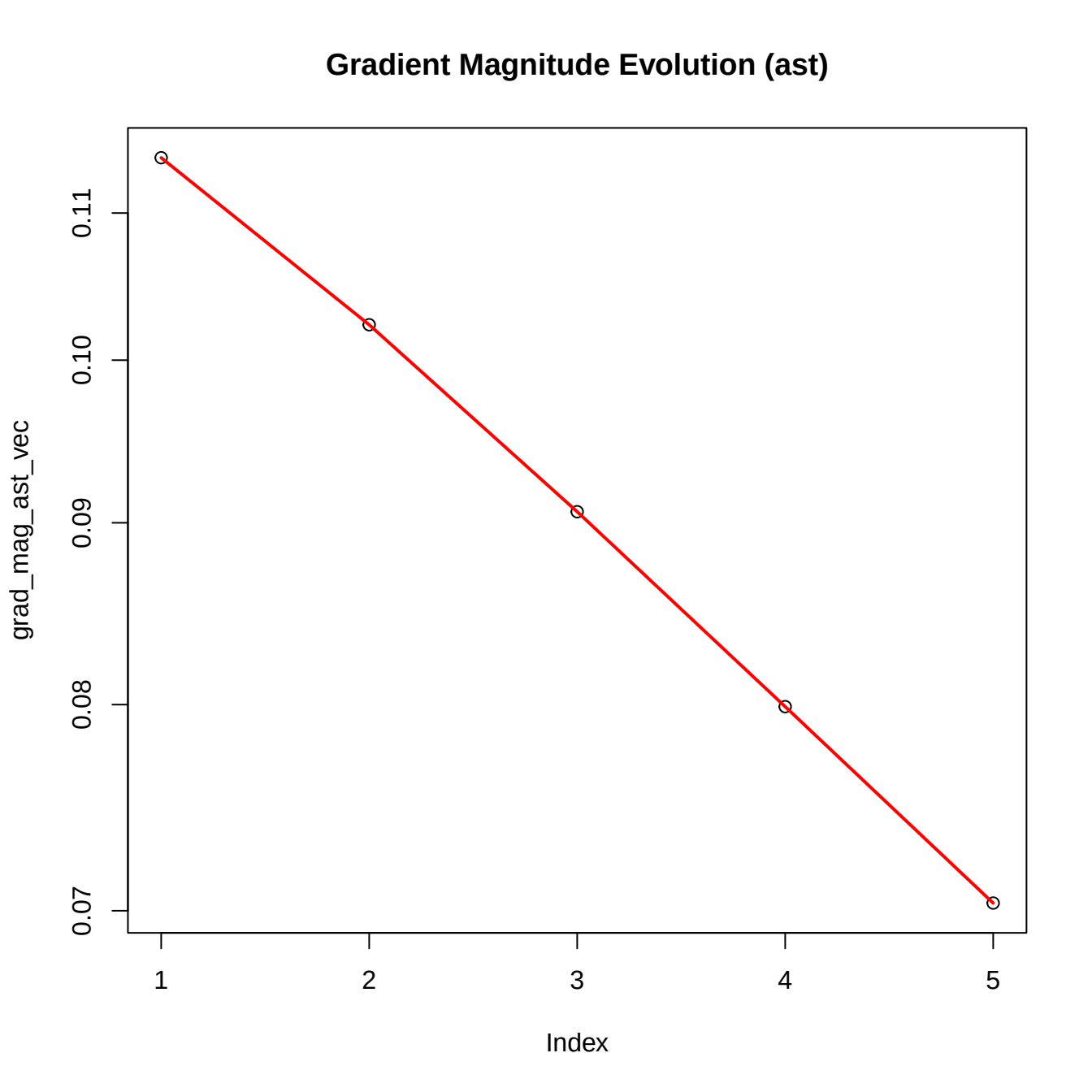
2
3
4
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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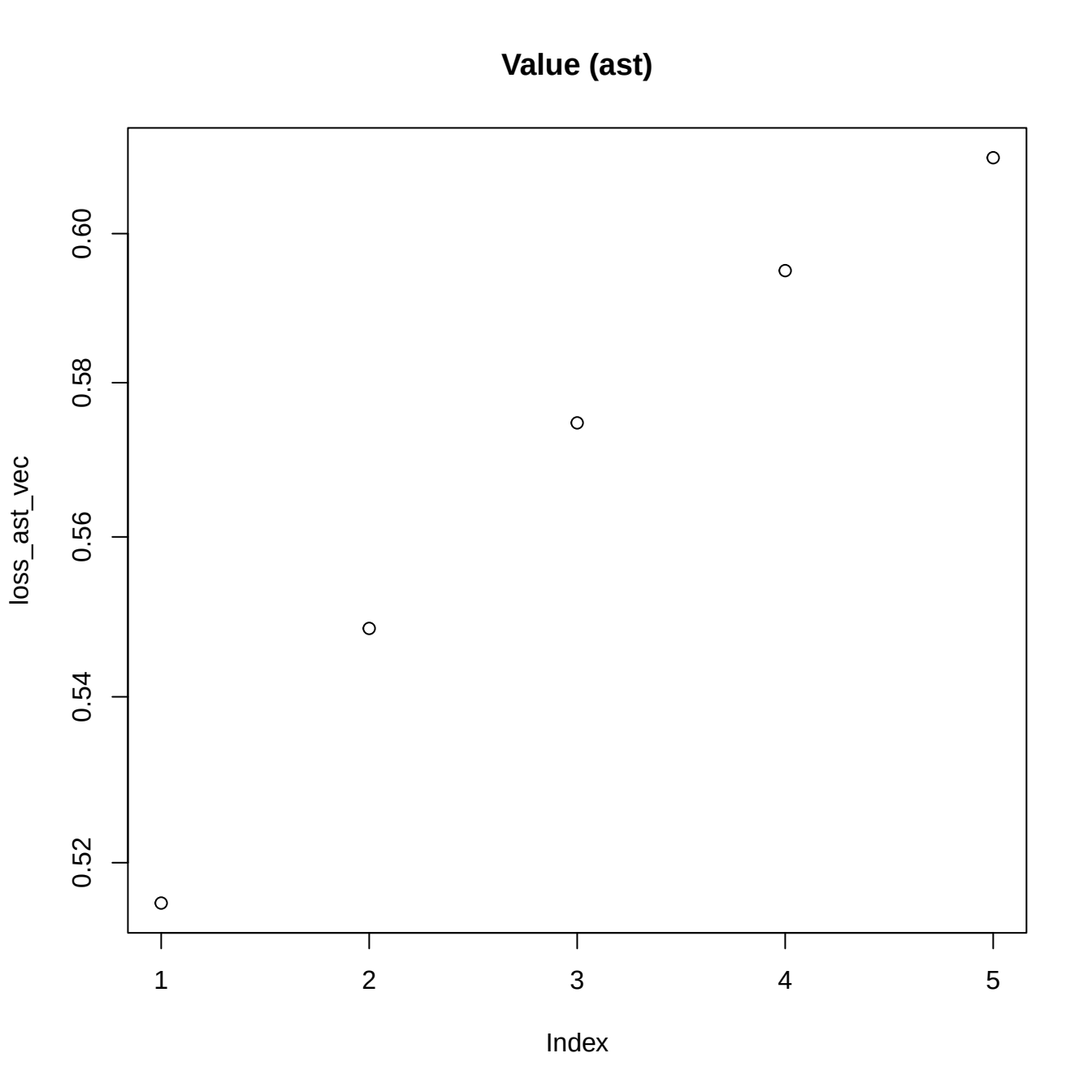
0.08
0.09
0.10
0.11
1
2
3
4
5
Index


Value (ast)
loss_ast_vec
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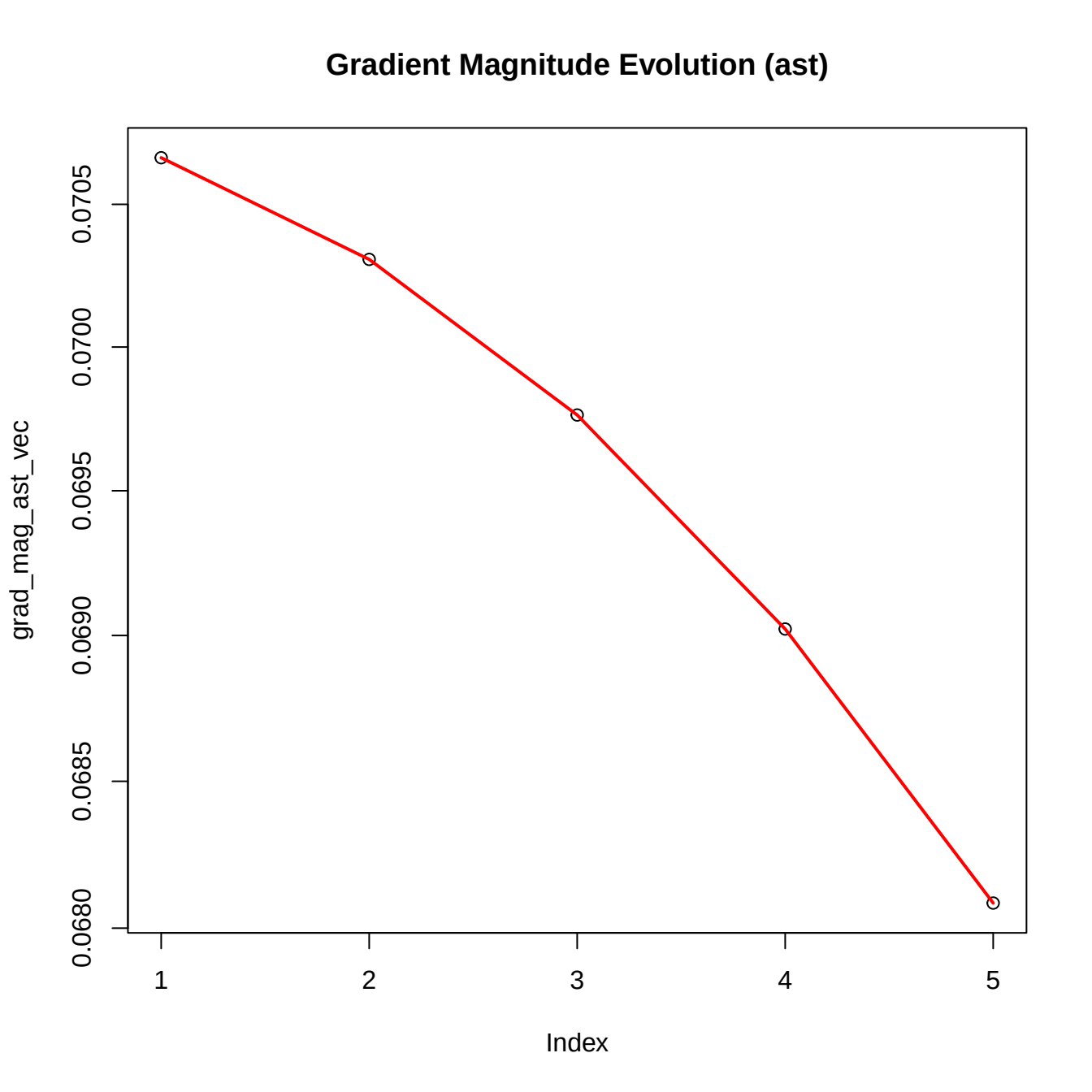
0.54
0.56
0.58
0.60
1
2
3
4
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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0.0685
0.0690
0.0695
0.0700
0.0705
1
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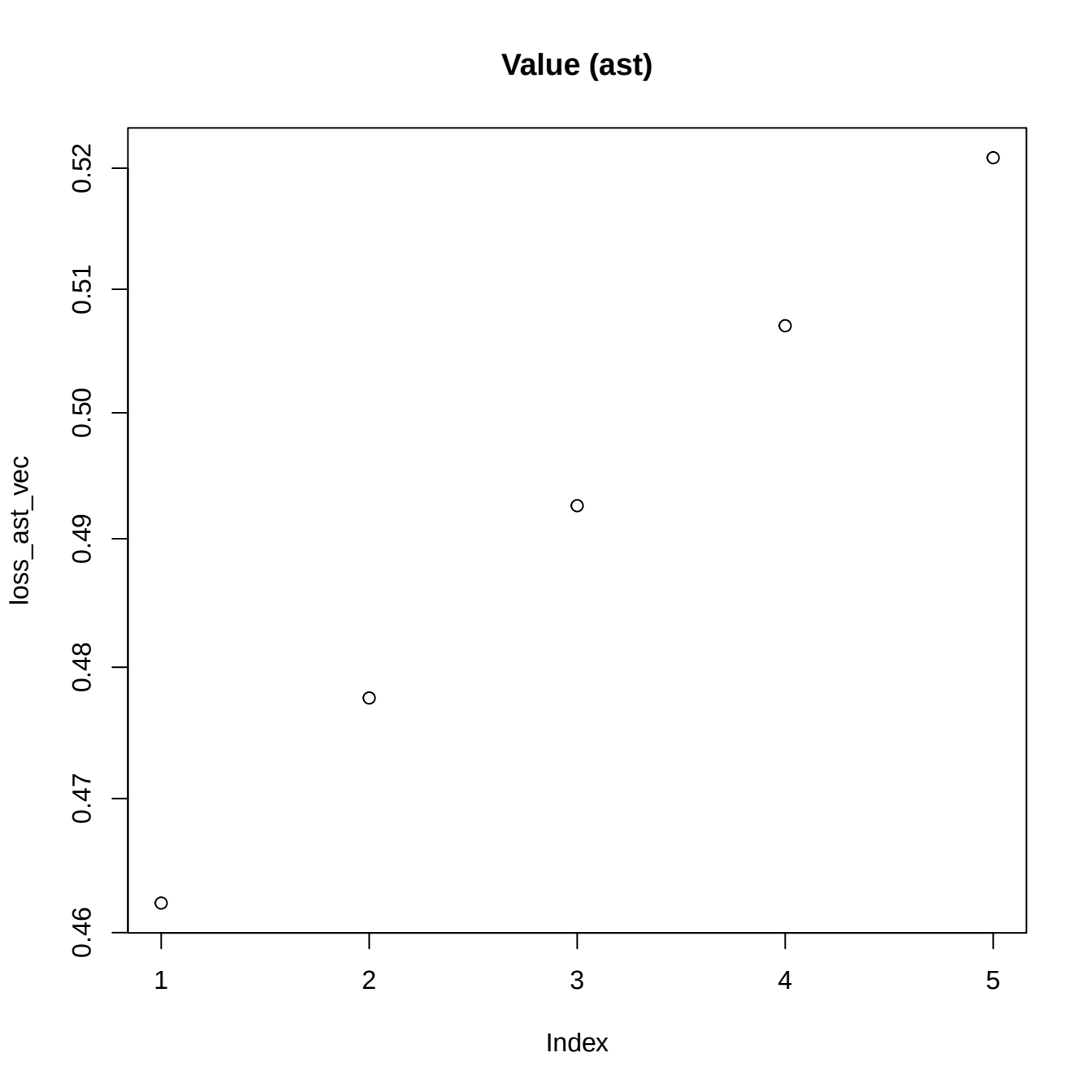
3
4
5
Index


Value (ast)
loss_ast_vec
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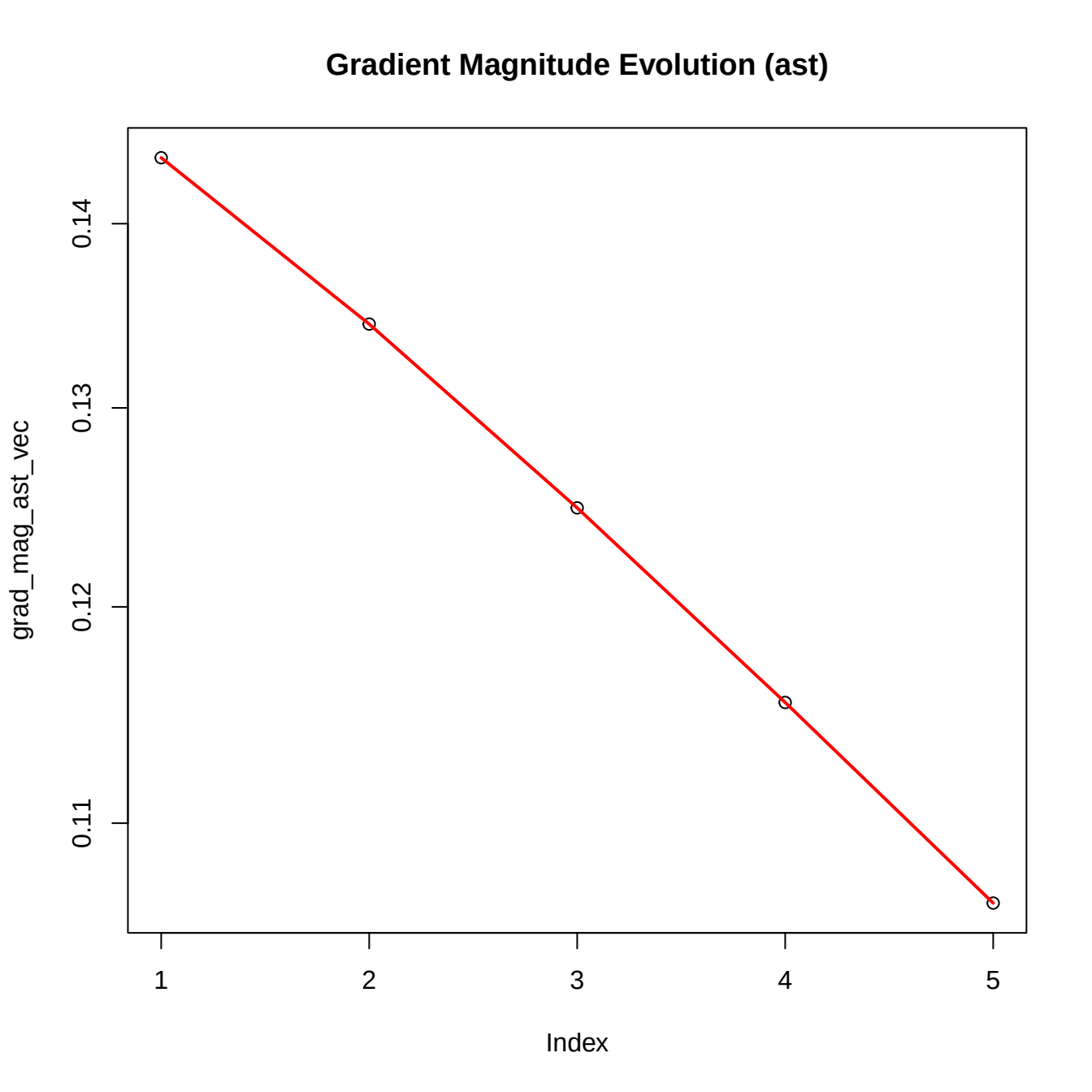
0.47
0.48
0.49
0.50
0.51
0.52
1
2
3
4
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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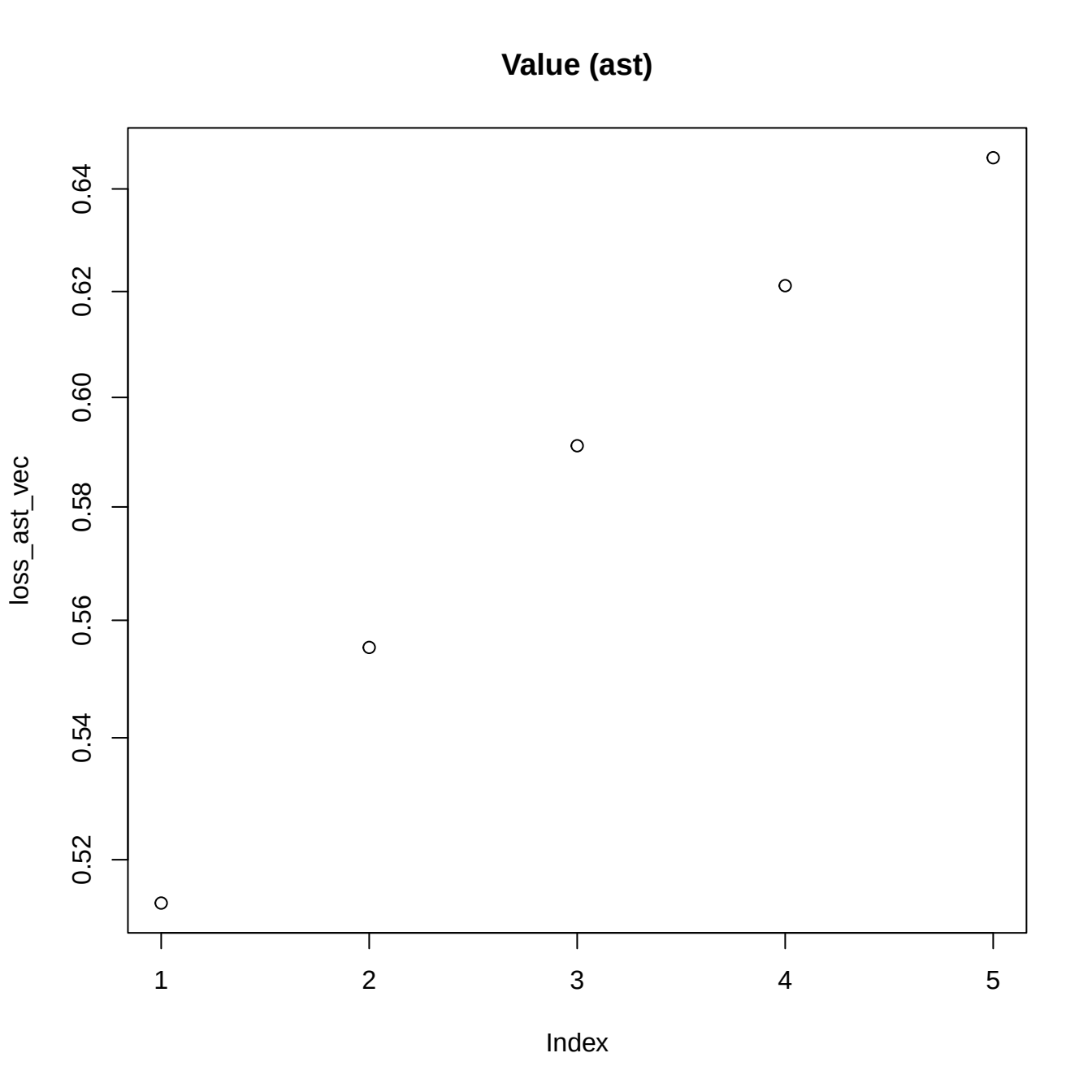
0.12
0.13
0.14
1
2
3
4
5
Index


Value (ast)
loss_ast_vec
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0.60
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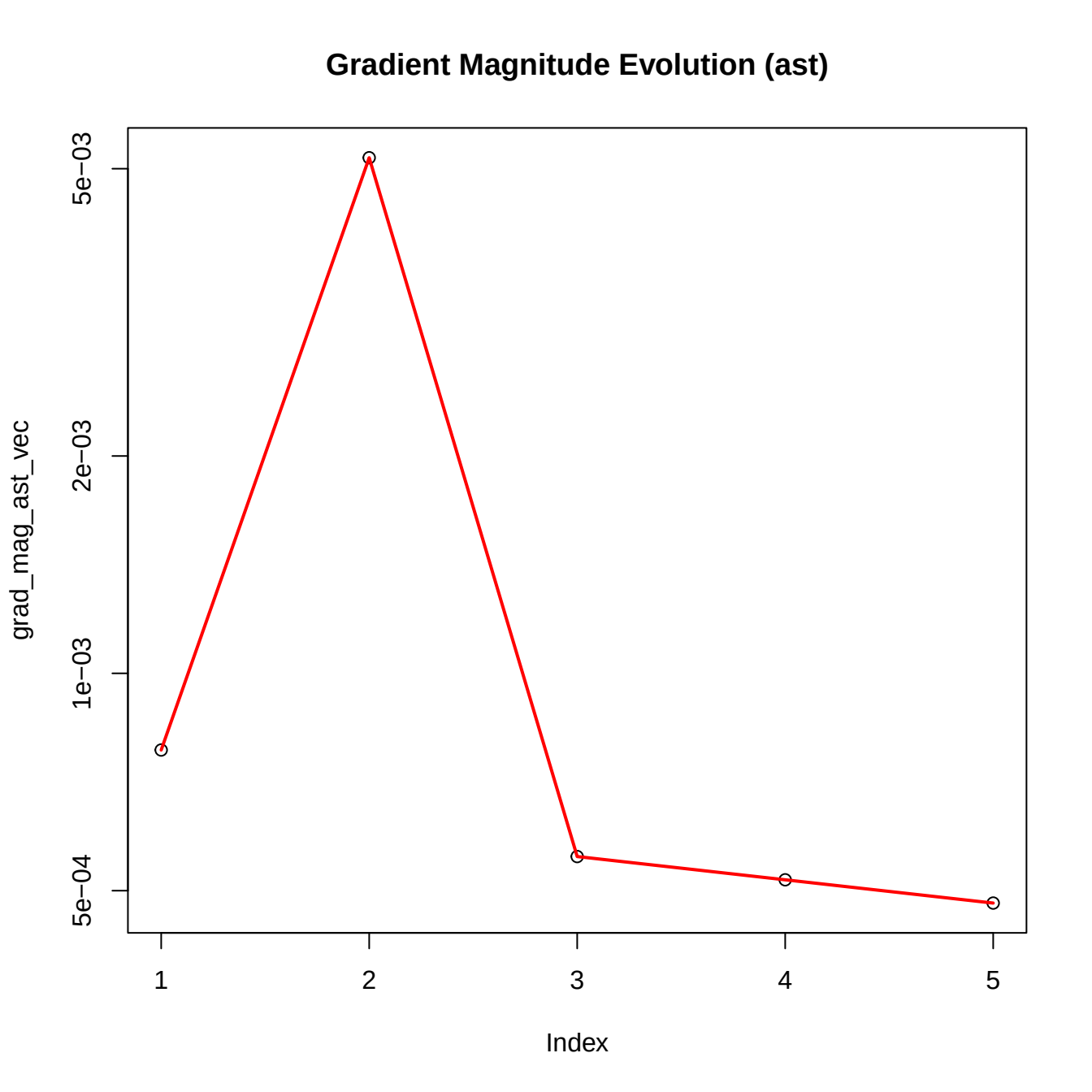
0.64
1
2
3
4
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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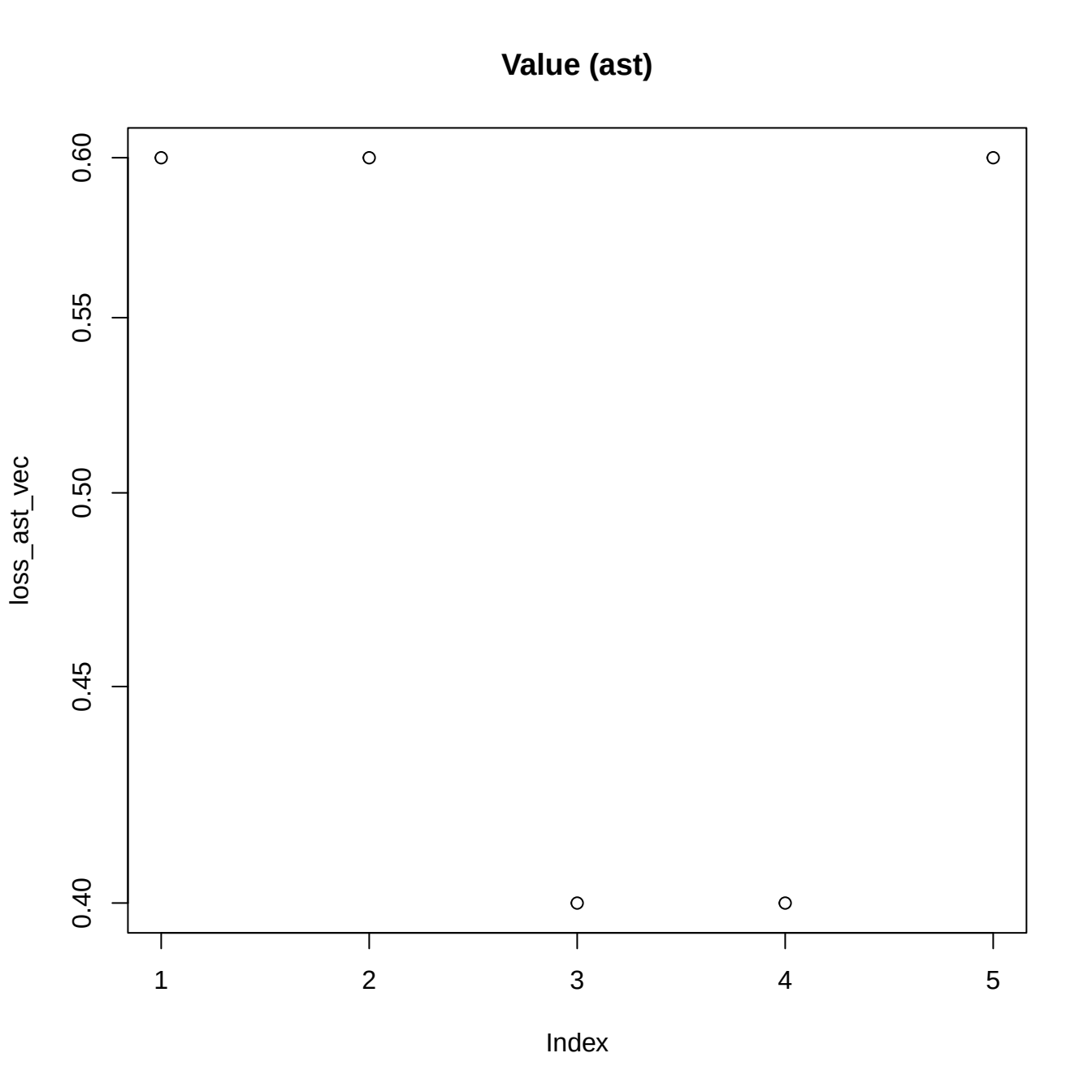
2e−03
1e−03
5e−04
1
2
3
4
5
Index


Value (ast)
loss_ast_vec
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0.60
1
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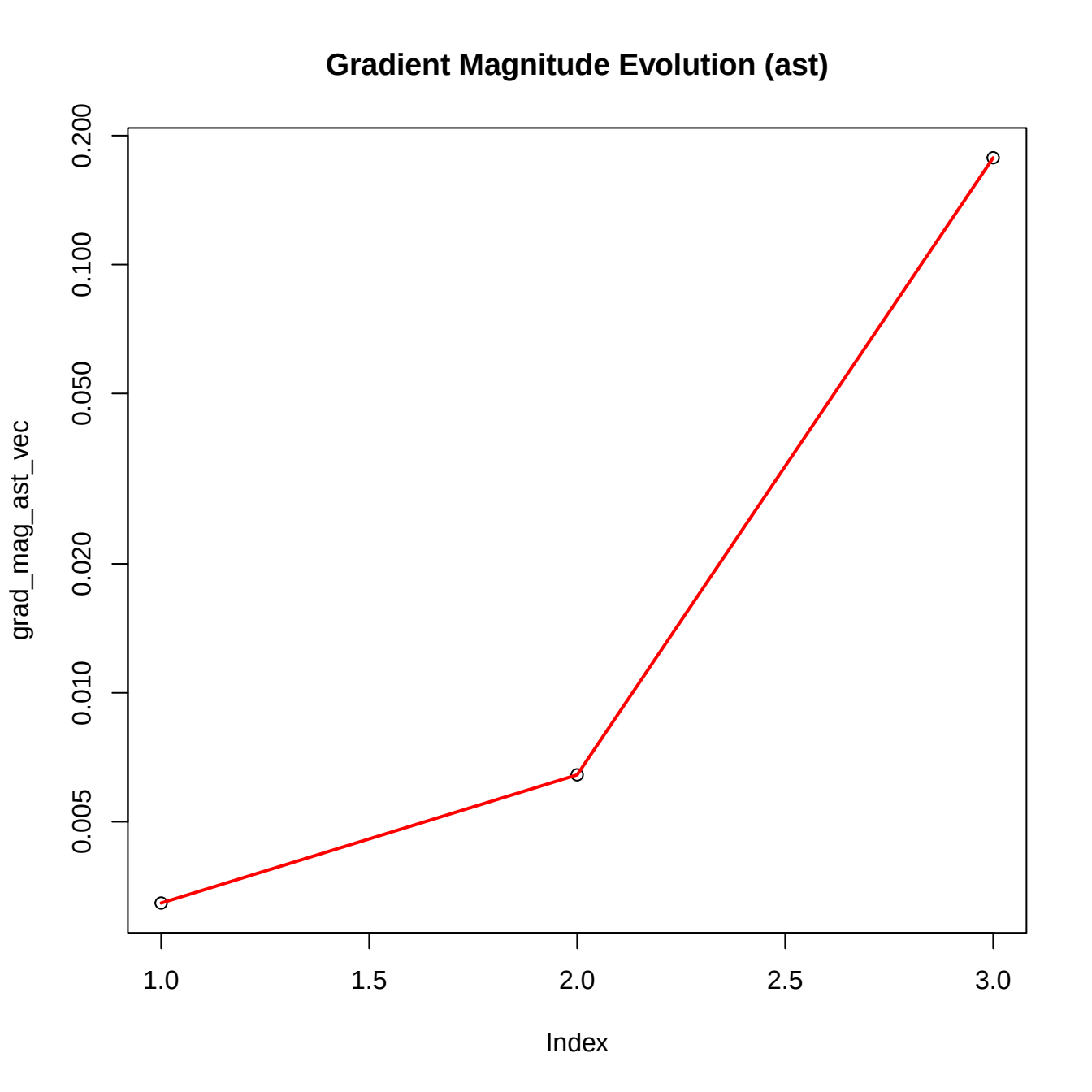
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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0.020
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0.100
0.200
1.0
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2.0
2.5
3.0
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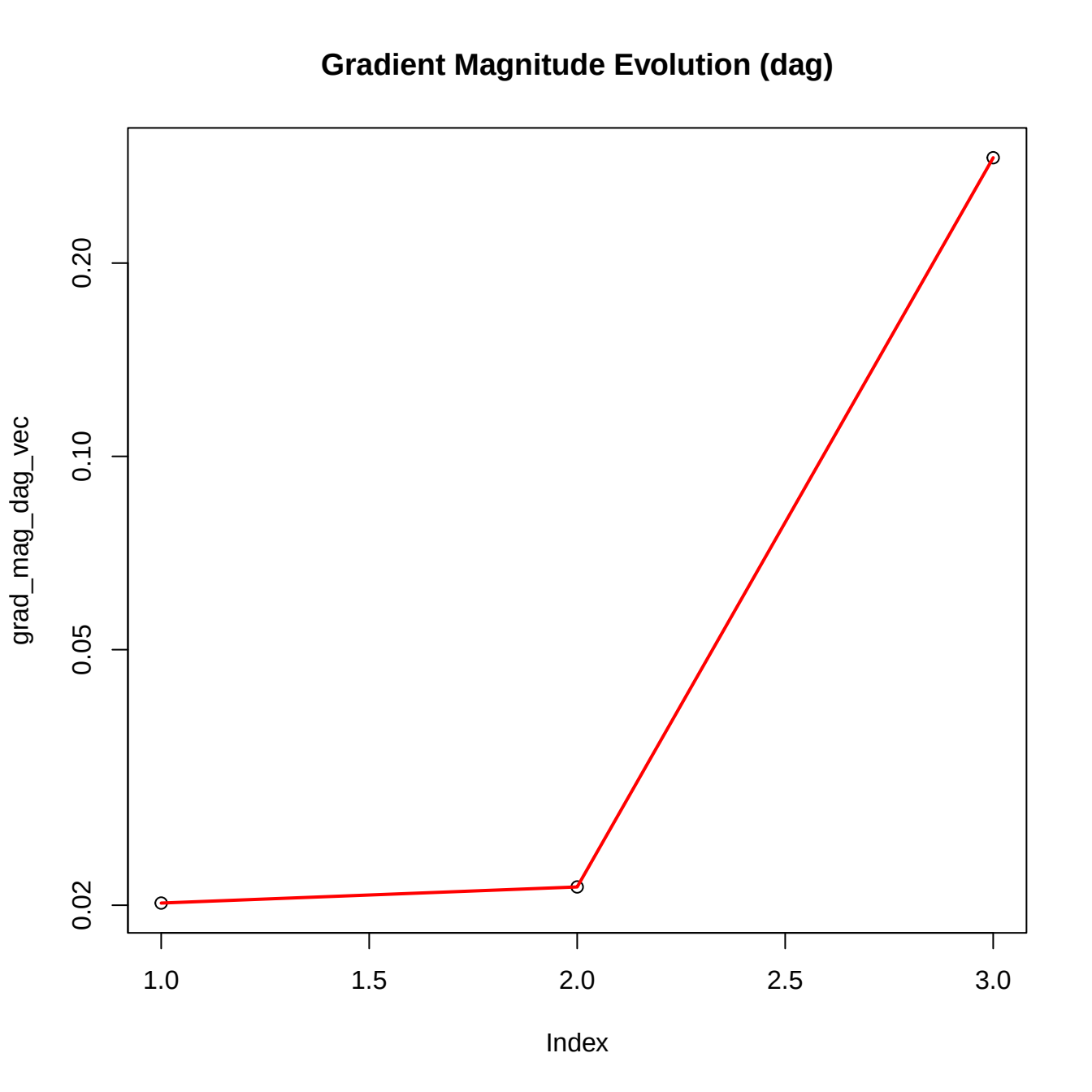
Gradient Magnitude Evolution (dag)
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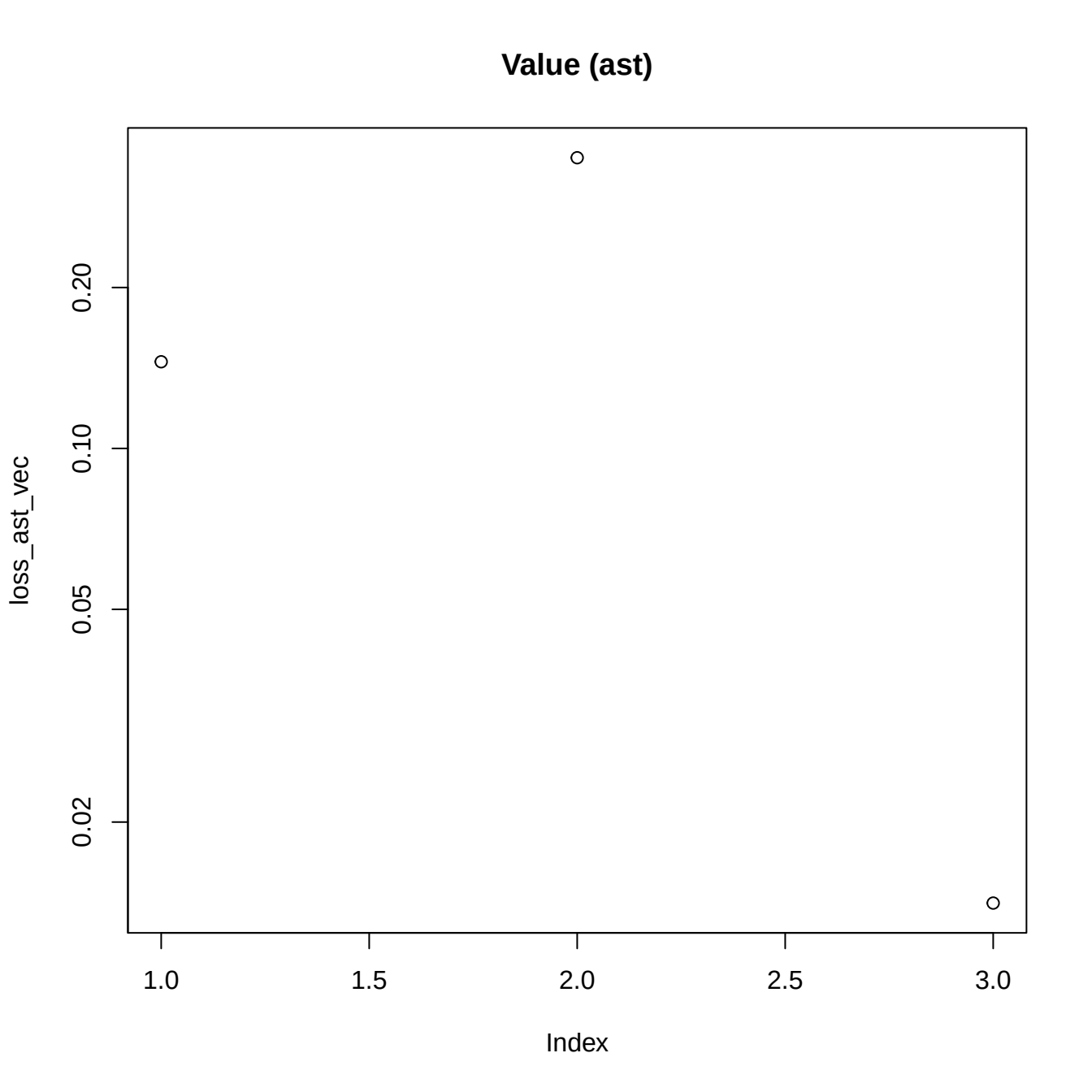
1.5
2.0
2.5
3.0
Index


Value (ast)
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0.10
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2.5
3.0
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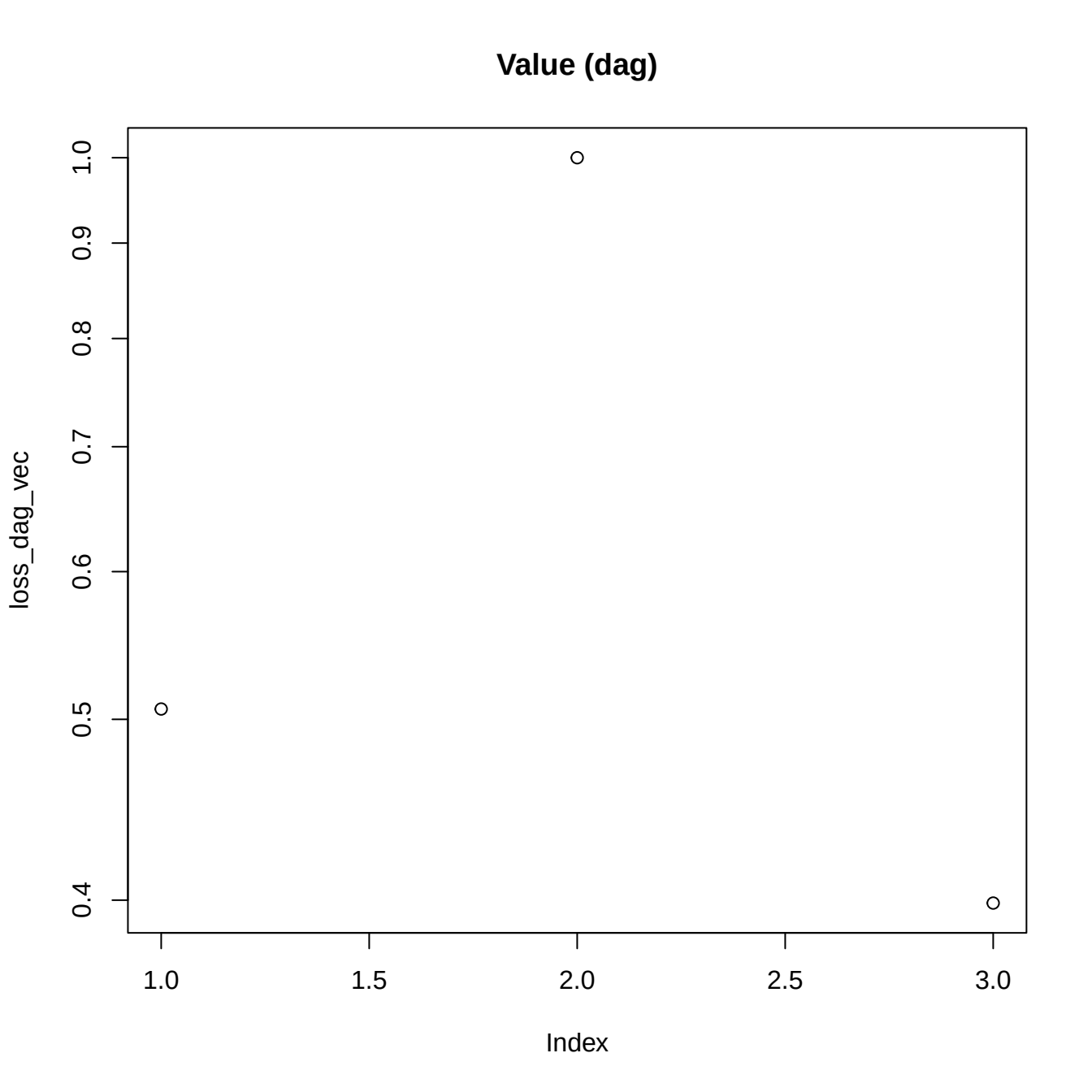
Value (dag)
loss_dag_vec
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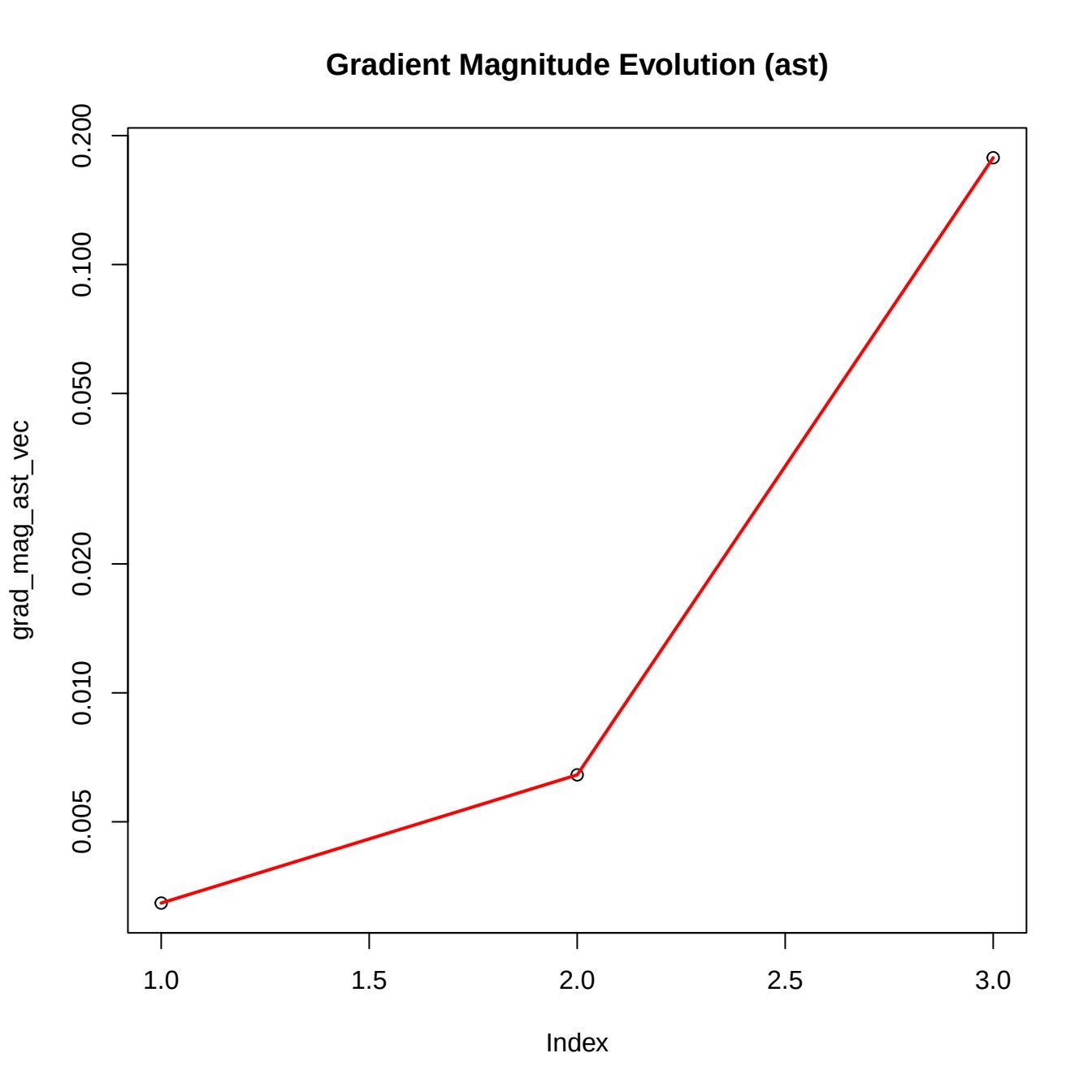
1.5
2.0
2.5
3.0
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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1.5
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3.0
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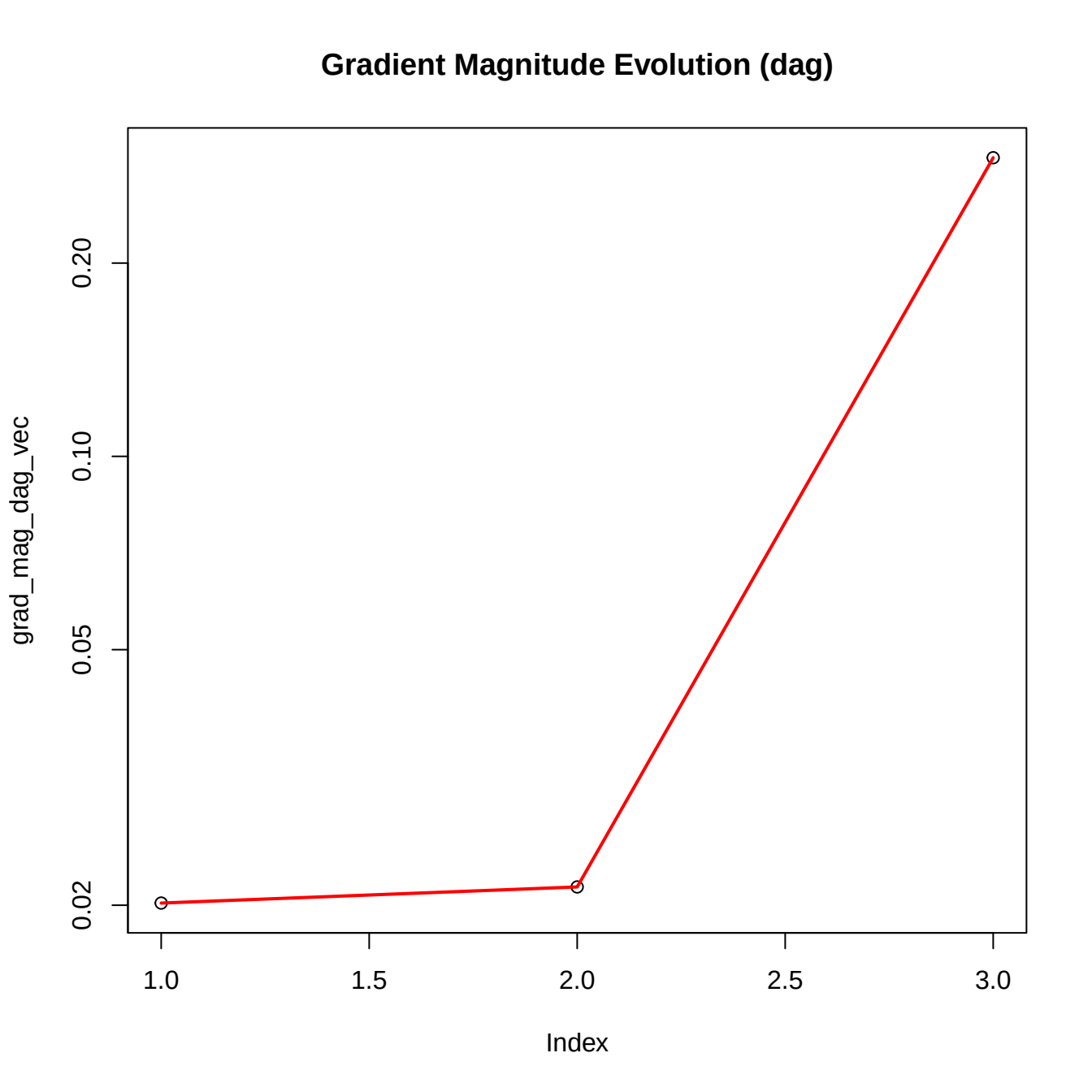
Gradient Magnitude Evolution (dag)
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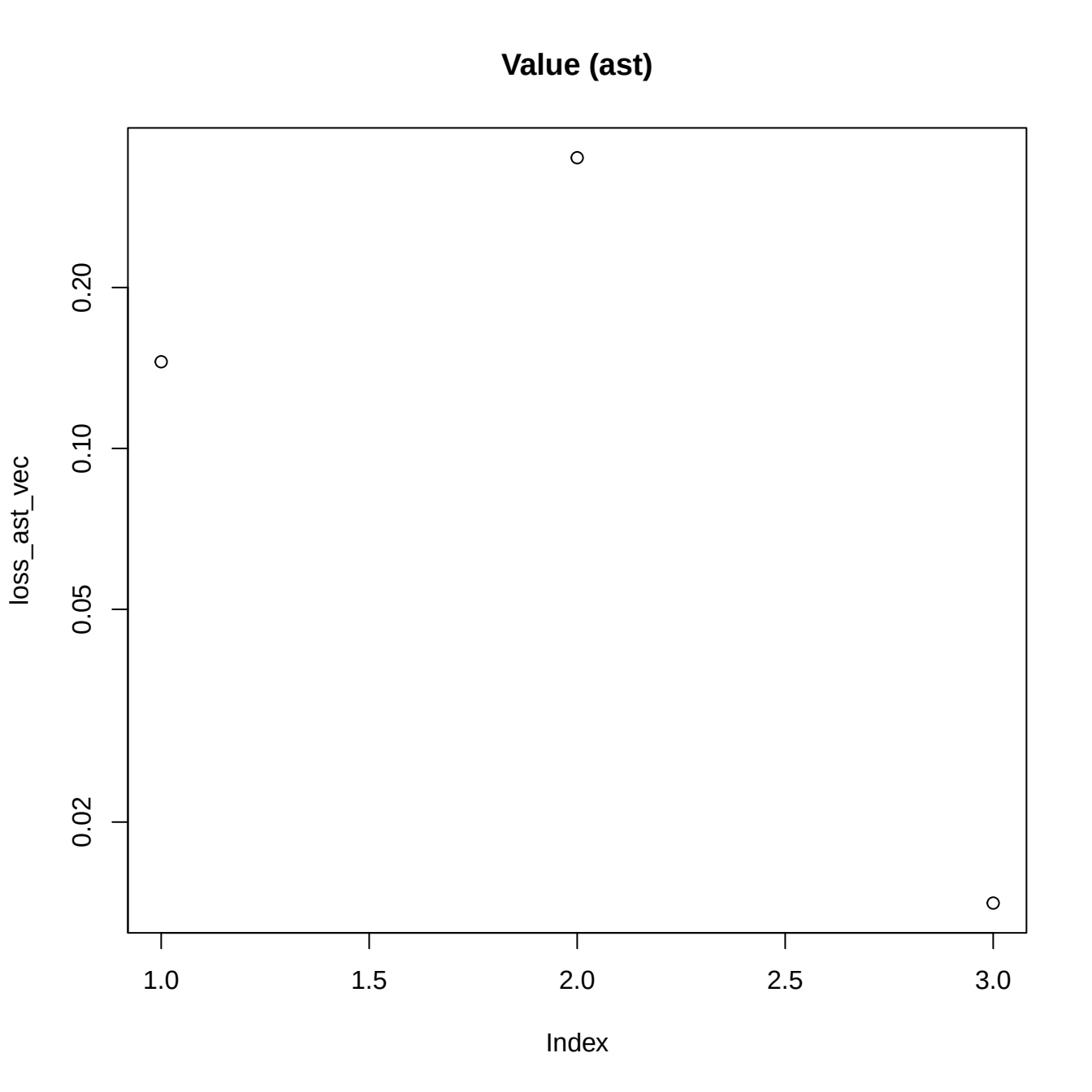
Value (ast)
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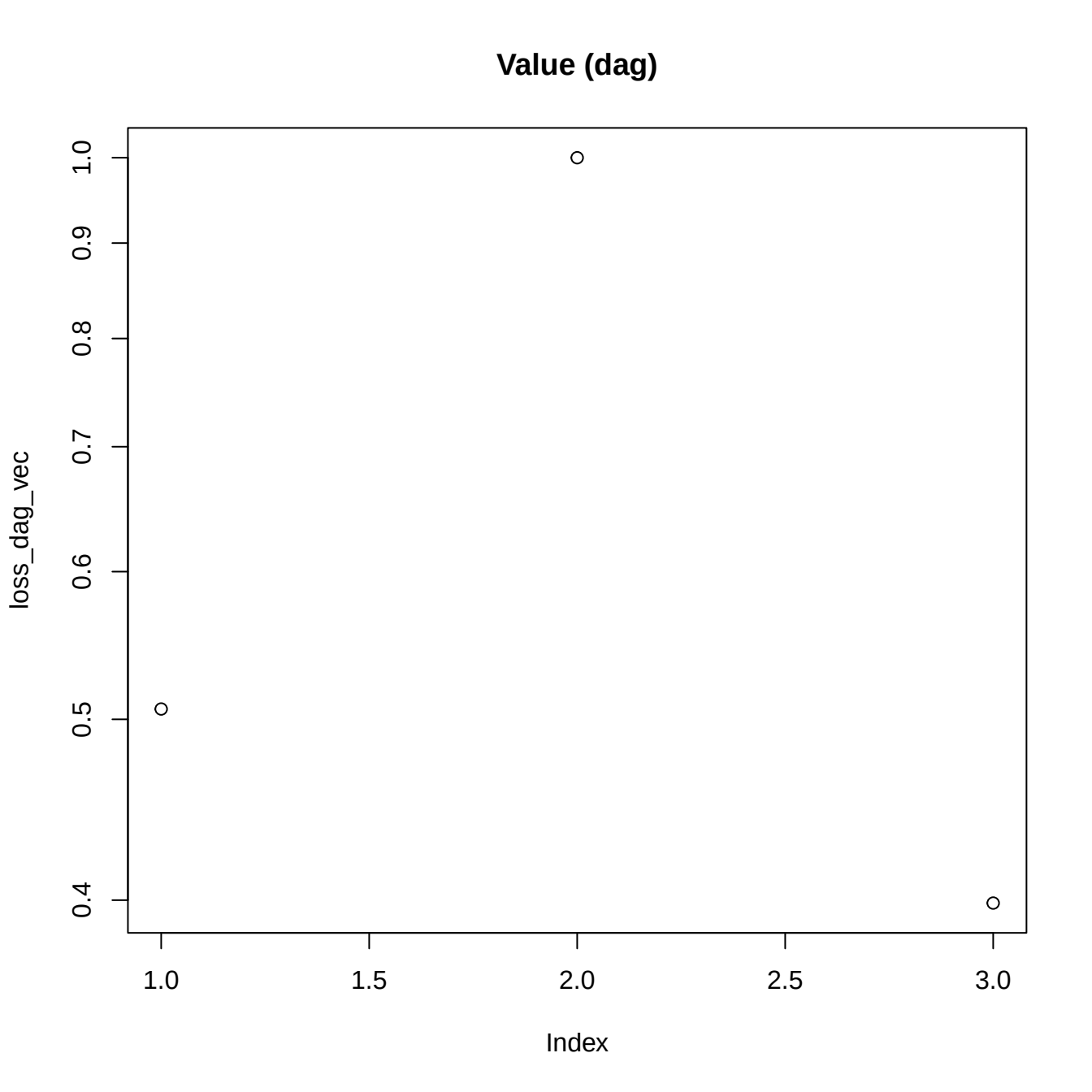
3.0
Index


Value (dag)
loss_dag_vec
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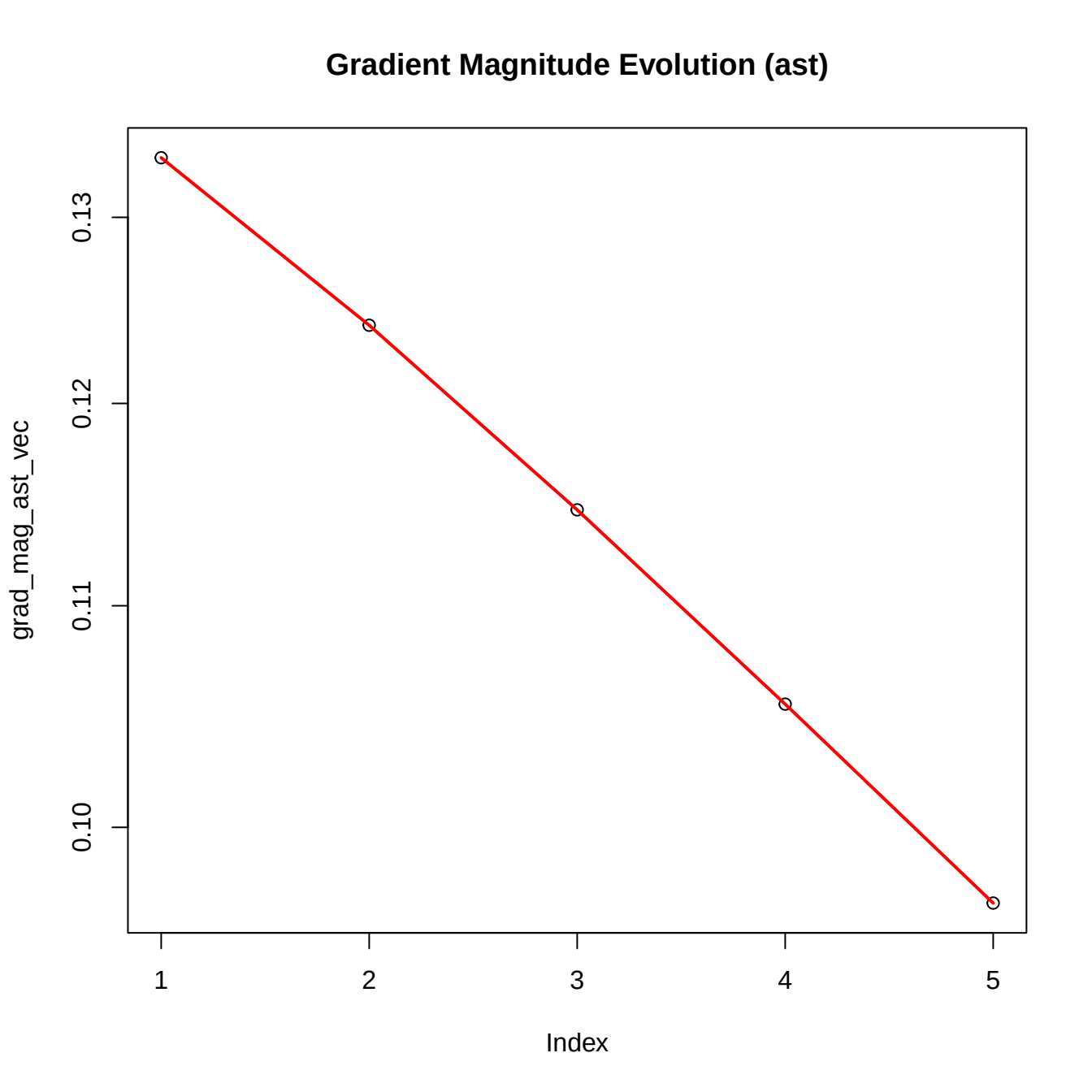
2.5
3.0
Index


Gradient Magnitude Evolution (ast)
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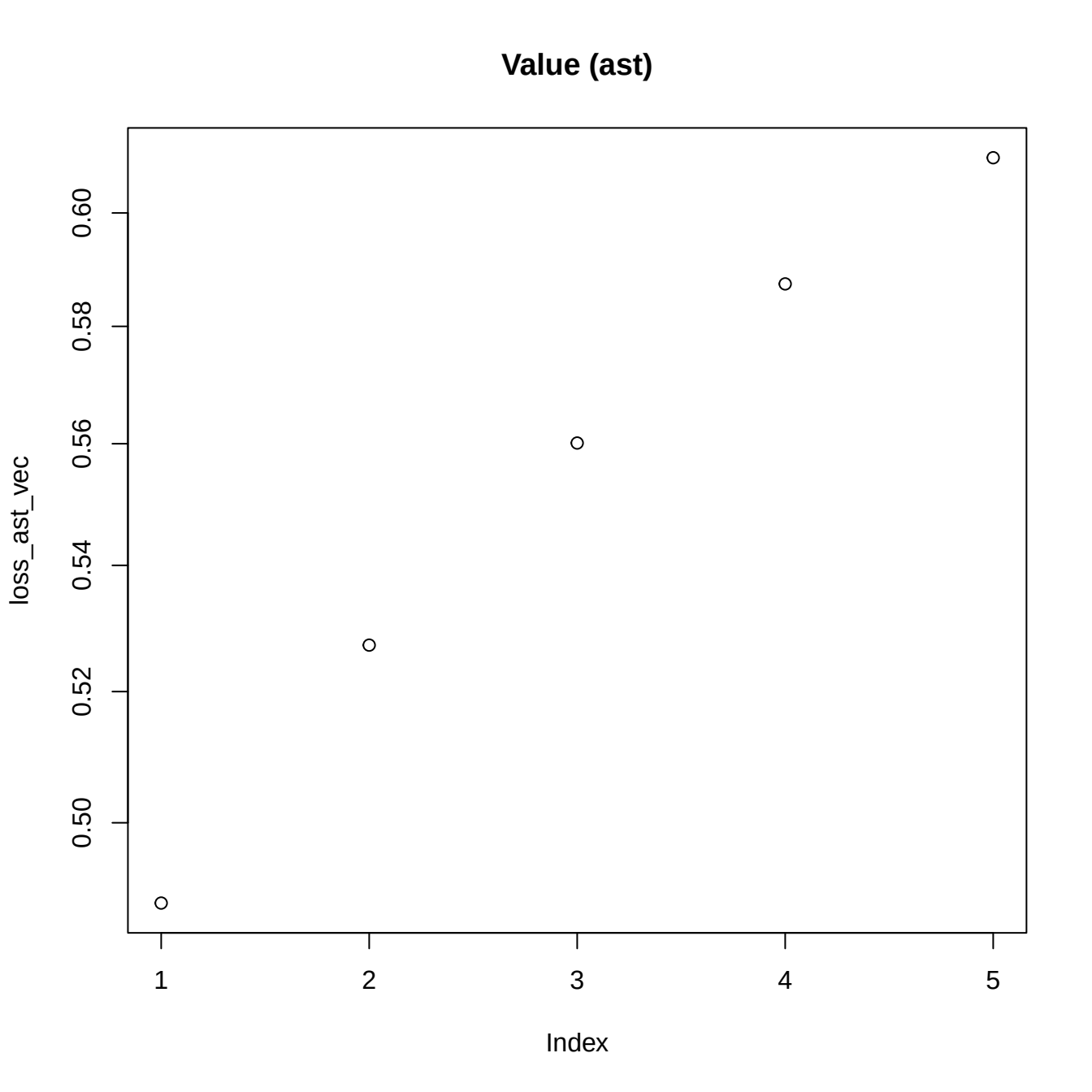
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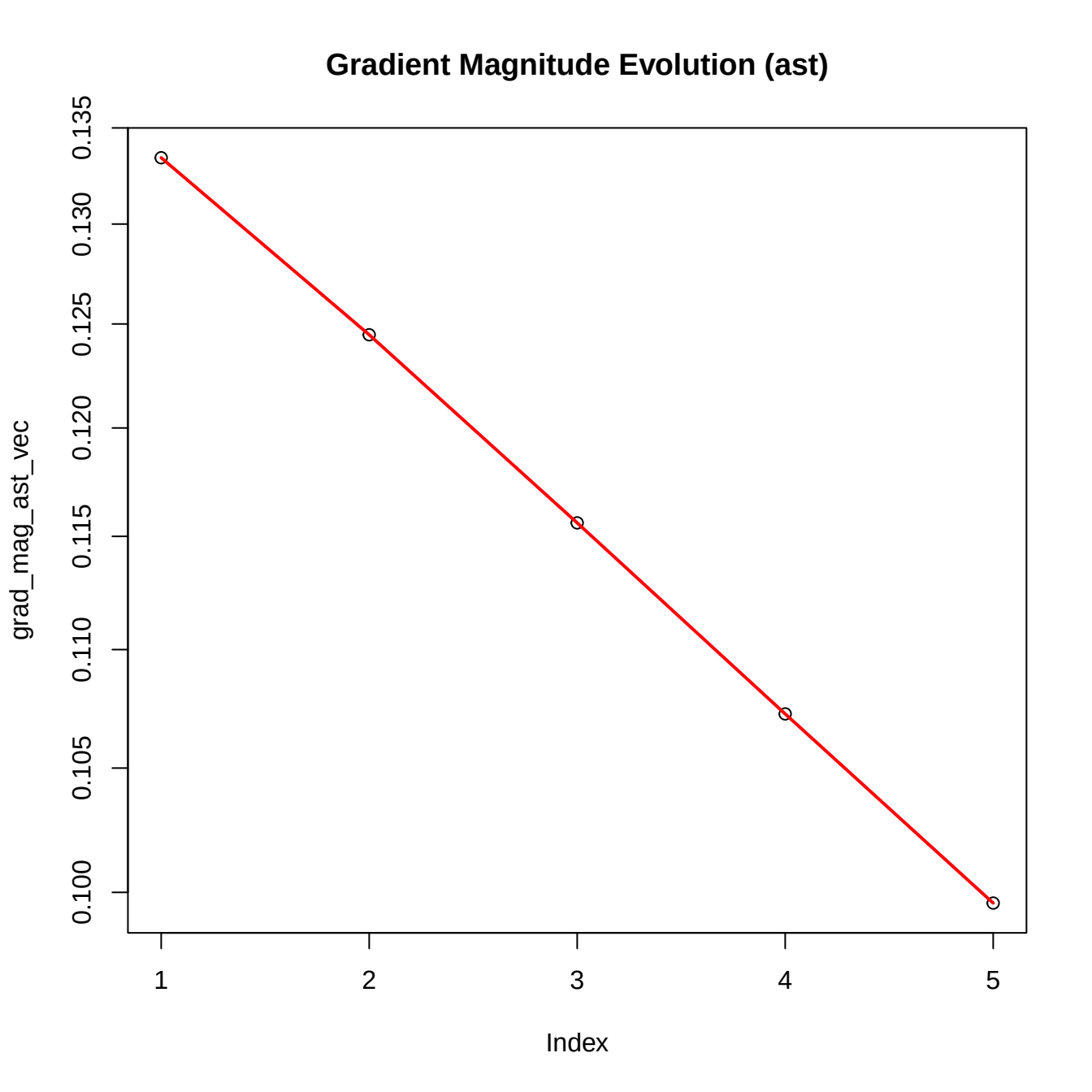
Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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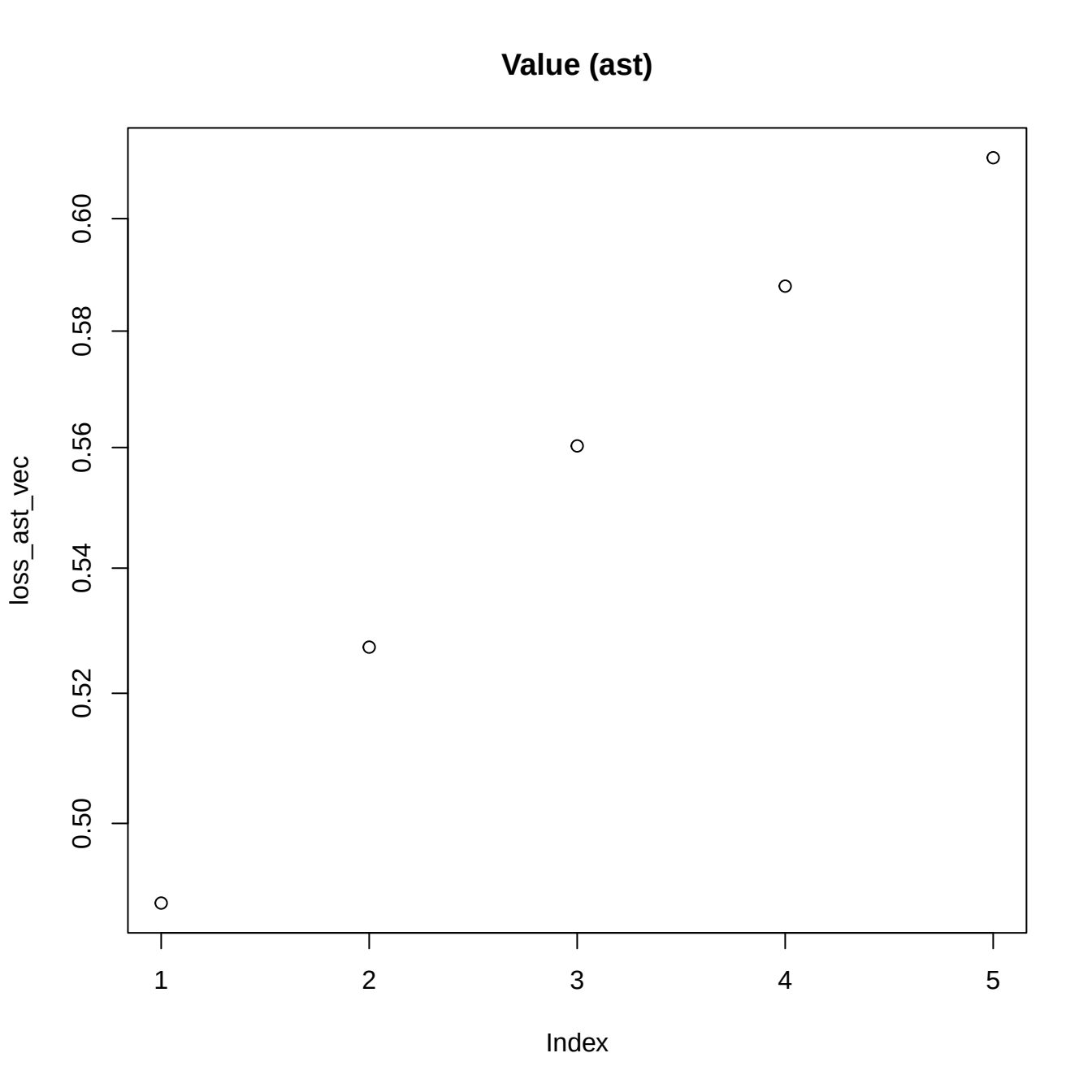
Index


Value (ast)
loss_ast_vec
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0.56
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0.60
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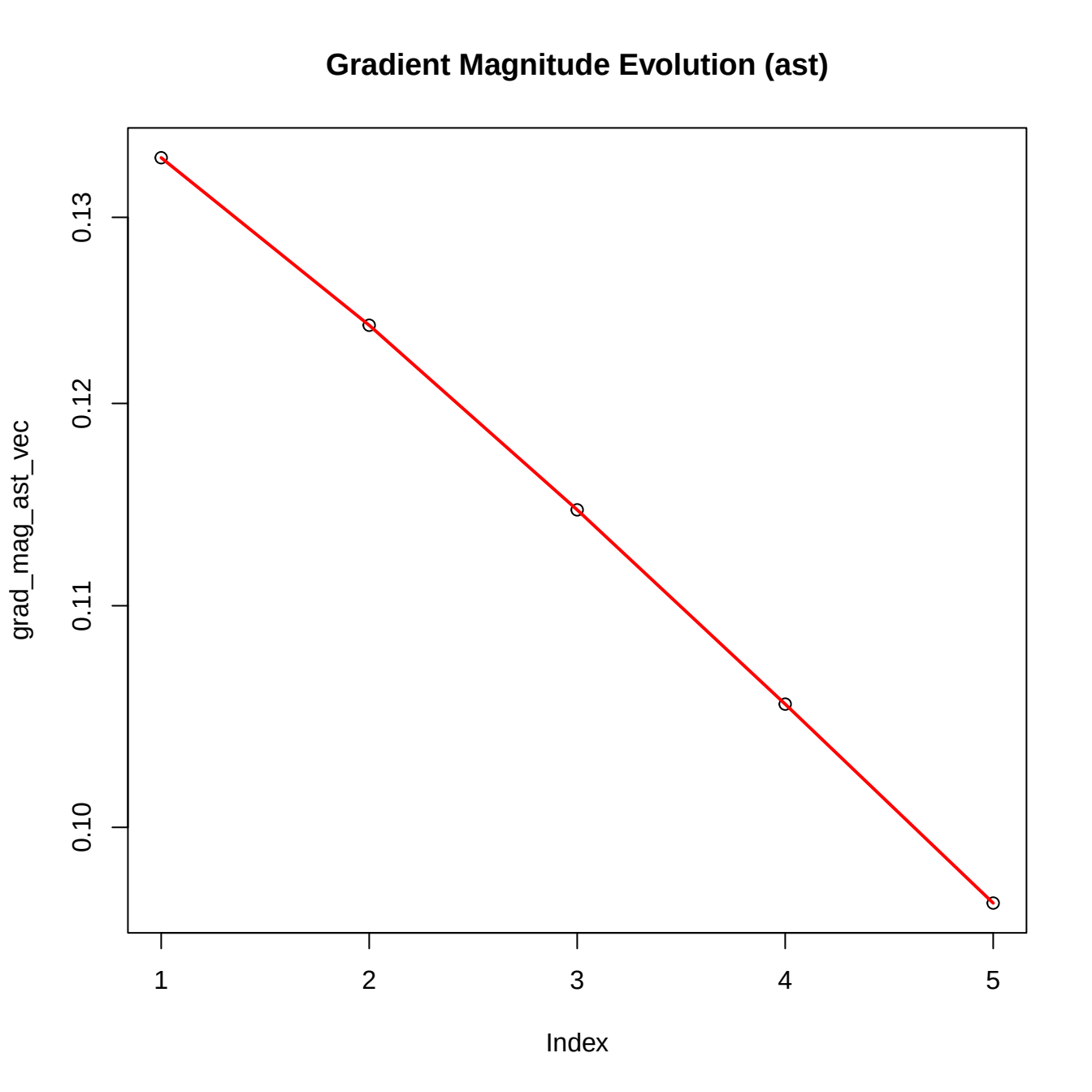
Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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5
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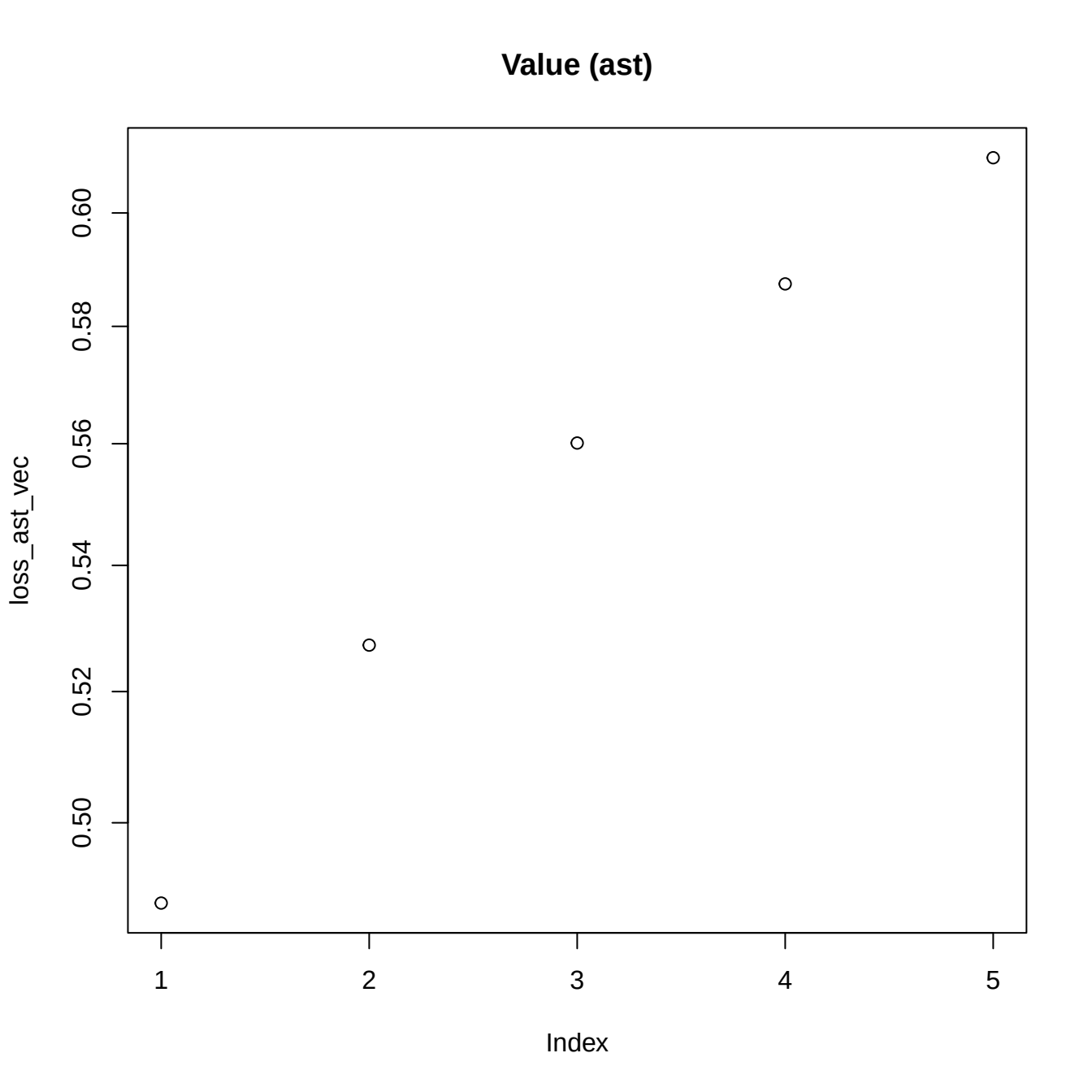
Value (ast)
loss_ast_vec
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0.54
0.56
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0.60
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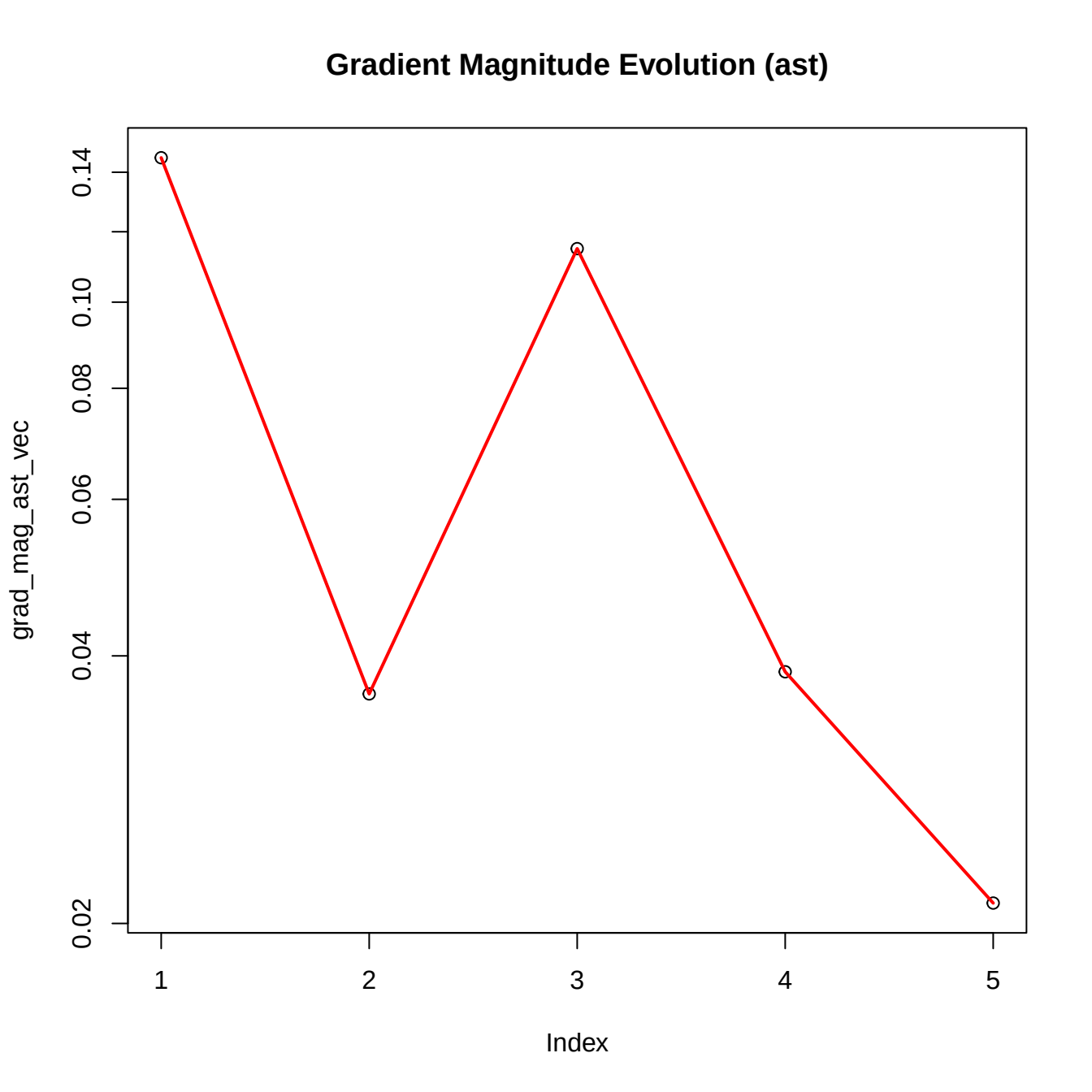
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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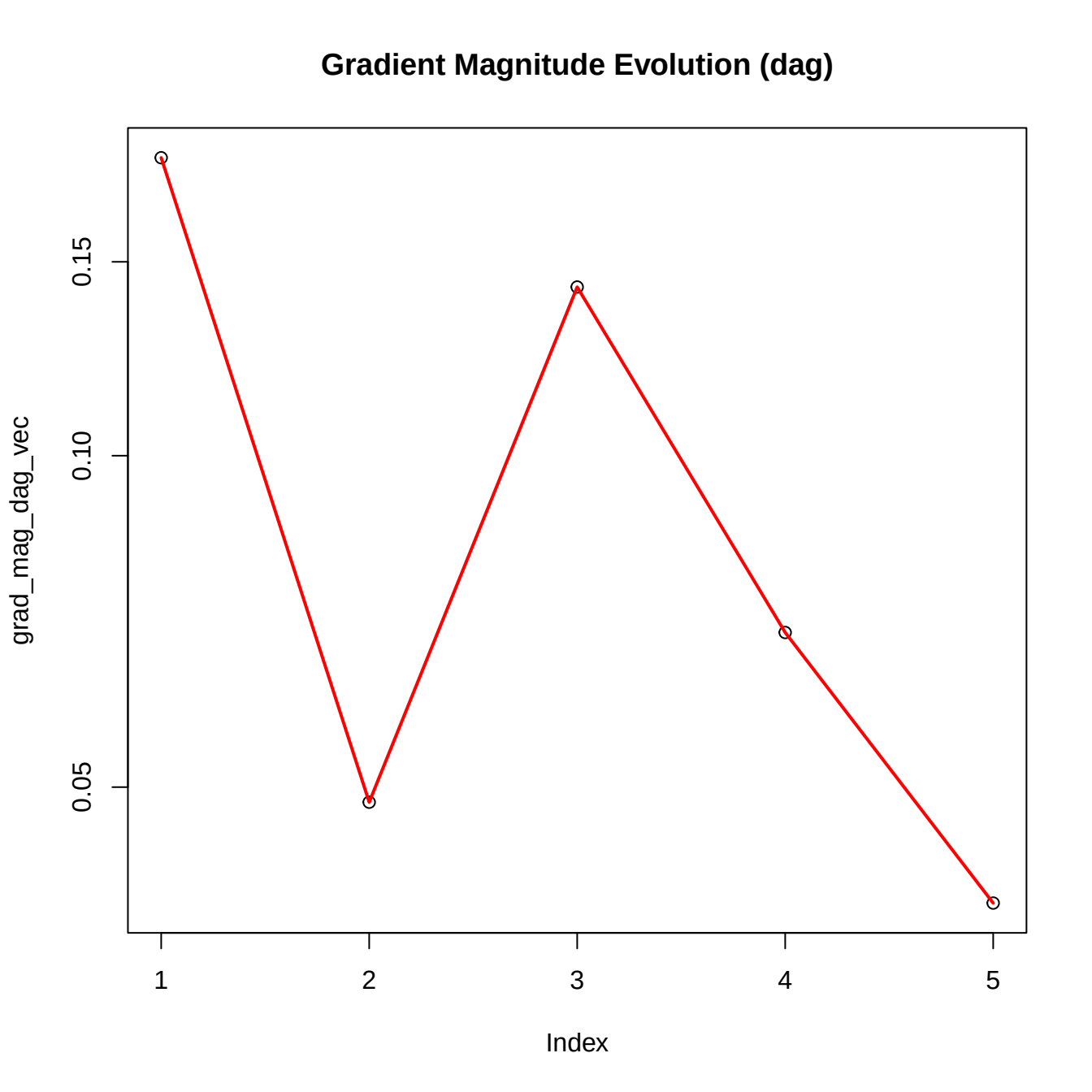
0.04
0.06
0.08
0.10
0.14
1
2
3
4
5
Index


Gradient Magnitude Evolution (dag)
grad_mag_dag_vec
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0.10
0.15
1
2
3
4
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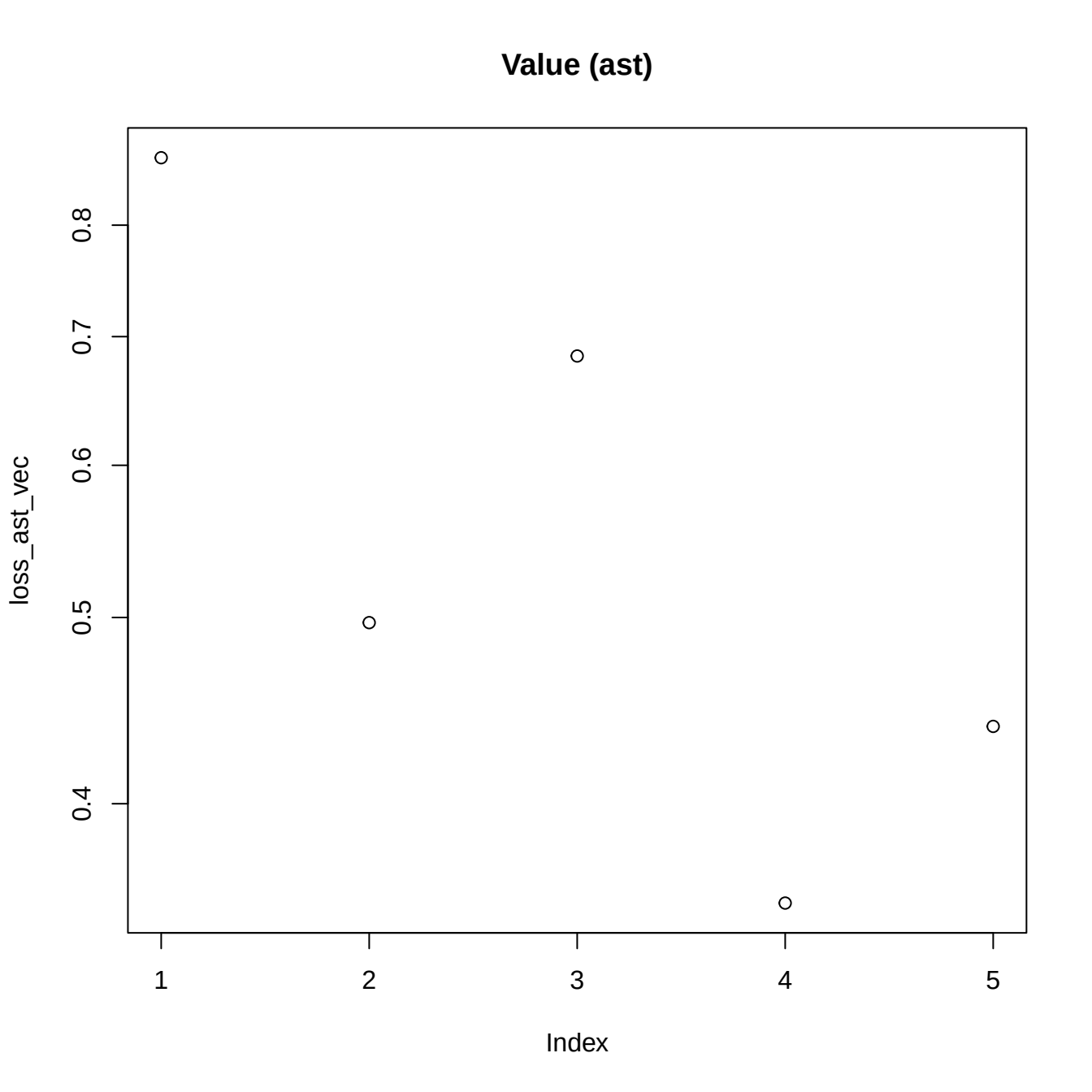
Value (ast)
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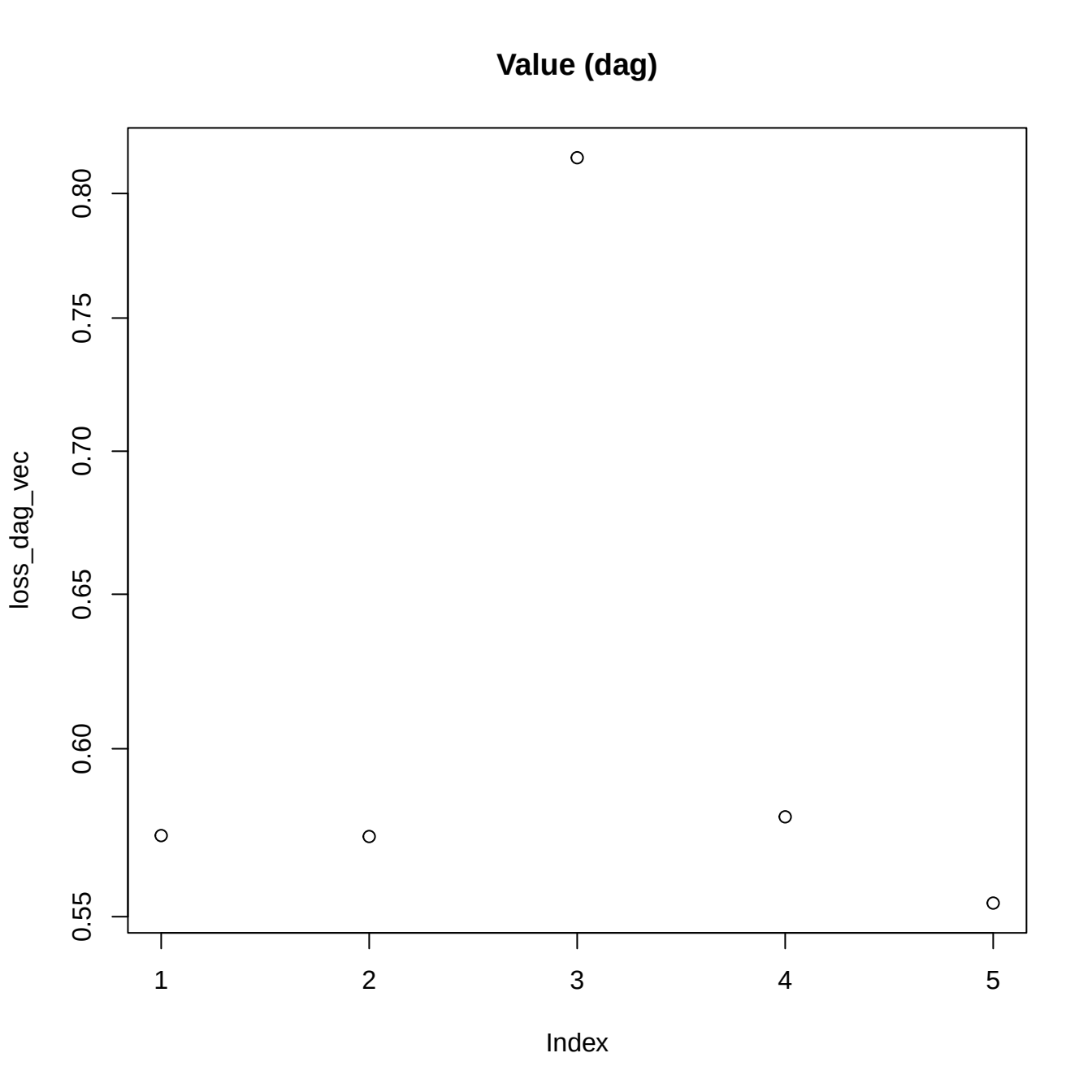
2
3
4
5
Index


Value (dag)
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3
4
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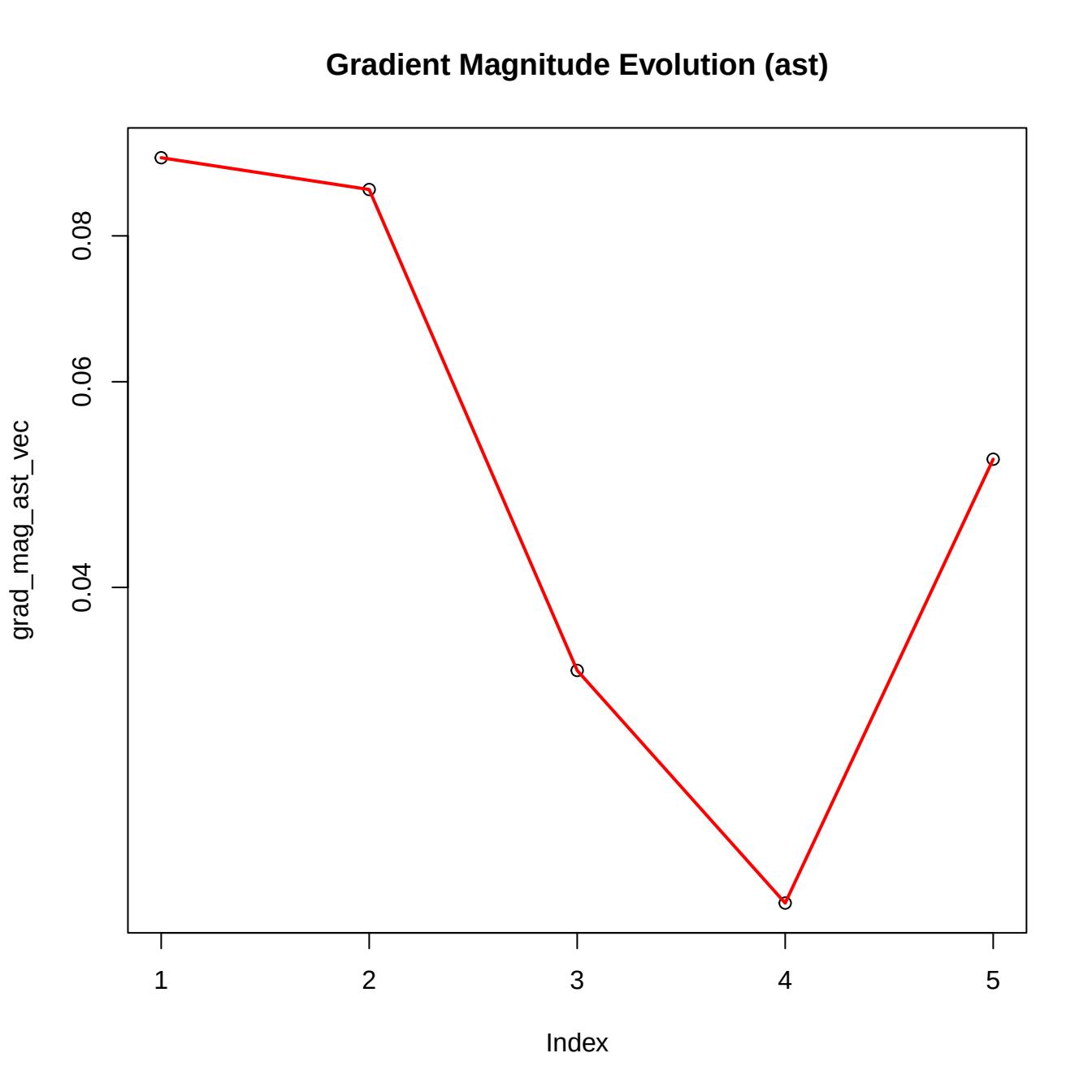
Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
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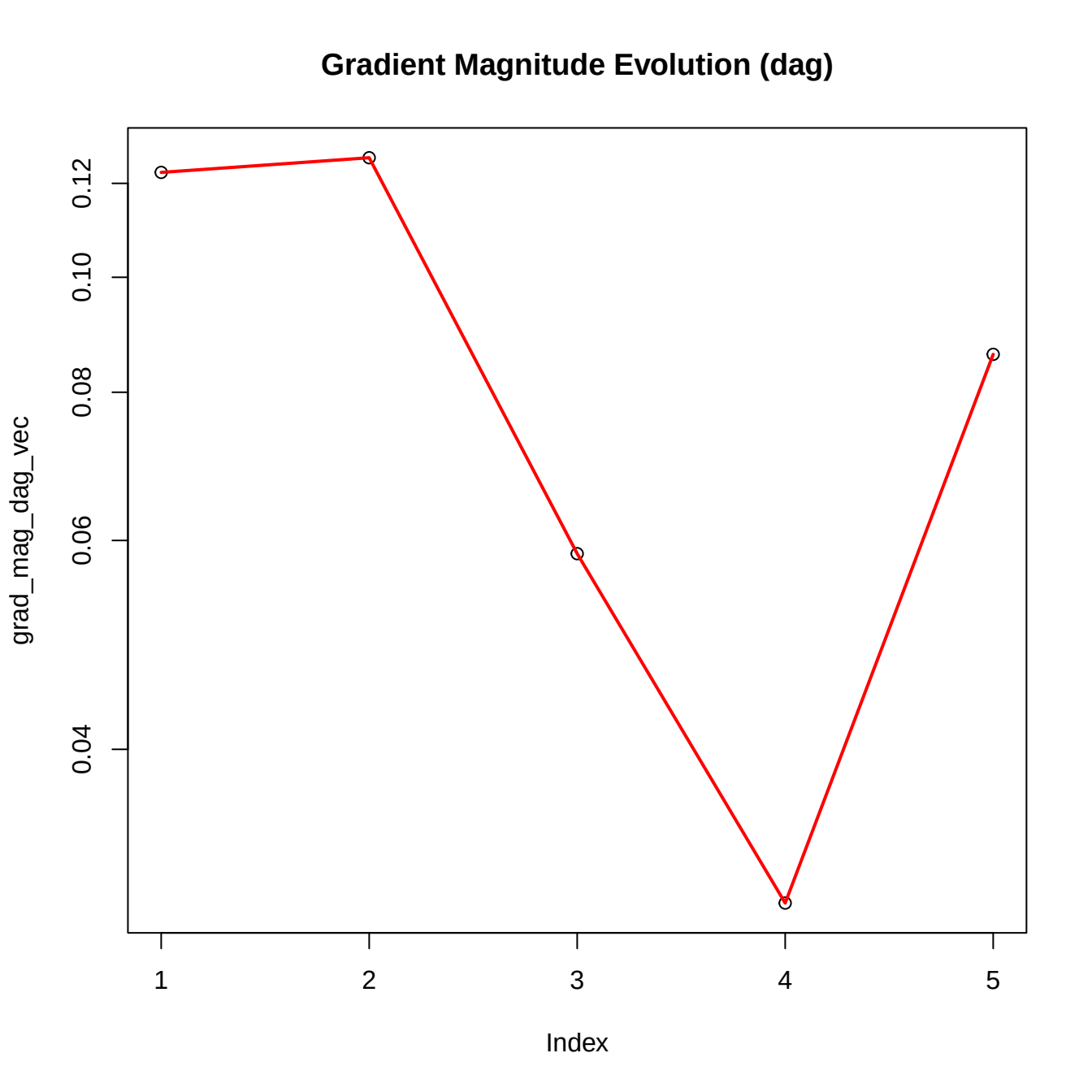
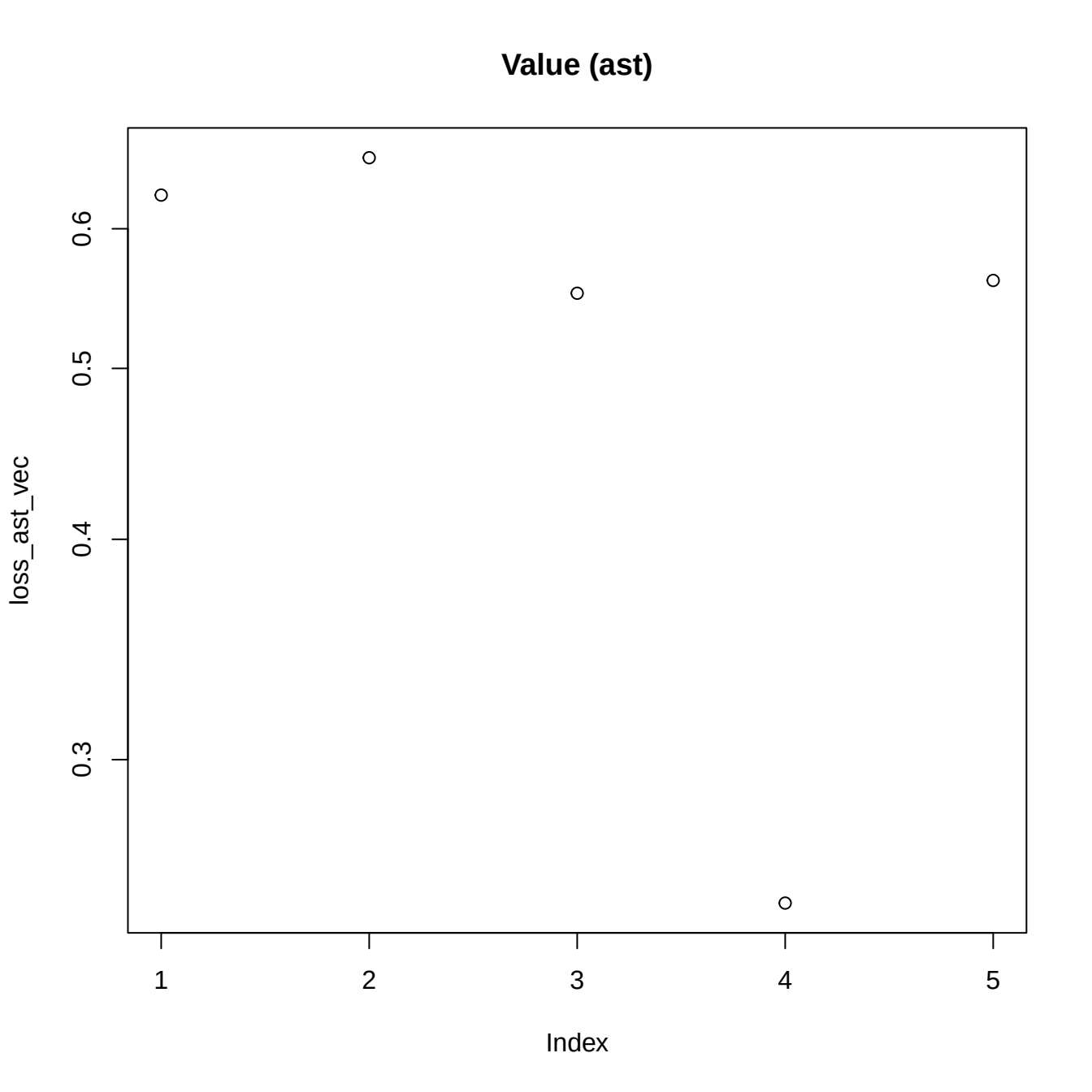
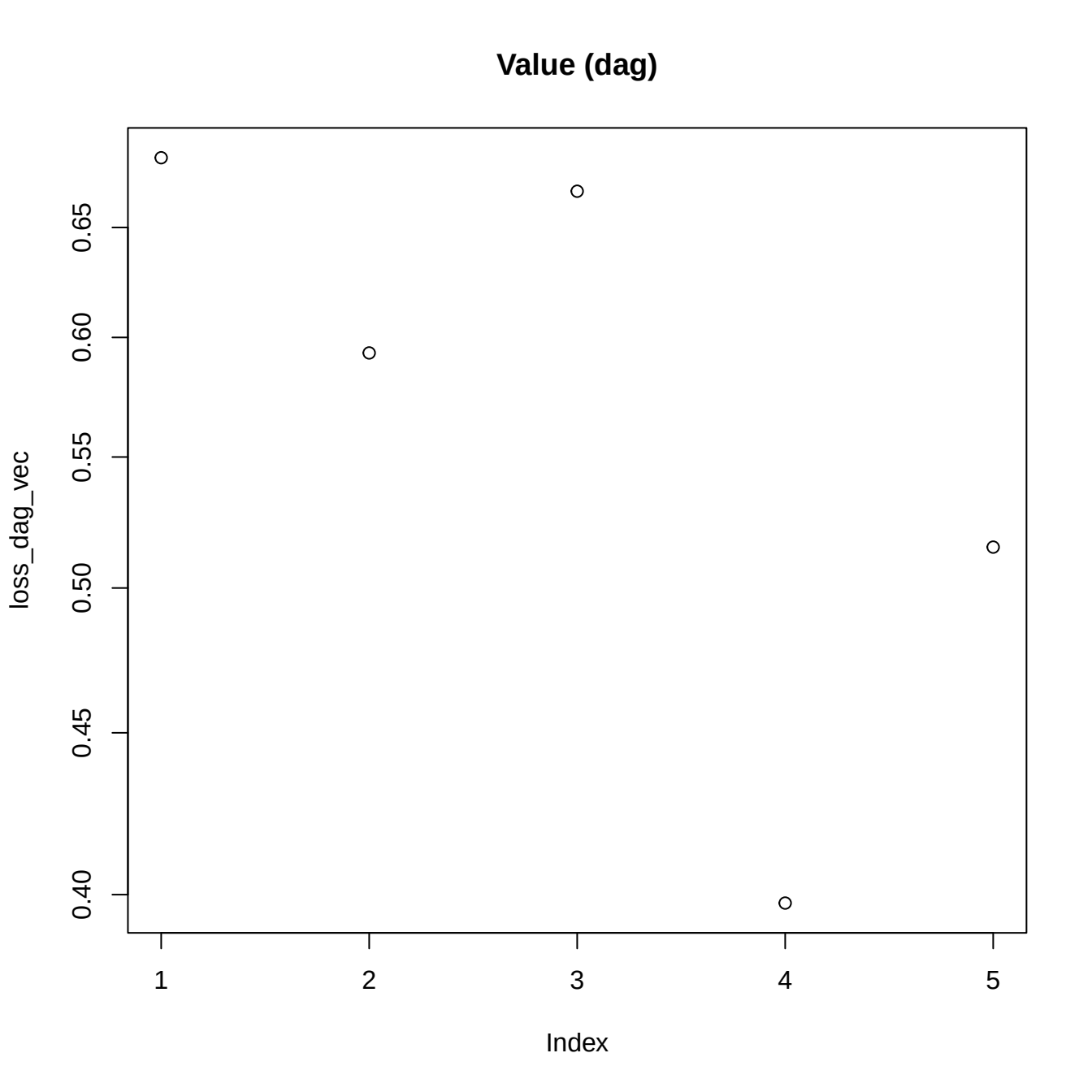
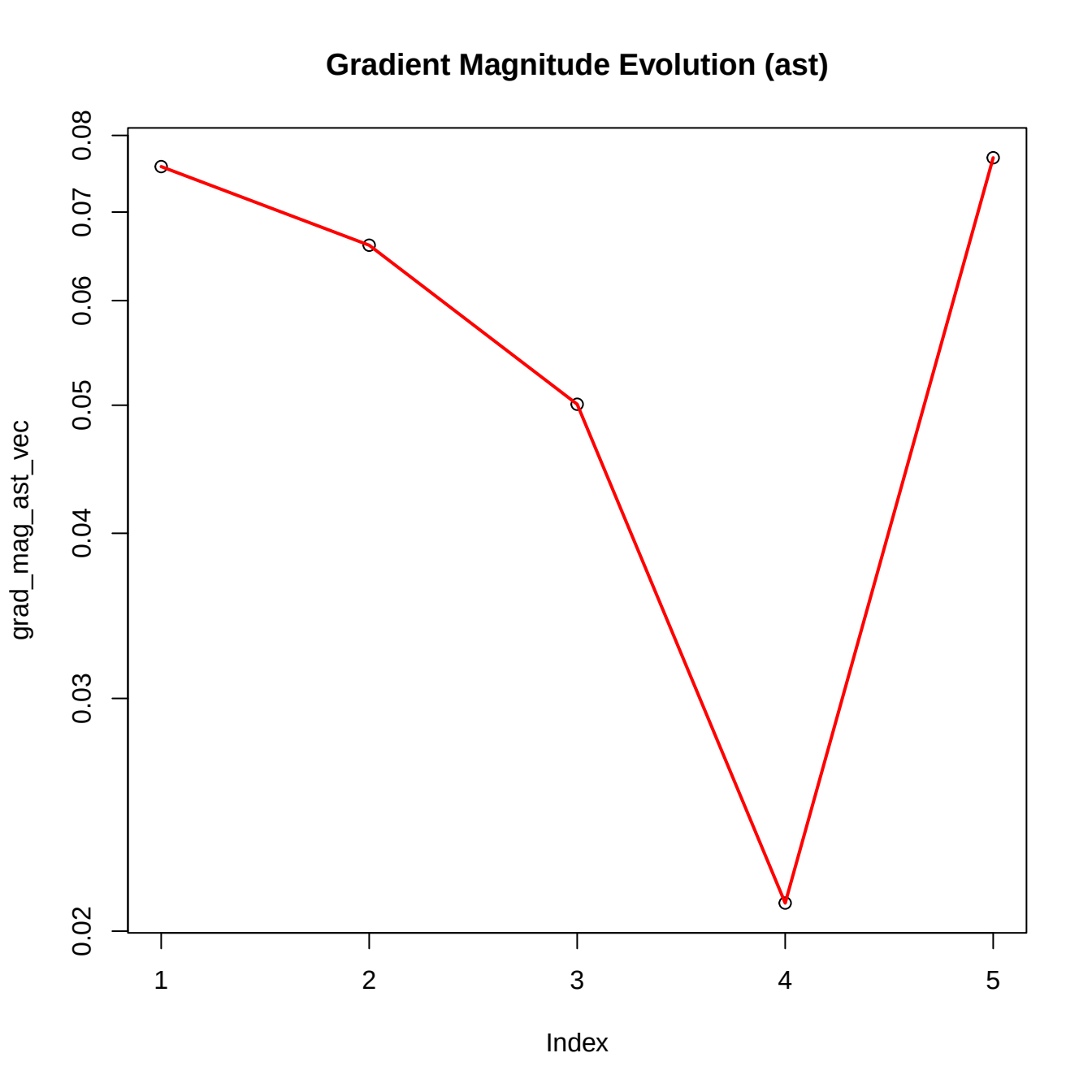
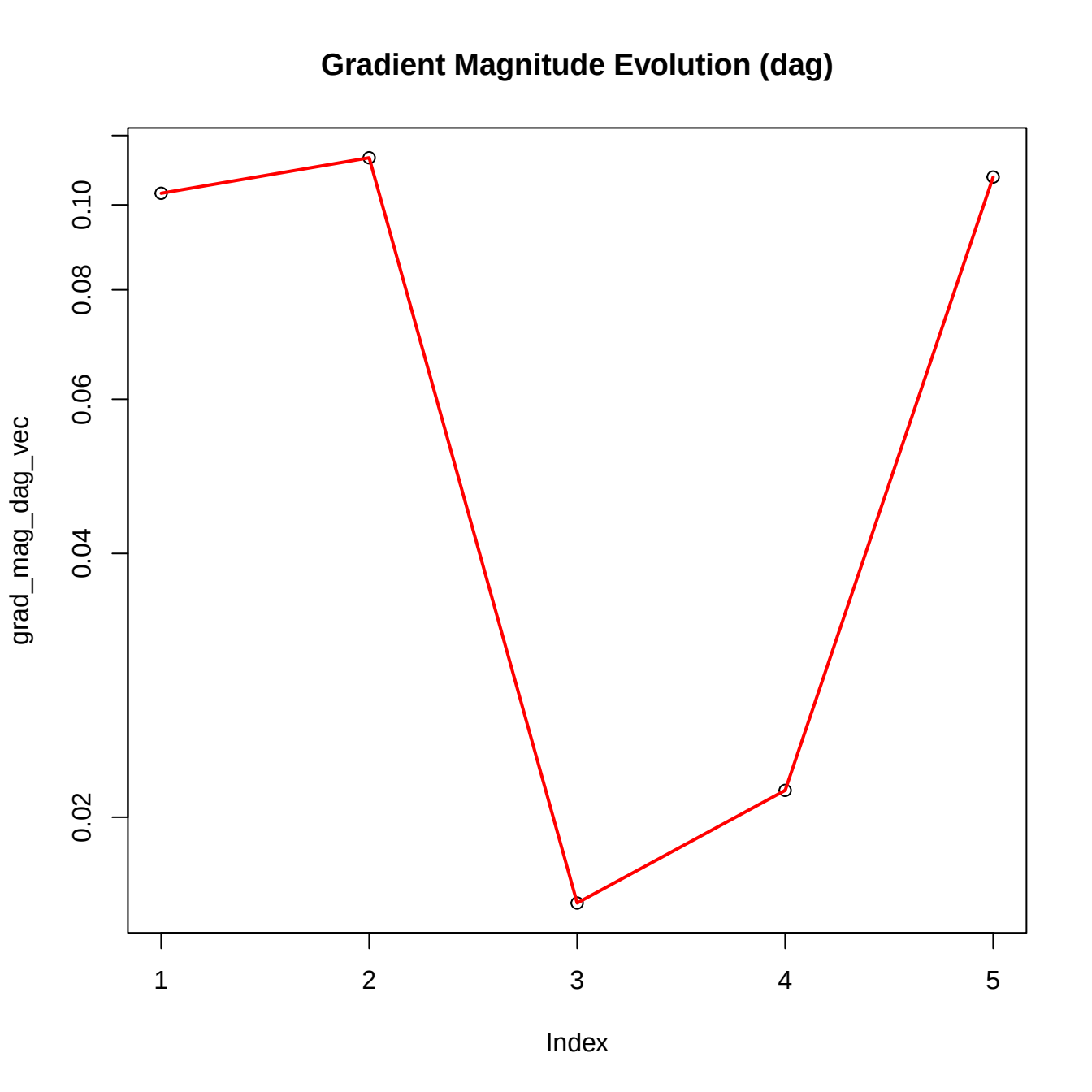
0.06
0.08
1
2
3
4
5
Index

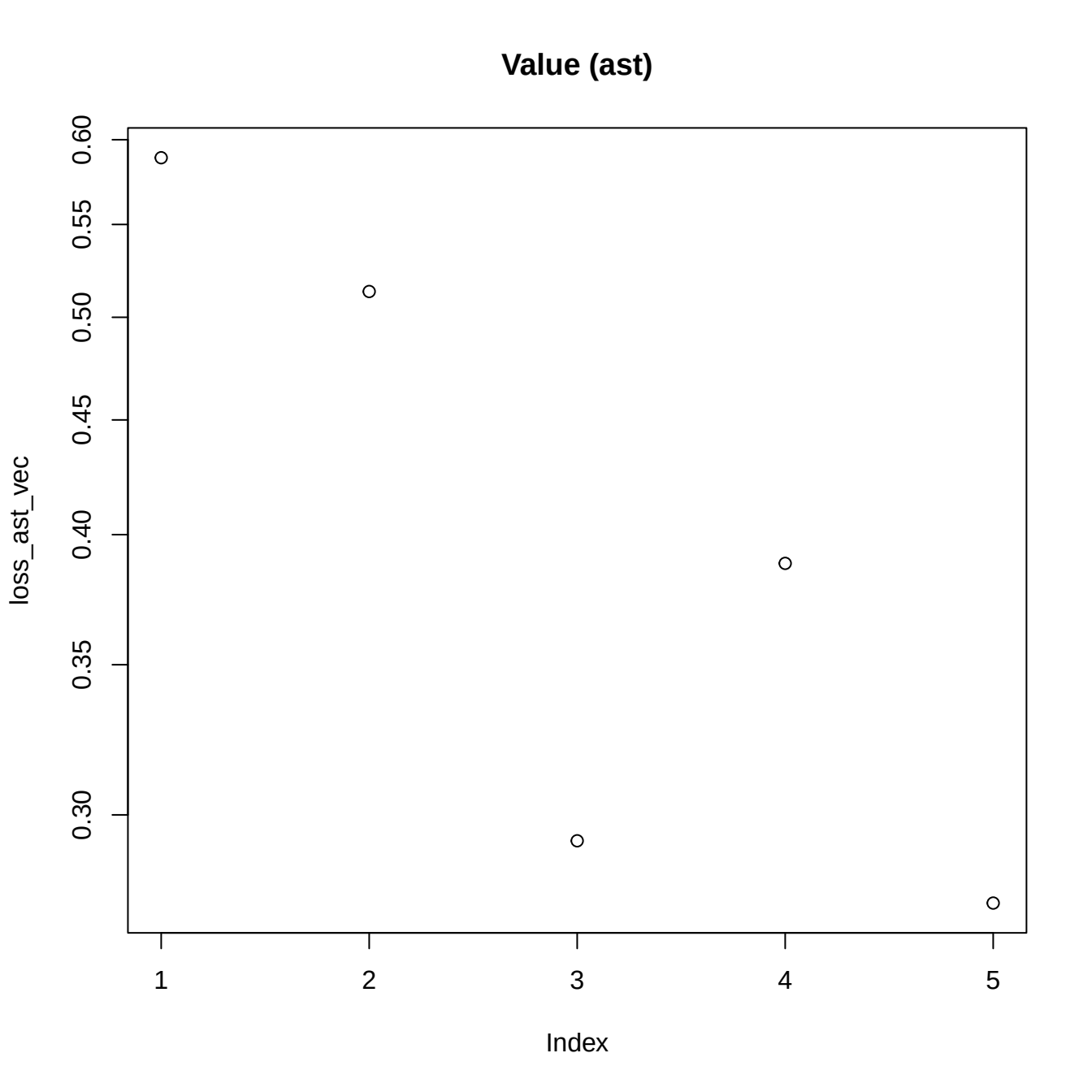

Gradient Magnitude Evolution (dag)
grad_mag_dag_vec
0.04
0.06
0.08
0.10
0.12
1
2
3
4
5
Index


Value (ast)
loss_ast_vec
0.3
0.4
0.5
0.6
1
2
3
4
5
Index


Value (dag)
loss_dag_vec
0.40
0.45
0.50
0.55
0.60
0.65
1
2
3
4
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.02
0.03
0.04
0.05
0.06
0.07
0.08
1
2
3
4
5
Index


Gradient Magnitude Evolution (dag)
grad_mag_dag_vec
0.02
0.04
0.06
0.08
0.10
1
2
3
4
5
Index


Value (ast)
loss_ast_vec
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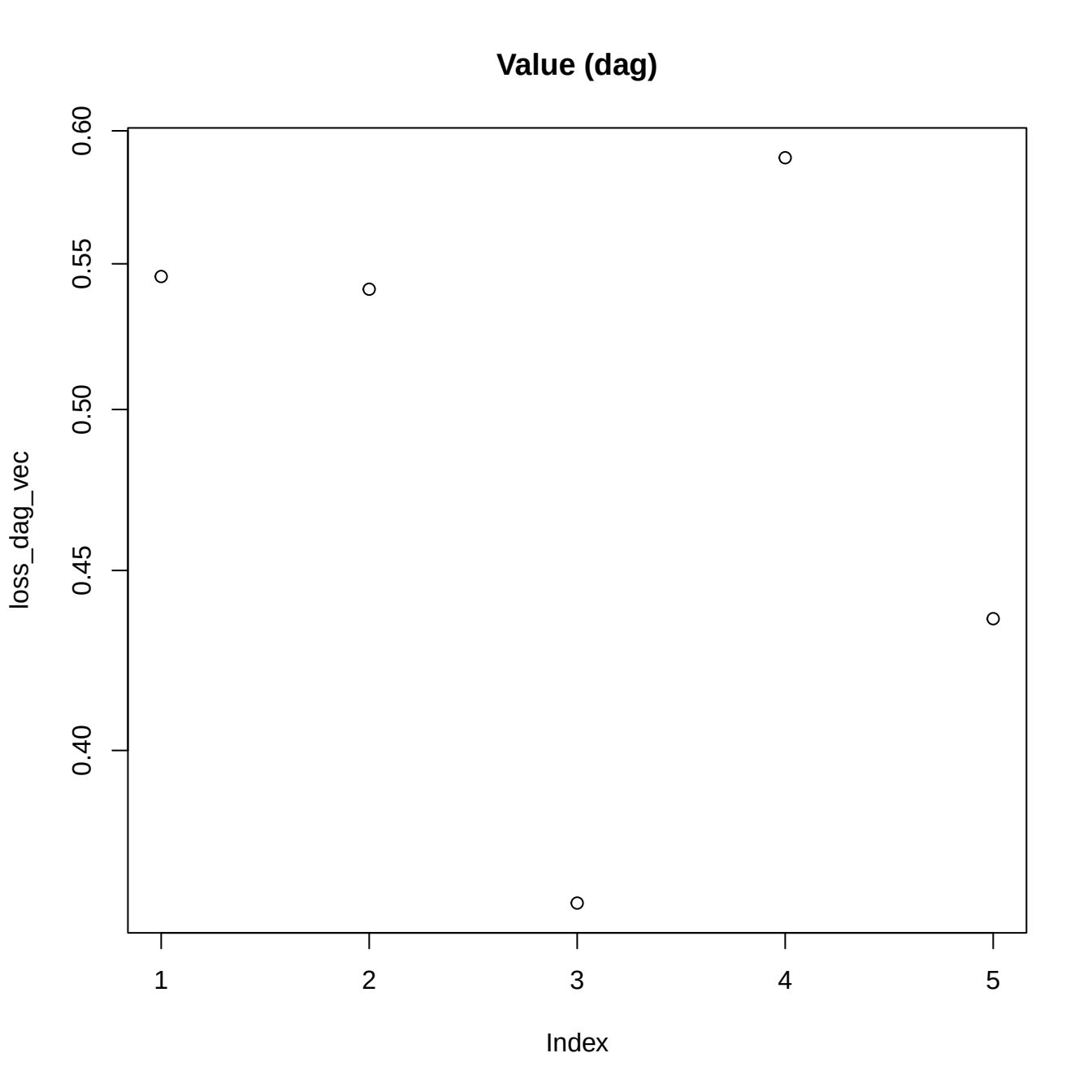
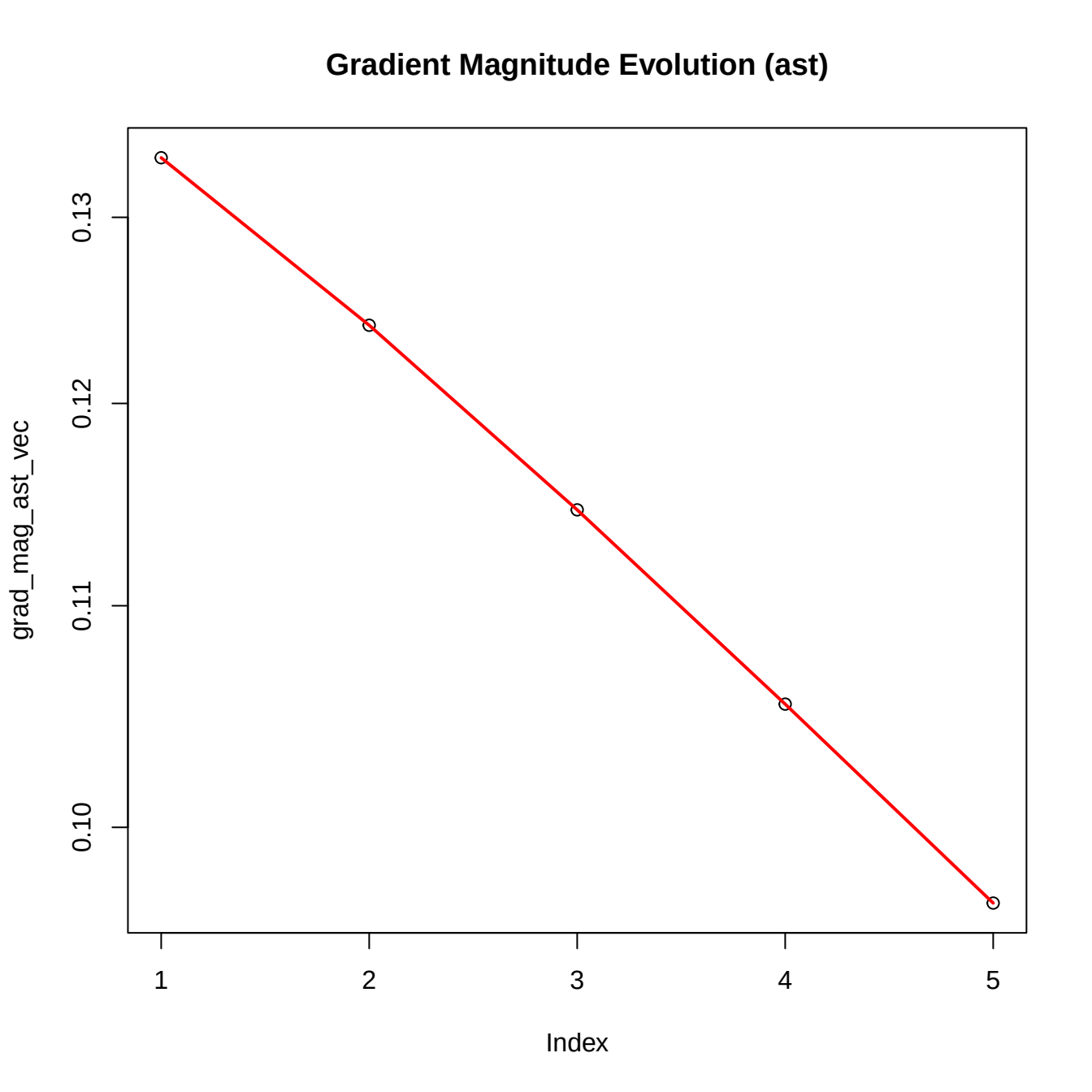
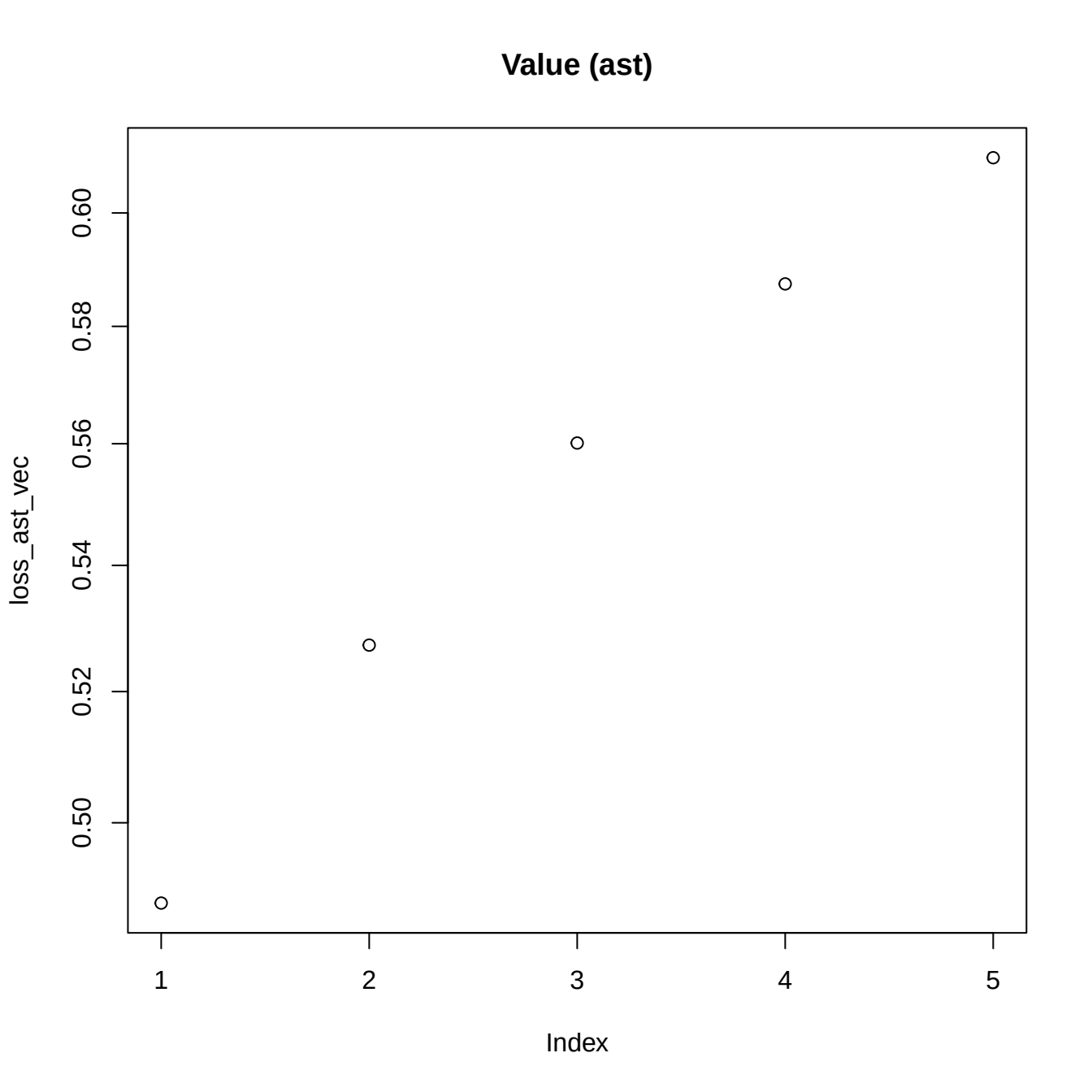
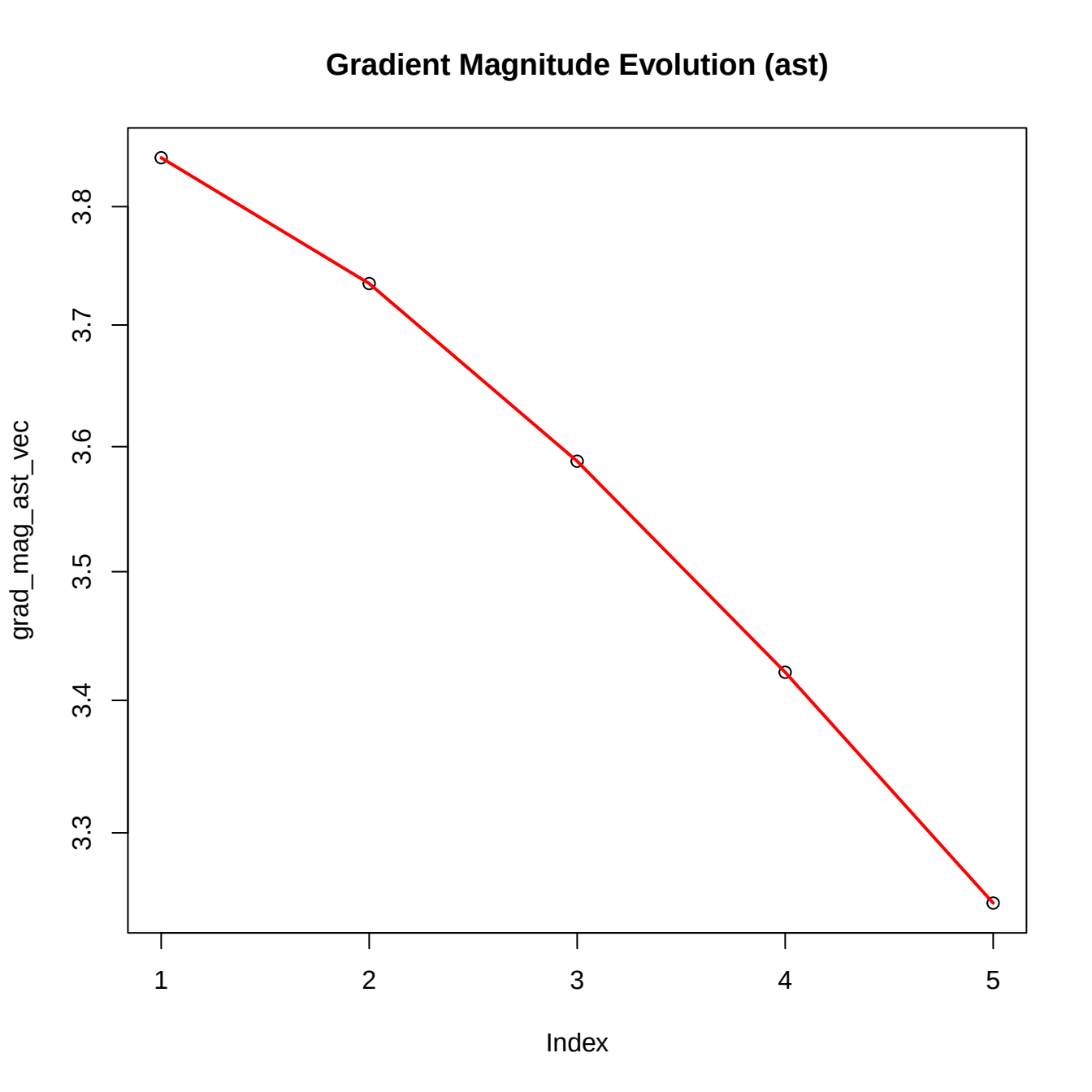
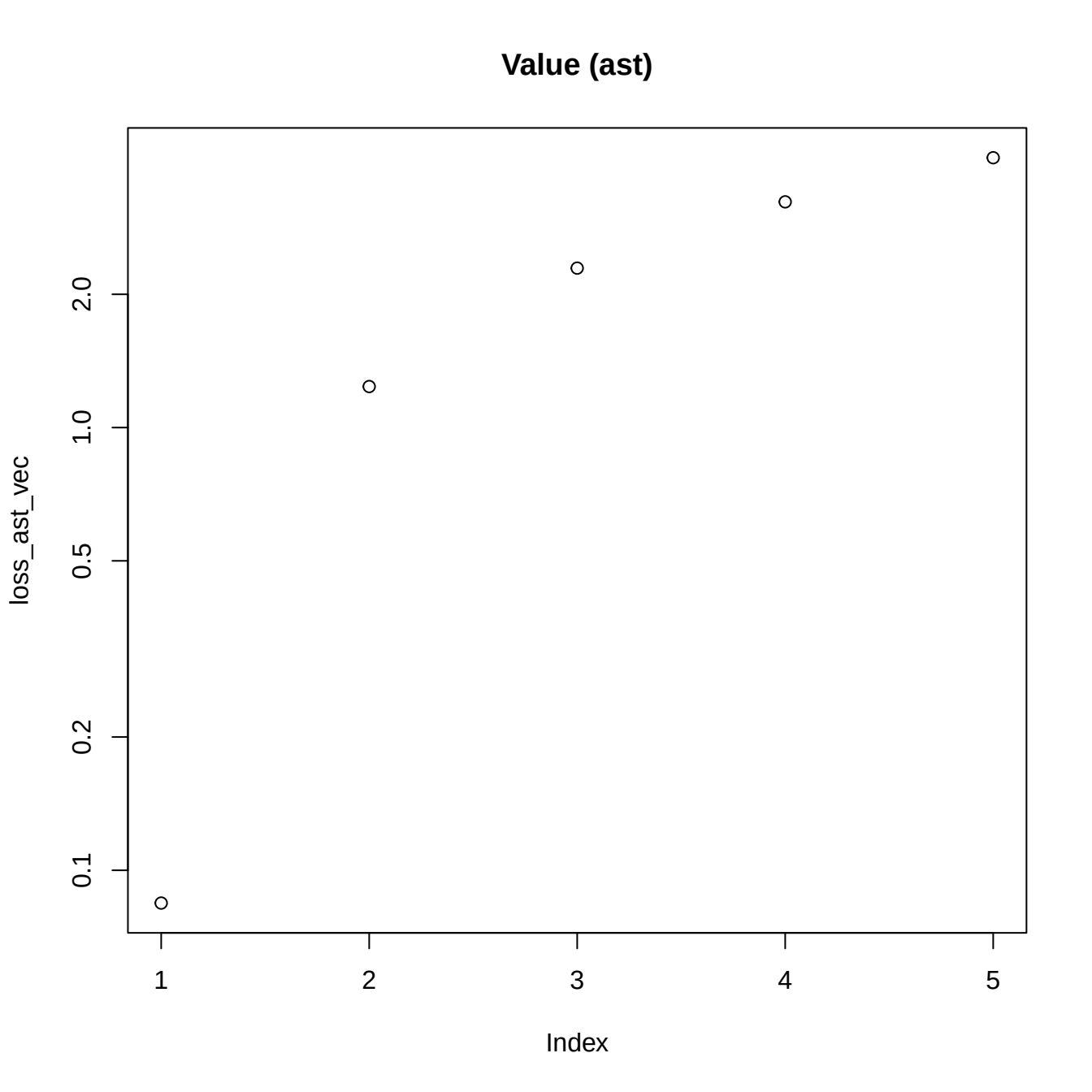
0.35
0.40
0.45
0.50
0.55
0.60
1
2
3
4
5
Index

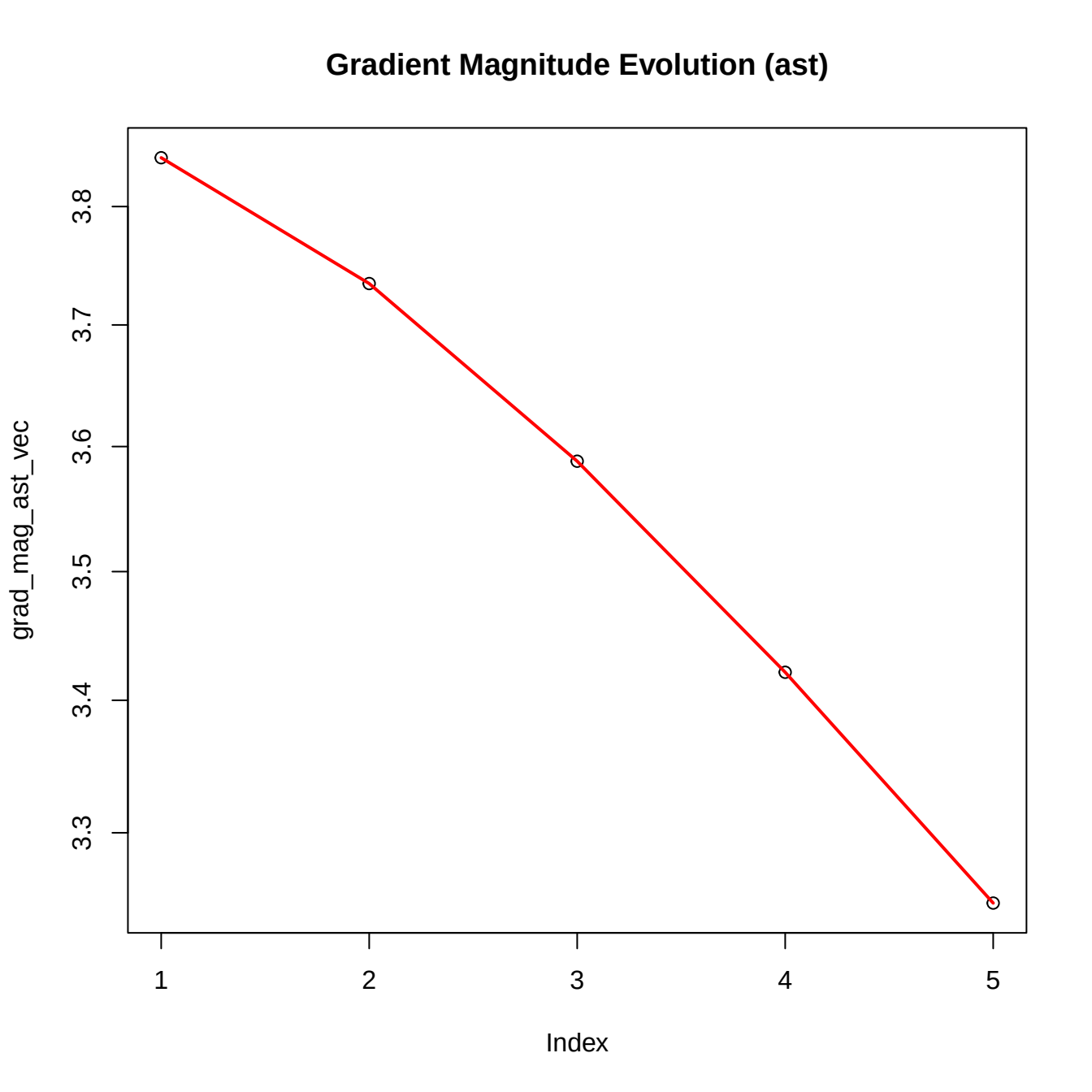

Value (dag)
loss_dag_vec
0.40
0.45
0.50
0.55
0.60
1
2
3
4
5
Index

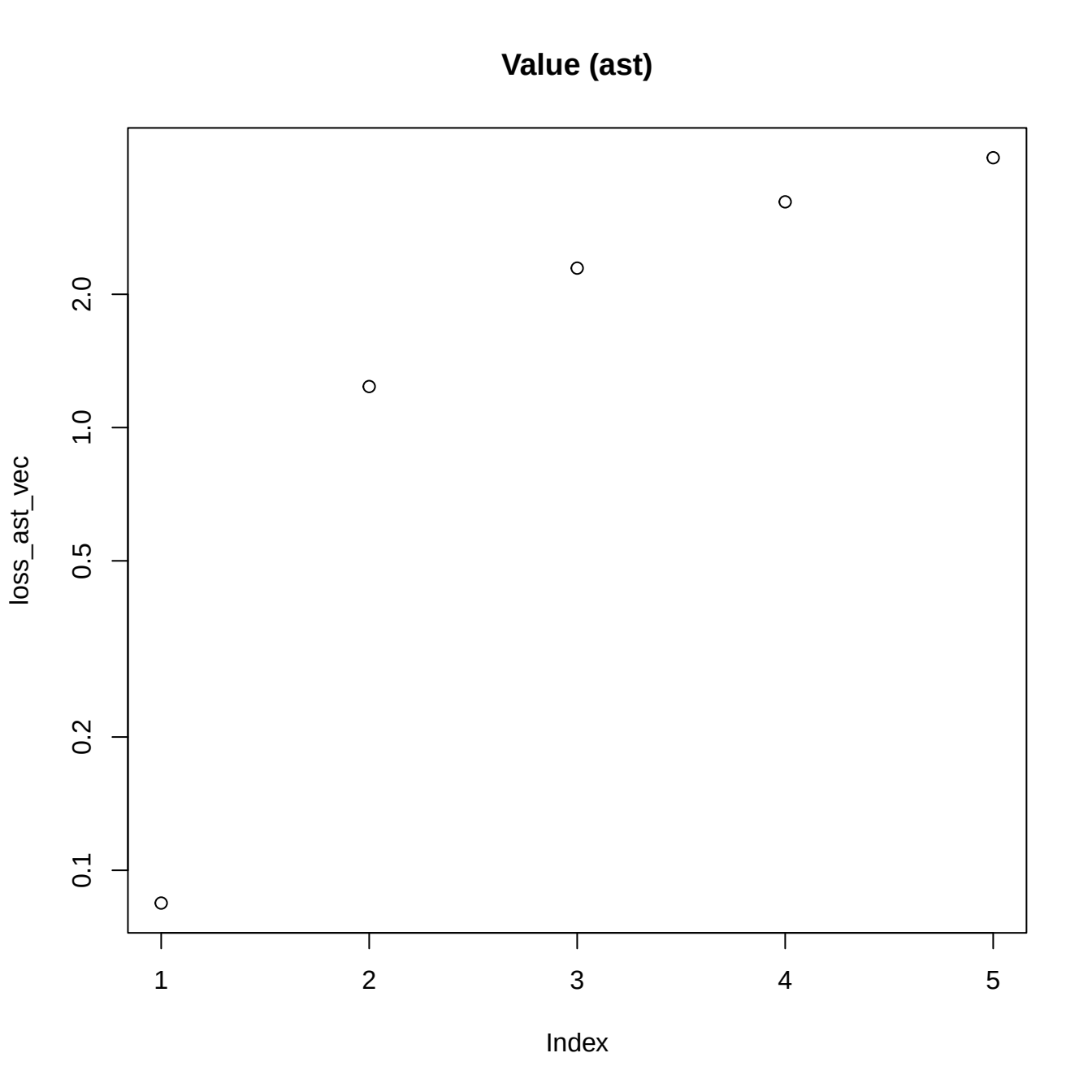

Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.10
0.11
0.12
0.13
1
2
3
4
5
Index

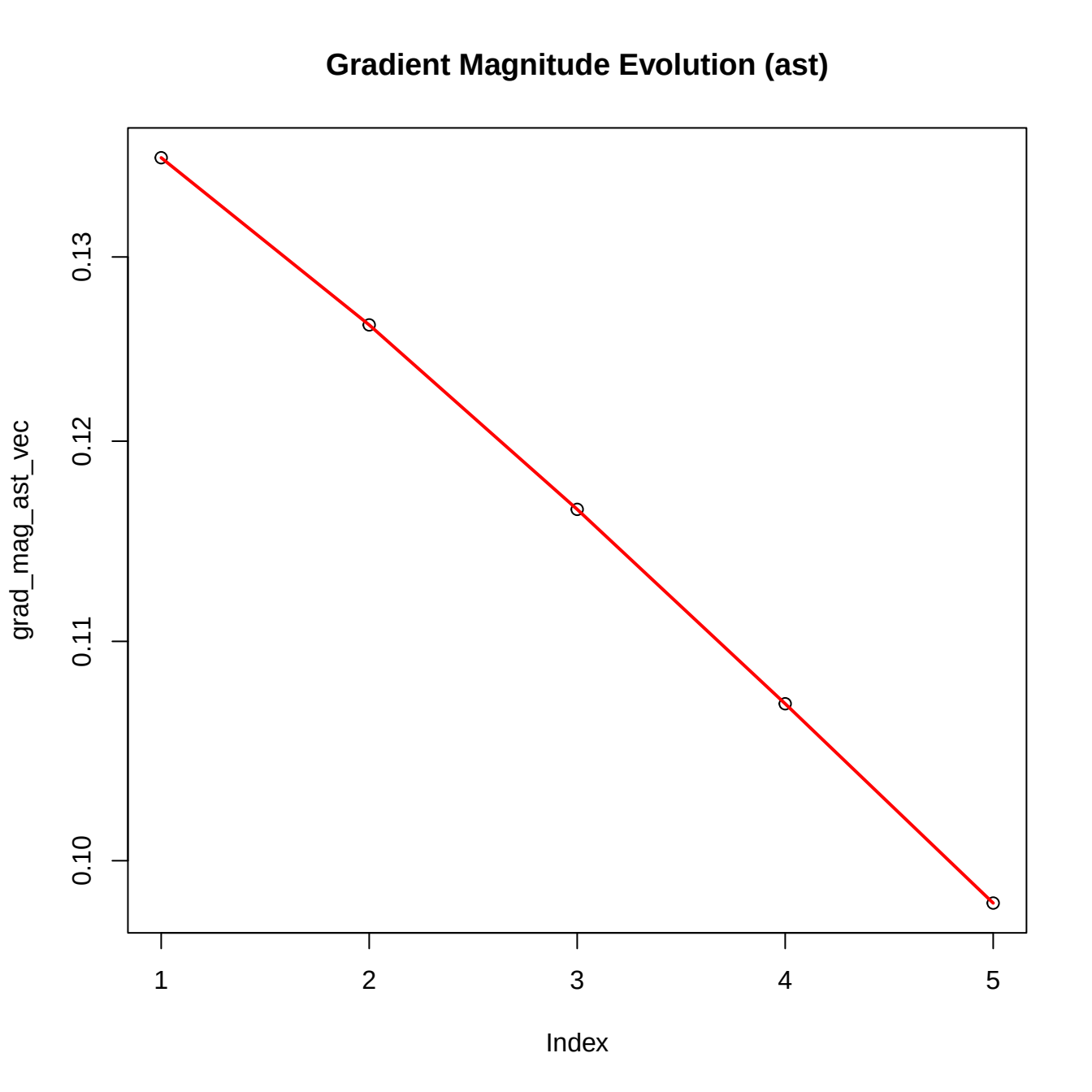

Value (ast)
loss_ast_vec
0.50
0.52
0.54
0.56
0.58
0.60
1
2
3
4
5
Index

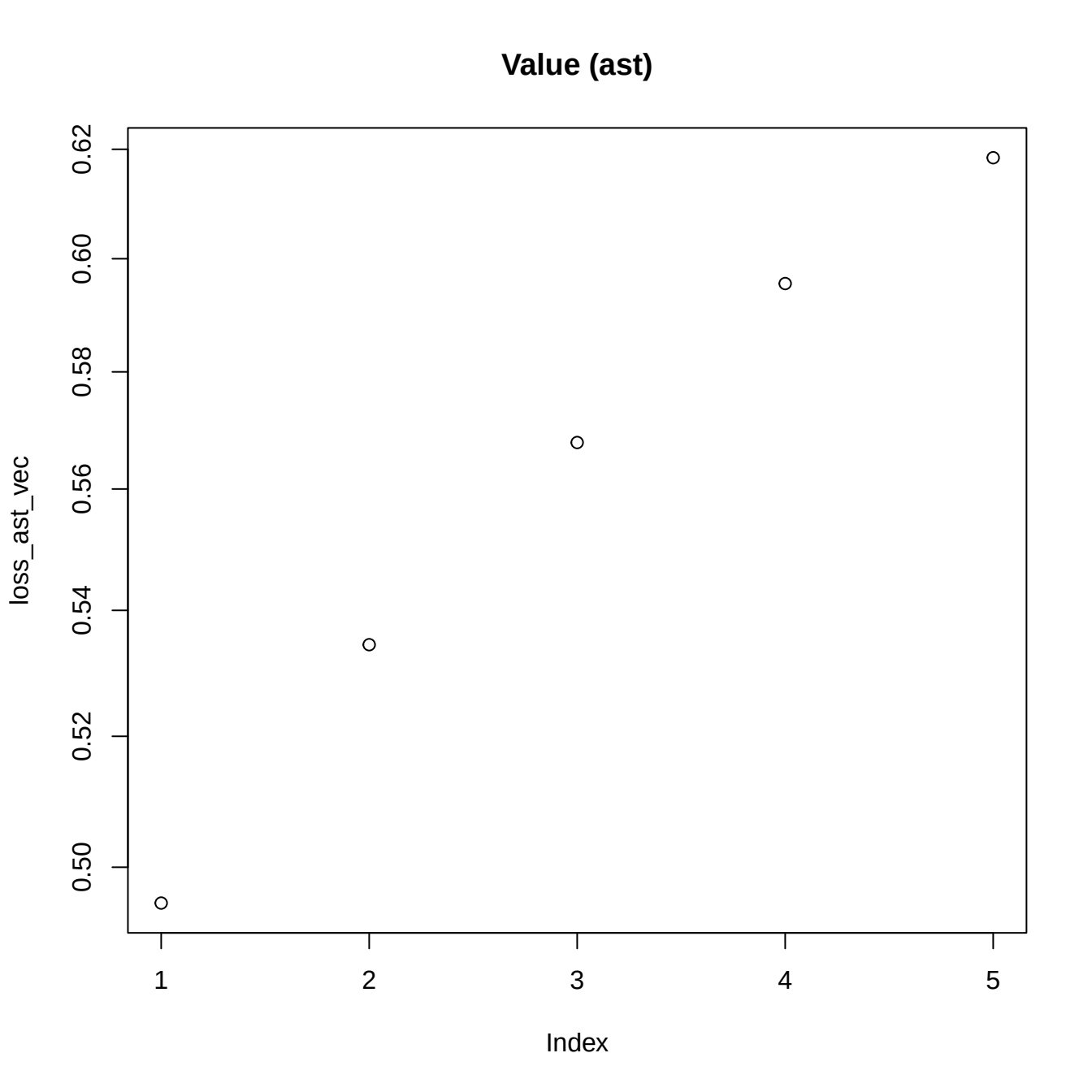

Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
3.3
3.4
3.5
3.6
3.7
3.8
1
2
3
4
5
Index


Value (ast)
loss_ast_vec
0.1
0.2
0.5
1.0
2.0
1
2
3
4
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
3.3
3.4
3.5
3.6
3.7
3.8
1
2
3
4
5
Index


Value (ast)
loss_ast_vec
0.1
0.2
0.5
1.0
2.0
1
2
3
4
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.10
0.11
0.12
0.13
1
2
3
4
5
Index


Value (ast)
loss_ast_vec
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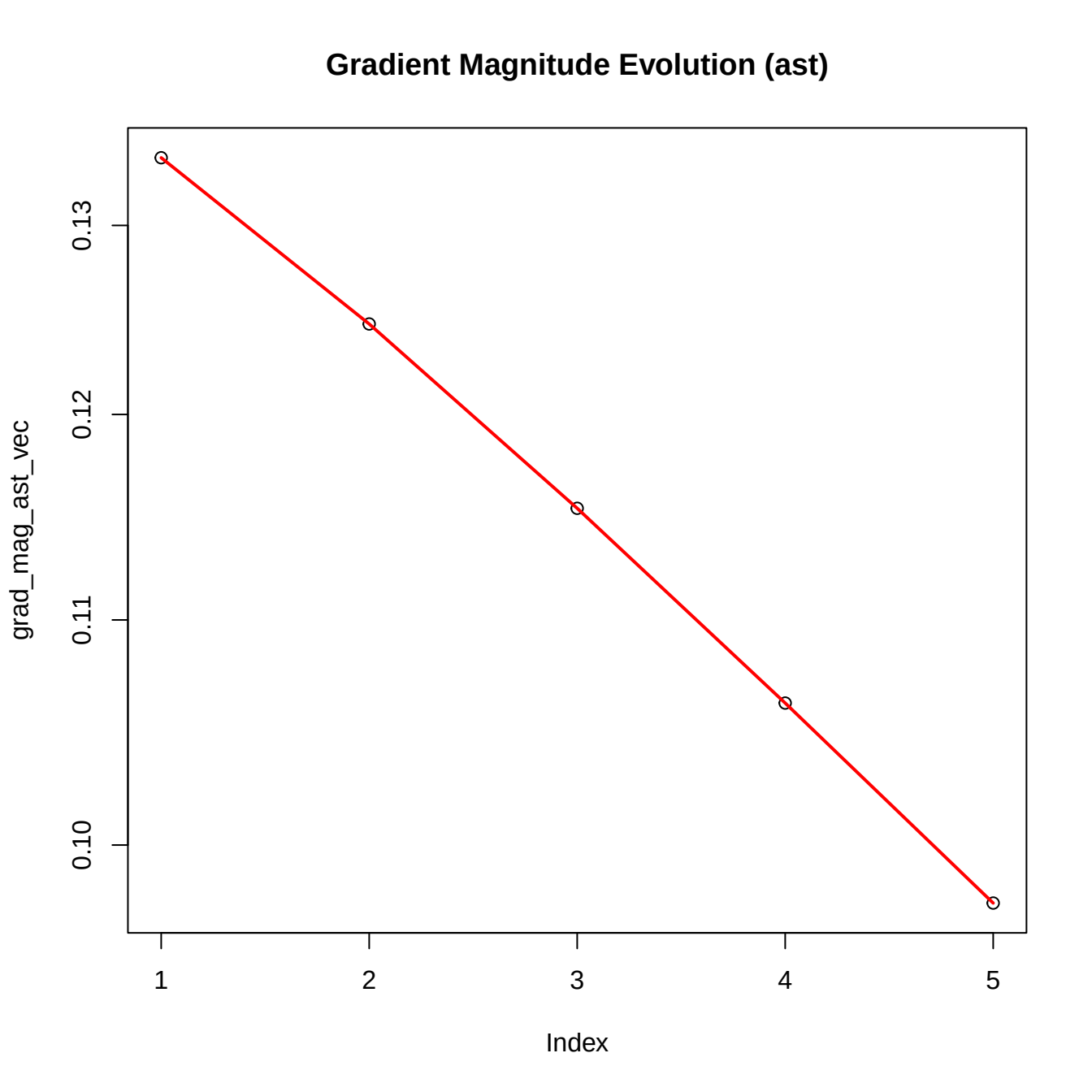
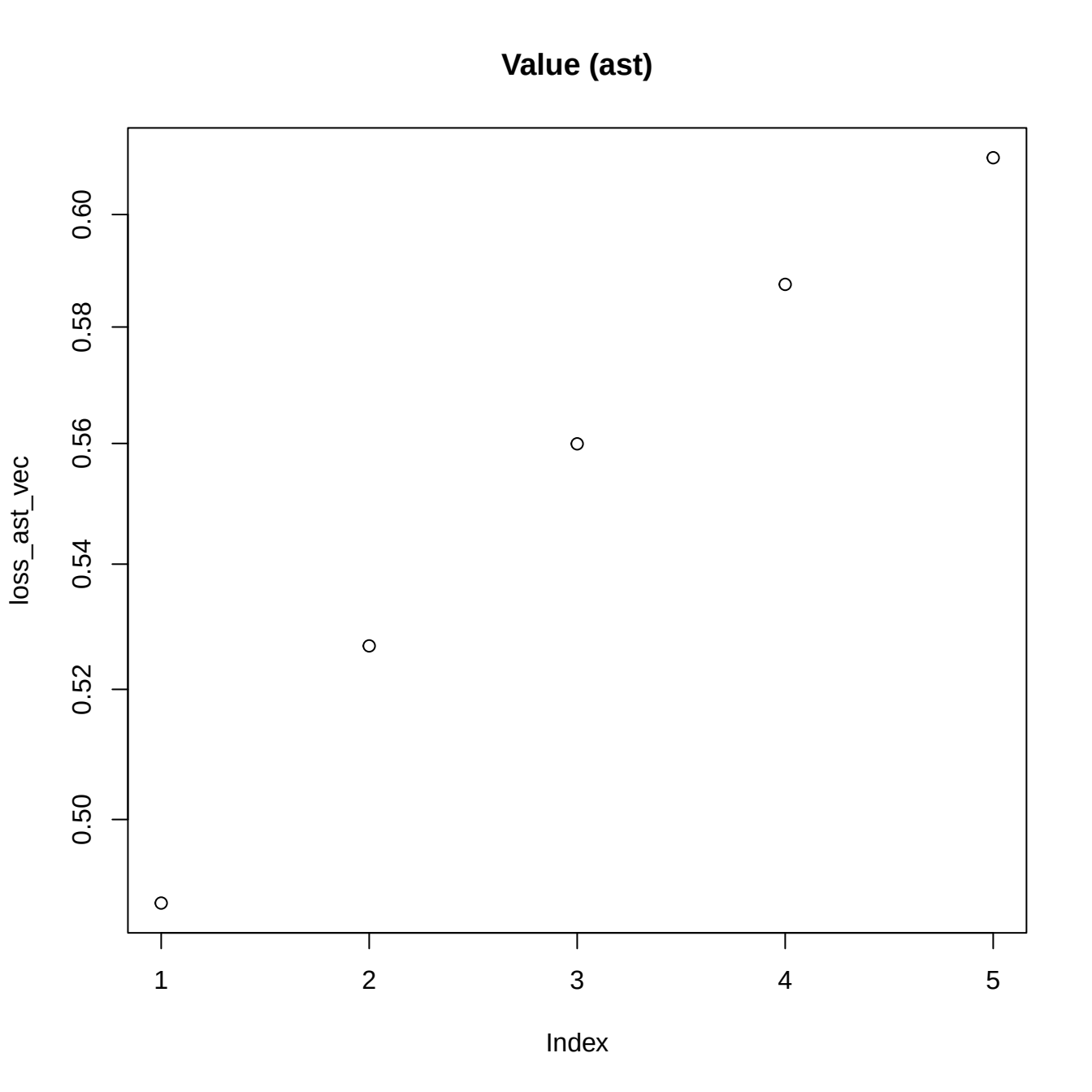
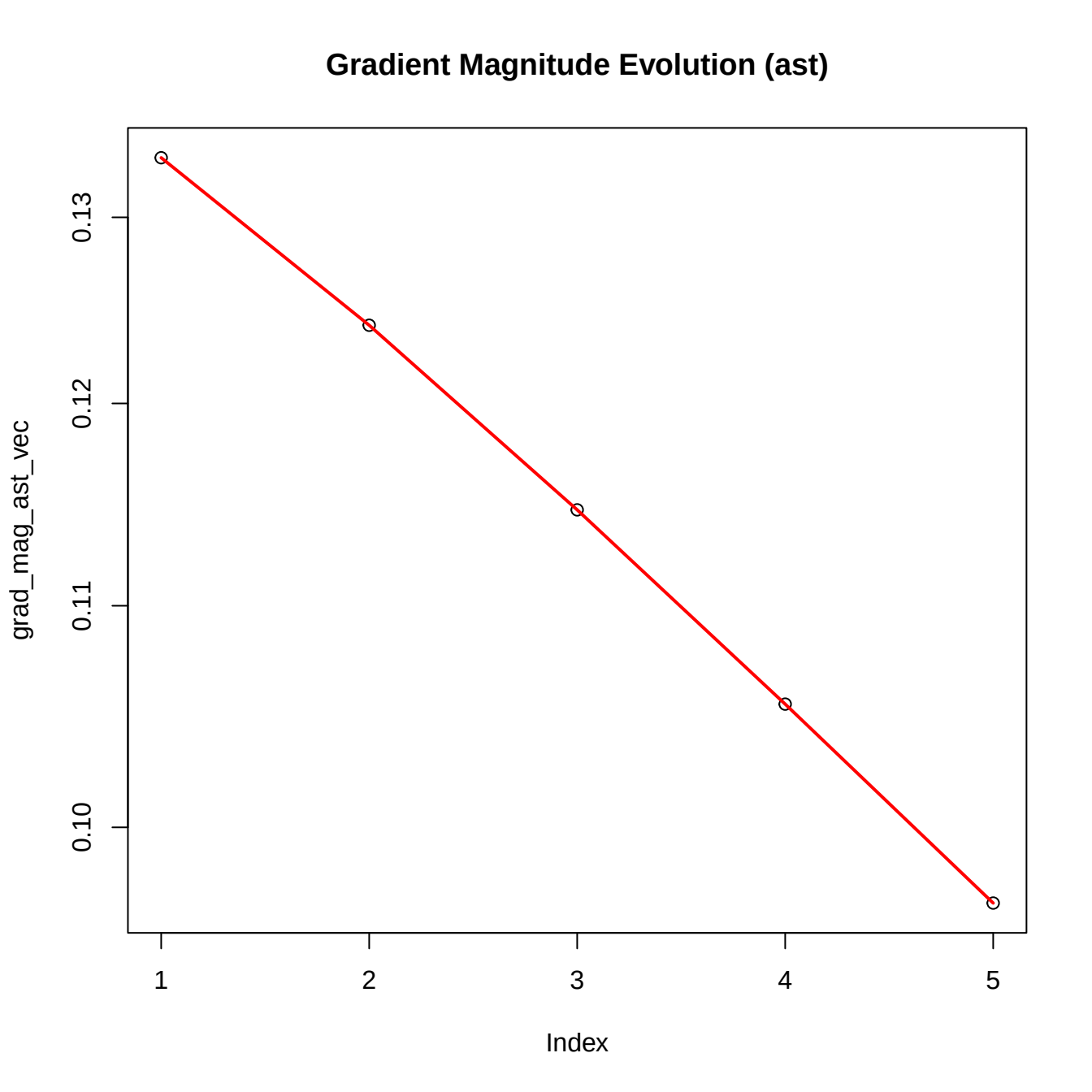
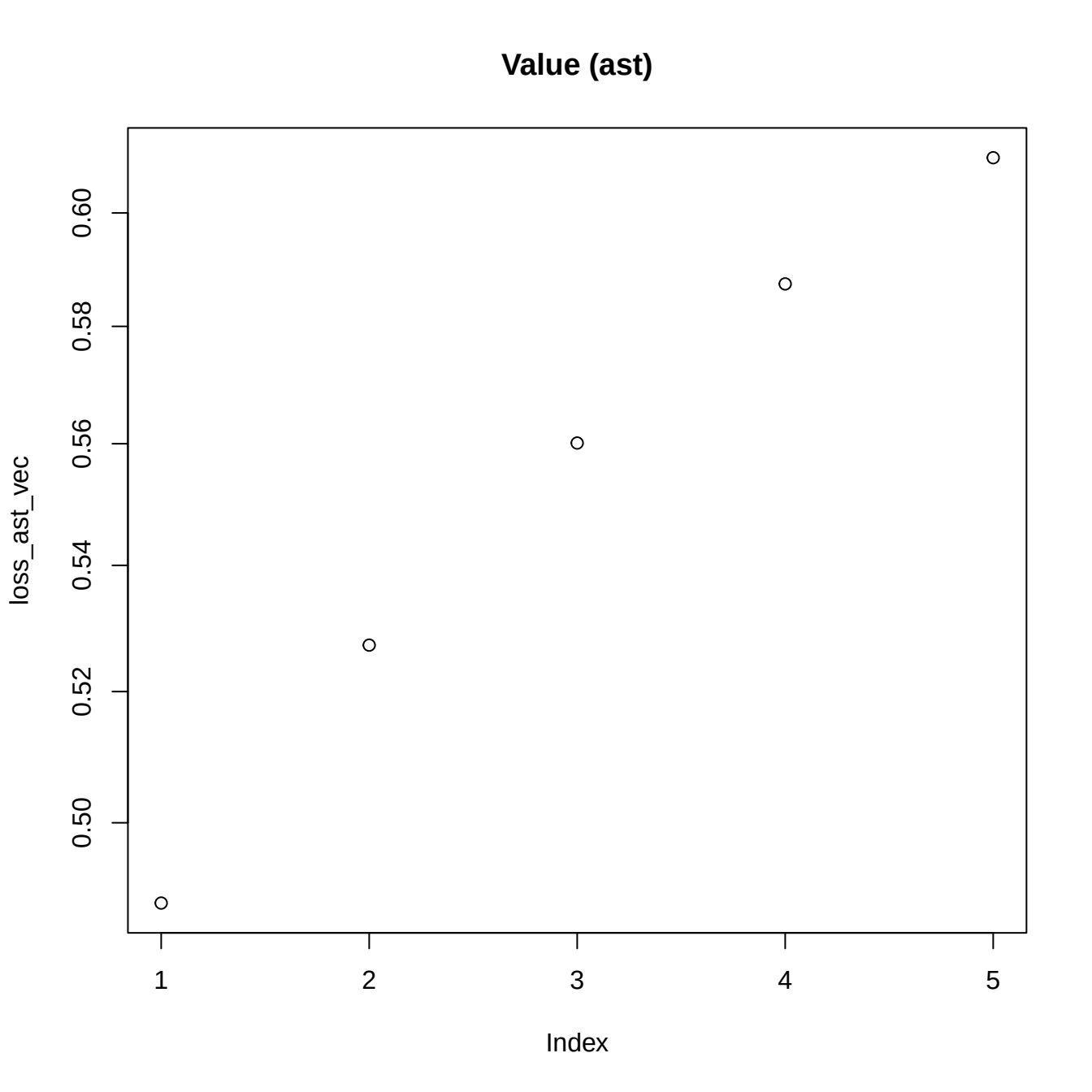
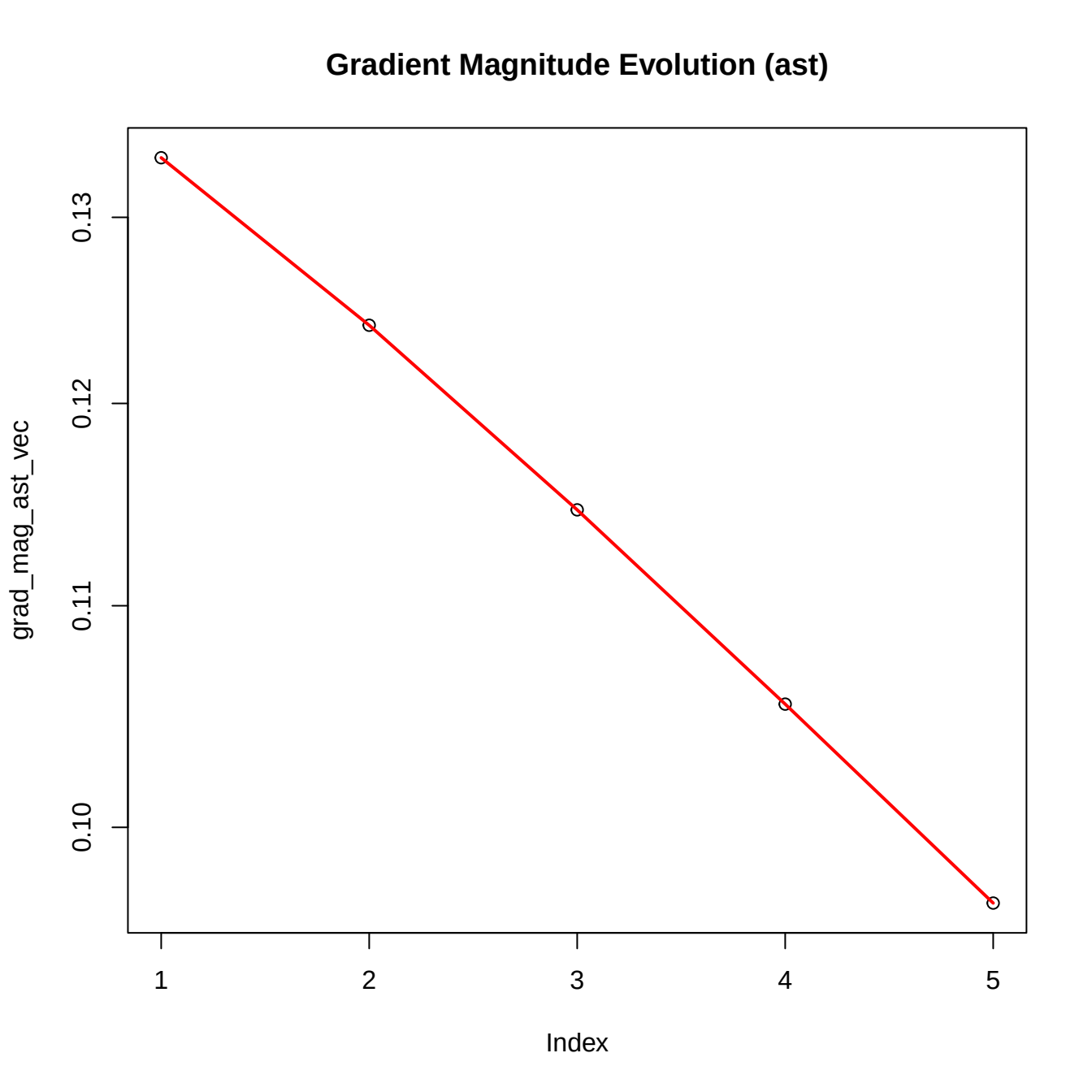
0.52
0.54
0.56
0.58
0.60
0.62
1
2
3
4
5
Index

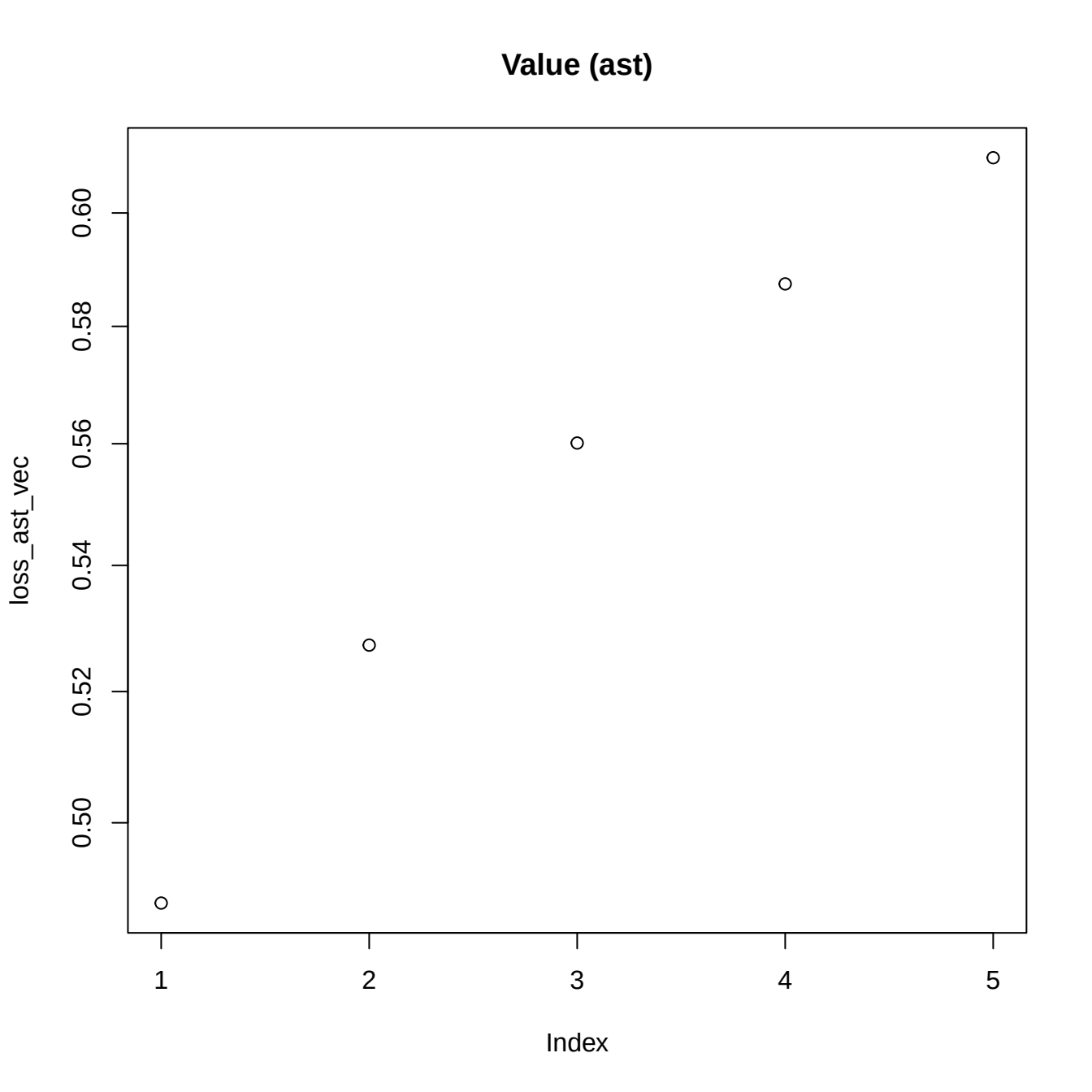

Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.10
0.11
0.12
0.13
1
2
3
4
5
Index

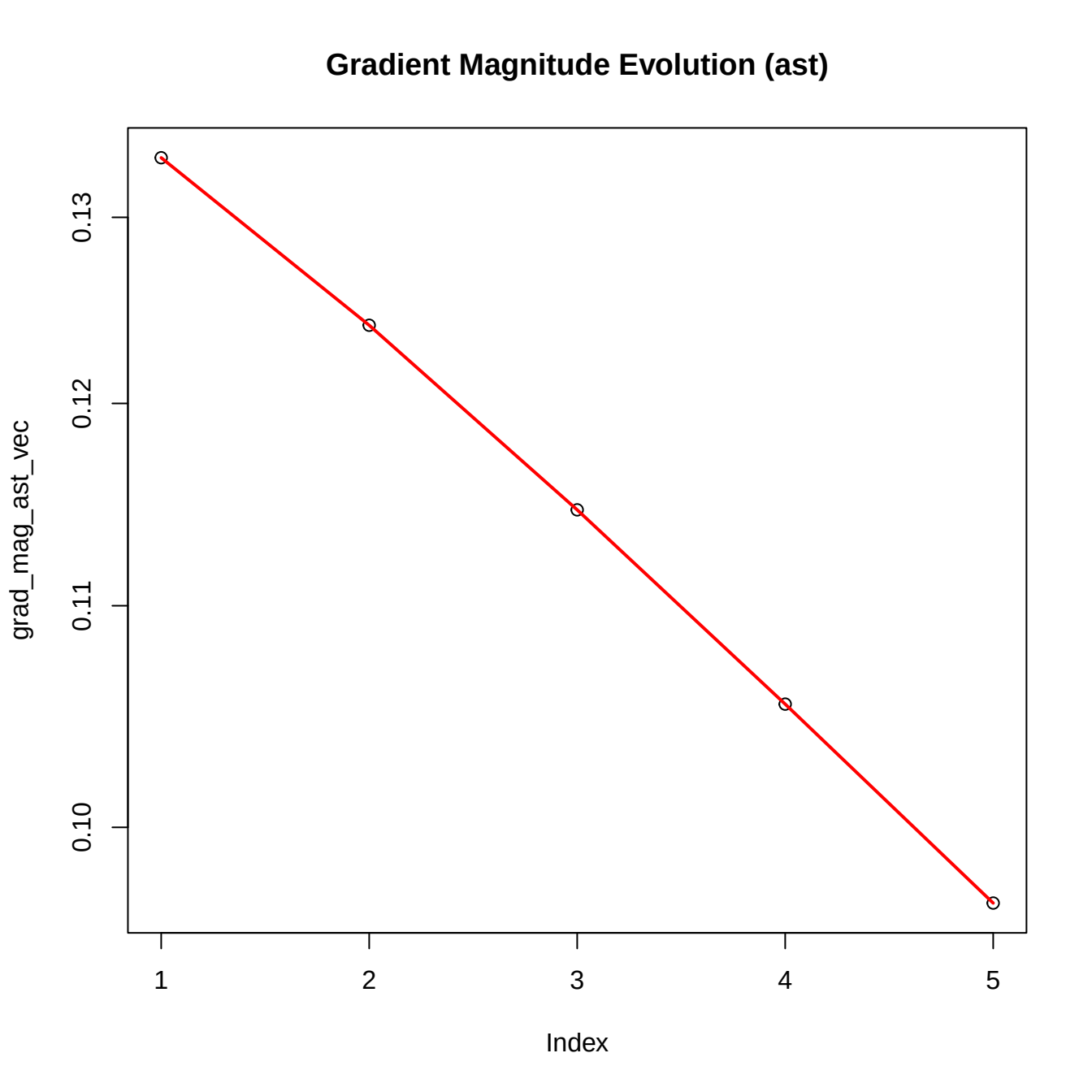

Value (ast)
loss_ast_vec
0.50
0.52
0.54
0.56
0.58
0.60
1
2
3
4
5
Index

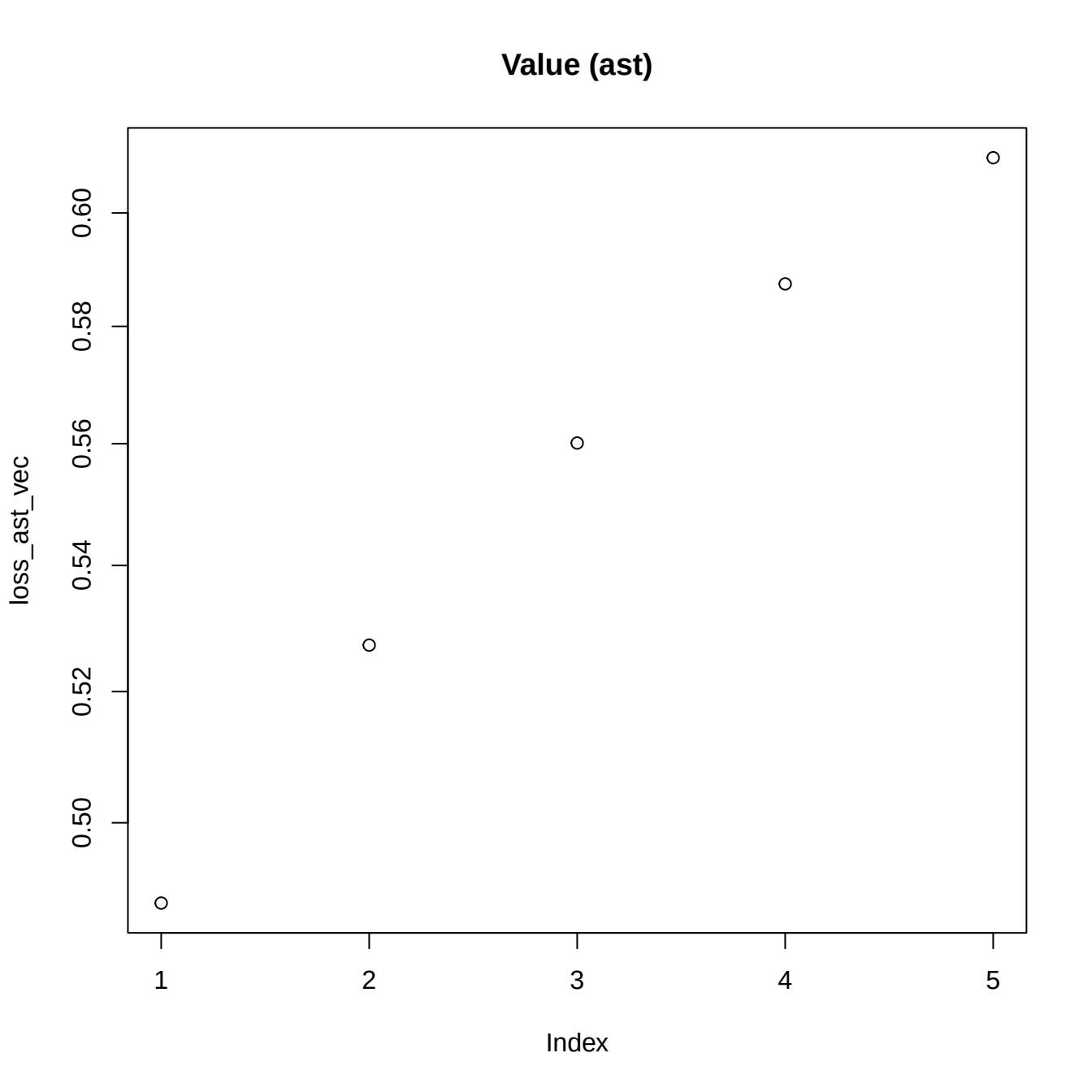

Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.10
0.11
0.12
0.13
1
2
3
4
5
Index

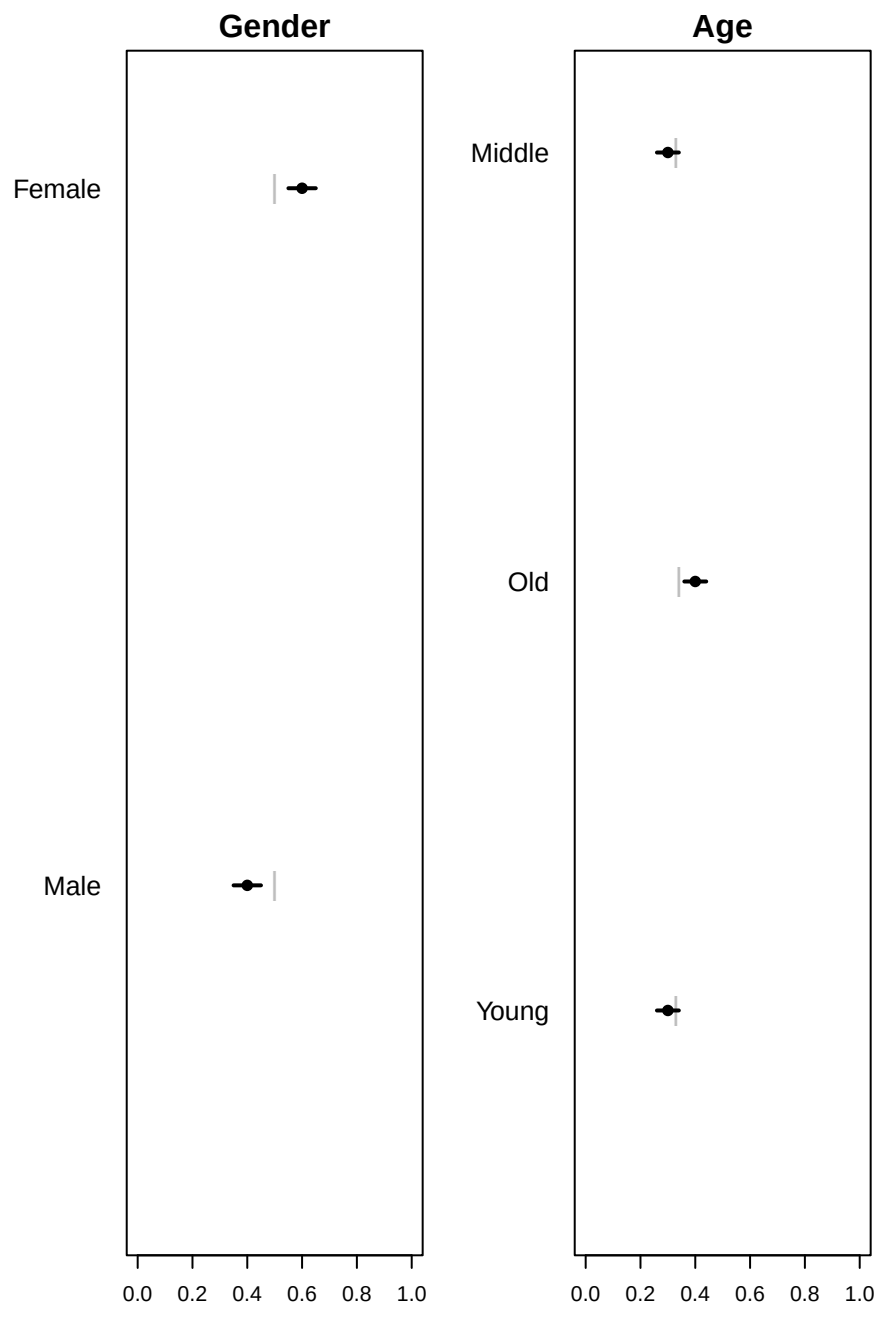

Value (ast)
loss_ast_vec
0.50
0.52
0.54
0.56
0.58
0.60
1
2
3
4
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.10
0.11
0.12
0.13
1
2
3
4
5
Index


Value (ast)
loss_ast_vec
0.50
0.52
0.54
0.56
0.58
0.60
1
2
3
4
5
Index


Gradient Magnitude Evolution (ast)
grad_mag_ast_vec
0.10
0.11
0.12
0.13
1
2
3
4
5
Index


Value (ast)
loss_ast_vec
0.50
0.52
0.54
0.56
0.58
0.60
1
2
3
4
5
Index


Gender
Female
Male
0.0
0.2
0.4
0.6
0.8
1.0
Age
Middle
Old
Young
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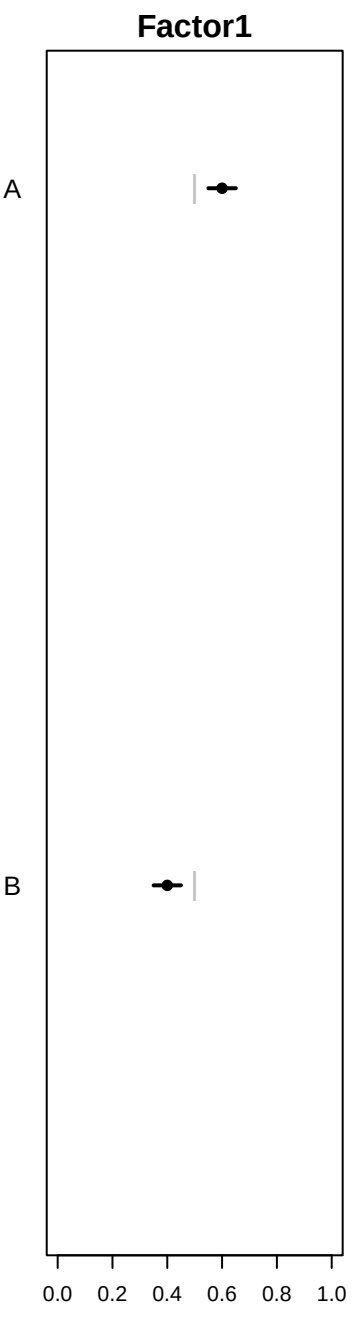
0.2
0.4
0.6
0.8
1.0


Factor1
A
B
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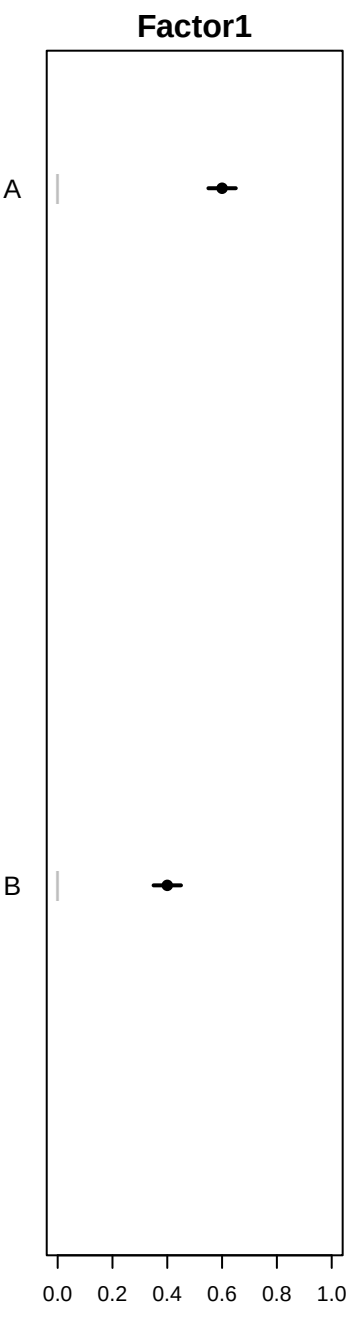
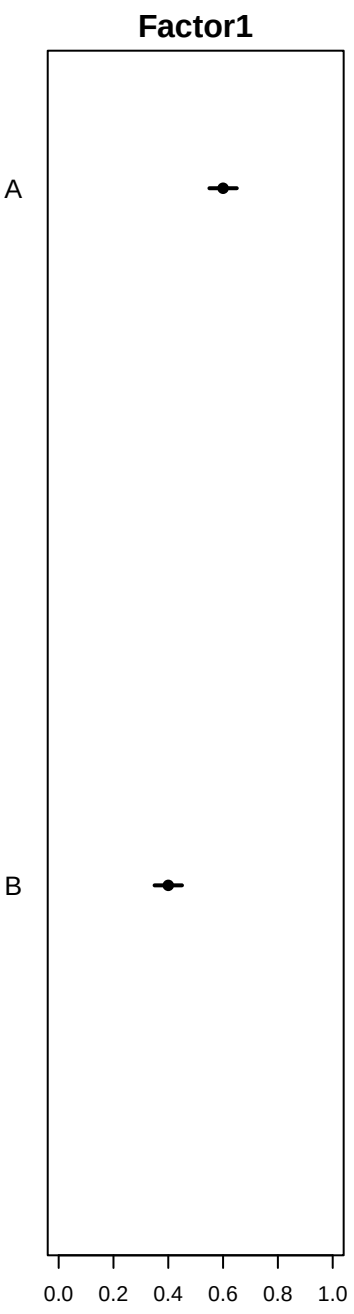
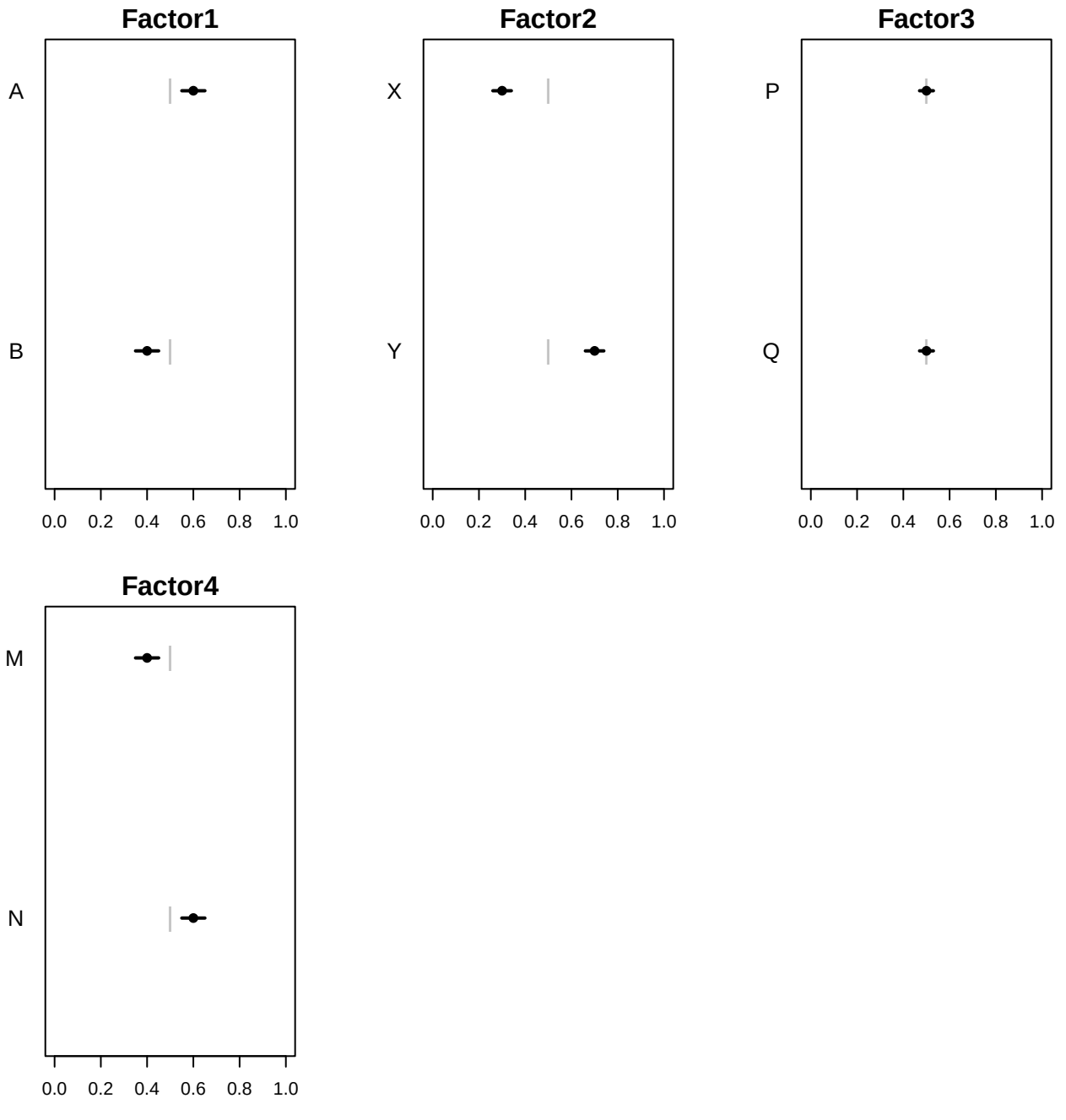
0.2
0.4
0.6
0.8
1.0


Factor1
A
B
0.0
0.2
0.4
0.6
0.8
1.0


Factor1
A
B
0.0
0.2
0.4
0.6
0.8
1.0


Factor1
A
B
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0.2
0.4
0.6
0.8
1.0
Factor2
X
Y
0.0
0.2
0.4
0.6
0.8
1.0
Factor3
P
Q
0.0
0.2
0.4
0.6
0.8
1.0
Factor4
M
N
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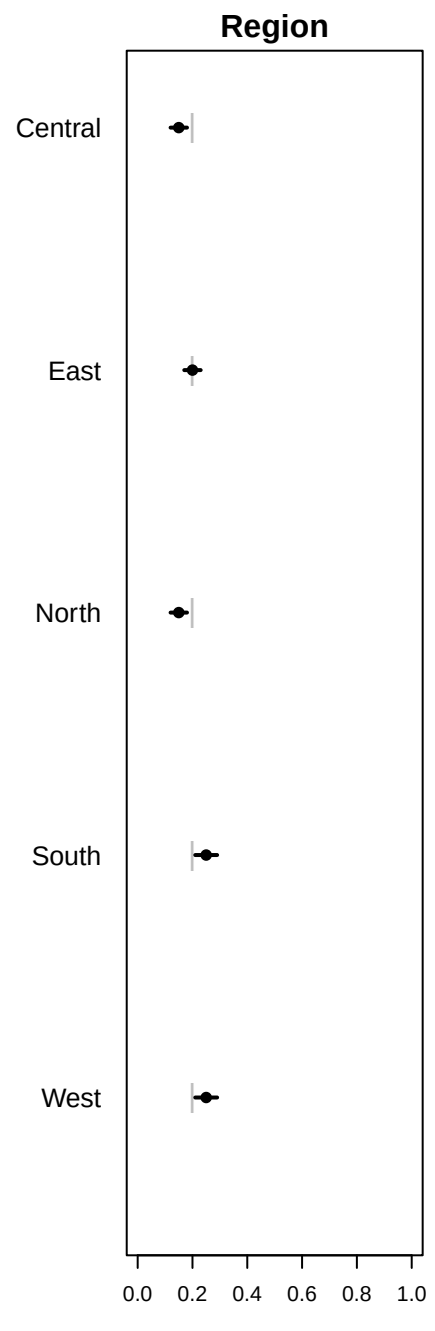
0.6
0.8
1.0


Region
Central
East
North
South
West
0.0
0.2
0.4
0.6
0.8
1.0

Gender
Female
Male
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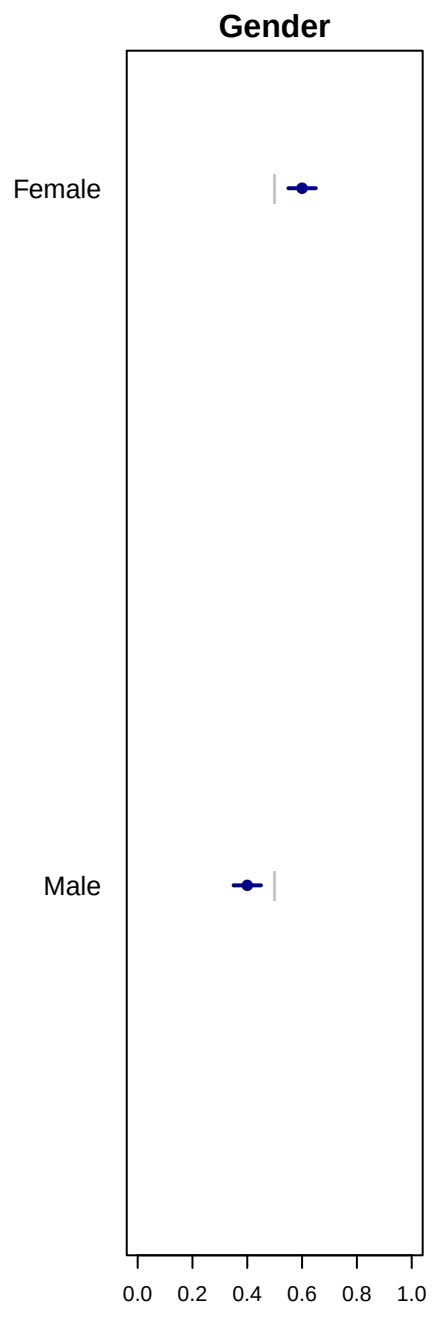
0.8
1.0


Gender
Female
Male
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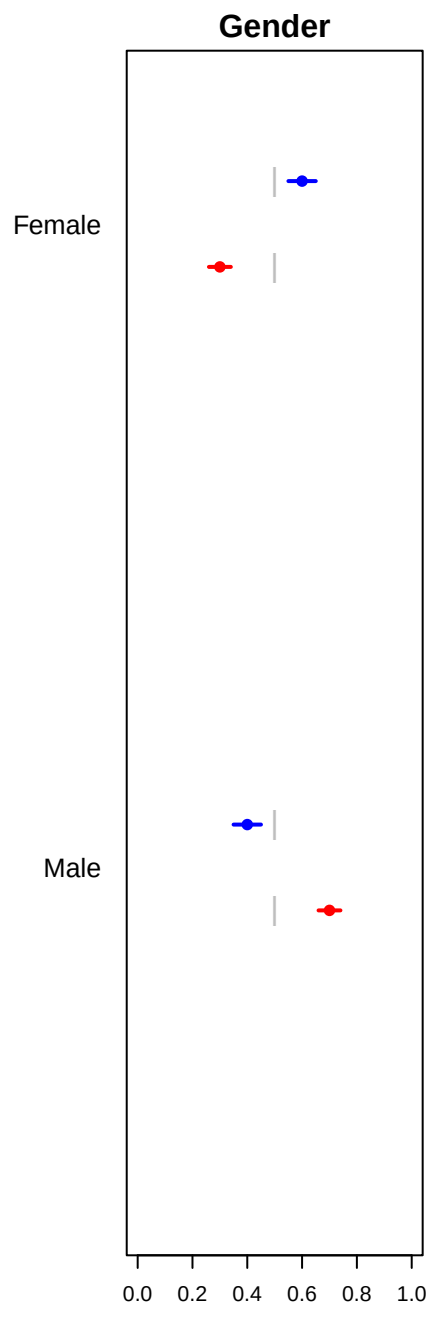
0.2
0.4
0.6
0.8
1.0


Gender
Female
Male
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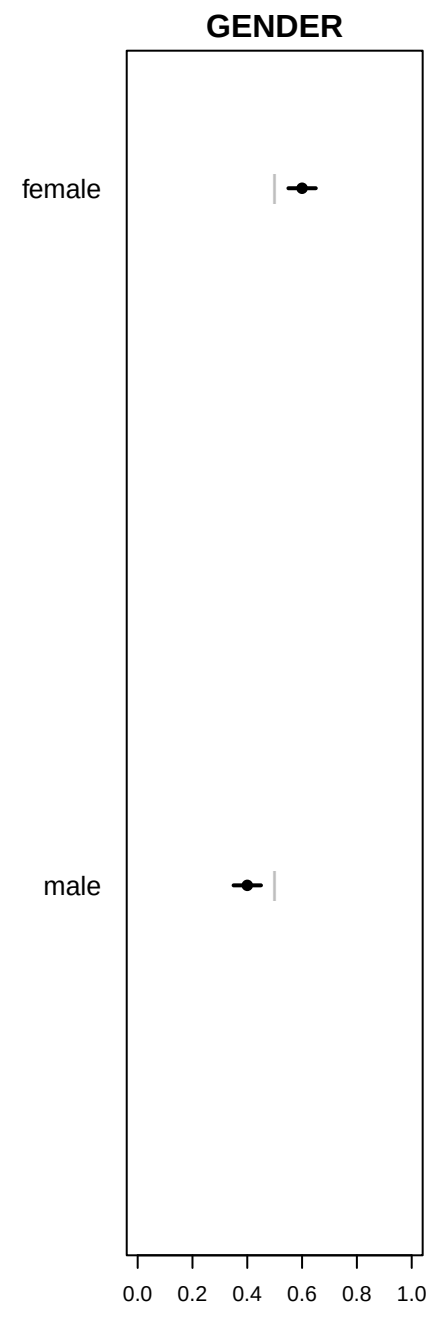
0.4
0.6
0.8
1.0


GENDER
female
male
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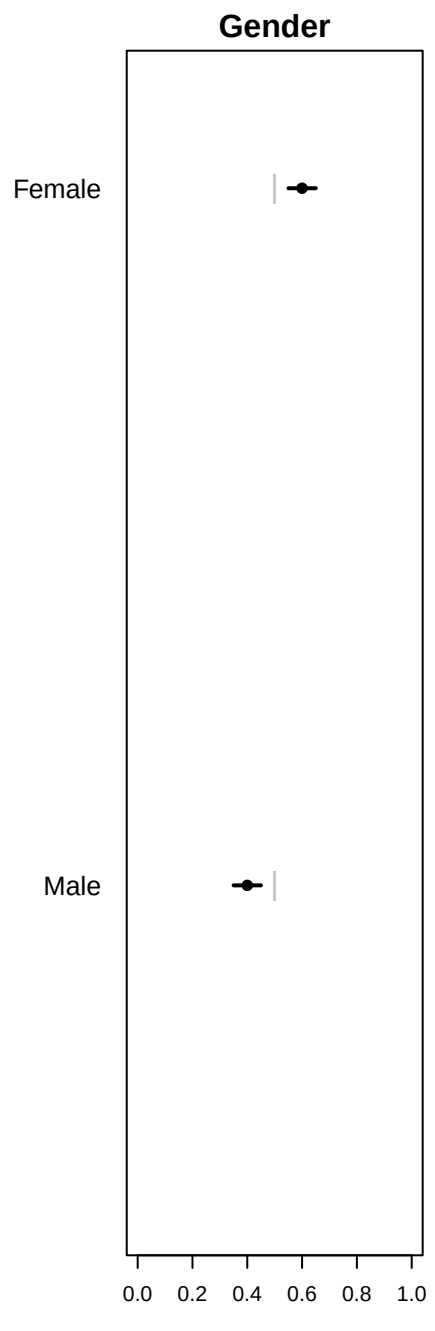
0.2
0.4
0.6
0.8
1.0


Gender
Female
Male
0.0
0.2
0.4
0.6
0.8
1.0