

CSCI 455: Lab #2 — Parallel Sum

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Parallel Sum

Program Outputs and Results

```
ubuntu@ip-172-31-43-252:~/csci455/Lab2-Parallel_Sum$ make parsum.log
mpicc -std=c99 -Wall -Wextra -g -D_GLIBCXX_DEBUG -O0 parsum.c -lm -o parsum
Platform: Linux (96 cpu cores recognized)
mpirun --use-hwthread-cpus -np 96 ./parsum given/rand_data.txt | tee parsum.log

[0/96]#72: starting
[0/96]#74: opening data file

[0/96]#96: data is read.

[0/96]#103: calling MPI_Bcast

[0/96]#110: MPI_Bcast done
I got 5192 from node 20
I got 4478 from node 22
I got 4930 from node 23
I got 5574 from node 24
I got 4137 from node 25
I got 5725 from node 26
I got 6922 from node 27
I got 4818 from node 28
I got 5582 from node 29
I got 4658 from node 30
I got 4516 from node 31
I got 5602 from node 32
I got 4426 from node 33
I got 6787 from node 34
I got 3781 from node 35
I got 6177 from node 36
I got 6271 from node 37
I got 5496 from node 38
I got 5084 from node 39

[0/96]#122: adding...
I got 4314 from node 40
I got 6828 from node 41
I got 2985 from node 42
```

Figure 1: Screenshot of the compilation and beginning of execution of the parallelized summation program, running on a 96 node cluster.

```
I got 0 from node 40
I got 0 from node 41
I got 0 from node 42
I got 0 from node 43
I got 0 from node 44
I got 0 from node 45
I got 0 from node 46
I got 0 from node 47
I got 0 from node 48
I got 0 from node 49
I got 0 from node 50
I got 0 from node 51
I got 0 from node 52
I got 0 from node 53
I got 0 from node 54
I got 0 from node 55
I got 0 from node 56
I got 0 from node 57
I got 0 from node 58
I got 0 from node 59

[0/96]#122: adding...

[0/96]#129: calling reduce...
The sum is 203.
ubuntu@ip-172-31-43-252:~/csci455/Lab2-Parallel_Sum$
```

Figure 2: The final output of the above execution. The calculated sum is 203.

The Complete Execution Output (parsum.log)

```
ubuntu@ip-172-31-43-252:~/csci455/Lab2-Parallel_Sum$ make parsum.log
Platform: Linux (96 cpu cores recognized)
mpirun --use-hwthread-cpus -np 96 ./parsum given/rand_data.txt | tee parsum.log

[0/96]#72: starting
[0/96]#74: opening data file

[0/96]#96: data is read.

[0/96]#103: calling MPI_Bcast

[0/96]#110: MPI_Bcast done
I got 5015 from node 16
I got 3971 from node 17
```

I got 6514 from node 18
I got 4036 from node 19
I got 5192 from node 20
I got 3990 from node 21
I got 4478 from node 22
I got 4930 from node 23
I got 5574 from node 24
I got 4137 from node 25
I got 5725 from node 26
I got 6922 from node 27
I got 4818 from node 28
I got 5582 from node 29
I got 4658 from node 30
I got 4516 from node 31
I got 5602 from node 32
I got 4426 from node 33
I got 6787 from node 34
I got 3781 from node 35
I got 6177 from node 36
I got 6271 from node 37
I got 5496 from node 38
I got 5084 from node 39
I got 4314 from node 40
I got 6828 from node 41
I got 2985 from node 42
I got 5293 from node 43
I got 5318 from node 44
I got 5026 from node 45
I got 5203 from node 46
I got 5142 from node 47
I got 4101 from node 48
I got 3558 from node 49
I got 6118 from node 50
I got 5986 from node 51
I got 4991 from node 52
I got 5377 from node 53
I got 5206 from node 54
I got 5650 from node 55
I got 5349 from node 56
I got 4103 from node 57
I got 5445 from node 58
I got 5600 from node 59
I got 4539 from node 60
I got 5766 from node 61
I got 7699 from node 62
I got 6173 from node 63

```
I got 4416 from node 64
I got 5919 from node 65
I got 5819 from node 66
I got 5046 from node 67
I got 4893 from node 68
I got 4546 from node 69
I got 6314 from node 70
I got 6678 from node 71
I got 4672 from node 72
I got 6735 from node 73
I got 5912 from node 74
I got 5989 from node 75
I got 3735 from node 76
I got 4613 from node 77
```

```
[0/96]#122: adding...
```

```
I got 5906 from node 78
I got 4906 from node 79
I got 5719 from node 80
I got 6482 from node 81
I got 5560 from node 82
I got 5073 from node 83
I got 5732 from node 84
I got 4638 from node 85
I got 4481 from node 86
I got 3415 from node 87
I got 5713 from node 88
I got 3853 from node 89
I got 5536 from node 90
I got 0 from node 91
I got 0 from node 92
I got 0 from node 93
I got 0 from node 94
I got 0 from node 95
I got 5294 from node 0
I got 4185 from node 1
I got 4983 from node 2
I got 5185 from node 3
I got 4002 from node 4
I got 5069 from node 5
I got 7026 from node 6
I got 6433 from node 7
I got 5194 from node 8
I got 4729 from node 9
I got 4513 from node 10
I got 4612 from node 11
```

```
I got 5187 from node 12
I got 6316 from node 13
I got 5564 from node 14
I got 5754 from node 15
```

```
[0/96]#129: calling reduce...
The sum is 475799.
```

```
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
I got 3883 from node 2
I got 4347 from node 3
I got 5002 from node 4
I got 6147 from node 5
I got 6394 from node 6
I got 5668 from node 7
I got 5862 from node 8
I got 6875 from node 9
I got 6250 from node 10
I got 5574 from node 11
I got 4740 from node 12
I got 7545 from node 13
I got 5792 from node 14
I got 0 from node 95
I got 5169 from node 16
I got 5525 from node 17
I got 6465 from node 18
I got 3637 from node 19
I got 5502 from node 20
I got 5384 from node 21
I got 7224 from node 22
I got 4968 from node 23
I got 3855 from node 24
I got 3830 from node 25
I got 6015 from node 26
I got 6126 from node 27
I got 5477 from node 28
I got 6341 from node 29
I got 6195 from node 30
I got 5846 from node 31
I got 4685 from node 32
I got 6453 from node 33
I got 7244 from node 34
```

```
I got 5386 from node 35
I got 4929 from node 36
I got 4167 from node 37
I got 4590 from node 38
I got 6253 from node 39
I got 6107 from node 40
I got 4437 from node 41
I got 3930 from node 42
I got 5967 from node 43
I got 4704 from node 44
I got 6214 from node 45
I got 4833 from node 46
I got 5508 from node 47
I got 6837 from node 48
I got 6023 from node 49
I got 6030 from node 50
I got 4740 from node 51
I got 5867 from node 52
I got 6529 from node 53
I got 5185 from node 54
I got 5508 from node 55
I got 5553 from node 56
I got 6074 from node 57
I got 5527 from node 58
I got 6589 from node 59
I got 4472 from node 60
I got 4624 from node 61
I got 6164 from node 62
I got 5275 from node 63
I got 4709 from node 64
I got 4146 from node 65
I got 4425 from node 66
I got 3758 from node 67
I got 5440 from node 68
I got 5830 from node 69
I got 4088 from node 70
I got 4081 from node 71
I got 5503 from node 72
I got 6161 from node 73
```

```
[0/96]#122: adding...
```

```
I got 4829 from node 74
I got 4819 from node 75
I got 6568 from node 76
I got 5297 from node 77
I got 6733 from node 78
```

```
I got 4258 from node 79
I got 4942 from node 80
I got 6717 from node 81
I got 6206 from node 82
I got 4263 from node 83
I got 5675 from node 84
I got 6622 from node 85
I got 6144 from node 86
I got 7572 from node 87
I got 7028 from node 88
I got 6033 from node 89
I got 4504 from node 90
I got 0 from node 91
I got 0 from node 92
I got 0 from node 93
I got 0 from node 94
I got 4984 from node 15
I got 4405 from node 0
I got 5427 from node 1
```

```
[0/96]#129: calling reduce...
The sum is 499209.
```

```
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
I got 0 from node 94
I got 6264 from node 2
I got 6663 from node 3
I got 5562 from node 4
I got 4374 from node 5
I got 5199 from node 6
I got 6099 from node 7
I got 4997 from node 8
I got 6771 from node 9
I got 3750 from node 10
I got 5328 from node 11
I got 5482 from node 12
I got 5957 from node 13
I got 6000 from node 14
I got 0 from node 95
I got 6857 from node 16
I got 4650 from node 17
I got 5694 from node 18
```


I got 4447 from node 19
I got 6192 from node 20
I got 5767 from node 21
I got 4811 from node 22
I got 5669 from node 23
I got 6190 from node 24
I got 5886 from node 25
I got 5533 from node 26
I got 6020 from node 27
I got 5842 from node 28
I got 4452 from node 29
I got 5493 from node 30
I got 5052 from node 31
I got 6437 from node 32
I got 6709 from node 33
I got 4588 from node 34
I got 5111 from node 35
I got 6549 from node 36
I got 4789 from node 37
I got 6260 from node 38
I got 4907 from node 39
I got 7050 from node 40
I got 3975 from node 41
I got 4543 from node 42
I got 7692 from node 43
I got 5779 from node 44
I got 4556 from node 45
I got 5741 from node 46
I got 5700 from node 47
I got 5948 from node 48
I got 5313 from node 49
I got 6072 from node 50
I got 6112 from node 51
I got 4865 from node 52
I got 6014 from node 53
I got 6138 from node 54
I got 8244 from node 55
I got 5100 from node 56
I got 6966 from node 57
I got 4544 from node 58
I got 5180 from node 59
I got 4647 from node 60
I got 6046 from node 61
I got 4521 from node 62
I got 6584 from node 63
I got 5219 from node 64

```
I got 7205 from node 65
I got 5896 from node 66
I got 4875 from node 67
I got 7225 from node 68
I got 4895 from node 69
I got 6247 from node 70
I got 6538 from node 71
```

```
[0/96]#122: adding...
```

```
I got 6575 from node 72
I got 5395 from node 73
I got 4602 from node 74
I got 5707 from node 75
I got 5849 from node 76
I got 7526 from node 77
I got 4499 from node 78
I got 5852 from node 79
I got 5963 from node 80
I got 4672 from node 81
I got 4785 from node 82
I got 5659 from node 83
I got 5927 from node 84
I got 5640 from node 85
I got 5961 from node 86
I got 4960 from node 87
I got 6763 from node 88
I got 6266 from node 89
I got 4477 from node 90
I got 0 from node 91
I got 0 from node 92
I got 0 from node 93
I got 4056 from node 1
I got 5350 from node 15
I got 5869 from node 0
```

```
[0/96]#129: calling reduce...
The sum is 514134.
```

```
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
I got 4129 from node 1
I got 6345 from node 15
I got 0 from node 93
```

```
I got 0 from node 94
I got 5677 from node 2
I got 6343 from node 3
I got 5509 from node 4
I got 5533 from node 5
I got 6631 from node 6
I got 6872 from node 7
I got 5616 from node 8
I got 6078 from node 9
I got 7027 from node 10
I got 6476 from node 11
I got 6031 from node 12
I got 5548 from node 13
I got 5484 from node 14
I got 0 from node 95
I got 5070 from node 16
I got 7658 from node 17
I got 4696 from node 18
I got 6469 from node 19
I got 6009 from node 20
I got 5551 from node 21
I got 6577 from node 22
I got 5574 from node 23
I got 7322 from node 24
I got 6661 from node 25
I got 4094 from node 26
I got 6379 from node 27
I got 4996 from node 28
I got 5359 from node 29
I got 5713 from node 30
I got 5782 from node 31
I got 4998 from node 32
I got 4397 from node 33
I got 5693 from node 34
I got 5270 from node 35
I got 5537 from node 36
I got 4575 from node 37
I got 6183 from node 38
I got 6238 from node 39
I got 5181 from node 40
I got 6636 from node 41
I got 5388 from node 42
I got 6435 from node 43
I got 6420 from node 44
I got 4836 from node 45
I got 5672 from node 46
```

```
I got 5282 from node 47
I got 6777 from node 48
I got 6163 from node 49
I got 5970 from node 50
I got 4233 from node 51
I got 5071 from node 52
I got 5680 from node 53
I got 6297 from node 54
I got 3965 from node 55
I got 4919 from node 56
I got 5954 from node 57
I got 4746 from node 58
```

```
[0/96]#122: adding...
```

```
I got 5542 from node 59
I got 6059 from node 60
I got 6041 from node 61
I got 5791 from node 62
I got 5335 from node 63
I got 4588 from node 64
I got 6000 from node 65
I got 5253 from node 66
I got 5867 from node 67
I got 5741 from node 68
I got 6383 from node 69
I got 4775 from node 70
I got 5342 from node 71
I got 4269 from node 72
I got 4724 from node 73
I got 7126 from node 74
I got 5044 from node 75
I got 6018 from node 76
I got 6425 from node 77
I got 4202 from node 78
I got 5355 from node 79
I got 5805 from node 80
I got 6056 from node 81
I got 6071 from node 82
I got 4581 from node 83
I got 6220 from node 84
I got 6529 from node 85
I got 5875 from node 86
I got 5329 from node 87
I got 6340 from node 88
I got 7105 from node 89
I got 4608 from node 90
```

```
I got 0 from node 91
I got 0 from node 92
I got 7621 from node 0
```

```
[0/96]#129: calling reduce...
The sum is 519745.
```

```
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
I got 0 from node 92
I got 5064 from node 1
I got 7563 from node 15
I got 0 from node 93
I got 0 from node 94
I got 5798 from node 2
I got 6250 from node 3
I got 4772 from node 4
I got 5164 from node 5
I got 4033 from node 6
I got 5951 from node 7
I got 4960 from node 8
I got 4003 from node 9
I got 5840 from node 10
I got 5745 from node 11
I got 4629 from node 12
I got 6551 from node 13
I got 5874 from node 14
I got 0 from node 95
I got 4600 from node 16
I got 6205 from node 17
I got 6417 from node 18
I got 5914 from node 19
I got 5957 from node 20
I got 6519 from node 21
I got 4468 from node 22
I got 5211 from node 23
I got 4492 from node 24
I got 4299 from node 25
I got 5826 from node 26
I got 6906 from node 27
I got 5041 from node 28
I got 5608 from node 29
I got 6066 from node 30
```

```
I got 5190 from node 31
I got 4818 from node 32
I got 4553 from node 33
I got 5734 from node 34
I got 5440 from node 35
I got 6301 from node 36
I got 7435 from node 37
I got 4622 from node 38
I got 6110 from node 39
I got 3823 from node 40
I got 6147 from node 41
I got 6413 from node 42
I got 5398 from node 43
I got 6419 from node 44
I got 7309 from node 45
I got 5613 from node 46
I got 5253 from node 47
I got 5016 from node 48
I got 6135 from node 49
I got 5074 from node 50
I got 4055 from node 51
I got 4611 from node 52
I got 6469 from node 53
I got 6932 from node 54
I got 5635 from node 55
I got 5477 from node 56
I got 4979 from node 57
I got 6368 from node 58
I got 4889 from node 59
I got 4011 from node 60
```

```
[0/96]#122: adding...
```

```
I got 4968 from node 61
I got 5948 from node 62
I got 5644 from node 63
I got 5327 from node 64
I got 5759 from node 65
I got 5983 from node 66
I got 5077 from node 67
I got 7175 from node 68
I got 5164 from node 69
I got 7663 from node 70
I got 5323 from node 71
I got 5285 from node 72
I got 4958 from node 73
I got 3377 from node 74
```

```
I got 6566 from node 75
I got 6726 from node 76
I got 4846 from node 77
I got 7014 from node 78
I got 5264 from node 79
I got 6378 from node 80
I got 4910 from node 81
I got 5629 from node 82
I got 5789 from node 83
I got 5116 from node 84
I got 4969 from node 85
I got 3284 from node 86
I got 5146 from node 87
I got 5768 from node 88
I got 5848 from node 89
I got 5731 from node 90
I got 0 from node 91
I got 5365 from node 0
```

```
[0/96]#129: calling reduce...
The sum is 503955.
```

```
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
I got 0 from node 91
I got 0 from node 92
I got 5479 from node 1
I got 6052 from node 15
I got 0 from node 93
I got 0 from node 94
I got 7468 from node 2
I got 5231 from node 3
I got 7283 from node 4
I got 6577 from node 5
I got 4902 from node 6
I got 4108 from node 7
I got 5821 from node 8
I got 7521 from node 9
I got 6594 from node 10
I got 3674 from node 11
I got 4901 from node 12
I got 4847 from node 13
I got 6976 from node 14
```

```
I got 0 from node 95
I got 4242 from node 16
I got 4897 from node 17
I got 5058 from node 18
I got 7277 from node 19
I got 4936 from node 20
I got 3595 from node 21
I got 4799 from node 22
I got 5851 from node 23
I got 4502 from node 24
I got 5709 from node 25
I got 4840 from node 26
I got 3677 from node 27
I got 5611 from node 28
I got 6022 from node 29
I got 5405 from node 30
I got 5101 from node 31
I got 5620 from node 32
I got 5414 from node 33
I got 4729 from node 34
I got 4274 from node 35
I got 4535 from node 36
I got 5310 from node 37
I got 5906 from node 38
I got 6561 from node 39
I got 5382 from node 40
I got 5483 from node 41
I got 5401 from node 42
I got 5203 from node 43
I got 6743 from node 44
I got 4622 from node 45
I got 6170 from node 46
I got 3949 from node 47
I got 5407 from node 48
I got 5728 from node 49
I got 7666 from node 50
I got 5914 from node 51
I got 6815 from node 52
I got 4713 from node 53
I got 6597 from node 54
```

```
[0/96]#122: adding...
I got 6327 from node 55
I got 5360 from node 56
I got 4229 from node 57
I got 5807 from node 58
```



```
I got 7408 from node 59
I got 7142 from node 60
I got 5182 from node 61
I got 6047 from node 62
I got 5134 from node 63
I got 6268 from node 64
I got 5890 from node 65
I got 6084 from node 66
I got 5045 from node 67
I got 5306 from node 68
I got 5355 from node 69
I got 3884 from node 70
I got 3847 from node 71
I got 4966 from node 72
I got 5629 from node 73
I got 6318 from node 74
I got 4040 from node 75
I got 7604 from node 76
I got 4753 from node 77
I got 6139 from node 78
I got 6248 from node 79
I got 4680 from node 80
I got 5182 from node 81
I got 6636 from node 82
I got 4532 from node 83
I got 4684 from node 84
I got 4244 from node 85
I got 5801 from node 86
I got 3329 from node 87
I got 3723 from node 88
I got 5534 from node 89
I got 6420 from node 90
I got 6037 from node 0
```

```
[0/96]#129: calling reduce...
The sum is 497912.
```

```
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
I got 6340 from node 15
I got 0 from node 93
I got 0 from node 94
I got 4876 from node 2
```

```
I got 6040 from node 3
I got 4988 from node 4
I got 6532 from node 5
I got 5986 from node 6
I got 4564 from node 7
I got 4991 from node 8
I got 4211 from node 9
I got 4393 from node 10
I got 6931 from node 11
I got 6746 from node 12
I got 6014 from node 13
I got 6787 from node 14
I got 0 from node 95
I got 5111 from node 16
I got 3508 from node 17
I got 5003 from node 18
I got 6022 from node 19
I got 5513 from node 20
I got 3271 from node 21
I got 6095 from node 22
I got 5900 from node 23
I got 3950 from node 24
I got 4141 from node 25
I got 5044 from node 26
I got 6201 from node 27
I got 5508 from node 28
I got 6475 from node 29
I got 5972 from node 30
I got 6717 from node 31
I got 6490 from node 32
I got 6371 from node 33
I got 5209 from node 34
I got 5961 from node 35
I got 4752 from node 36
I got 5308 from node 37
I got 6042 from node 38
I got 4936 from node 39
I got 6323 from node 40
I got 4206 from node 41
I got 5506 from node 42
I got 6708 from node 43
I got 4941 from node 44
I got 6342 from node 45
I got 6039 from node 46
I got 3535 from node 47
I got 4571 from node 48
```

```
I got 5096 from node 49
I got 5375 from node 50
I got 5738 from node 51
I got 3469 from node 52
```

```
[0/96]#122: adding...
```

```
I got 6032 from node 53
I got 6479 from node 54
I got 6088 from node 55
I got 4985 from node 56
I got 5223 from node 57
I got 5915 from node 58
I got 4829 from node 59
I got 6561 from node 60
I got 3340 from node 61
I got 4446 from node 62
I got 5182 from node 63
I got 6140 from node 64
I got 6448 from node 65
I got 5240 from node 66
I got 4445 from node 67
I got 3524 from node 68
I got 5974 from node 69
I got 5515 from node 70
I got 4443 from node 71
I got 5753 from node 72
I got 3858 from node 73
I got 4961 from node 74
I got 6585 from node 75
I got 6157 from node 76
I got 4270 from node 77
I got 6793 from node 78
I got 8176 from node 79
I got 6133 from node 80
I got 6965 from node 81
I got 6783 from node 82
I got 5253 from node 83
I got 5245 from node 84
I got 4674 from node 85
I got 4087 from node 86
I got 5654 from node 87
I got 4757 from node 88
I got 6508 from node 89
I got 6377 from node 0
I got 5331 from node 90
I got 0 from node 91
```

```
I got 0 from node 92
I got 6673 from node 1
```

```
[0/96]#129: calling reduce...
The sum is 498550.
```

```
[0/96]#96: data is read.
I got 4724 from node 1
I got 7204 from node 1
I got 6533 from node 1
I got 4954 from node 1
I got 5118 from node 1
I got 5324 from node 1
I got 6351 from node 1
I got 5943 from node 1
I got 6896 from node 1
I got 6792 from node 1
I got 6336 from node 1
I got 7335 from node 1
I got 4295 from node 1
I got 5637 from node 1
I got 6558 from node 1
I got 4492 from node 1
I got 6207 from node 1
I got 4543 from node 1
I got 4738 from node 1
I got 5420 from node 1
I got 6188 from node 1
I got 4851 from node 1
I got 6260 from node 1
I got 5791 from node 1
I got 5445 from node 1
I got 5555 from node 1
I got 4154 from node 1
I got 5931 from node 1
I got 3838 from node 1
I got 6309 from node 1
I got 5112 from node 1
I got 5816 from node 1
I got 4887 from node 1
I got 4422 from node 1
I got 5484 from node 1
I got 4084 from node 1
I got 6769 from node 1
I got 5859 from node 1
I got 5275 from node 1
```

```
I got 6029 from node 1
I got 4319 from node 1
I got 5241 from node 1
I got 4144 from node 1
I got 5606 from node 1
I got 4642 from node 0
The sum is 504515.
I got 4439 from node 0
The sum is 501560.
I got 5679 from node 0
The sum is 491379.
I got 4650 from node 0
The sum is 506170.
I got 4257 from node 0
The sum is 507408.
I got 6307 from node 0
The sum is 498213.
I got 5000 from node 0
The sum is 480421.
I got 5506 from node 0
The sum is 481882.
I got 6654 from node 0
The sum is 498329.
I got 6792 from node 0
The sum is 513966.
I got 4718 from node 0
The sum is 488042.
I got 5774 from node 0
The sum is 518716.
I got 6059 from node 0
The sum is 513475.
I got 5750 from node 0
The sum is 504967.
I got 3561 from node 0
The sum is 502550.
I got 5329 from node 0
The sum is 509021.
I got 6723 from node 0
The sum is 495215.
I got 5065 from node 0
The sum is 484714.
I got 6302 from node 0
The sum is 503452.
I got 6073 from node 0
The sum is 510384.
I got 5929 from node 0
```

```
The sum is 503197.  
I got 4656 from node 0  
The sum is 499909.  
I got 7739 from node 0  
The sum is 506507.  
I got 4935 from node 0  
The sum is 496669.  
I got 5992 from node 0  
The sum is 497364.  
I got 5472 from node 0  
The sum is 489541.  
I got 3704 from node 0  
The sum is 485775.  
I got 4886 from node 0  
The sum is 498934.  
I got 6264 from node 0  
The sum is 502806.  
I got 5489 from node 0  
The sum is 500786.  
I got 4062 from node 0  
The sum is 512491.  
I got 6914 from node 0  
The sum is 506517.  
I got 6118 from node 0  
The sum is 490950.  
I got 3724 from node 0  
The sum is 495122.  
I got 4703 from node 0  
The sum is 500233.  
I got 6050 from node 0  
The sum is 501042.  
I got 6967 from node 0  
The sum is 522449.  
I got 5213 from node 0  
The sum is 500250.  
I got 4557 from node 0  
The sum is 496741.  
I got 6351 from node 0  
The sum is 500302.  
I got 5251 from node 0  
The sum is 498211.  
I got 4032 from node 0  
The sum is 490171.  
I got 5573 from node 0  
The sum is 504031.  
I got 6904 from node 0
```

```
The sum is 488397.  
I got 5759 from node 90  
I got 5460 from node 90  
I got 3723 from node 90  
I got 5694 from node 90  
I got 3931 from node 90  
I got 6245 from node 90  
I got 4764 from node 90  
I got 5233 from node 90  
I got 5623 from node 90  
I got 5915 from node 90  
I got 5189 from node 90  
I got 4939 from node 90  
I got 5651 from node 90  
I got 5609 from node 90  
I got 3973 from node 90  
I got 4109 from node 90  
I got 4139 from node 90  
I got 5778 from node 90  
I got 5399 from node 90  
I got 6348 from node 90  
I got 5523 from node 90  
I got 5195 from node 90  
I got 4058 from node 90  
I got 4584 from node 90  
I got 4561 from node 90  
I got 3932 from node 90  
I got 4860 from node 90  
I got 5048 from node 90  
I got 3306 from node 90  
I got 6384 from node 90  
I got 4022 from node 90  
I got 5287 from node 90  
I got 6139 from node 90  
I got 4254 from node 90  
I got 6074 from node 90  
I got 3165 from node 90  
I got 4750 from node 90  
I got 5555 from node 90  
I got 4865 from node 90  
I got 5850 from node 90  
I got 4134 from node 90  
I got 5620 from node 90  
I got 4549 from node 90  
I got 4829 from node 90  
I got 0 from node 91
```



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I got 5209 from node 89
I got 6455 from node 89
I got 5402 from node 89
I got 5324 from node 89
I got 7176 from node 89
I got 6056 from node 89
I got 5311 from node 89
I got 8245 from node 89
I got 6494 from node 89
I got 6964 from node 89
I got 6459 from node 89
I got 3887 from node 89
I got 4107 from node 89
I got 4413 from node 89
I got 7621 from node 89
I got 6797 from node 89
I got 5610 from node 89
I got 6284 from node 89
I got 6218 from node 89
I got 5202 from node 89
I got 6260 from node 89
I got 6123 from node 89
I got 5338 from node 89
I got 5966 from node 89
I got 5965 from node 89
I got 5132 from node 89
I got 5709 from node 89
I got 5620 from node 89
I got 6296 from node 89
I got 5165 from node 89
I got 4738 from node 89
I got 6345 from node 89
I got 6471 from node 89
I got 6729 from node 89
I got 5469 from node 89
I got 4984 from node 89
I got 4372 from node 89
I got 5002 from node 89
I got 5611 from node 89
I got 6055 from node 15
I got 5180 from node 15
I got 5929 from node 15
I got 5262 from node 15
I got 6000 from node 15
I got 4579 from node 15
I got 6450 from node 15
```

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I got 6052 from node 15
I got 5469 from node 15
I got 5659 from node 15
I got 5356 from node 15
I got 7556 from node 15
I got 5655 from node 15
I got 6210 from node 15
I got 5289 from node 15
I got 4518 from node 15
I got 5665 from node 15
I got 4934 from node 15
I got 4810 from node 15
I got 3591 from node 15
I got 4499 from node 15
I got 5436 from node 15
I got 5372 from node 15
I got 4339 from node 15
I got 7067 from node 15
I got 5233 from node 15
I got 6342 from node 15
I got 8231 from node 15
I got 5195 from node 15
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I got 3991 from node 15
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I got 4299 from node 15
I got 4501 from node 15
I got 6832 from node 15
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I got 4950 from node 15
I got 5011 from node 15
I got 4688 from node 15
I got 5368 from node 15
I got 5334 from node 15
I got 5262 from node 15
I got 0 from node 93
I got 0 from node 93
I got 0 from node 93
I got 0 from node 93
I got 0 from node 93
I got 0 from node 93
I got 0 from node 93
I got 0 from node 93
I got 0 from node 93
```



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I got 4809 from node 2
I got 6363 from node 2
I got 6800 from node 2
I got 6231 from node 2
I got 3646 from node 2
I got 5472 from node 2
I got 4249 from node 2
I got 4432 from node 2
I got 5312 from node 2
I got 4072 from node 2
I got 4960 from node 2
I got 4590 from node 2
I got 5368 from node 2
I got 5043 from node 2
I got 5383 from node 2
I got 5980 from node 2
I got 5158 from node 2
I got 6053 from node 2
I got 4762 from node 2
I got 5657 from node 2
I got 5813 from node 2
I got 4548 from node 2
I got 6106 from node 2
I got 6463 from node 2
I got 4237 from node 2
I got 5753 from node 2
I got 5216 from node 2
I got 6011 from node 2
I got 6119 from node 2
I got 6682 from node 2
I got 3675 from node 2
I got 5913 from node 3
I got 5762 from node 3
I got 4993 from node 3
I got 4937 from node 3
I got 3926 from node 3
I got 5977 from node 3
I got 4119 from node 3
I got 4321 from node 3
I got 5073 from node 3
I got 4563 from node 3
I got 4501 from node 3
I got 5563 from node 3
I got 5452 from node 3
I got 6591 from node 3
I got 5439 from node 3
```

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I got 6438 from node 3
I got 5564 from node 3
I got 5541 from node 3
I got 3638 from node 3
I got 7121 from node 3
I got 5315 from node 3
I got 5297 from node 3
I got 5212 from node 3
I got 6210 from node 3
I got 6024 from node 3
I got 6153 from node 3
I got 5676 from node 3
I got 6694 from node 3
I got 5411 from node 3
I got 5806 from node 3
I got 4951 from node 3
I got 4976 from node 3
I got 5602 from node 3
I got 6354 from node 3
I got 5375 from node 3
I got 4860 from node 3
I got 5127 from node 3
I got 6313 from node 3
I got 5680 from node 3
I got 4560 from node 3
I got 5932 from node 3
I got 5599 from node 3
I got 7007 from node 3
I got 5697 from node 3
I got 3994 from node 4
I got 4844 from node 4
I got 5906 from node 4
I got 3888 from node 4
I got 5497 from node 4
I got 4197 from node 4
I got 6101 from node 4
I got 5005 from node 4
I got 4516 from node 4
I got 4334 from node 4
I got 4638 from node 4
I got 4610 from node 4
I got 6082 from node 4
I got 5297 from node 4
I got 5812 from node 4
I got 4510 from node 4
I got 6757 from node 4
```

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I got 3655 from node 4
I got 6447 from node 4
I got 5040 from node 4
I got 5633 from node 4
I got 5508 from node 4
I got 4904 from node 4
I got 5063 from node 4
I got 4334 from node 4
I got 4485 from node 4
I got 6077 from node 4
I got 3978 from node 4
I got 6016 from node 4
I got 3757 from node 4
I got 5382 from node 4
I got 6713 from node 4
I got 6368 from node 4
I got 5012 from node 4
I got 4771 from node 4
I got 4733 from node 4
I got 5607 from node 4
I got 4479 from node 4
I got 4730 from node 4
I got 6024 from node 4
I got 4477 from node 4
I got 5914 from node 4
I got 7273 from node 4
I got 5112 from node 4
I got 4508 from node 5
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I got 4198 from node 5
I got 6827 from node 5
I got 6270 from node 5
I got 4798 from node 5
I got 5241 from node 5
I got 5665 from node 5
I got 4631 from node 5
I got 7130 from node 5
I got 6099 from node 5
I got 4591 from node 5
I got 7560 from node 5
I got 4267 from node 5
I got 4317 from node 5
I got 7322 from node 5
I got 6183 from node 5
I got 4997 from node 5
I got 6600 from node 5
```



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I got 5724 from node 5
I got 5779 from node 5
I got 5265 from node 5
I got 3809 from node 5
I got 4823 from node 5
I got 4789 from node 5
I got 5176 from node 5
I got 4959 from node 5
I got 4794 from node 5
I got 5805 from node 5
I got 3983 from node 5
I got 5219 from node 5
I got 3979 from node 5
I got 6580 from node 5
I got 5102 from node 5
I got 5918 from node 5
I got 5865 from node 5
I got 6017 from node 5
I got 4104 from node 5
I got 5546 from node 5
I got 5104 from node 5
I got 5181 from node 5
I got 5718 from node 5
I got 5739 from node 5
I got 6502 from node 5
I got 5537 from node 6
I got 5660 from node 6
I got 8814 from node 6
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I got 7600 from node 6
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I got 6952 from node 6
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I got 4772 from node 6
I got 6544 from node 6
I got 5410 from node 6
I got 5558 from node 6
I got 4297 from node 6
I got 5890 from node 6
I got 4571 from node 6
I got 5636 from node 6
I got 3696 from node 6
I got 6035 from node 6
I got 6096 from node 6
I got 7098 from node 6
I got 5771 from node 6
```

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I got 5223 from node 6
I got 5924 from node 6
I got 4831 from node 6
I got 4601 from node 6
I got 4982 from node 6
I got 4288 from node 6
I got 4006 from node 6
I got 5556 from node 6
I got 7125 from node 6
I got 5684 from node 6
I got 7079 from node 6
I got 5279 from node 6
I got 6742 from node 6
I got 5903 from node 6
I got 3772 from node 6
I got 6695 from node 6
I got 7206 from node 6
I got 5009 from node 6
I got 5104 from node 6
I got 5017 from node 6
I got 5169 from node 6
I got 7355 from node 6
I got 6368 from node 6
I got 5243 from node 7
I got 5637 from node 7
I got 5325 from node 7
I got 5101 from node 7
I got 5714 from node 7
I got 5264 from node 7
I got 3195 from node 7
I got 5930 from node 7
I got 7114 from node 7
I got 5512 from node 7
I got 7496 from node 7
I got 5180 from node 7
I got 5175 from node 7
I got 5964 from node 7
I got 4914 from node 7
I got 6893 from node 7
I got 5535 from node 7
I got 5110 from node 7
I got 6039 from node 7
I got 6008 from node 7
I got 6739 from node 7
I got 4347 from node 7
I got 6373 from node 7
```

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I got 5380 from node 7
I got 4239 from node 7
I got 5981 from node 7
I got 6317 from node 7
I got 6764 from node 7
I got 6392 from node 7
I got 8214 from node 7
I got 6183 from node 7
I got 6818 from node 7
I got 6464 from node 7
I got 3170 from node 7
I got 6188 from node 7
I got 5113 from node 7
I got 4623 from node 7
I got 5865 from node 7
I got 6459 from node 7
I got 5125 from node 7
I got 4945 from node 7
I got 5226 from node 7
I got 6017 from node 7
I got 6235 from node 7
I got 6860 from node 8
I got 4111 from node 8
I got 6561 from node 8
I got 5104 from node 8
I got 4813 from node 8
I got 6126 from node 8
I got 6191 from node 8
I got 5326 from node 8
I got 5591 from node 8
I got 5496 from node 8
I got 4843 from node 8
I got 5673 from node 8
I got 6350 from node 8
I got 5768 from node 8
I got 6688 from node 8
I got 6197 from node 8
I got 5269 from node 8
I got 6499 from node 8
I got 5926 from node 8
I got 5973 from node 8
I got 4564 from node 8
I got 6292 from node 8
I got 5779 from node 8
I got 6124 from node 8
I got 5482 from node 8
```

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I got 5771 from node 8
I got 5516 from node 8
I got 5784 from node 8
I got 4296 from node 8
I got 6598 from node 8
I got 5423 from node 8
I got 6134 from node 8
I got 6315 from node 8
I got 5459 from node 8
I got 5827 from node 8
I got 4384 from node 8
I got 6880 from node 8
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I got 5086 from node 8
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I got 5536 from node 8
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I got 4744 from node 9
I got 4546 from node 9
I got 6089 from node 9
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I got 5688 from node 9
I got 7100 from node 9
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I got 5986 from node 9
I got 5016 from node 9
I got 3663 from node 9
I got 4088 from node 9
I got 6768 from node 9
I got 6354 from node 9
I got 6156 from node 9
I got 6216 from node 9
I got 6051 from node 9
I got 5991 from node 9
I got 7149 from node 9
I got 5032 from node 9
I got 5750 from node 9
I got 6868 from node 9
I got 5880 from node 9
I got 6306 from node 9
I got 6420 from node 9
```

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I got 4580 from node 9
I got 6228 from node 9
I got 3462 from node 9
I got 5272 from node 9
I got 6385 from node 9
I got 5740 from node 9
I got 3581 from node 9
I got 6181 from node 9
I got 5191 from node 9
I got 6615 from node 9
I got 5402 from node 9
I got 4674 from node 9
I got 4565 from node 9
I got 5712 from node 9
I got 4325 from node 9
I got 6935 from node 9
I got 4732 from node 9
I got 5224 from node 10
I got 4242 from node 10
I got 5224 from node 10
I got 6088 from node 10
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I got 6118 from node 10
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I got 4890 from node 10
I got 5734 from node 10
I got 3668 from node 10
I got 5463 from node 10
I got 6313 from node 10
I got 5009 from node 10
I got 5240 from node 10
I got 6023 from node 10
I got 5243 from node 10
I got 4334 from node 10
```

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I got 8088 from node 10
I got 4567 from node 10
I got 5160 from node 10
I got 5767 from node 10
I got 6081 from node 10
I got 6031 from node 10
I got 5329 from node 10
I got 6132 from node 10
I got 4868 from node 10
I got 5139 from node 10
I got 3781 from node 10
I got 4041 from node 10
I got 4880 from node 10
I got 5386 from node 10
I got 4341 from node 10
I got 4263 from node 11
I got 5045 from node 11
I got 4491 from node 11
I got 4453 from node 11
I got 4878 from node 11
I got 6860 from node 11
I got 5345 from node 11
I got 5437 from node 11
I got 6344 from node 11
I got 5941 from node 11
I got 3969 from node 11
I got 4841 from node 11
I got 7096 from node 11
I got 6447 from node 11
I got 6493 from node 11
I got 5027 from node 11
I got 5968 from node 11
I got 4942 from node 11
I got 5464 from node 11
I got 5759 from node 11
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I got 6186 from node 11
I got 5932 from node 11
I got 5978 from node 11
I got 6796 from node 11
I got 4098 from node 11
I got 6540 from node 11
```

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I got 6027 from node 11
I got 4667 from node 11
I got 4323 from node 11
I got 3821 from node 11
I got 3759 from node 11
I got 3941 from node 11
I got 8450 from node 11
I got 4349 from node 11
I got 4973 from node 11
I got 6898 from node 11
I got 6489 from node 11
I got 6095 from node 11
I got 5876 from node 11
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I got 4410 from node 12
I got 5232 from node 12
I got 5296 from node 12
I got 5702 from node 12
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I got 5021 from node 12
I got 5683 from node 12
I got 5091 from node 12
I got 4635 from node 12
I got 6090 from node 12
I got 4979 from node 12
I got 5117 from node 12
I got 4240 from node 12
I got 5787 from node 12
I got 5796 from node 12
I got 5897 from node 12
I got 5491 from node 12
I got 3002 from node 12
I got 5269 from node 12
I got 5080 from node 12
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I got 7138 from node 12
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I got 3844 from node 12
I got 5089 from node 12
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I got 6413 from node 12
I got 5900 from node 12
I got 3843 from node 12
I got 6497 from node 12
I got 7018 from node 12
I got 3487 from node 12
```

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I got 5054 from node 12
I got 5203 from node 12
I got 5156 from node 12
I got 5382 from node 12
I got 6251 from node 12
I got 4800 from node 12
I got 4618 from node 12
I got 5885 from node 12
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I got 5738 from node 12
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I got 4276 from node 13
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I got 5209 from node 13
I got 6666 from node 13
I got 5052 from node 13
I got 5992 from node 13
I got 5880 from node 13
I got 4766 from node 13
```



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I got 5914 from node 13
I got 3947 from node 13
I got 5637 from node 13
I got 5316 from node 13
I got 4910 from node 13
I got 5601 from node 13
I got 5108 from node 13
I got 7601 from node 13
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I got 5840 from node 14
I got 6464 from node 14
I got 5633 from node 14
I got 6387 from node 14
I got 7782 from node 14
I got 6489 from node 14
```



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I got 0 from node 95
I got 0 from node 95
I got 0 from node 95
I got 0 from node 95
I got 0 from node 95
I got 5122 from node 16
I got 5559 from node 16
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I got 4056 from node 16
I got 4528 from node 16
I got 6284 from node 16
I got 5566 from node 16
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I got 5213 from node 16
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I got 6095 from node 16
I got 6093 from node 16
I got 5313 from node 16
I got 5317 from node 16
I got 4777 from node 16
I got 4938 from node 16
```

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I got 4196 from node 16
I got 5814 from node 16
I got 5728 from node 16
I got 4839 from node 17
I got 6172 from node 17
I got 5379 from node 17
I got 5651 from node 17
I got 5827 from node 17
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I got 5916 from node 17
I got 6501 from node 17
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I got 5317 from node 17
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I got 5276 from node 17
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I got 4965 from node 17
I got 4827 from node 17
I got 6856 from node 17
I got 6655 from node 17
I got 4716 from node 17
I got 5533 from node 17
```

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I got 4321 from node 17
I got 5872 from node 18
I got 6691 from node 18
I got 6203 from node 18
I got 4281 from node 18
I got 7480 from node 18
I got 5731 from node 18
I got 6116 from node 18
I got 5810 from node 18
I got 6128 from node 18
I got 5707 from node 18
I got 4784 from node 18
I got 4655 from node 18
I got 5202 from node 18
I got 4574 from node 18
I got 5989 from node 18
I got 3667 from node 18
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I got 5891 from node 19
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I got 3499 from node 38
I got 4755 from node 38
I got 4676 from node 38
I got 4709 from node 38
I got 6325 from node 38
I got 6231 from node 38
I got 6743 from node 38
I got 5282 from node 38
```



```
I got 5979 from node 38
I got 4416 from node 38
I got 5484 from node 38
I got 5386 from node 38
I got 7725 from node 38
I got 4634 from node 39
I got 6498 from node 39
I got 4798 from node 39
I got 3896 from node 39
I got 4457 from node 39
I got 5359 from node 39
I got 6187 from node 39
I got 4356 from node 39
I got 4876 from node 39
I got 5720 from node 39
I got 5843 from node 39
I got 4788 from node 39
I got 6964 from node 39
I got 5509 from node 39
I got 6797 from node 39
I got 6578 from node 39
I got 2710 from node 39
I got 6558 from node 39
I got 7992 from node 39
I got 6008 from node 39
I got 6997 from node 39
I got 4607 from node 39
I got 5261 from node 39
I got 4276 from node 39
I got 7624 from node 39
I got 5304 from node 39
I got 5356 from node 39
I got 5478 from node 39
I got 7290 from node 39
I got 5204 from node 39
I got 5933 from node 39
I got 5624 from node 39
I got 6605 from node 39
I got 3764 from node 39
I got 6551 from node 39
I got 6624 from node 39
I got 7081 from node 39
I got 6343 from node 39
I got 4678 from node 39
I got 5298 from node 39
I got 5137 from node 39
```

```
I got 4226 from node 39
I got 5686 from node 39
I got 6367 from node 39
I got 6244 from node 40
I got 5094 from node 40
I got 5495 from node 40
I got 7197 from node 40
I got 4676 from node 40
I got 4818 from node 40
I got 5768 from node 40
I got 3885 from node 40
I got 6816 from node 40
I got 5714 from node 40
I got 7555 from node 40
I got 5615 from node 40
I got 6038 from node 40
I got 5535 from node 40
I got 6245 from node 40
I got 3663 from node 40
I got 4738 from node 40
I got 4067 from node 40
I got 7253 from node 40
I got 5325 from node 40
I got 4349 from node 40
I got 7130 from node 40
I got 5025 from node 40
I got 7934 from node 40
I got 7342 from node 40
I got 5563 from node 40
I got 4050 from node 40
I got 6851 from node 40
I got 2208 from node 40
I got 5249 from node 40
I got 6827 from node 40
I got 4470 from node 40
I got 6473 from node 40
I got 6098 from node 40
I got 6904 from node 40
I got 6217 from node 40
I got 4694 from node 40
I got 6046 from node 40
I got 5858 from node 40
I got 4549 from node 40
I got 5466 from node 40
I got 5071 from node 40
I got 5286 from node 40
```

```
I got 4952 from node 40
I got 4461 from node 41
I got 6546 from node 41
I got 5159 from node 41
I got 5226 from node 41
I got 6395 from node 41
I got 5103 from node 41
I got 4335 from node 41
I got 7944 from node 41
I got 5634 from node 41
I got 5561 from node 41
I got 5542 from node 41
I got 4924 from node 41
I got 6039 from node 41
I got 4307 from node 41
I got 5960 from node 41
I got 4391 from node 41
I got 7120 from node 41
I got 5402 from node 41
I got 6433 from node 41
I got 7226 from node 41
I got 5046 from node 41
I got 4546 from node 41
I got 3457 from node 41
I got 3959 from node 41
I got 5639 from node 41
I got 5105 from node 41
I got 5181 from node 41
I got 4785 from node 41
I got 6387 from node 41
I got 6099 from node 41
I got 5418 from node 41
I got 4554 from node 41
I got 5416 from node 41
I got 5202 from node 41
I got 6629 from node 41
I got 7766 from node 41
I got 6525 from node 41
I got 6751 from node 41
I got 3938 from node 41
I got 5584 from node 41
I got 6167 from node 41
I got 5730 from node 41
I got 5121 from node 41
I got 4826 from node 41
I got 4925 from node 42
```

I got 5717 from node 42
I got 4708 from node 42
I got 4556 from node 42
I got 5920 from node 42
I got 5768 from node 42
I got 5788 from node 42
I got 3955 from node 42
I got 6201 from node 42
I got 7213 from node 42
I got 5357 from node 42
I got 6742 from node 42
I got 7375 from node 42
I got 5484 from node 42
I got 5923 from node 42
I got 4738 from node 42
I got 5839 from node 42
I got 4793 from node 42
I got 5764 from node 42
I got 5548 from node 42
I got 4761 from node 42
I got 6136 from node 42
I got 4946 from node 42
I got 5556 from node 42
I got 6101 from node 42
I got 4288 from node 42
I got 6312 from node 42
I got 4925 from node 42
I got 5590 from node 42
I got 5800 from node 42
I got 4491 from node 42
I got 4603 from node 42
I got 2746 from node 42
I got 5013 from node 42
I got 5888 from node 42
I got 6316 from node 42
I got 5867 from node 42
I got 7042 from node 42
I got 4692 from node 42
I got 3577 from node 42
I got 5034 from node 42
I got 4789 from node 42
I got 6872 from node 42
I got 6670 from node 42
I got 5465 from node 43
I got 5759 from node 43
I got 6325 from node 43

```
I got 6646 from node 43
I got 5912 from node 43
I got 4561 from node 43
I got 5501 from node 43
I got 5901 from node 43
I got 5648 from node 43
I got 4405 from node 43
I got 3304 from node 43
I got 6270 from node 43
I got 5950 from node 43
I got 6287 from node 43
I got 5712 from node 43
I got 5957 from node 43
I got 5497 from node 43
I got 5620 from node 43
I got 5111 from node 43
I got 4577 from node 43
I got 5382 from node 43
I got 7217 from node 43
I got 5290 from node 43
I got 4144 from node 43
I got 6094 from node 43
I got 6298 from node 43
I got 3449 from node 43
I got 5085 from node 43
I got 6538 from node 43
I got 5495 from node 43
I got 6192 from node 43
I got 6230 from node 43
I got 5020 from node 43
I got 6836 from node 43
I got 5527 from node 43
I got 4815 from node 43
I got 4252 from node 43
I got 5764 from node 43
I got 4871 from node 43
I got 6486 from node 43
I got 3350 from node 43
I got 5123 from node 43
I got 6050 from node 43
I got 4286 from node 43
I got 4656 from node 44
I got 4267 from node 44
I got 4672 from node 44
I got 5162 from node 44
I got 6463 from node 44
```

```
I got 4864 from node 44
I got 3489 from node 44
I got 4704 from node 44
I got 6615 from node 44
I got 4734 from node 44
I got 5740 from node 44
I got 5361 from node 44
I got 5417 from node 44
I got 5946 from node 44
I got 4489 from node 44
I got 5460 from node 44
I got 6699 from
[0/96]#103: calling MPI_Bcast

[0/96]#110: MPI_Bcast done

[0/96]#122: adding...

[0/96]#129: calling reduce...

[0/96]#96: data is read.

[0/96]#103: calling MPI_Bcast

[0/96]#110: MPI_Bcast done

[0/96]#122: adding...

[0/96]#129: calling reduce...

[0/96]#96: data is read.

[0/96]#103: calling MPI_Bcast

[0/96]#110: MPI_Bcast done

[0/96]#122: adding...

[0/96]#129: calling reduce...

[0/96]#96: data is read.

[0/96]#103: calling MPI_Bcast

[0/96]#110: MPI_Bcast done
```

```
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
```



```
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
```

```
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done
```

```
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
```

```
[0/9node 44
I got 5092 from node 44
I got 3337 from node 44
I got 4866 from node 44
I got 5836 from node 44
I got 5291 from node 44
I got 5418 from node 44
I got 4962 from node 44
I got 5718 from node 44
I got 5202 from node 44
I got 6399 from node 44
I got 6672 from node 44
I got 5778 from node 44
I got 5010 from node 44
I got 5467 from node 44
I got 4448 from node 44
I got 4977 from node 44
I got 6436 from node 44
```

```
I got 4353 from node 44
I got 6275 from node 44
I got 5803 from node 44
I got 4729 from node 44
I got 4311 from node 44
I got 4665 from node 44
I got 6279 from node 44
I got 6667 from node 44
I got 5132 from node 44
I got 5667 from node 44
I got 6117 from node 45
I got 5468 from node 45
I got 6190 from node 45
I got 7389 from node 45
I got 5152 from node 45
I got 5815 from node 45
I got 4893 from node 45
I got 4592 from node 45
I got 4995 from node 45
I got 4825 from node 45
I got 3863 from node 45
I got 4995 from node 45
I got 4854 from node 45
I got 7114 from node 45
I got 5393 from node 45
I got 5806 from node 45
I got 8101 from node 45
I got 6467 from node 45
I got 5926 from node 45
I got 5377 from node 45
I got 5259 from node 45
I got 6825 from node 45
I got 4063 from node 45
I got 7231 from node 45
I got 4005 from node 45
I got 5278 from node 45
I got 5565 from node 45
I got 5034 from node 45
I got 5176 from node 45
I got 6077 from node 45
I got 6344 from node 45
I got 5619 from node 45
I got 5768 from node 45
I got 4633 from node 45
I got 5472 from node 45
I got 3969 from node 45
```

```
I got 6926 from node 45
I got 3502 from node 45
I got 5171 from node 45
I got 5227 from node 45
I got 5955 from node 45
I got 4408 from node 45
I got 6831 from node 45
I got 6688 from node 45
I got 6635 from node 46
I got 6817 from node 46
I got 5761 from node 46
I got 6947 from node 46
I got 8268 from node 46
I got 6268 from node 46
I got 4509 from node 46
I got 6066 from node 46
I got 4116 from node 46
I got 5709 from node 46
I got 5603 from node 46
I got 5270 from node 46
I got 6005 from node 46
I got 4157 from node 46
I got 4504 from node 46
I got 6726 from node 46
I got 5041 from node 46
I got 3919 from node 46
I got 4959 from node 46
I got 5876 from node 46
I got 4613 from node 46
I got 6574 from node 46
I got 5000 from node 46
I got 6442 from node 46
I got 6389 from node 46
I got 4989 from node 46
I got 4935 from node 46
I got 4433 from node 46
I got 6320 from node 46
I got 6312 from node 46
I got 7355 from node 46
I got 4128 from node 46
I got 5634 from node 46
I got 5962 from node 46
I got 6134 from node 46
I got 3101 from node 46
I got 5850 from node 46
I got 4654 from node 46
```

```
I got 4426 from node 46
I got 5200 from node 46
I got 3761 from node 46
I got 6379 from node 46
I got 5660 from node 46
I got 4551 from node 46
I got 6132 from node 47
I got 5588 from node 47
I got 3830 from node 47
I got 6889 from node 47
I got 4524 from node 47
I got 4470 from node 47
I got 7326 from node 47
I got 5043 from node 47
I got 6082 from node 47
I got 6133 from node 47
I got 6519 from node 47
I got 7190 from node 47
I got 6350 from node 47
I got 4719 from node 47
I got 5405 from node 47
I got 7412 from node 47
I got 6767 from node 47
I got 7270 from node 47
I got 5880 from node 47
I got 6714 from node 47
I got 5686 from node 47
I got 5736 from node 47
I got 5742 from node 47
I got 6000 from node 47
I got 5361 from node 47
I got 5981 from node 47
I got 6707 from node 47
I got 5079 from node 47
I got 4954 from node 47
I got 4759 from node 47
I got 4383 from node 47
I got 5668 from node 47
I got 6534 from node 47
I got 3749 from node 47
I got 4300 from node 47
I got 5390 from node 47
I got 6076 from node 47
I got 4523 from node 47
I got 4879 from node 47
I got 5775 from node 47
```

```
I got 4465 from node 47
I got 6567 from node 47
I got 4458 from node 47
I got 5259 from node 47
I got 5955 from node 48
I got 6934 from node 48
I got 7005 from node 48
I got 6122 from node 48
I got 6157 from node 48
I got 6471 from node 48
I got 4630 from node 48
I got 6242 from node 48
I got 4904 from node 48
I got 5280 from node 48
I got 5322 from node 48
I got 4600 from node 48
I got 4744 from node 48
I got 7045 from node 48
I got 5144 from node 48
I got 5890 from node 48
I got 4257 from node 48
I got 5477 from node 48
I got 5195 from node 48
I got 5841 from node 48
I got 5061 from node 48
I got 7324 from node 48
I got 4599 from node 48
I got 4214 from node 48
I got 4795 from node 48
I got 5359 from node 48
I got 6518 from node 48
I got 3805 from node 48
I got 5135 from node 48
I got 4396 from node 48
I got 4144 from node 48
I got 4435 from node 48
I got 2790 from node 48
I got 5269 from node 48
I got 3695 from node 48
I got 4957 from node 48
I got 6492 from node 48
I got 5854 from node 48
I got 6430 from node 48
I got 6261 from node 48
I got 7012 from node 48
I got 6047 from node 48
```



```
I got 5626 from node 48
I got 6263 from node 48
I got 6394 from node 49
I got 4756 from node 49
I got 4879 from node 49
I got 6270 from node 49
I got 4067 from node 49
I got 6528 from node 49
I got 8128 from node 49
I got 6268 from node 49
I got 4649 from node 49
I got 6213 from node 49
I got 4766 from node 49
I got 6180 from node 49
I got 5270 from node 49
I got 8227 from node 49
I got 5753 from node 49
I got 6755 from node 49
I got 4715 from node 49
I got 4648 from node 49
I got 3702 from node 49
I got 8391 from node 49
I got 5429 from node 49
I got 3205 from node 49
I got 5890 from node 49
I got 5153 from node 49
I got 6507 from node 49
I got 5284 from node 49
I got 5236 from node 49
I got 4749 from node 49
I got 5702 from node 49
I got 4930 from node 49
I got 4322 from node 49
I got 5555 from node 49
I got 7426 from node 49
I got 6839 from node 49
I got 6388 from node 49
I got 5599 from node 49
I got 4748 from node 49
I got 6370 from node 49
I got 7334 from node 49
I got 5561 from node 49
I got 5388 from node 49
I got 4535 from node 49
I got 4701 from node 49
I got 6780 from node 49
```

```
I got 4747 from node 50
I got 4902 from node 50
I got 5346 from node 50
I got 4882 from node 50
I got 4687 from node 50
I got 6464 from node 50
I got 5752 from node 50
I got 4346 from node 50
I got 3865 from node 50
I got 6403 from node 50
I got 7345 from node 50
I got 5301 from node 50
I got 7129 from node 50
I got 6141 from node 50
I got 5377 from node 50
I got 5058 from node 50
I got 4117 from node 50
I got 6877 from node 50
I got 5864 from node 50
I got 3712 from node 50
I got 7241 from node 50
I got 5605 from node 50
I got 5612 from node 50
I got 5141 from node 50
I got 3699 from node 50
I got 6087 from node 50
I got 4212 from node 50
I got 6004 from node 50
I got 5470 from node 50
I got 6873 from node 50
I got 6030 from node 50
I got 4734 from node 50
I got 5311 from node 50
I got 6292 from node 50
I got 6216 from node 50
I got 4555 from node 50
I got 4764 from node 50
I got 5455 from node 50
I got 4702 from node 50
I got 5469 from node 50
I got 6148 from node 50
I got 6251 from node 50
I got 7200 from node 50
I got 5256 from node 50
I got 4841 from node 51
I got 6383 from node 51
```

```
I got 5413 from node 51
I got 6587 from node 51
I got 4478 from node 51
I got 4494 from node 51
I got 6483 from node 51
I got 4888 from node 51
I got 3588 from node 51
I got 6327 from node 51
I got 4787 from node 51
I got 6275 from node 51
I got 6038 from node 51
I got 4216 from node 51
I got 6390 from node 51
I got 4785 from node 51
I got 6097 from node 51
I got 5903 from node 51
I got 5759 from node 51
I got 5874 from node 51
I got 6435 from node 51
I got 4543 from node 51
I got 5777 from node 51
I got 6392 from node 51
I got 4138 from node 51
I got 4690 from node 51
I got 4722 from node 51
I got 5598 from node 51
I got 5688 from node 51
I got 4308 from node 51
I got 5285 from node 51
I got 4158 from node 51
I got 5977 from node 51
I got 6766 from node 51
I got 4566 from node 51
I got 6147 from node 51
I got 5310 from node 51
I got 3842 from node 51
I got 4063 from node 51
I got 4040 from node 51
I got 6388 from node 51
I got 7713 from node 51
I got 5684 from node 51
I got 5725 from node 51
I got 5220 from node 52
I got 5087 from node 52
I got 5115 from node 52
I got 5140 from node 52
```

```
I got 4684 from node 52
I got 6971 from node 52
I got 4074 from node 52
I got 6196 from node 52
I got 6038 from node 52
I got 6346 from node 52
I got 7540 from node 52
I got 5482 from node 52
I got 5393 from node 52
I got 5833 from node 52
I got 4881 from node 52
I got 6390 from node 52
I got 6387 from node 52
I got 4578 from node 52
I got 5009 from node 52
I got 4831 from node 52
I got 3190 from node 52
I got 5257 from node 52
I got 7355 from node 52
I got 6245 from node 52
I got 6511 from node 52
I got 7086 from node 52
I got 4892 from node 52
I got 3610 from node 52
I got 3575 from node 52
I got 5802 from node 52
I got 4116 from node 52
I got 4433 from node 52
I got 5156 from node 52
I got 6680 from node 52
I got 5060 from node 52
I got 6754 from node 52
I got 6539 from node 52
I got 4524 from node 52
I got 5282 from node 52
I got 6139 from node 52
I got 6561 from node 52
I got 6667 from node 52
I got 5878 from node 52
I got 5695 from node 52
I got 5880 from node 53
I got 5694 from node 53
I got 5694 from node 53
I got 3272 from node 53
I got 7051 from node 53
I got 5524 from node 53
```

I got 5353 from node 53
I got 5276 from node 53
I got 7643 from node 53
I got 5568 from node 53
I got 5720 from node 53
I got 5741 from node 53
I got 7268 from node 53
I got 5598 from node 53
I got 6980 from node 53
I got 4514 from node 53
I got 5691 from node 53
I got 4552 from node 53
I got 4480 from node 53
I got 5603 from node 53
I got 4830 from node 53
I got 5509 from node 53
I got 6722 from node 53
I got 6178 from node 53
I got 4771 from node 53
I got 4717 from node 53
I got 6356 from node 53
I got 5556 from node 53
I got 5744 from node 53
I got 6572 from node 53
I got 5201 from node 53
I got 5214 from node 53
I got 5139 from node 53
I got 4628 from node 53
I got 6223 from node 53
I got 5783 from node 53
I got 5506 from node 53
I got 6598 from node 53
I got 5548 from node 53
I got 7056 from node 53
I got 6546 from node 53
I got 4346 from node 53
I got 6457 from node 53
I got 5976 from node 53
I got 5904 from node 54
I got 5934 from node 54
I got 4116 from node 54
I got 5345 from node 54
I got 4840 from node 54
I got 4279 from node 54
I got 5015 from node 54
I got 6449 from node 54

```
I got 4525 from node 54
I got 4333 from node 54
I got 3844 from node 54
I got 6791 from node 54
I got 4646 from node 54
I got 5723 from node 54
I got 5438 from node 54
I got 6653 from node 54
I got 6178 from node 54
I got 5377 from node 54
I got 4908 from node 54
I got 4587 from node 54
I got 5374 from node 54
I got 6491 from node 54
I got 5654 from node 54
I got 4439 from node 54
I got 4775 from node 54
I got 5549 from node 54
I got 4350 from node 54
I got 6330 from node 54
I got 5196 from node 54
I got 5314 from node 54
I got 6958 from node 54
I got 3667 from node 54
I got 4738 from node 54
I got 5828 from node 54
I got 4713 from node 54
I got 5129 from node 54
I got 5774 from node 54
I got 6419 from node 54
I got 5138 from node 54
I got 3686 from node 54
I got 4974 from node 54
I got 5688 from node 54
I got 6036 from node 54
I got 4583 from node 54
I got 5462 from node 55
I got 6607 from node 55
I got 4051 from node 55
I got 6071 from node 55
I got 6698 from node 55
I got 5350 from node 55
I got 6071 from node 55
I got 6435 from node 55
I got 7017 from node 55
I got 7559 from node 55
```

```
I got 3688 from node 55
I got 6323 from node 55
I got 4667 from node 55
I got 5831 from node 55
I got 4097 from node 55
I got 4794 from node 55
I got 4800 from node 55
I got 4674 from node 55
I got 5407 from node 55
I got 5804 from node 55
I got 5479 from node 55
I got 4503 from node 55
I got 4635 from node 55
I got 6217 from node 55
I got 4674 from node 55
I got 3632 from node 55
I got 4695 from node 55
I got 6804 from node 55
I got 5248 from node 55
I got 6287 from node 55
I got 4421 from node 55
I got 6248 from node 55
I got 5990 from node 55
I got 6603 from node 55
I got 5540 from node 55
I got 5129 from node 55
I got 5583 from node 55
I got 4613 from node 55
I got 4693 from node 55
I got 5942 from node 55
I got 5621 from node 55
I got 6261 from node 55
I got 3426 from node 55
I got 5078 from node 55
I got 6426 from node 56
I got 6378 from node 56
I got 5232 from node 56
I got 5288 from node 56
I got 6083 from node 56
I got 3849 from node 56
I got 5099 from node 56
I got 5325 from node 56
I got 5839 from node 56
I got 5725 from node 56
I got 5925 from node 56
I got 4442 from node 56
```

```
I got 5671 from node 56
I got 6867 from node 56
I got 4708 from node 56
I got 5017 from node 56
I got 5596 from node 56
I got 7166 from node 56
I got 4470 from node 56
I got 4463 from node 56
I got 5652 from node 56
I got 5551 from node 56
I got 5272 from node 56
I got 6216 from node 56
I got 5914 from node 56
I got 4980 from node 56
I got 4205 from node 56
I got 5750 from node 56
I got 5481 from node 56
I got 5436 from node 56
I got 5386 from node 56
I got 4568 from node 56
I got 7500 from node 56
I got 3937 from node 56
I got 5969 from node 56
I got 6208 from node 56
I got 5131 from node 56
I got 4540 from node 56
I got 7136 from node 56
I got 6227 from node 56
I got 5571 from node 56
I got 4317 from node 56
I got 4096 from node 56
I got 5229 from node 56
I got 6547 from node 57
I got 6193 from node 57
I got 4534 from node 57
I got 3920 from node 57
I got 6915 from node 57
I got 5117 from node 57
I got 5652 from node 57
I got 6269 from node 57
I got 7057 from node 57
I got 4791 from node 57
I got 5915 from node 57
I got 6132 from node 57
I got 5620 from node 57
I got 5904 from node 57
```



```
I got 6298 from node 57
I got 5022 from node 57
I got 4921 from node 57
I got 6807 from node 57
I got 6442 from node 57
I got 5124 from node 57
I got 6920 from node 57
I got 6503 from node 57
I got 3638 from node 57
I got 5266 from node 57
I got 5235 from node 57
I got 5652 from node 57
I got 4834 from node 57
I got 5938 from node 57
I got 6152 from node 57
I got 5569 from node 57
I got 4639 from node 57
I got 5281 from node 57
I got 4598 from node 57
I got 7229 from node 57
I got 6314 from node 57
I got 5102 from node 57
I got 6168 from node 57
I got 4262 from node 57
I got 5778 from node 57
I got 6855 from node 57
I got 6104 from node 57
I got 5949 from node 57
I got 5601 from node 57
I got 4652 from node 57
I got 6439 from node 58
I got 7552 from node 58
I got 5547 from node 58
I got 5626 from node 58
I got 5833 from node 58
I got 5100 from node 58
I got 4422 from node 58
I got 7169 from node 58
I got 5490 from node 58
I got 3893 from node 58
I got 6891 from node 58
I got 4821 from node 58
I got 5764 from node 58
I got 6603 from node 58
I got 8184 from node 58
I got 6635 from node 58
```

I got 6772 from node 58
I got 4670 from node 58
I got 5322 from node 58
I got 4450 from node 58
I got 4423 from node 58
I got 7324 from node 58
I got 7100 from node 58
I got 5883 from node 58
I got 5412 from node 58
I got 6577 from node 58
I got 5099 from node 58
I got 6336 from node 58
I got 4201 from node 58
I got 6214 from node 58
I got 6678 from node 58
I got 5988 from node 58
I got 5046 from node 58
I got 5809 from node 58
I got 3983 from node 58
I got 5804 from node 58
I got 5975 from node 58
I got 3715 from node 58
I got 5931 from node 58
I got 5522 from node 58
I got 3807 from node 58
I got 6069 from node 58
I got 4232 from node 58
I got 4673 from node 58
I got 7625 from node 59
I got 5815 from node 59
I got 6412 from node 59
I got 5494 from node 59
I got 5888 from node 59
I got 4487 from node 59
I got 5195 from node 59
I got 4491 from node 59
I got 5625 from node 59
I got 6427 from node 59
I got 4749 from node 59
I got 5540 from node 59
I got 5532 from node 59
I got 3552 from node 59
I got 6474 from node 59
I got 7770 from node 59
I got 6713 from node 59
I got 4201 from node 59

```
I got 6176 from node 59
I got 5708 from node 59
I got 5680 from node 59
I got 5106 from node 59
I got 5071 from node 59
I got 5300 from node 59
I got 4349 from node 59
I got 5410 from node 59
I got 4778 from node 59
I got 6891 from node 59
I got 5037 from node 59
I got 3663 from node 59
I got 6320 from node 59
I got 6233 from node 59
I got 5478 from node 59
I got 5818 from node 59
I got 7133 from node 59
I got 4481 from node 59
I got 5808 from node 59
I got 5244 from node 59
I got 5052 from node 59
I got 826]#110: MPI_Bcast done
```

```
[0/96]#122: adding...
```

```
[0/96]#129: calling reduce...
```

```
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
```

```
[0/96]#122: adding...
```

```
[0/96]#129: calling reduce...
```

```
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
```

```
[0/96]#122: adding...
```

```
[0/96]#129: calling reduce...
```

```
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done
```

```
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
06 from node 59
I got 5564 from node 59
I got 5696 from node 59
I got 5321 from node 59
I got 5371 from node 59
I got 6123 from node 60
I got 3823 from node 60
I got 5313 from node 60
I got 6547 from node 60
I got 4555 from node 60
I got 4331 from node 60
I got 5855 from node 60
I got 5236 from node 60
I got 5992 from node 60
```

```
I got 6425 from node 60
I got 5163 from node 60
I got 4782 from node 60
I got 6593 from node 60
I got 5531 from node 60
I got 3168 from node 60
I got 4870 from node 60
I got 7054 from node 60
I got 5594 from node 60
I got 6331 from node 60
I got 4720 from node 60
I got 7603 from node 60
I got 4103 from node 60
I got 6639 from node 60
I got 5080 from node 60
I got 3994 from node 60
I got 5071 from node 60
I got 4620 from node 60
I got 5229 from node 60
I got 7515 from node 60
I got 5044 from node 60
I got 7325 from node 60
I got 5983 from node 60
I got 4987 from node 60
I got 6099 from node 60
I got 6344 from node 60
I got 3680 from node 60
I got 5766 from node 60
I got 5847 from node 60
I got 5786 from node 60
I got 5197 from node 60
I got 6724 from node 60
I got 5426 from node 60
I got 5302 from node 60
I got 4943 from node 60
I got 5287 from node 61
I got 4609 from node 61
I got 4788 from node 61
I got 4983 from node 61
I got 5445 from node 61
I got 5550 from node 61
I got 5462 from node 61
I got 5414 from node 61
I got 3618 from node 61
I got 5808 from node 61
I got 3387 from node 61
```

```
I got 8226 from node 61
I got 5066 from node 61
I got 6553 from node 61
I got 5899 from node 61
I got 6173 from node 61
I got 4202 from node 61
I got 6110 from node 61
I got 5487 from node 61
I got 7155 from node 61
I got 4595 from node 61
I got 5972 from node 61
I got 4803 from node 61
I got 6240 from node 61
I got 5972 from node 61
I got 5772 from node 61
I got 4652 from node 61
I got 6642 from node 61
I got 4217 from node 61
I got 6312 from node 61
I got 4993 from node 61
I got 8743 from node 61
I got 6373 from node 61
I got 3543 from node 61
I got 3945 from node 61
I got 7072 from node 61
I got 5628 from node 61
I got 7575 from node 61
I got 5781 from node 61
I got 5312 from node 61
I got 6338 from node 61
I got 5674 from node 61
I got 3933 from node 61
I got 6314 from node 61
I got 5179 from node 62
I got 7438 from node 62
I got 6191 from node 62
I got 5923 from node 62
I got 5486 from node 62
I got 5107 from node 62
I got 4484 from node 62
I got 7030 from node 62
I got 5241 from node 62
I got 7182 from node 62
I got 5094 from node 62
I got 5134 from node 62
I got 6254 from node 62
```



```
I got 6166 from node 62
I got 6470 from node 62
I got 5886 from node 62
I got 5615 from node 62
I got 4848 from node 62
I got 5347 from node 62
I got 3203 from node 62
I got 5699 from node 62
I got 6294 from node 62
I got 4736 from node 62
I got 4300 from node 62
I got 5157 from node 62
I got 5856 from node 62
I got 4932 from node 62
I got 5666 from node 62
I got 6925 from node 62
I got 3157 from node 62
I got 6512 from node 62
I got 5072 from node 62
I got 4217 from node 62
I got 6114 from node 62
I got 5329 from node 62
I got 5570 from node 62
I got 6532 from node 62
I got 5919 from node 62
I got 5525 from node 62
I got 3488 from node 62
I got 4650 from node 62
I got 4045 from node 62
I got 4515 from node 62
I got 5445 from node 62
I got 6816 from node 63
I got 3198 from node 63
I got 3771 from node 63
I got 5004 from node 63
I got 4764 from node 63
I got 4336 from node 63
I got 5042 from node 63
I got 5495 from node 63
I got 6481 from node 63
I got 5460 from node 63
I got 5696 from node 63
I got 8016 from node 63
I got 6176 from node 63
I got 4881 from node 63
I got 6398 from node 63
```

```
I got 6828 from node 63
I got 4966 from node 63
I got 6813 from node 63
I got 4717 from node 63
I got 6103 from node 63
I got 5868 from node 63
I got 6387 from node 63
I got 7127 from node 63
I got 4917 from node 63
I got 4817 from node 63
I got 4627 from node 63
I got 5009 from node 63
I got 5254 from node 63
I got 5643 from node 63
I got 4469 from node 63
I got 5652 from node 63
I got 3998 from node 63
I got 4088 from node 63
I got 5756 from node 63
I got 5247 from node 63
I got 6953 from node 63
I got 6797 from node 63
I got 7237 from node 63
I got 6897 from node 63
I got 5814 from node 63
I got 6324 from node 63
I got 5568 from node 63
I got 4605 from node 63
I got 5188 from node 63
I got 6293 from node 64
I got 4501 from node 64
I got 4957 from node 64
I got 5314 from node 64
I got 5931 from node 64
I got 6171 from node 64
I got 4889 from node 64
I got 4985 from node 64
I got 7132 from node 64
I got 5598 from node 64
I got 3209 from node 64
I got 7425 from node 64
I got 5555 from node 64
I got 6072 from node 64
I got 5096 from node 64
I got 3948 from node 64
I got 3890 from node 64
```

I got 5917 from node 64
I got 6748 from node 64
I got 5893 from node 64
I got 6860 from node 64
I got 5488 from node 64
I got 5411 from node 64
I got 7626 from node 64
I got 5217 from node 64
I got 6170 from node 64
I got 5347 from node 64
I got 4551 from node 64
I got 6747 from node 64
I got 5385 from node 64
I got 4861 from node 64
I got 5102 from node 64
I got 3265 from node 64
I got 6575 from node 64
I got 6281 from node 64
I got 3741 from node 64
I got 4617 from node 64
I got 7222 from node 64
I got 5972 from node 64
I got 5960 from node 64
I got 4682 from node 64
I got 5839 from node 64
I got 6325 from node 64
I got 7294 from node 64
I got 5221 from node 65
I got 5483 from node 65
I got 6311 from node 65
I got 5565 from node 65
I got 6507 from node 65
I got 4992 from node 65
I got 5339 from node 65
I got 4793 from node 65
I got 4621 from node 65
I got 6847 from node 65
I got 4584 from node 65
I got 5015 from node 65
I got 5994 from node 65
I got 4261 from node 65
I got 5293 from node 65
I got 4776 from node 65
I got 5705 from node 65
I got 6106 from node 65
I got 4379 from node 65

```
I got 5277 from node 65
I got 5497 from node 65
I got 5912 from node 65
I got 4409 from node 65
I got 5369 from node 65
I got 5761 from node 65
I got 5860 from node 65
I got 5607 from node 65
I got 5570 from node 65
I got 5548 from node 65
I got 4791 from node 65
I got 6849 from node 65
I got 7043 from node 65
I got 3564 from node 65
I got 5201 from node 65
I got 4671 from node 65
I got 4616 from node 65
I got 5179 from node 65
I got 5244 from node 65
I got 5266 from node 65
I got 6766 from node 65
I got 6406 from node 65
I got 5724 from node 65
I got 5480 from node 65
I got 3632 from node 65
I got 5139 from node 66
I got 6874 from node 66
I got 5515 from node 66
I got 6765 from node 66
I got 5783 from node 66
I got 6090 from node 66
I got 5632 from node 66
I got 4954 from node 66
I got 5490 from node 66
I got 7006 from node 66
I got 5138 from node 66
I got 6073 from node 66
I got 5349 from node 66
I got 6780 from node 66
I got 5504 from node 66
I got 5171 from node 66
I got 5227 from node 66
I got 5350 from node 66
I got 4997 from node 66
I got 5080 from node 66
I got 5775 from node 66
```

I got 5433 from node 66
I got 5645 from node 66
I got 5406 from node 66
I got 5422 from node 66
I got 6538 from node 66
I got 5280 from node 66
I got 5543 from node 66
I got 6380 from node 66
I got 6939 from node 66
I got 6501 from node 66
I got 7664 from node 66
I got 5647 from node 66
I got 4707 from node 66
I got 5692 from node 66
I got 4725 from node 66
I got 4991 from node 66
I got 5680 from node 66
I got 6017 from node 66
I got 6458 from node 66
I got 4973 from node 66
I got 5490 from node 66
I got 6428 from node 66
I got 5383 from node 66
I got 4649 from node 67
I got 7927 from node 67
I got 6255 from node 67
I got 6754 from node 67
I got 5767 from node 67
I got 3545 from node 67
I got 4562 from node 67
I got 3456 from node 67
I got 4596 from node 67
I got 5283 from node 67
I got 4546 from node 67
I got 5607 from node 67
I got 6922 from node 67
I got 5900 from node 67
I got 5198 from node 67
I got 5670 from node 67
I got 4933 from node 67
I got 4563 from node 67
I got 5905 from node 67
I got 3516 from node 67
I got 6225 from node 67
I got 4845 from node 67
I got 5469 from node 67

I got 5415 from node 67
I got 5801 from node 67
I got 4728 from node 67
I got 5097 from node 67
I got 6056 from node 67
I got 5070 from node 67
I got 5589 from node 67
I got 6397 from node 67
I got 5527 from node 67
I got 6842 from node 67
I got 7226 from node 67
I got 6390 from node 67
I got 5317 from node 67
I got 5345 from node 67
I got 4834 from node 67
I got 4494 from node 67
I got 6332 from node 67
I got 6203 from node 67
I got 5016 from node 67
I got 5549 from node 67
I got 4874 from node 67
I got 5980 from node 68
I got 3841 from node 68
I got 6705 from node 68
I got 5101 from node 68
I got 6146 from node 68
I got 5309 from node 68
I got 4313 from node 68
I got 5132 from node 68
I got 6178 from node 68
I got 5521 from node 68
I got 5324 from node 68
I got 6333 from node 68
I got 5544 from node 68
I got 6957 from node 68
I got 5477 from node 68
I got 4940 from node 68
I got 5241 from node 68
I got 6618 from node 68
I got 7040 from node 68
I got 5727 from node 68
I got 6802 from node 68
I got 5046 from node 68
I got 5803 from node 68
I got 6000 from node 68
I got 4288 from node 68

```
I got 5308 from node 68
I got 5096 from node 68
I got 6593 from node 68
I got 5294 from node 68
I got 7010 from node 68
I got 4778 from node 68
I got 5870 from node 68
I got 5937 from node 68
I got 5278 from node 68
I got 5239 from node 68
I got 5733 from node 68
I got 4880 from node 68
I got 4779 from node 68
I got 6400 from node 68
I got 5608 from node 68
I got 3309 from node 68
I got 5705 from node 68
I got 3713 from node 68
I got 4455 from node 68
I got 6251 from node 69
I got 3507 from node 69
I got 6711 from node 69
I got 7636 from node 69
I got 5640 from node 69
I got 6074 from node 69
I got 5325 from node 69
I got 5467 from node 69
I got 3554 from node 69
I got 7536 from node 69
I got 6769 from node 69
I got 6203 from node 69
I got 5151 from node 69
I got 7709 from node 69
I got 5781 from node 69
I got 6747 from node 69
I got 6741 from node 69
I got 4574 from node 69
I got 7253 from node 69
I got 6152 from node 69
I got 5795 from node 69
I got 5263 from node 69
I got 6233 from node 69
I got 3634 from node 69
I got 2936 from node 69
I got 6064 from node 69
I got 5918 from node 69
```

```
I got 4553 from node 69
I got 6947 from node 69
I got 5421 from node 69
I got 4673 from node 69
I got 5437 from node 69
I got 5763 from node 69
I got 5940 from node 69
I got 6014 from node 69
I got 3966 from node 69
I got 6483 from node 69
I got 6374 from node 69
I got 5612 from node 69
I got 3976 from node 69
I got 6356 from node 69
I got 6645 from node 69
I got 5294 from node 69
I got 3459 from node 69
I got 6978 from node 70
I got 6394 from node 70
I got 3080 from node 70
I got 5158 from node 70
I got 6296 from node 70
I got 5563 from node 70
I got 4433 from node 70
I got 4878 from node 70
I got 3627 from node 70
I got 5512 from node 70
I got 5973 from node 70
I got 5651 from node 70
I got 6145 from node 70
I got 5867 from node 70
I got 5023 from node 70
I got 4746 from node 70
I got 5312 from node 70
I got 5524 from node 70
I got 6181 from node 70
I got 6702 from node 70
I got 6870 from node 70
I got 4674 from node 70
I got 5325 from node 70
I got 4350 from node 70
I got 5832 from node 70
I got 4781 from node 70
I got 5619 from node 70
I got 5790 from node 70
I got 4502 from node 70
```



```
I got 5594 from node 70
I got 5505 from node 70
I got 8418 from node 70
I got 5468 from node 70
I got 6137 from node 70
I got 4706 from node 70
I got 3894 from node 70
I got 7594 from node 70
I got 6723 from node 70
I got 6226 from node 70
I got 7176 from node 70
I got 6021 from node 70
I got 6943 from node 70
I got 5355 from node 70
I got 5491 from node 70
I got 6056 from node 71
I got 5927 from node 71
I got 5102 from node 71
I got 4548 from node 71
I got 5925 from node 71
I got 6950 from node 71
I got 4403 from node 71
I got 3764 from node 71
I got 5465 from node 71
I got 4754 from node 71
I got 5222 from node 71
I got 6914 from node 71
I got 6094 from node 71
I got 6614 from node 71
I got 4931 from node 71
I got 4719 from node 71
I got 5137 from node 71
I got 4706 from node 71
I got 5806 from node 71
I got 4809 from node 71
I got 5832 from node 71
I got 5118 from node 71
I got 7040 from node 71
I got 5725 from node 71
I got 5313 from node 71
I got 4836 from node 71
I got 5718 from node 71
I got 4907 from node 71
I got 5629 from node 71
I got 5760 from node 71
I got 6844 from node 71
```

```
I got 6709 from node 71
I got 3727 from node 71
I got 4691 from node 71
I got 5318 from node 71
I got 6383 from node 71
I got 6467 from node 71
I got 5338 from node 71
I got 4954 from node 71
I got 6094 from node 71
I got 4613 from node 71
I got 4317 from node 71
I got 5466 from node 71
I got 5911 from node 71
I got 5780 from node 72
I got 5565 from node 72
I got 6846 from node 72
I got 6548 from node 72
I got 5853 from node 72
I got 3416 from node 72
I got 5691 from node 72
I got 5385 from node 72
I got 5051 from node 72
I got 4788 from node 72
I got 4073 from node 72
I got 5720 from node 72
I got 4958 from node 72
I got 5646 from node 72
I got 5599 from node 72
I got 6039 from node 72
I got 4197 from node 72
I got 5996 from node 72
I got 5899 from node 72
I got 5864 from node 72
I got 5416 from node 72
I got 5871 from node 72
I got 6648 from node 72
I got 5745 from node 72
I got 6306 from node 72
I got 6337 from node 72
I got 4539 from node 72
I got 5259 from node 72
I got 6571 from node 72
I got 6493 from node 72
I got 4304 from node 72
I got 6021 from node 72
I got 3963 from node 72
```

```
I got 5464 from node 72
I got 5705 from node 72
I got 4677 from node 72
I got 7255 from node 72
I got 3408 from node 72
I got 5531 from node 72
I got 4900 from node 72
I got 4258 from node 72
I got 4522 from node 72
I got 6609 from node 72
I got 4398 from node 72
I got 3812 from node 73
I got 4813 from node 73
I got 6054 from node 73
I got 5958 from node 73
I got 5129 from node 73
I got 4971 from node 73
I got 6903 from node 73
I got 4198 from node 73
I got 5473 from node 73
I got 7771 from node 73
I got 6290 from node 73
I got 4739 from node 73
I got 6289 from node 73
I got 5195 from node 73
I got 6002 from node 73
I got 6395 from node 73
I got 5688 from node 73
I got 3894 from node 73
I got 4467 from node 73
I got 4645 from node 73
I got 4429 from node 73
I got 6163 from node 73
I got 5774 from node 73
I got 6614 from node 73
I got 5928 from node 73
I got 5962 from node 73
I got 4673 from node 73
I got 5086 from node 73
I got 6264 from node 73
I got 4904 from node 73
I got 6564 from node 73
I got 5505 from node 73
I got 6164 from node 73
I got 5261 from node 73
I got 6507 from node 73
```

```
I got 4967 from node 73
I got 6018 from node 73
I got 5956 from node 73
I got 6221 from node 73
I got 5227 from node 73
I got 4868 from node 73
I got 6573 from node 73
I got 5068 from node 73
I got 5699 from node 73
I got 5539 from node 74
I got 5807 from node 74
I got 4469 from node 74
I got 5730 from node 74
I got 5969 from node 74
I got 6538 from node 74
I got 4690 from node 74
I got 3641 from node 74
I got 3714 from node 74
I got 6686 from node 74
I got 6172 from node 74
I got 3194 from node 74
I got 4859 from node 74
I got 5156 from node 74
I got 5881 from node 74
I got 3685 from node 74
I got 5260 from node 74
I got 5628 from node 74
I got 7571 from node 74
I got 7186 from node 74
I got 6559 from node 74
I got 4559 from node 74
I got 5772 from node 74
I got 5549 from node 74
I got 6180 from node 74
I got 5198 from node 74
I got 4801 from node 74
I got 3409 from node 74
I got 5327 from node 74
I got 7567 from node 74
I got 6750 from node 74
I got 4180 from node 74
I got 4987 from node 74
I got 5473 from node 74
I got 4501 from node 74
I got 5053 from node 74
I got 5928 from node 74
```

I got 3502 from node 74
I got 5702 from node 74
I got 6015 from node 74
I got 6690 from node 74
I got 5025 from node 74
I got 5800 from node 74
I got 3823 from node 74
I got 5613 from node 75
I got 5387 from node 75
I got 5222 from node 75
I got 5299 from node 75
I got 7102 from node 75
I got 5487 from node 75
I got 6383 from node 75
I got 6085 from node 75
I got 5223 from node 75
I got 6308 from node 75
I got 6934 from node 75
I got 6590 from node 75
I got 6098 from node 75
I got 6692 from node 75
I got 6700 from node 75
I got 5855 from node 75
I got 7250 from node 75
I got 4894 from node 75
I got 6910 from node 75
I got 5343 from node 75
I got 5612 from node 75
I got 4570 from node 75
I got 5197 from node 75
I got 5912 from node 75
I got 6522 from node 75
I got 3785 from node 75
I got 5602 from node 75
I got 5830 from node 75
I got 4726 from node 75
I got 6013 from node 75
I got 6575 from node 75
I got 4773 from node 75
I got 3373 from node 75
I got 6130 from node 75
I got 5973 from node 75
I got 6819 from node 75
I got 6017 from node 75
I got 5416 from node 75
I got 6049 from node 75

```
I got 5457 from node 75
I got 5629 from node 75
I got 5565 from node 75
I got 5473 from node 75
I got 5576 from node 75
I got 4780 from node 76
I got 6905 from node 76
I got 6272 from node 76
I got 4323 from node 76
I got 5721 from node 76
I got 5989 from node 76
I got 5295 from node 76
I got 5328 from node 76
I got 5326 from node 76
I got 4229 from node 76
I got 3928 from node 76
I got 5685 from node 76
I got 6626 from node 76
I got 4403 from node 76
I got 4966 from node 76
I got 5442 from node 76
I got 6166 from node 76
I got 5826 from node 76
I got 5723 from node 76
I got 5177 from node 76
I got 5037 from node 76
I got 6337 from node 76
I got 5049 from node 76
I got 5996 from node 76
I got 6856 from node 76
I got 6314 from node 76
I got 5332 from node 76
I got 4543 from node 76
I got 1767 from node 76
I got 4659 from node 76
I got 4481 from node 76
I got 4986 from node 76
I got 6451 from node 76
I got 5813 from node 76
I got 5940 from node 76
I got 6028 from node 76
I got 6118 from node 76
I got 5742 from node 76
I got 4687 from node 76
I got 5904 from node 76
I got 6508 from node 76
```

```
I got 5941 from node 76
I got 7228 from node 76
I got 6377 from node 76
I got 4337 from node 77
I got 6998 from node 77
I got 4307 from node 77
I got 4868 from node 77
I got 3988 from node 77
I got 4473 from node 77
I got 4028 from node 77
I got 6298 from node 77
I got 5526 from node 77
I got 3834 from node 77
I got 5145 from node 77
I got 6707 from node 77
I got 4255 from node 77
I got 5799 from node 77
I got 6039 from node 77
I got 6389 from node 77
I got 4639 from node 77
I got 5249 from node 77
I got 5254 from node 77
I got 5796 from node 77
I got 5292 from node 77
I got 6208 from node 77
I got 4480 from node 77
I got 5542 from node 77
I got 6992 from node 77
I got 6867 from node 77
I got 6571 from node 77
I got 4389 from node 77
I got 4664 from node 77
I got 6570 from node 77
I got 7535 from node 77
I got 5260 from node 77
I got 2397 from node 77
I got 5817 from node 77
I got 5536 from node 77
I got 5235 from node 77
I got 5434 from node 77
I got 5265 from node 77
I got 7894 from node 77
I got 4549 from node 77
I got 7173 from node 77
I got 3728 from node 77
I got 5089 from node 77
```

```
I got 4589 from node 77
I got 5339 from node 78
I got 4505 from node 78
I got 4752 from node 78
I got 4773 from node 78
I got 5091 from node 78
I got 5803 from node 78
I got 4453 from node 78
I got 5005 from node 78
I got 4965 from node 78
I got 3620 from node 78
I got 6389 from node 78
I got 5339 from node 78
I got 3762 from node 78
I got 5940 from node 78
I got 6001 from node 78
I got 4904 from node 78
I got 5553 from node 78
I got 5041 from node 78
I got 5003 from node 78
I got 5112 from node 78
I got 6697 from node 78
I got 6469 from node 78
I got 6387 from node 78
I got 4656 from node 78
I got 4831 from node 78
I got 6058 from node 78
I got 6437 from node 78
I got 5511 from node 78
I got 4876 from node 78
I got 4926 from node 78
I got 6712 from node 78
I got 5928 from node 78
I got 6028 from node 78
I got 7465 from node 78
I got 4050 from node 78
I got 7448 from node 78
I got 5773 from node 78
I got 5355 from node 78
I got 4579 from node 78
I got 4884 from node 78
I got 4872 from node 78
I got 4554 from node 78
I got 4699 from node 78
I got 5337 from node 78
I got 4729 from node 79
```



```
I got 5671 from node 79
I got 4711 from node 79
I got 8019 from node 79
I got 5350 from node 79
I got 5794 from node 79
I got 6168 from node 79
I got 5003 from node 79
I got 6187 from node 79
I got 4210 from node 79
I got 3048 from node 79
I got 7661 from node 79
I got 4128 from node 79
I got 5402 from node 79
I got 4683 from node 79
I got 5422 from node 79
I got 4956 from node 79
I got 4760 from node 79
I got 4315 from node 79
I got 3636 from node 79
I got 5367 from node 79
I got 5576 from node 79
I got 4094 from node 79
I got 5542 from node 79
I got 6962 from node 79
I got 5055 from node 79
I got 5068 from node 79
I got 6304 from node 79
I got 4243 from node 79
I got 4299 from node 79
I got 6197 from node 79
I got 5976 from node 79
I got 5627 from node 79
I got 4329 from node 79
I got 5349 from node 79
I got 6530 from node 79
I got 6427 from node 79
I got 6061 from node 79
I got 6295 from node 79
I got 5836 from node 79
I got 7874 from node 79
I got 5323 from node 79
I got 4710 from node 79
I got 4672 from node 79
I got 4049 from node 80
I got 4202 from node 80
I got 4537 from node 80
```

```
I got 6007 from node 80
I got 5517 from node 80
I got 5026 from node 80
I got 5737 from node 80
I got 6437 from node 80
I got 5949 from node 80
I got 5721 from node 80
I got 6532 from node 80
I got 4313 from node 80
I got 5114 from node 80
I got 5194 from node 80
I got 5205 from node 80
I got 5547 from node 80
I got 5814 from node 80
I got 6371 from node 80
I got 5074 from node 80
I got 5095 from node 80
I got 3876 from node 80
I got 5220 from node 80
I got 7486 from node 80
I got 6931 from node 80
I got 6166 from node 80
I got 6733 from node 80
I got 5814 from node 80
I got 4068 from node 80
I got 6576 from node 80
I got 4939 from node 80
I got 5474 from node 80
I got 5546 from node 80
I got 5032 from node 80
I got 6898 from node 80
I got 5904 from node 80
I got 6442 from node 80
I got 4490 from node 80
I got 4694 from node 80
I got 4574 from node 80
I got 5859 from node 80
I got 5940 from node 80
I got 6452 from node 80
I got 4990 from node 80
I got 4932 from node 80
I got 5343 from node 81
I got 4849 from node 81
I got 5581 from node 81
I got 5915 from node 81
I got 4854 from node 81
```

```
I got 6001 from node 81
I got 6158 from node 81
I got 5546 from node 81
I got 5656 from node 81
I got 3718 from node 81
I got 4803 from node 81
I got 7542 from node 81
I got 4473 from node 81
I got 6016 from node 81
I got 5071 from node 81
I got 6243 from node 81
I got 6678 from node 81
I got 3559 from node 81
I got 4168 from node 81
I got 5645 from node 81
I got 5317 from node 81
I got 6672 from node 81
I got 4956 from node 81
I got 5402 from node 81
I got 4075 from node 81
I got 5337 from node 81
I got 6956 from node 81
I got 4824 from node 81
I got 5302 from node 81
I got 6192 from node 81
I got 5346 from node 81
I got 4875 from node 81
I got 4998 from node 81
I got 4529 from node 81
I got 4955 from node 81
I got 7173 from node 81
I got 4831 from node 81
I got 3297 from node 81
I got 5274 from node 81
I got 6000 from node 81
I got 5111 from node 81
I got 6103 from node 81
I got 6447 from node 81
I got 4288 from node 81
I got 5347 from node 82
I got 3356 from node 82
I got 5886 from node 82
I got 5503 from node 82
I got 4796 from node 82
I got 6063 from node 82
I got 5108 from node 82
```

```
I got 4164 from node 82
I got 5959 from node 82
I got 5865 from node 82
I got 4228 from node 82
I got 5771 from node 82
I got 7154 from node 82
I got 5656 from node 82
I got 5962 from node 82
I got 7099 from node 82
I got 5488 from node 82
I got 5104 from node 82
I got 4802 from node 82
I got 5721 from node 82
I got 4841 from node 82
I got 3670 from node 82
I got 5024 from node 82
I got 4975 from node 82
I got 2884 from node 82
I got 4583 from node 82
I got 3682 from node 82
I got 4992 from node 82
I got 6055 from node 82
I got 3863 from node 82
I got 3614 from node 82
I got 5672 from node 82
I got 6591 from node 82
I got 4308 from node 82
I got 6441 from node 82
I got 7713 from node 82
I got 7495 from node 82
I got 6496 from node 82
I got 6558 from node 82
I got 6576 from node 82
I got 5559 from node 82
I got 4790 from node 82
I got 6150 from node 82
I got 4521 from node 82
I got 6897 from node 83
I got 6861 from node 83
I got 6551 from node 83
I got 6580 from node 83
I got 5584 from node 83
I got 4654 from node 83
I got 5418 from node 83
I got 2722 from node 83
I got 4944 from node 83
```

I got 5948 from node 83
I got 3635 from node 83
I got 7151 from node 83
I got 5683 from node 83
I got 6922 from node 83
I got 4111 from node 83
I got 4754 from node 83
I got 3912 from node 83
I got 6163 from node 83
I got 5160 from node 83
I got 5821 from node 83
I got 4148 from node 83
I got 6669 from node 83
I got 5502 from node 83
I got 6051 from node 83
I got 5316 from node 83
I got 4839 from node 83
I got 5267 from node 83
I got 5549 from node 83
I got 4748 from node 83
I got 6479 from node 83
I got 4986 from node 83
I got 4823 from node 83
I got 5174 from node 83
I got 5804 from node 83
I got 5600 from node 83
I got 4790 from node 83
I got 6747 from node 83
I got 4430 from node 83
I got 4452 from node 83
I got 4772 from node 83
I got 6008 from node 83
I got 3387 from node 83
I got 5300 from node 83
I got 4498 from node 83
I got 6274 from node 84
I got 5425 from node 84
I got 3668 from node 84
I got 5554 from node 84
I got 6632 from node 84
I got 5936 from node 84
I got 2660 from node 84
I got 3903 from node 84
I got 5586 from node 84
I got 5451 from node 84
I got 5220 from node 84

```
I got 3858 from node 84
I got 5964 from node 84
I got 5303 from node 84
I got 4443 from node 84
I got 6515 from node 84
I got 4126 from node 84
I got 5364 from node 84
I got 5952 from node 84
I got 4513 from node 84
I got 5960 from node 84
I got 6026 from node 84
I got 5905 from node 84
I got 5012 from node 84
I got 4889 from node 84
I got 5224 from node 84
I got 5988 from node 84
I got 5706 from node 84
I got 4864 from node 84
I got 4411 from node 84
I got 4415 from node 84
I got 6824 from node 84
I got 5370 from node 84
I got 4584 from node 84
I got 6939 from node 84
I got 7119 from node 84
I got 5420 from node 84
I got 5263 from node 84
I got 5842 from node 84
I got 6885 from node 84
I got 5563 from node 84
I got 5504 from node 84
I got 4929 from node 84
I got 4935 from node 84
I got 6648 from node 85
I got 4264 from node 85
I got 5640 from node 85
I got 5811 from node 85
I got 3257 from node 85
I got 6084 from node 85
I got 5786 from node 85
I got 5678 from node 85
I got 3908 from node 85
I got 5137 from node 85
I got 5807 from node 85
I got 6068 from node 85
I got 5304 from node 85
```

```
I got 5289 from node 85
I got 5981 from node 85
I got 4927 from node 85
I got 4304 from node 85
I got 6567 from node 85
I got 3748 from node 85
I got 7357 from node 85
I got 4923 from node 85
I got 7149 from node 85
I got 4702 from node 85
I got 5615 from node 85
I got 7335 from node 85
I got 5371 from node 85
I got 5590 from node 85
I got 5115 from node 85
I got 5866 from node 85
I got 5727 from node 85
I got 5324 from node 85
I got 6427 from node 85
I got 4004 from node 85
I got 5867 from node 85
I got 3962 from node 85
I got 5280 from node 85
I got 6387 from node 85
I got 5592 from node 85
I got 4726 from node 85
I got 5555 from node 85
I got 2813 from node 85
I got 7862 from node 85
I got 4989 from node 85
I got 5293 from node 85
I got 3867 from node 86
I got 6023 from node 86
I got 3842 from node 86
I got 4383 from node 86
I got 5955 from node 86
I got 5733 from node 86
I got 4509 from node 86
I got 4532 from node 86
I got 4517 from node 86
I got 6750 from node 86
I got 5322 from node 86
I got 6503 from node 86
I got 6219 from node 86
I got 4674 from node 86
I got 5083 from node 86
```

```
I got 6541 from node 86
I got 4999 from node 86
I got 4394 from node 86
I got 6877 from node 86
I got 4174 from node 86
I got 5085 from node 86
I got 5082 from node 86
I got 6065 from node 86
I got 6214 from node 86
I got 5976 from node 86
I got 4185 from node 86
I got 6296 from node 86
I got 5752 from node 86
I got 7464 from node 86
I got 5438 from node 86
I got 6494 from node 86
I got 5157 from node 86
I got 5616 from node 86
I got 4849 from node 86
I got 3873 from node 86
I got 5088 from node 86
I got 4776 from node 86
I got 5717 from node 86
I got 5915 from node 86
I got 4476 from node 86
I got 5581 from node 86
I got 4618 from node 86
I got 3395 from node 86
I got 6537 from node 86
I got 3731 from node 87
I got 6660 from node 87
I got 4257 from node 87
I got 6959 from node 87
I got 7307 from node 87
I got 4089 from node 87
I got 5089 from node 87
I got 5461 from node 87
I got 6740 from node 87
I got 6473 from node 87
I got 4460 from node 87
I got 6647 from node 87
I got 4627 from node 87
I got 6753 from node 87
I got 3920 from node 87
I got 5920 from node 87
I got 6459 from node 87
```


I got 5780 from node 87
I got 5917 from node 87
I got 5580 from node 87
I got 5646 from node 87
I got 5307 from node 87
I got 7812 from node 87
I got 3833 from node 87
I got 5499 from node 87
I got 5004 from node 87
I got 5865 from node 87
I got 5798 from node 87
I got 6234 from node 87
I got 5433 from node 87
I got 5246 from node 87
I got 7495 from node 87
I got 4973 from node 87
I got 6069 from node 87
I got 4035 from node 87
I got 4854 from node 87
I got 6746 from node 87
I got 6295 from node 87
I got 6212 from node 87
I got 6707 from node 87
I got 4487 from node 87
I got 4398 from node 87
I got 4671 from node 87
I got 7794 from node 87
I got 7633 from node 88
I got 5768 from node 88
I got 6832 from node 88
I got 6450 from node 88
I got 5033 from node 88
I got 3725 from node 88
I got 3505 from node 88
I got 5376 from node 88
I got 2710 from node 88
I got 5695 from node 88
I got 4924 from node 88
I got 5100 from node 88
I got 4864 from node 88
I got 4760 from node 88
I got 5306 from node 88
I got 5219 from node 88
I got 5722 from node 88
I got 7027 from node 88
I got 7896 from node 88

```
I got 7360 from node 88
I got 4550 from node 88
I got 6646 from node 88
I got 3970 from node 88
I got 4187 from node 88
I got 4634 from node 88
I got 5788 from node 88
I got 4836 from node 88
I got 5384 from node 88
I got 5301 from node 88
I got 7662 from node 88
I got 5830 from node 88
I got 5678 from node 88
I got 5905 from node 88
I got 5501 from node 88
I got 5327 from node 88
I got 4821 from node 88
I got 4834 from node 88
I got 5579 from node 88
I got 7726 from node 88
I got 5599 from node 88
I got 4501 from node 88
I got 5196 from node 88
I got 5463 from node 88
I got 6821 from node 88
```

```
[0/96]#110: MPI_Bcast done
```

```
I got 5357 from node 88
I got 7021 from node 1
I got 4435 from node 0
I got 4610 from node 90
I got 0 from node 91
I got 0 from node 92
I got 5032 from node 89
I got 4347 from node 15
I got 0 from node 93
I got 0 from node 94
I got 4703 from node 2
I got 5360 from node 3
I got 4264 from node 4
I got 5290 from node 5
I got 4731 from node 6
I got 3416 from node 7
I got 6160 from node 8
I got 4536 from node 9
I got 3887 from node 10
```

```
I got 6222 from node 11
I got 5834 from node 12
I got 5318 from node 13
I got 5087 from node 14
I got 0 from node 95
I got 6543 from node 16
I got 6346 from node 17
I got 5925 from node 18
I got 5290 from node 19
I got 8122 from node 20
I got 5562 from node 21
I got 6607 from node 22
I got 6496 from node 23
I got 6539 from node 24
I got 6546 from node 25
I got 4623 from node 26
I got 5657 from node 27
I got 5509 from node 28
I got 6734 from node 29
I got 4970 from node 30
I got 3972 from node 31
I got 5301 from node 32
I got 4428 from node 33
I got 5294 from node 34
I got 5610 from node 35
I got 6293 from node 36
I got 6018 from node 37
I got 4773 from node 38
I got 4104 from node 39
I got 4401 from node 40
I got 4440 from node 41
I got 6106 from node 42
I got 6849 from node 43
I got 5960 from node 44
I got 5315 from node 45
I got 5442 from node 46
I got 4482 from node 47
I got 6154 from node 48
I got 3725 from node 49
I got 3569 from node 50
I got 6320 from node 51
I got 6577 from node 52
I got 5120 from node 53
I got 7275 from node 54
I got 5596 from node 55
I got 5056 from node 56
```

```
I got 7312 from node 57
I got 6134 from node 58
I got 5697 from node 59
I got 6280 from node 60
I got 6014 from node 61
I got 5627 from node 62
I got 6128 from node 63
I got 4367 from node 64
I got 5923 from node 65
I got 5929 from node 66
I got 5446 from node 67
I got 6939 from node 68
I got 4783 from node 69
I got 7179 from node 70
I got 6834 from node 71
I got 4812 from node 72
I got 4412 from node 73
I got 5612 from node 74
I got 4569 from node 75
I got 7896 from node 76
I got 5169 from node 77
I got 7370 from node 78
I got 6095 from node 79
I got 5393 from node 80
I got 5812 from node 81
I got 4353 from node 82
I got 5918 from node 83
I got 4873 from node 84
I got 6234 from node 85
```

```
[0/96]#122: adding...
```

```
I got 3940 from node 86
```

```
I got 6043 from node 87
```

```
[0/96]#129: calling reduce...
```

```
The sum is 504352.
```

```
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
```

```
I got 4086 from node 90
```

```
I got 0 from node 91
```

```
I got 0 from node 92
```

```
I got 5533 from node 89
```

```
I got 6067 from node 15
I got 0 from node 93
I got 0 from node 94
I got 2927 from node 2
I got 6533 from node 3
I got 5605 from node 4
I got 6825 from node 5
I got 3565 from node 6
I got 6093 from node 7
I got 5653 from node 8
I got 7395 from node 9
I got 6330 from node 10
I got 5847 from node 11
I got 4393 from node 12
I got 5072 from node 13
I got 5243 from node 14
I got 0 from node 95
I got 5585 from node 16
I got 5928 from node 17
I got 7940 from node 18
I got 5632 from node 19
I got 4261 from node 20
I got 6846 from node 21
I got 6533 from node 22
I got 5395 from node 23
I got 6460 from node 24
I got 7197 from node 25
I got 5528 from node 26
I got 5388 from node 27
I got 2884 from node 28
I got 5393 from node 29
I got 5611 from node 30
I got 6577 from node 31
I got 4557 from node 32
I got 6259 from node 33
I got 5660 from node 34
I got 4365 from node 35
I got 7005 from node 36
I got 6724 from node 37
I got 5809 from node 38
I got 5581 from node 39
I got 6170 from node 40
I got 4786 from node 41
I got 6937 from node 42
I got 4167 from node 43
I got 5565 from node 44
```

```
I got 5222 from node 45
I got 4402 from node 46
I got 7267 from node 47
I got 6780 from node 48
I got 6003 from node 49
I got 5358 from node 50
I got 3971 from node 51
I got 5976 from node 52
I got 5901 from node 53
I got 5531 from node 54
I got 5398 from node 55
I got 5388 from node 56
I got 5239 from node 57
I got 5776 from node 58
I got 5358 from node 59
I got 5506 from node 60
I got 5264 from node 61
I got 4247 from node 62
I got 6303 from node 63
I got 5965 from node 64
I got 6112 from node 65
I got 5538 from node 66
```

```
[0/96]#122: adding...
```

```
I got 5785 from node 67
I got 6785 from node 68
I got 4816 from node 69
I got 5672 from node 70
I got 5150 from node 71
I got 6026 from node 72
I got 6350 from node 73
I got 5188 from node 74
I got 6669 from node 75
I got 4448 from node 76
I got 6171 from node 77
I got 3299 from node 78
I got 5848 from node 79
I got 4320 from node 80
I got 5206 from node 81
I got 5331 from node 82
I got 4105 from node 83
I got 6891 from node 84
I got 5805 from node 85
I got 5402 from node 86
I got 4572 from node 87
I got 4678 from node 88
```

```
I got 6845 from node 1
I got 4291 from node 0
```

```
[0/96]#129: calling reduce...
The sum is 506068.
```

```
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
I got 6403 from node 1
I got 4366 from node 86
I got 5593 from node 90
I got 0 from node 91
I got 0 from node 92
I got 5802 from node 89
I got 7548 from node 15
I got 0 from node 93
I got 0 from node 94
I got 5124 from node 2
I got 4911 from node 3
I got 4944 from node 4
I got 4295 from node 5
I got 3567 from node 6
I got 4807 from node 7
I got 5724 from node 8
I got 6805 from node 9
I got 6059 from node 10
I got 5453 from node 11
I got 6475 from node 12
I got 6071 from node 13
I got 6721 from node 14
I got 0 from node 95
I got 5120 from node 16
I got 6010 from node 17
I got 6594 from node 18
I got 4596 from node 19
I got 6324 from node 20
I got 6674 from node 21
I got 2839 from node 22
I got 5512 from node 23
I got 3861 from node 24
I got 4053 from node 25
I got 6244 from node 26
I got 5631 from node 27
```

I got 5659 from node 28
I got 6827 from node 29
I got 4956 from node 30
I got 3798 from node 31
I got 5636 from node 32
I got 5997 from node 33
I got 5745 from node 34
I got 6805 from node 35
I got 6977 from node 36
I got 5914 from node 37
I got 5619 from node 38
I got 7854 from node 39
I got 5831 from node 40
I got 6615 from node 41
I got 6181 from node 42
I got 7286 from node 43
I got 6136 from node 44
I got 4989 from node 45
I got 4560 from node 46
I got 3277 from node 47
I got 5606 from node 48
I got 3704 from node 49
I got 5203 from node 50
I got 5749 from node 51
I got 5471 from node 52
I got 5391 from node 53
I got 4485 from node 54
I got 4186 from node 55
I got 5104 from node 56
I got 5017 from node 57
I got 5368 from node 58
I got 4591 from node 59
I got 6072 from node 60
I got 4983 from node 61
I got 5003 from node 62
I got 5284 from node 63
I got 5769 from node 64
I got 7821 from node 65
I got 4647 from node 66
I got 4784 from node 67
I got 5160 from node 68
I got 4046 from node 69
I got 6657 from node 70
I got 4480 from node 71
I got 5791 from node 72
I got 6085 from node 73


```
I got 5010 from node 74
I got 6312 from node 75
I got 5601 from node 76
```

```
[0/96]#122: adding...
I got 5752 from node 77
I got 7095 from node 78
I got 7182 from node 79
I got 4685 from node 80
I got 6274 from node 81
I got 6174 from node 82
I got 6295 from node 83
I got 5550 from node 84
I got 7285 from node 85
I got 4745 from node 0
I got 4200 from node 87
I got 5997 from node 88
```

```
[0/96]#129: calling reduce...
The sum is 505402.
```

```
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
I got 5339 from node 88
I got 5832 from node 0
I got 4767 from node 87
I got 5688 from node 85
I got 5409 from node 1
I got 4769 from node 86
I got 4897 from node 90
I got 0 from node 91
I got 0 from node 92
I got 5527 from node 89
I got 4582 from node 15
I got 0 from node 93
I got 0 from node 94
I got 4838 from node 2
I got 7296 from node 3
I got 6050 from node 4
I got 7015 from node 5
I got 6138 from node 6
I got 4731 from node 7
I got 5016 from node 8
```

```
I got 5570 from node 9
I got 7614 from node 10
I got 5074 from node 11
I got 5369 from node 12
I got 4261 from node 13
I got 4214 from node 14
I got 0 from node 95
I got 3677 from node 16
I got 6400 from node 17
I got 5764 from node 18
I got 5309 from node 19
I got 5823 from node 20
I got 6724 from node 21
I got 5825 from node 22
I got 5822 from node 23
I got 5322 from node 24
I got 6211 from node 25
I got 5224 from node 26
I got 5874 from node 27
I got 5145 from node 28
I got 5905 from node 29
I got 4083 from node 30
I got 5735 from node 31
I got 5162 from node 32
I got 5690 from node 33
I got 5702 from node 34
I got 4410 from node 35
I got 5794 from node 36
I got 4507 from node 37
I got 5109 from node 38
I got 5469 from node 39
I got 3946 from node 40
I got 5960 from node 41
I got 6674 from node 42
I got 6674 from node 43
I got 6855 from node 44
I got 4802 from node 45
I got 5571 from node 46
I got 5187 from node 47
I got 3910 from node 48
I got 5260 from node 49
I got 5481 from node 50
I got 5494 from node 51
I got 6047 from node 52
I got 4646 from node 53
I got 6351 from node 54
```

```
I got 3842 from node 55
I got 6843 from node 56
I got 5266 from node 57
```

```
[0/96]#122: adding...
```

```
I got 5559 from node 58
I got 5362 from node 59
I got 5848 from node 60
I got 6073 from node 61
I got 4340 from node 62
I got 5591 from node 63
I got 5297 from node 64
I got 5010 from node 65
I got 5795 from node 66
I got 6659 from node 67
I got 6771 from node 68
I got 5563 from node 69
I got 5356 from node 70
I got 6806 from node 71
I got 4906 from node 72
I got 5444 from node 73
I got 6014 from node 74
I got 4478 from node 75
I got 5745 from node 76
I got 4905 from node 77
I got 6193 from node 78
I got 5730 from node 79
I got 4831 from node 80
I got 3627 from node 81
I got 6574 from node 82
I got 5103 from node 83
I got 4623 from node 84
```

```
[0/96]#129: calling reduce...
The sum is 497694.
```

```
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
I got 6159 from node 87
I got 4762 from node 85
I got 5025 from node 1
I got 5041 from node 86
I got 6795 from node 90
```

```
I got 0 from node 91
I got 0 from node 92
I got 6639 from node 89
I got 5252 from node 15
I got 0 from node 93
I got 0 from node 94
I got 5718 from node 2
I got 6163 from node 3
I got 3780 from node 4
I got 4721 from node 5
I got 5612 from node 6
I got 4922 from node 7
I got 5705 from node 8
I got 6259 from node 9
I got 5841 from node 10
I got 4995 from node 11
I got 5593 from node 12
I got 6624 from node 13
I got 5154 from node 14
I got 0 from node 95
I got 4525 from node 16
I got 5610 from node 17
I got 4996 from node 18
I got 5382 from node 19
I got 5767 from node 20
I got 3950 from node 21
I got 6435 from node 22
I got 4614 from node 23
I got 3452 from node 24
I got 4033 from node 25
I got 5078 from node 26
I got 5926 from node 27
I got 6543 from node 28
I got 4658 from node 29
I got 5759 from node 30
I got 3459 from node 31
I got 6247 from node 32
I got 4836 from node 33
I got 5433 from node 34
I got 7440 from node 35
I got 6429 from node 36
I got 6072 from node 37
I got 6040 from node 38
I got 7210 from node 39
I got 4158 from node 40
I got 6110 from node 41
```

```
I got 5726 from node 42
I got 4671 from node 43
I got 6934 from node 44
I got 3629 from node 45
I got 7245 from node 46
I got 5824 from node 47
I got 7744 from node 48
I got 4795 from node 49
I got 3911 from node 50
I got 5632 from node 51
I got 6476 from node 52
I got 4246 from node 53
I got 5904 from node 54
I got 5921 from node 55
```

```
[0/96]#122: adding...
```

```
I got 5840 from node 56
I got 6349 from node 57
I got 5332 from node 58
I got 4559 from node 59
I got 6380 from node 60
I got 6316 from node 61
I got 6807 from node 62
I got 5576 from node 63
I got 6618 from node 64
I got 4064 from node 65
I got 4976 from node 66
I got 5520 from node 67
I got 7019 from node 68
I got 4331 from node 69
I got 3776 from node 70
I got 3711 from node 71
I got 6784 from node 72
I got 5007 from node 73
I got 5799 from node 74
I got 5620 from node 75
I got 5088 from node 76
I got 5130 from node 77
I got 6594 from node 78
I got 5128 from node 79
I got 4909 from node 80
I got 4564 from node 81
I got 6230 from node 82
I got 4833 from node 83
I got 6962 from node 84
I got 4881 from node 88
```

I got 5033 from node 0

[0/96]#129: calling reduce...
The sum is 499316.

[0/96]#96: data is read.

[0/96]#103: calling MPI_Bcast

[0/96]#110: MPI_Bcast done

I got 5420 from node 83
I got 4916 from node 87
I got 6680 from node 85
I got 7605 from node 1
I got 6214 from node 86
I got 4912 from node 90
I got 0 from node 91
I got 0 from node 92
I got 4146 from node 89
I got 5171 from node 15
I got 0 from node 93
I got 0 from node 94
I got 4916 from node 2
I got 5840 from node 3
I got 4374 from node 4
I got 6466 from node 5
I got 4614 from node 6
I got 7201 from node 7
I got 5200 from node 8
I got 5317 from node 9
I got 5209 from node 10
I got 5329 from node 11
I got 5050 from node 12
I got 6469 from node 13
I got 5932 from node 14
I got 0 from node 95
I got 6223 from node 16
I got 5330 from node 17
I got 4681 from node 18
I got 4835 from node 19
I got 5677 from node 20
I got 6251 from node 21
I got 4379 from node 22
I got 7131 from node 23
I got 6378 from node 24
I got 4989 from node 25

```
I got 5612 from node 26
I got 6216 from node 27
I got 4842 from node 28
I got 7297 from node 29
I got 6423 from node 30
I got 6012 from node 31
I got 4846 from node 32
I got 3601 from node 33
I got 5529 from node 34
I got 6620 from node 35
I got 6028 from node 36
I got 5237 from node 37
I got 5895 from node 38
I got 3498 from node 39
```

```
[0/96]#122: adding...
```

```
I got 6381 from node 40
I got 6221 from node 41
I got 6947 from node 42
I got 6552 from node 43
I got 4260 from node 44
I got 5979 from node 45
I got 6278 from node 46
I got 6919 from node 47
I got 6022 from node 48
I got 6096 from node 49
I got 6225 from node 50
I got 5610 from node 51
I got 3850 from node 52
I got 6440 from node 53
I got 5113 from node 54
I got 4781 from node 55
I got 4893 from node 56
I got 4722 from node 57
I got 5548 from node 58
I got 5806 from node 59
I got 4292 from node 60
I got 6921 from node 61
I got 5561 from node 62
I got 4916 from node 63
I got 8177 from node 64
I got 5527 from node 65
I got 7022 from node 66
I got 4555 from node 67
I got 5276 from node 68
I got 5116 from node 69
```

```
I got 5059 from node 70
I got 7264 from node 71
I got 5167 from node 72
I got 5184 from node 73
I got 4925 from node 74
I got 6233 from node 75
I got 6820 from node 76
I got 6722 from node 77
I got 6109 from node 78
I got 6272 from node 79
I got 5485 from node 80
I got 4531 from node 81
I got 5038 from node 82
I got 4116 from node 0
I got 5539 from node 84
I got 5392 from node 88
```

```
[0/96]#129: calling reduce...
The sum is 512373.
```

```
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
I got 4578 from node 84
I got 5381 from node 82
I got 4009 from node 83
I got 7503 from node 87
I got 5300 from node 85
I got 5036 from node 1
I got 5159 from node 86
I got 5783 from node 90
I got 0 from node 91
I got 0 from node 92
I got 6609 from node 89
I got 4393 from node 15
I got 0 from node 93
I got 0 from node 94
I got 5643 from node 2
I got 5340 from node 3
I got 2826 from node 4
I got 6167 from node 5
I got 6561 from node 6
I got 5666 from node 7
I got 5972 from node 8
```



```
I got 5777 from node 9
I got 5220 from node 10
I got 5207 from node 11
I got 5289 from node 12
I got 5325 from node 13
I got 6269 from node 14
I got 0 from node 95
I got 5368 from node 16
I got 5522 from node 17
I got 6365 from node 18
I got 4671 from node 19
I got 5738 from node 20
I got 4752 from node 21
I got 4352 from node 22
I got 4802 from node 23
I got 4320 from node 24
I got 6143 from node 25
I got 5020 from node 26
I got 4760 from node 27
I got 4811 from node 28
I got 4888 from node 29
I got 5310 from node 30
I got 5037 from node 31
I got 4195 from node 32
I got 6671 from node 33
I got 4311 from node 34
I got 6466 from node 35
I got 5799 from node 36
I got 5731 from node 37
I got 4863 from node 38
I got 7371 from node 39
I got 6154 from node 40
I got 3506 from node 41
I got 5155 from node 42
I got 5219 from node 43
I got 5171 from node 44
I got 5339 from node 45
I got 4117 from node 46
I got 6480 from node 47
I got 5712 from node 48
I got 7203 from node 49
I got 3982 from node 50
I got 6971 from node 51
I got 6220 from node 52
I got 4936 from node 53
I got 3857 from node 54
```

```
I got 5338 from node 55
I got 4430 from node 56
I got 5914 from node 57
I got 4605 from node 58
I got 6922 from node 59
I got 4807 from node 60
I got 4678 from node 61
I got 5968 from node 62
I got 4754 from node 63
I got 5756 from node 64
I got 5448 from node 65
```

```
[0/96]#122: adding...
```

```
I got 4183 from node 66
I got 4843 from node 67
I got 4258 from node 68
I got 7010 from node 69
I got 4981 from node 70
I got 4524 from node 71
I got 4962 from node 72
I got 4949 from node 73
I got 5339 from node 74
I got 7053 from node 75
I got 7380 from node 76
I got 6668 from node 77
I got 5732 from node 78
I got 5199 from node 79
I got 6227 from node 80
I got 4212 from node 81
I got 5828 from node 88
I got 5088 from node 0
```

```
[0/96]#129: calling reduce...
```

```
The sum is 489357.
```

```
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
```

```
I got 5287 from node 0
```

```
The sum is 515749.
```

```
I got 5575 from node 0
```

```
The sum is 507715.
```

```
I got 6682 from node 0
```

```
The sum is 507858.
```

```
I got 3655 from node 0
```

```
The sum is 503677.
```

I got 5450 from node 0
The sum is 496399.
I got 5623 from node 0
The sum is 495502.
I got 4183 from node 0
The sum is 488471.
I got 6524 from node 0
The sum is 508413.
I got 3534 from node 0
The sum is 501747.
I got 4781 from node 0
The sum is 482781.
I got 4852 from node 0
The sum is 487411.
I got 6813 from node 0
The sum is 484832.
I got 6789 from node 0
The sum is 512145.
I got 4670 from node 0
The sum is 491953.
I got 4946 from node 0
The sum is 489120.
I got 5659 from node 0
The sum is 497437.
I got 4485 from node 0
The sum is 523142.
I got 4953 from node 0
The sum is 493670.
I got 4761 from node 0
The sum is 504357.
I got 5240 from node 0
The sum is 488023.
I got 4936 from node 0
The sum is 493597.
I got 4322 from node 0
The sum is 506854.
I got 5620 from node 0
The sum is 501075.
I got 4764 from node 0
The sum is 489586.
I got 5480 from node 0
The sum is 489577.
I got 4497 from node 0
The sum is 481646.
I got 5875 from node 0
The sum is 491459.

```
I got 6464 from node 0
The sum is 515442.
I got 5483 from node 0
The sum is 493486.
I got 4231 from node 0
The sum is 494471.
I got 5917 from node 0
The sum is 511992.
I got 5615 from node 0
The sum is 494128.
I got 6352 from node 0
The sum is 506846.
I got 6309 from node 0
The sum is 484908.
I got 5158 from node 0
The sum is 513380.
I got 5513 from node 0
The sum is 486344.
I got 4517 from node 0
The sum is 508533.
I got 5550 from node 0
The sum is 494926.
I got 6050 from node 0
The sum is 505607.
I got 4491 from node 0
The sum is 501180.
I got 5442 from node 0
The sum is 500575.
I got 4792 from node 0
I got 5035 from node 88
I got 4587 from node 88
I got 6730 from node 88
I got 5480 from node 88
I got 6812 from node 88
I got 5012 from node 88
I got 5118 from node 88
I got 6510 from node 88
I got 5613 from node 88
I got 4732 from node 88
I got 5013 from node 88
I got 5509 from node 88
I got 4409 from node 88
I got 3353 from node 88
I got 5899 from node 88
I got 4097 from node 88
I got 5206 from node 88
```

```
I got 5510 from node 88
I got 5300 from node 88
I got 5928 from node 88
I got 5034 from node 88
I got 3872 from node 88
I got 4761 from node 88
I got 4680 from node 88
I got 3962 from node 88
I got 5132 from node 88
I got 5867 from node 88
I got 6072 from node 88
I got 6085 from node 88
I got 5026 from node 88
I got 3229 from node 88
I got 4844 from node 88
I got 4534 from node 88
I got 5312 from node 88
I got 7491 from node 88
I got 5776 from node 88
I got 5466 from node 88
I got 3782 from node 88
I got 7328 from node 88
I got 4679 from node 88
I got 4074 from node 88
I got 5260 from node 88
I got 5263 from node 81
I got 7654 from node 81
I got 4644 from node 81
I got 5375 from node 81
I got 6101 from node 81
I got 6024 from node 81
I got 4781 from node 81
I got 5537 from node 81
I got 5695 from node 81
I got 6268 from node 81
I got 5828 from node 81
I got 7118 from node 81
I got 7265 from node 81
I got 5643 from node 81
I got 5326 from node 81
I got 6200 from node 81
I got 5682 from node 81
I got 5059 from node 81
I got 5477 from node 81
I got 5527 from node 81
I got 5470 from node 81
```

```
I got 6083 from node 81
I got 4135 from node 81
I got 5489 from node 81
I got 5814 from node 81
I got 5935 from node 81
I got 5815 from node 81
I got 5142 from node 81
I got 4557 from node 81
I got 4498 from node 81
I got 5683 from node 81
I got 5190 from node 81
I got 7193 from node 81
I got 5306 from node 81
I got 8561 from node 81
I got 5994 from node 81
I got 4874 from node 81
I got 7552 from node 81
I got 5935 from node 81
I got 6576 from node 81
I got 5410 from node 81
I got 5081 from node 81
I got 5829 from node 84
I got 5966 from node 84
I got 5098 from node 84
I got 4417 from node 84
I got 5973 from node 84
I got 4562 from node 84
I got 4745 from node 84
I got 6002 from node 84
I got 5991 from node 84
I got 4945 from node 84
I got 5193 from node 84
I got 5807 from node 84
I got 6364 from node 84
I got 5851 from node 84
I got 5680 from node 84
I got 5826 from node 84
I got 5097 from node 84
I got 5550 from node 84
I got 4982 from node 84
I got 6587 from node 84
I got 4730 from node 84
I got 5834 from node 84
I got 5400 from node 84
I got 5159 from node 84
I got 5331 from node 84
```

```
I got 4028 from node 84
I got 6770 from node 84
I got 6132 from node 84
I got 4502 from node 84
I got 5997 from node 84
I got 5462 from node 84
I got 6629 from node 84
I got 5375 from node 84
I got 5125 from node 84
I got 6368 from node 84
I got 5305 from node 84
I got 4613 from node 84
I got 5337 from node 84
I got 5922 from node 84
I got 5351 from node 84
I got 6409 from node 84
I got 5082 from node 84
I got 5553 from node 82
I got 6329 from node 82
I got 7623 from node 82
I got 5286 from node 82
I got 5049 from node 82
I got 3562 from node 82
I got 4565 from node 82
I got 5204 from node 82
I got 5443 from node 82
I got 4624 from node 82
I got 5135 from node 82
I got 6217 from node 82
I got 5888 from node 82
I got 3993 from node 82
I got 4378 from node 82
I got 5195 from node 82
I got 6324 from node 82
I got 6930 from node 82
I got 5126 from node 82
I got 4789 from node 82
I got 4473 from node 82
I got 3474 from node 82
I got 4989 from node 82
I got 8425 from node 82
I got 4833 from node 82
I got 5447 from node 82
I got 7355 from node 82
I got 7322 from node 82
I got 6691 from node 82
```

```
I got 4451 from node 82
I got 4403 from node 82
I got 5468 from node 82
I got 6107 from node 82
I got 5869 from node 82
I got 5081 from node 82
I got 4639 from node 82
I got 4924 from node 82
I got 6872 from node 82
I got 5134 from node 82
I got 6393 from node 82
I got 5771 from node 82
I got 5397 from node 82
I got 6127 from node 83
I got 4522 from node 83
I got 3577 from node 83
I got 6407 from node 83
I got 4522 from node 83
I got 7161 from node 83
I got 5233 from node 83
I got 5872 from node 83
I got 4638 from node 83
I got 5332 from node 83
I got 6436 from node 83
I got 5180 from node 83
I got 5234 from node 83
I got 7016 from node 83
I got 6654 from node 83
I got 6528 from node 83
I got 5478 from node 83
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I got 3917 from node 83
I got 4017 from node 83
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I got 7607 from node 83
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I got 5118 from node 83
I got 6782 from node 83
I got 6856 from node 83
I got 4876 from node 83
I got 4149 from node 83
I got 6301 from node 83
I got 5479 from node 83
```



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I got 5162 from node 83
I got 4602 from node 83
I got 4897 from node 83
I got 6675 from node 83
I got 5410 from node 83
I got 4379 from node 83
I got 6199 from node 83
I got 6048 from node 83
I got 4461 from node 83
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I got 5438 from node 87
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I got 5475 from node 87
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I got 4947 from node 87
I got 4565 from node 87
I got 4669 from node 87
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I got 4912 from node 87
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I got 6044 from node 87
I got 6510 from node 87
I got 7484 from node 87
I got 5753 from node 87
I got 5413 from node 87
I got 4250 from node 87
```

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I got 5735 from node 87
I got 7668 from node 87
I got 5415 from node 87
I got 5799 from node 87
I got 5590 from node 87
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I got 5627 from node 85
I got 5550 from node 85
I got 5708 from node 85
I got 6029 from node 85
I got 5037 from node 85
I got 5774 from node 85
```

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I got 5423 from node 1
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I got 4804 from node 1
I got 4760 from node 1
I got 6097 from node 1
I got 4952 from node 86
I got 4363 from node 86
I got 6471 from node 86
```

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I got 5388 from node 86
I got 5146 from node 86
I got 5661 from node 86
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I got 4951 from node 86
I got 4688 from node 86
I got 4972 from node 86
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I got 6210 from node 90
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I got 5376 from node 90
I got 4010 from node 90
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I got 3750 from node 90
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I got 4974 from node 90
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I got 5790 from node 90
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I got 5696 from node 90
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I got 0 from node 91
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I got 0 from node 91
I got 0 from node 91
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[illegible]

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I got 5445 from node 89
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I got 5090 from node 15
I got 3585 from node 15
I got 4650 from node 15
I got 7075 from node 15
I got 4546 from node 15
I got 4877 from node 15
```



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I got 5144 from node 2
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I got 7063 from node 2
I got 6250 from node 2
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I got 6302 from node 2
I got 5049 from node 2
I got 6066 from node 2
```

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I got 4499 from node 3
I got 7663 from node 3
I got 4661 from node 3
I got 4012 from node 3
I got 5935 from node 3
I got 5536 from node 3
I got 5640 from node 3
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I got 5438 from node 3
I got 5413 from node 3
I got 5453 from node 3
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I got 3573 from node 3
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I got 3486 from node 3
I got 5930 from node 3
I got 3736 from node 3
I got 5786 from node 3
I got 5788 from node 3
I got 4463 from node 3
```

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I got 6373 from node 3
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I got 6551 from node 3
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I got 4568 from node 4
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I got 6344 from node 4
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I got 6178 from node 4
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I got 4569 from node 4
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I got 4379 from node 4
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I got 5662 from node 4
I got 5420 from node 4
I got 5765 from node 5
```

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I got 5599 from node 5
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I got 5939 from node 5
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I got 5908 from node 5
I got 6505 from node 5
I got 5773 from node 5
I got 4781 from node 5
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I got 5912 from node 6
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I got 8022 from node 6
I got 6473 from node 6
I got 5405 from node 6
I got 4433 from node 6
I got 6125 from node 6
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I got 5084 from node 6
I got 3922 from node 6
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I got 6372 from node 6
I got 6142 from node 6
I got 4152 from node 6
I got 4369 from node 6
I got 2967 from node 6
I got 4438 from node 6
I got 4840 from node 6
I got 5150 from node 6
I got 5757 from node 6
I got 6074 from node 6
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I got 4187 from node 6
I got 4446 from node 6
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I got 6344 from node 7
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I got 5126 from node 7
I got 5644 from node 7
I got 5494 from node 7
I got 5990 from node 7
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I got 6135 from node 7
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I got 6293 from node 8
I got 5038 from node 8


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I got 5138 from node 8
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I got 6815 from node 8
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I got 4131 from node 9
I got 5173 from node 9
I got 5481 from node 9
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I got 4608 from node 9
I got 5516 from node 9
```

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I got 6194 from node 9
I got 6479 from node 9
I got 6516 from node 9
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I got 6593 from node 9
I got 6143 from node 9
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I got 5859 from node 9
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I got 5986 from node 10
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I got 4803 from node 11
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I got 5305 from node 14
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I got 6309 from node 14
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I got 4753 from node 14
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```



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I got 4307 from node 17
```



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I got 6218 from node 17
I got 6088 from node 17
I got 5828 from node 17
I got 4835 from node 17
I got 5924 from node 17
I got 6178 from node 17
I got 3423 from node 17
I got 5325 from node 17
I got 7101 from node 17
I got 4892 from node 17
I got 4708 from node 17
I got 6045 from node 17
I got 4098 from node 17
I got 5606 from node 17
I got 6347 from node 17
I got 4204 from node 17
I got 5901 from node 17
I got 6361 from node 17
I got 5668 from node 17
I got 5661 from node 17
I got 7170 from node 17
I got 5847 from node 17
I got 6651 from node 17
I got 5945 from node 17
I got 3210 from node 17
I got 4408 from node 17
I got 5930 from node 17
I got 5223 from node 17
I got 4992 from node 17
I got 4049 from node 17
I got 5803 from node 17
I got 6334 from node 17
I got 6129 from node 17
I got 4434 from node 17
I got 7157 from node 18
I got 6301 from node 18
I got 5829 from node 18
I got 5383 from node 18
I got 5132 from node 18
I got 5815 from node 18
I got 4925 from node 18
```

```
I got 7019 from node 18
I got 7125 from node 18
I got 8296 from node 18
I got 5306 from node 18
I got 5423 from node 18
I got 5353 from node 18
I got 3290 from node 18
I got 7076 from node 18
I got 6523 from node 18
I got 4826 from node 18
I got 6113 from node 18
I got 4131 from node 18
I got 4033 from node 18
I got 6320 from node 18
I got 5871 from node 18
I got 5141 from node 18
I got 4448 from node 18
I got 4397 from node 18
I got 7446 from node 18
I got 5564 from node 18
I got 5039 from node 18
I got 6410 from node 18
I got 5506 from node 18
I got 5631 from node 18
I got 6866 from node 18
I got 4481 from node 18
I got 4495 from node 18
I got 5364 from node 18
I got 5761 from node 18
I got 5510 from node 18
I got 4642 from node 18
I got 5556 from node 18
I got 4347 from node 18
I got 4198 from node 18
I got 3954 from node 18
I got 8073 from node 19
I got 5203 from node 19
I got 3663 from node 19
I got 6546 from node 19
I got 5144 from node 19
I got 5239 from node 19
I got 5077 from node 19
I got 6906 from node 19
I got 6182 from node 19
I got 6385 from node 19
I got 5449 from node 19
```

```
I got 2848 from node 19
I got 5268 from node 19
I got 4935 from node 19
I got 5554 from node 19
I got 4873 from node 19
I got 3877 from node 19
I got 5603 from node 19
I got 4578 from node 19
I got 5894 from node 19
I got 5895 from node 19
I got 5490 from node 19
I got 6100 from node 19
I got 4218 from node 19
I got 3611 from node 19
I got 4122 from node 19
I got 7122 from node 19
I got 5573 from node 19
I got 5723 from node 19
I got 3420 from node 19
I got 6042 from node 19
I got 6086 from node 19
I got 5340 from node 19
I got 4713 from node 19
I got 6666 from node 19
I got 7285 from node 19
I got 5968 from node 19
I got 5742 from node 19
I got 4212 from node 19
I got 4112 from node 19
I got 5519 from node 19
I got 4642 from node 19
I got 7078 from node 20
I got 4134 from node 20
I got 5198 from node 20
I got 6056 from node 20
I got 5743 from node 20
I got 3460 from node 20
I got 4573 from node 20
I got 6769 from node 20
I got 6329 from node 20
I got 5507 from node 20
I got 6066 from node 20
I got 3915 from node 20
I got 4871 from node 20
I got 5576 from node 20
I got 5487 from node 20
```

```
I got 6050 from node 20
I got 5942 from node 20
I got 5488 from node 20
I got 5169 from node 20
I got 5269 from node 20
I got 7639 from node 20
I got 4608 from node 20
I got 5981 from node 20
I got 6196 from node 20
I got 6597 from node 20
I got 4821 from node 20
I got 6314 from node 20
I got 4987 from node 20
I got 5980 from node 20
I got 4551 from node 20
I got 6102 from node 20
I got 6331 from node 20
I got 5480 from node 20
I got 6748 from node 20
I got 5808 from node 20
I got 4442 from node 20
I got 6324 from node 20
I got 3898 from node 20
I got 4419 from node 20
I got 4071 from node 20
I got 6268 from node 20
I got 6017 from node 20
I got 5709 from node 21
I got 6066 from node 21
I got 4585 from node 21
I got 7650 from node 21
I got 5681 from node 21
I got 8145 from node 21
I got 7246 from node 21
I got 4192 from node 21
I got 5108 from node 21
I got 4577 from node 21
I got 2788 from node 21
I got 5339 from node 21
I got 5632 from node 21
I got 4911 from node 21
I got 5926 from node 21
I got 6220 from node 21
I got 7036 from node 21
I got 6846 from node 21
I got 5521 from node 21
```

```
I got 5116 from node 21
I got 5268 from node 21
I got 5244 from node 21
I got 5602 from node 21
I got 6461 from node 21
I got 6427 from node 21
I got 5123 from node 21
I got 4346 from node 21
I got 5852 from node 21
I got 6775 from node 21
I got 6654 from node 21
I got 5089 from node 21
I got 5040 from node 21
I got 3728 from node 21
I got 5164 from node 21
I got 5327 from node 21
I got 6931 from node 21
I got 4848 from node 21
I got 6138 from node 21
I got 5705 from node 21
I got 5587 from node 21
I got 5871 from node 21
I got 7218 from node 21
I got 6419 from node 22
I got 5491 from node 22
I got 5941 from node 22
I got 5340 from node 22
I got 5327 from node 22
I got 4590 from node 22
I got 4981 from node 22
I got 7762 from node 22
I got 3951 from node 22
I got 3831 from node 22
I got 5550 from node 22
I got 5855 from node 22
I got 6977 from node 22
I got 5595 from node 22
I got 6961 from node 22
I got 6141 from node 22
I got 6370 from node 22
I got 5543 from node 22
I got 5832 from node 22
I got 4423 from node 22
I got 5378 from node 22
I got 56
[0/96]#110: MPI_Bcast done
```

```
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
```

```
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
```

```
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
```



```
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
```

```
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done
```

```
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
```

[0/96]#103: calling MPI_Bcast

[0/96]#110: MPI_Bcast done

[0/96]#122: adding...

[0/96]#129: calling reduce...

[0/96]#96: data is read.

[0/96]#103: calling MPI_Bcast

[0/96]#110: MPI_Bcast done

[0/96]18 from node 22

I got 4046 from node 22

I got 5782 from node 22

I got 4527 from node 22

I got 5042 from node 22

I got 6773 from node 22

I got 6588 from node 22

I got 5630 from node 22

I got 6325 from node 22

I got 6463 from node 22

I got 3480 from node 22

I got 5778 from node 22

I got 8244 from node 22

I got 6849 from node 22

I got 4386 from node 22

I got 4340 from node 22

I got 6877 from node 22

I got 4941 from node 22

I got 6517 from node 22

I got 6974 from node 22

I got 4566 from node 22

I got 4140 from node 23

I got 4241 from node 23

I got 5911 from node 23

I got 7416 from node 23

I got 6873 from node 23

I got 4243 from node 23

I got 4957 from node 23

I got 6188 from node 23

I got 5705 from node 23

I got 4401 from node 23

```
I got 5407 from node 23
I got 4845 from node 23
I got 6219 from node 23
I got 6406 from node 23
I got 5292 from node 23
I got 5028 from node 23
I got 5901 from node 23
I got 4844 from node 23
I got 4558 from node 23
I got 5282 from node 23
I got 6153 from node 23
I got 5213 from node 23
I got 7056 from node 23
I got 5059 from node 23
I got 5273 from node 23
I got 6923 from node 23
I got 4541 from node 23
I got 5716 from node 23
I got 4474 from node 23
I got 5283 from node 23
I got 5676 from node 23
I got 4518 from node 23
I got 5869 from node 23
I got 5506 from node 23
I got 7030 from node 23
I got 5633 from node 23
I got 6485 from node 23
I got 5720 from node 23
I got 6075 from node 23
I got 5140 from node 23
I got 4246 from node 23
I got 5951 from node 23
I got 5281 from node 24
I got 3906 from node 24
I got 4427 from node 24
I got 4737 from node 24
I got 5603 from node 24
I got 5009 from node 24
I got 5592 from node 24
I got 6242 from node 24
I got 6798 from node 24
I got 5893 from node 24
I got 4888 from node 24
I got 5983 from node 24
I got 6398 from node 24
I got 4724 from node 24
```

```
I got 4367 from node 24
I got 7141 from node 24
I got 5968 from node 24
I got 6704 from node 24
I got 6114 from node 24
I got 5937 from node 24
I got 5104 from node 24
I got 7061 from node 24
I got 5237 from node 24
I got 6611 from node 24
I got 5436 from node 24
I got 5059 from node 24
I got 5880 from node 24
I got 6439 from node 24
I got 5622 from node 24
I got 3985 from node 24
I got 6218 from node 24
I got 5732 from node 24
I got 7353 from node 24
I got 5165 from node 24
I got 5462 from node 24
I got 4828 from node 24
I got 5352 from node 24
I got 6954 from node 24
I got 5844 from node 24
I got 4096 from node 24
I got 5372 from node 24
I got 5740 from node 24
I got 6228 from node 25
I got 5396 from node 25
I got 4540 from node 25
I got 4286 from node 25
I got 4578 from node 25
I got 5909 from node 25
I got 7165 from node 25
I got 5092 from node 25
I got 4410 from node 25
I got 4510 from node 25
I got 5836 from node 25
I got 5822 from node 25
I got 5518 from node 25
I got 6788 from node 25
I got 5184 from node 25
I got 3395 from node 25
I got 7363 from node 25
I got 6989 from node 25
```

```
I got 5494 from node 25
I got 7385 from node 25
I got 5060 from node 25
I got 7014 from node 25
I got 5708 from node 25
I got 6024 from node 25
I got 6377 from node 25
I got 4424 from node 25
I got 5421 from node 25
I got 7196 from node 25
I got 3739 from node 25
I got 4433 from node 25
I got 5890 from node 25
I got 5446 from node 25
I got 5230 from node 25
I got 3909 from node 25
I got 5028 from node 25
I got 5972 from node 25
I got 5589 from node 25
I got 6388 from node 25
I got 5395 from node 25
I got 4633 from node 25
I got 7210 from node 25
I got 6046 from node 25
I got 6164 from node 26
I got 5011 from node 26
I got 5192 from node 26
I got 4667 from node 26
I got 5519 from node 26
I got 4899 from node 26
I got 6060 from node 26
I got 5543 from node 26
I got 6474 from node 26
I got 5987 from node 26
I got 5782 from node 26
I got 4790 from node 26
I got 6990 from node 26
I got 5313 from node 26
I got 4713 from node 26
I got 4331 from node 26
I got 5807 from node 26
I got 4686 from node 26
I got 6986 from node 26
I got 5875 from node 26
I got 5454 from node 26
I got 5703 from node 26
```

```
I got 5520 from node 26
I got 5900 from node 26
I got 6235 from node 26
I got 3742 from node 26
I got 6010 from node 26
I got 3677 from node 26
I got 4238 from node 26
I got 5956 from node 26
I got 6932 from node 26
I got 6253 from node 26
I got 5328 from node 26
I got 4289 from node 26
I got 6542 from node 26
I got 5459 from node 26
I got 6162 from node 26
I got 4459 from node 26
I got 5889 from node 26
I got 5905 from node 26
I got 6163 from node 26
I got 4964 from node 26
I got 6698 from node 27
I got 5508 from node 27
I got 5813 from node 27
I got 4818 from node 27
I got 4389 from node 27
I got 5735 from node 27
I got 6723 from node 27
I got 4832 from node 27
I got 5699 from node 27
I got 4329 from node 27
I got 4905 from node 27
I got 5227 from node 27
I got 5782 from node 27
I got 4428 from node 27
I got 4720 from node 27
I got 6850 from node 27
I got 6207 from node 27
I got 6569 from node 27
I got 4935 from node 27
I got 5940 from node 27
I got 5943 from node 27
I got 6709 from node 27
I got 5724 from node 27
I got 6150 from node 27
I got 5368 from node 27
I got 5191 from node 27
```



```
I got 3668 from node 27
I got 6534 from node 27
I got 4264 from node 27
I got 4781 from node 27
I got 7756 from node 27
I got 7559 from node 27
I got 6823 from node 27
I got 5643 from node 27
I got 5375 from node 27
I got 5091 from node 27
I got 4640 from node 27
I got 4351 from node 27
I got 5327 from node 27
I got 6406 from node 27
I got 7719 from node 27
I got 4883 from node 27
I got 5181 from node 28
I got 6885 from node 28
I got 6466 from node 28
I got 3598 from node 28
I got 5721 from node 28
I got 5817 from node 28
I got 6309 from node 28
I got 6070 from node 28
I got 5572 from node 28
I got 6163 from node 28
I got 5444 from node 28
I got 5811 from node 28
I got 6080 from node 28
I got 4269 from node 28
I got 7483 from node 28
I got 5941 from node 28
I got 6120 from node 28
I got 6021 from node 28
I got 6564 from node 28
I got 5107 from node 28
I got 5096 from node 28
I got 6831 from node 28
I got 6357 from node 28
I got 5486 from node 28
I got 5945 from node 28
I got 4645 from node 28
I got 6065 from node 28
I got 5788 from node 28
I got 4136 from node 28
I got 4938 from node 28
```

```
I got 5423 from node 28
I got 5259 from node 28
I got 4668 from node 28
I got 5714 from node 28
I got 6698 from node 28
I got 6668 from node 28
I got 5069 from node 28
I got 4516 from node 28
I got 5682 from node 28
I got 6317 from node 28
I got 4402 from node 28
I got 5412 from node 28
I got 5621 from node 29
I got 5745 from node 29
I got 6071 from node 29
I got 5159 from node 29
I got 6091 from node 29
I got 6882 from node 29
I got 5516 from node 29
I got 5605 from node 29
I got 3684 from node 29
I got 4103 from node 29
I got 6577 from node 29
I got 6342 from node 29
I got 6932 from node 29
I got 4608 from node 29
I got 6373 from node 29
I got 5641 from node 29
I got 6528 from node 29
I got 5749 from node 29
I got 6164 from node 29
I got 4937 from node 29
I got 5311 from node 29
I got 5030 from node 29
I got 6375 from node 29
I got 5810 from node 29
I got 4281 from node 29
I got 6119 from node 29
I got 6583 from node 29
I got 8006 from node 29
I got 5595 from node 29
I got 4837 from node 29
I got 6521 from node 29
I got 4424 from node 29
I got 5572 from node 29
I got 4155 from node 29
```

```
I got 5084 from node 29
I got 5119 from node 29
I got 5670 from node 29
I got 5216 from node 29
I got 6318 from node 29
I got 5301 from node 29
I got 6523 from node 29
I got 5302 from node 29
I got 5684 from node 30
I got 6191 from node 30
I got 5371 from node 30
I got 6249 from node 30
I got 4074 from node 30
I got 6211 from node 30
I got 7088 from node 30
I got 4338 from node 30
I got 7029 from node 30
I got 5025 from node 30
I got 4482 from node 30
I got 5441 from node 30
I got 6598 from node 30
I got 4137 from node 30
I got 5745 from node 30
I got 5696 from node 30
I got 6112 from node 30
I got 4326 from node 30
I got 6353 from node 30
I got 4518 from node 30
I got 6192 from node 30
I got 5648 from node 30
I got 6062 from node 30
I got 4612 from node 30
I got 4727 from node 30
I got 3446 from node 30
I got 4906 from node 30
I got 4957 from node 30
I got 5898 from node 30
I got 6341 from node 30
I got 5206 from node 30
I got 4819 from node 30
I got 4160 from node 30
I got 5240 from node 30
I got 7556 from node 30
I got 3736 from node 30
I got 6258 from node 30
I got 6323 from node 30
```

```
I got 6840 from node 30
I got 4537 from node 30
I got 6207 from node 30
I got 5060 from node 30
I got 6033 from node 31
I got 6231 from node 31
I got 4106 from node 31
I got 4491 from node 31
I got 6345 from node 31
I got 5126 from node 31
I got 5794 from node 31
I got 7446 from node 31
I got 5559 from node 31
I got 5880 from node 31
I got 5922 from node 31
I got 5097 from node 31
I got 5472 from node 31
I got 4141 from node 31
I got 5233 from node 31
I got 4546 from node 31
I got 6786 from node 31
I got 5462 from node 31
I got 4387 from node 31
I got 6794 from node 31
I got 4104 from node 31
I got 6304 from node 31
I got 5939 from node 31
I got 5753 from node 31
I got 5944 from node 31
I got 7027 from node 31
I got 6360 from node 31
I got 5250 from node 31
I got 5727 from node 31
I got 6912 from node 31
I got 6020 from node 31
I got 7002 from node 31
I got 4776 from node 31
I got 5128 from node 31
I got 6204 from node 31
I got 6642 from node 31
I got 5324 from node 31
I got 5764 from node 31
I got 5094 from node 31
I got 6709 from node 31
I got 5516 from node 31
I got 4809 from node 31
```

```
I got 6408 from node 32
I got 6169 from node 32
I got 6582 from node 32
I got 5113 from node 32
I got 5677 from node 32
I got 5848 from node 32
I got 7184 from node 32
I got 3692 from node 32
I got 5410 from node 32
I got 5100 from node 32
I got 5100 from node 32
I got 5268 from node 32
I got 7066 from node 32
I got 5772 from node 32
I got 5809 from node 32
I got 4197 from node 32
I got 5144 from node 32
I got 3745 from node 32
I got 5822 from node 32
I got 4875 from node 32
I got 5167 from node 32
I got 5925 from node 32
I got 4683 from node 32
I got 5730 from node 32
I got 5695 from node 32
I got 6255 from node 32
I got 3965 from node 32
I got 5216 from node 32
I got 5317 from node 32
I got 4704 from node 32
I got 6271 from node 32
I got 4819 from node 32
I got 5652 from node 32
I got 6280 from node 32
I got 3237 from node 32
I got 6059 from node 32
I got 5356 from node 32
I got 4011 from node 32
I got 6532 from node 32
I got 6487 from node 32
I got 6105 from node 32
I got 4965 from node 32
I got 4721 from node 33
I got 5520 from node 33
I got 5640 from node 33
I got 6817 from node 33
```

```
I got 4916 from node 33
I got 5534 from node 33
I got 4218 from node 33
I got 5312 from node 33
I got 5437 from node 33
I got 4581 from node 33
I got 3828 from node 33
I got 5693 from node 33
I got 6113 from node 33
I got 5031 from node 33
I got 4626 from node 33
I got 5151 from node 33
I got 5421 from node 33
I got 5899 from node 33
I got 6418 from node 33
I got 4535 from node 33
I got 4501 from node 33
I got 4863 from node 33
I got 7672 from node 33
I got 4348 from node 33
I got 7147 from node 33
I got 4252 from node 33
I got 5507 from node 33
I got 5750 from node 33
I got 4803 from node 33
I got 5059 from node 33
I got 4699 from node 33
I got 4557 from node 33
I got 4581 from node 33
I got 6925 from node 33
I got 5687 from node 33
I got 5247 from node 33
I got 5240 from node 33
I got 5153 from node 33
I got 6557 from node 33
I got 3943 from node 33
I got 4197 from node 33
I got 6701 from node 33
I got 7012 from node 34
I got 6070 from node 34
I got 6563 from node 34
I got 3760 from node 34
I got 6780 from node 34
I got 5418 from node 34
I got 5048 from node 34
I got 5692 from node 34
```

```
I got 6183 from node 34
I got 5469 from node 34
I got 6046 from node 34
I got 3495 from node 34
I got 6172 from node 34
I got 5003 from node 34
I got 5398 from node 34
I got 4330 from node 34
I got 5482 from node 34
I got 5565 from node 34
I got 5733 from node 34
I got 4147 from node 34
I got 5634 from node 34
I got 5502 from node 34
I got 3461 from node 34
I got 5670 from node 34
I got 3920 from node 34
I got 5930 from node 34
I got 4766 from node 34
I got 6412 from node 34
I got 4425 from node 34
I got 6745 from node 34
I got 5622 from node 34
I got 5663 from node 34
I got 5005 from node 34
I got 3632 from node 34
I got 6777 from node 34
I got 5491 from node 34
I got 5309 from node 34
I got 7054 from node 34
I got 4767 from node 34
I got 5752 from node 34
I got 5752 from node 34
I got 5249 from node 34
I got 7218 from node 35
I got 4419 from node 35
I got 7091 from node 35
I got 3554 from node 35
I got 6885 from node 35
I got 5960 from node 35
I got 7160 from node 35
I got 5684 from node 35
I got 4495 from node 35
I got 3873 from node 35
I got 6621 from node 35
I got 6876 from node 35
```

```
I got 5542 from node 35
I got 4382 from node 35
I got 5671 from node 35
I got 4546 from node 35
I got 5932 from node 35
I got 4111 from node 35
I got 3913 from node 35
I got 4530 from node 35
I got 5968 from node 35
I got 7096 from node 35
I got 5356 from node 35
I got 4066 from node 35
I got 5362 from node 35
I got 5778 from node 35
I got 5418 from node 35
I got 3791 from node 35
I got 6236 from node 35
I got 7000 from node 35
I got 5923 from node 35
I got 5758 from node 35
I got 7114 from node 35
I got 5015 from node 35
I got 3096 from node 35
I got 4424 from node 35
I got 6930 from node 35
I got 4482 from node 35
I got 4575 from node 35
I got 5648 from node 35
I got 4019 from node 35
I got 6465 from node 35
I got 6018 from node 36
I got 5201 from node 36
I got 5351 from node 36
I got 5360 from node 36
I got 4524 from node 36
I got 6205 from node 36
I got 5572 from node 36
I got 6520 from node 36
I got 6679 from node 36
I got 6558 from node 36
I got 5820 from node 36
I got 4670 from node 36
I got 5378 from node 36
I got 5924 from node 36
I got 4762 from node 36
I got 5730 from node 36
```



```
I got 6049 from node 36
I got 6480 from node 36
I got 5592 from node 36
I got 5153 from node 36
I got 5654 from node 36
I got 5953 from node 36
I got 5036 from node 36
I got 6923 from node 36
I got 5685 from node 36
I got 3587 from node 36
I got 6348 from node 36
I got 5554 from node 36
I got 5168 from node 36
I got 4164 from node 36
I got 4320 from node 36
I got 6096 from node 36
I got 5649 from node 36
I got 5999 from node 36
I got 6271 from node 36
I got 5119 from node 36
I got 6218 from node 36
I got 4927 from node 36
I got 7053 from node 36
I got 4737 from node 36
I got 5492 from node 36
I got 7332 from node 36
I got 5028 from node 37
I got 5643 from node 37
I got 6046 from node 37
I got 6189 from node 37
I got 3669 from node 37
I got 5514 from node 37
I got 4590 from node 37
I got 4645 from node 37
I got 5956 from node 37
I got 5621 from node 37
I got 5476 from node 37
I got 4614 from node 37
I got 4564 from node 37
I got 6061 from node 37
I got 4456 from node 37
I got 6772 from node 37
I got 6335 from node 37
I got 6079 from node 37
I got 6451 from node 37
I got 4942 from node 37
```

```
I got 6257 from node 37
I got 6086 from node 37
I got 5527 from node 37
I got 5114 from node 37
I got 5482 from node 37
I got 4645 from node 37
I got 4913 from node 37
I got 2424 from node 37
I got 6313 from node 37
I got 4471 from node 37
I got 4991 from node 37
I got 4175 from node 37
I got 7210 from node 37
I got 5443 from node 37
I got 5300 from node 37
I got 4815 from node 37
I got 5791 from node 37
I got 4593 from node 37
I got 5537 from node 37
I got 6957 from node 37
I got 6833 from node 37
I got 5104 from node 37
I got 4956 from node 38
I got 6240 from node 38
I got 7214 from node 38
I got 5281 from node 38
I got 4371 from node 38
I got 4676 from node 38
I got 2511 from node 38
I got 6312 from node 38
I got 6743 from node 38
I got 2925 from node 38
I got 5814 from node 38
I got 5683 from node 38
I got 4740 from node 38
I got 6855 from node 38
I got 5433 from node 38
I got 6401 from node 38
I got 5317 from node 38
I got 5610 from node 38
I got 7957 from node 38
I got 4745 from node 38
I got 4698 from node 38
I got 6625 from node 38
I got 5264 from node 38
I got 4289 from node 38
```

```
I got 5402 from node 38
I got 5600 from node 38
I got 4503 from node 38
I got 4877 from node 38
I got 5220 from node 38
I got 5525 from node 38
I got 4111 from node 38
I got 5642 from node 38
#122: adding...

[0/96]#129: calling reduce...

[0/96]#96: data is read.

[0/96]#103: calling MPI_Bcast

[0/96]#110: MPI_Bcast done

[0/96]#122: adding...

[0/96]#129: calling reduce...

[0/96]#96: data is read.

[0/96]#103: calling MPI_Bcast

[0/96]#110: MPI_Bcast done

[0/96]#122: adding...

[0/96]#129: calling reduce...

[0/96]#96: data is read.

[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
[0/96]#96: data is read.
[0/96]#103: calling MPI_Bcast
[0/96]#110: MPI_Bcast done
[0/96]#122: adding...
[0/96]#129: calling reduce...
```

```
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast  
[0/96]#110: MPI_Bcast done  
[0/96]#122: adding...  
[0/96]#129: calling reduce...  
[0/96]#92: Reached end of data file, closing.  
All  
[0/96]#96: data is read.  
[0/96]#103: calling MPI_Bcast
```

```
[0/96]#110: MPI_Bcast done
I got 5232 from node 38
I got 4672 from node 38
I got 5801 from node 38
I got 6000 from node 38
I got 6791 from node 38
I got 4596 from node 38
I got 3575 from node 38
I got 5634 from node 38
I got 4536 from node 38
I got 4125 from node 38
I got 6135 from node 39
I got 6599 from node 39
I got 5961 from node 39
I got 7328 from node 39
I got 4811 from node 39
I got 5309 from node 39
I got 2876 from node 39
I got 6721 from node 39
I got 5847 from node 39
I got 4298 from node 39
I got 5036 from node 39
I got 5456 from node 39
I got 4499 from node 39
I got 6419 from node 39
I got 5158 from node 39
I got 7345 from node 39
I got 5930 from node 39
I got 5443 from node 39
I got 6853 from node 39
I got 6103 from node 39
I got 8207 from node 39
I got 6030 from node 39
I got 4645 from node 39
I got 6354 from node 39
I got 4306 from node 39
I got 6762 from node 39
I got 5959 from node 39
I got 7628 from node 39
I got 5111 from node 39
I got 6122 from node 39
I got 5135 from node 39
I got 5360 from node 39
I got 5401 from node 39
I got 5500 from node 39
I got 6405 from node 39
```

```
I got 5891 from node 39
I got 6880 from node 39
I got 7188 from node 39
I got 5923 from node 39
I got 6473 from node 39
I got 5137 from node 39
I got 5389 from node 39
I got 4080 from node 40
I got 5413 from node 40
I got 5770 from node 40
I got 4959 from node 40
I got 5936 from node 40
I got 4886 from node 40
I got 4434 from node 40
I got 4974 from node 40
I got 5125 from node 40
I got 6320 from node 40
I got 5500 from node 40
I got 5960 from node 40
I got 5294 from node 40
I got 4492 from node 40
I got 6127 from node 40
I got 4707 from node 40
I got 7117 from node 40
I got 5208 from node 40
I got 5507 from node 40
I got 4041 from node 40
I got 5297 from node 40
I got 5309 from node 40
I got 5863 from node 40
I got 6815 from node 40
I got 5574 from node 40
I got 4667 from node 40
I got 5444 from node 40
I got 5915 from node 40
I got 5718 from node 40
I got 6179 from node 40
I got 5535 from node 40
I got 4264 from node 40
I got 4529 from node 40
I got 4785 from node 40
I got 6457 from node 40
I got 6801 from node 40
I got 6835 from node 40
I got 6439 from node 40
I got 4553 from node 40
```

```
I got 6513 from node 40
I got 5501 from node 40
I got 5144 from node 40
I got 4117 from node 41
I got 6598 from node 41
I got 6988 from node 41
I got 5543 from node 41
I got 4088 from node 41
I got 3973 from node 41
I got 5705 from node 41
I got 5127 from node 41
I got 5305 from node 41
I got 4970 from node 41
I got 5638 from node 41
I got 6319 from node 41
I got 6874 from node 41
I got 4974 from node 41
I got 6717 from node 41
I got 5832 from node 41
I got 6543 from node 41
I got 5027 from node 41
I got 4519 from node 41
I got 5040 from node 41
I got 3728 from node 41
I got 6830 from node 41
I got 5290 from node 41
I got 4967 from node 41
I got 5495 from node 41
I got 4741 from node 41
I got 4919 from node 41
I got 5300 from node 41
I got 5560 from node 41
I got 5768 from node 41
I got 4957 from node 41
I got 4374 from node 41
I got 4312 from node 41
I got 6581 from node 41
I got 5614 from node 41
I got 5193 from node 41
I got 6779 from node 41
I got 7502 from node 41
I got 5752 from node 41
I got 5403 from node 41
I got 5654 from node 41
I got 5516 from node 41
I got 6437 from node 42
```



```
I got 6315 from node 42
I got 6060 from node 42
I got 6102 from node 42
I got 3593 from node 42
I got 5082 from node 42
I got 5301 from node 42
I got 5117 from node 42
I got 6562 from node 42
I got 5006 from node 42
I got 3480 from node 42
I got 6079 from node 42
I got 6532 from node 42
I got 3856 from node 42
I got 4177 from node 42
I got 5645 from node 42
I got 6488 from node 42
I got 4183 from node 42
I got 4770 from node 42
I got 6254 from node 42
I got 7185 from node 42
I got 4315 from node 42
I got 6398 from node 42
I got 6125 from node 42
I got 5167 from node 42
I got 5361 from node 42
I got 3999 from node 42
I got 4255 from node 42
I got 5752 from node 42
I got 6214 from node 42
I got 6281 from node 42
I got 4435 from node 42
I got 6047 from node 42
I got 4548 from node 42
I got 6744 from node 42
I got 6224 from node 42
I got 4932 from node 42
I got 5818 from node 42
I got 4655 from node 42
I got 6967 from node 42
I got 5073 from node 42
I got 5255 from node 42
I got 6510 from node 43
I got 7161 from node 43
I got 4344 from node 43
I got 6886 from node 43
I got 6066 from node 43
```

I got 7058 from node 43
I got 6015 from node 43
I got 4738 from node 43
I got 7009 from node 43
I got 6519 from node 43
I got 6443 from node 43
I got 4630 from node 43
I got 6424 from node 43
I got 7093 from node 43
I got 6907 from node 43
I got 5819 from node 43
I got 4798 from node 43
I got 4750 from node 43
I got 5101 from node 43
I got 5973 from node 43
I got 7021 from node 43
I got 5856 from node 43
I got 6116 from node 43
I got 6165 from node 43
I got 6395 from node 43
I got 6187 from node 43
I got 4459 from node 43
I got 5868 from node 43
I got 3624 from node 43
I got 4927 from node 43
I got 6038 from node 43
I got 5977 from node 43
I got 5819 from node 43
I got 4660 from node 43
I got 5165 from node 43
I got 4775 from node 43
I got 4500 from node 43
I got 4385 from node 43
I got 7567 from node 43
I got 4960 from node 43
I got 5586 from node 43
I got 5500 from node 43
I got 5344 from node 44
I got 5815 from node 44
I got 6133 from node 44
I got 5622 from node 44
I got 4764 from node 44
I got 4751 from node 44
I got 5087 from node 44
I got 4399 from node 44
I got 6294 from node 44

```
I got 5417 from node 44
I got 5558 from node 44
I got 5948 from node 44
I got 5637 from node 44
I got 5031 from node 44
I got 5518 from node 44
I got 5244 from node 44
I got 6023 from node 44
I got 5327 from node 44
I got 7457 from node 44
I got 5798 from node 44
I got 6217 from node 44
I got 7582 from node 44
I got 4416 from node 44
I got 4643 from node 44
I got 4516 from node 44
I got 4599 from node 44
I got 4949 from node 44
I got 6354 from node 44
I got 3746 from node 44
I got 4714 from node 44
I got 6154 from node 44
I got 6028 from node 44
I got 6269 from node 44
I got 5792 from node 44
I got 6653 from node 44
I got 5296 from node 44
I got 4970 from node 44
I got 6233 from node 44
I got 4602 from node 44
I got 3326 from node 44
I got 6275 from node 44
I got 4962 from node 44
I got 5186 from node 45
I got 5665 from node 45
I got 5866 from node 45
I got 5733 from node 45
I got 5600 from node 45
I got 5357 from node 45
I got 7224 from node 45
I got 3181 from node 45
I got 4968 from node 45
I got 3789 from node 45
I got 4559 from node 45
I got 4844 from node 45
I got 4369 from node 45
```

```
I got 5203 from node 45
I got 4524 from node 45
I got 5047 from node 45
I got 7037 from node 45
I got 6998 from node 45
I got 6932 from node 45
I got 5261 from node 45
I got 3364 from node 45
I got 5730 from node 45
I got 5750 from node 45
I got 5123 from node 45
I got 4895 from node 45
I got 7111 from node 45
I got 5109 from node 45
I got 4426 from node 45
I got 4336 from node 45
I got 5006 from node 45
I got 5283 from node 45
I got 6106 from node 45
I got 7543 from node 45
I got 6438 from node 45
I got 5714 from node 45
I got 4274 from node 45
I got 4535 from node 45
I got 4588 from node 45
I got 4997 from node 45
I got 7181 from node 45
I got 3483 from node 45
I got 6797 from node 45
I got 7949 from node 46
I got 4813 from node 46
I got 5838 from node 46
I got 5612 from node 46
I got 6662 from node 46
I got 6064 from node 46
I got 5201 from node 46
I got 4606 from node 46
I got 3959 from node 46
I got 5198 from node 46
I got 5761 from node 46
I got 5940 from node 46
I got 6384 from node 46
I got 4696 from node 46
I got 5190 from node 46
I got 4733 from node 46
I got 5749 from node 46
```

```
I got 6323 from node 46
I got 4451 from node 46
I got 5391 from node 46
I got 5155 from node 46
I got 4124 from node 46
I got 6784 from node 46
I got 4601 from node 46
I got 4983 from node 46
I got 5420 from node 46
I got 5712 from node 46
I got 5324 from node 46
I got 4895 from node 46
I got 4821 from node 46
I got 4030 from node 46
I got 4811 from node 46
I got 5827 from node 46
I got 4214 from node 46
I got 4823 from node 46
I got 4591 from node 46
I got 6012 from node 46
I got 4769 from node 46
I got 6461 from node 46
I got 6471 from node 46
I got 3950 from node 46
I got 5936 from node 46
I got 5802 from node 47
I got 6090 from node 47
I got 6724 from node 47
I got 6123 from node 47
I got 5261 from node 47
I got 5787 from node 47
I got 5789 from node 47
I got 5165 from node 47
I got 4625 from node 47
I got 5328 from node 47
I got 5130 from node 47
I got 6469 from node 47
I got 5859 from node 47
I got 7030 from node 47
I got 8666 from node 47
I got 4809 from node 47
I got 5840 from node 47
I got 6117 from node 47
I got 6223 from node 47
I got 5865 from node 47
I got 5345 from node 47
```

I got 5720 from node 47
I got 4534 from node 47
I got 4216 from node 47
I got 6062 from node 47
I got 4879 from node 47
I got 4240 from node 47
I got 4355 from node 47
I got 6581 from node 47
I got 5539 from node 47
I got 4884 from node 47
I got 4681 from node 47
I got 5397 from node 47
I got 5544 from node 47
I got 4918 from node 47
I got 5494 from node 47
I got 5923 from node 47
I got 4654 from node 47
I got 4698 from node 47
I got 5004 from node 47
I got 4461 from node 47
I got 5530 from node 47
I got 6182 from node 48
I got 6649 from node 48
I got 4765 from node 48
I got 5324 from node 48
I got 6090 from node 48
I got 6760 from node 48
I got 5037 from node 48
I got 6853 from node 48
I got 4677 from node 48
I got 6002 from node 48
I got 5898 from node 48
I got 5734 from node 48
I got 5018 from node 48
I got 4332 from node 48
I got 5430 from node 48
I got 5446 from node 48
I got 3215 from node 48
I got 6738 from node 48
I got 4762 from node 48
I got 5487 from node 48
I got 4405 from node 48
I got 6236 from node 48
I got 5040 from node 48
I got 5396 from node 48
I got 7752 from node 48

```
I got 4881 from node 48
I got 4448 from node 48
I got 4736 from node 48
I got 4464 from node 48
I got 5748 from node 48
I got 4201 from node 48
I got 4101 from node 48
I got 4759 from node 48
I got 5959 from node 48
I got 6545 from node 48
I got 3122 from node 48
I got 4907 from node 48
I got 5649 from node 48
I got 3755 from node 48
I got 6464 from node 48
I got 5194 from node 48
I got 4998 from node 48
I got 7650 from node 49
I got 5291 from node 49
I got 4795 from node 49
I got 4718 from node 49
I got 4256 from node 49
I got 6562 from node 49
I got 4737 from node 49
I got 6428 from node 49
I got 4045 from node 49
I got 5607 from node 49
I got 6216 from node 49
I got 4160 from node 49
I got 4640 from node 49
I got 4087 from node 49
I got 4178 from node 49
I got 4409 from node 49
I got 5315 from node 49
I got 5324 from node 49
I got 5238 from node 49
I got 6318 from node 49
I got 6007 from node 49
I got 6288 from node 49
I got 6648 from node 49
I got 4680 from node 49
I got 3303 from node 49
I got 5605 from node 49
I got 6333 from node 49
I got 4964 from node 49
I got 4452 from node 49
```

```
I got 4568 from node 49
I got 6861 from node 49
I got 5275 from node 49
I got 6359 from node 49
I got 4110 from node 49
I got 7467 from node 49
I got 6388 from node 49
I got 5578 from node 49
I got 5838 from node 49
I got 6040 from node 49
I got 6726 from node 49
I got 7323 from node 49
I got 5998 from node 49
I got 6489 from node 50
I got 5835 from node 50
I got 7091 from node 50
I got 3602 from node 50
I got 5402 from node 50
I got 4790 from node 50
I got 5973 from node 50
I got 3890 from node 50
I got 5136 from node 50
I got 4005 from node 50
I got 4666 from node 50
I got 5472 from node 50
I got 5374 from node 50
I got 6487 from node 50
I got 5753 from node 50
I got 6741 from node 50
I got 6587 from node 50
I got 4031 from node 50
I got 4593 from node 50
I got 4885 from node 50
I got 7027 from node 50
I got 6201 from node 50
I got 6327 from node 50
I got 6861 from node 50
I got 6726 from node 50
I got 4354 from node 50
I got 4878 from node 50
I got 4414 from node 50
I got 4495 from node 50
I got 5627 from node 50
I got 5957 from node 50
I got 5070 from node 50
I got 6935 from node 50
```



```
I got 4931 from node 50
I got 5038 from node 50
I got 6133 from node 50
I got 4417 from node 50
I got 3963 from node 50
I got 6395 from node 50
I got 4690 from node 50
I got 6099 from node 50
I got 6201 from node 50
I got 6040 from node 51
I got 6238 from node 51
I got 5028 from node 51
I got 5482 from node 51
I got 5472 from node 51
I got 4475 from node 51
I got 5034 from node 51
I got 5817 from node 51
I got 6296 from node 51
I got 5080 from node 51
I got 5845 from node 51
I got 3913 from node 51
I got 6430 from node 51
I got 7190 from node 51
I got 5074 from node 51
I got 7117 from node 51
I got 6198 from node 51
I got 4363 from node 51
I got 3750 from node 51
I got 6180 from node 51
I got 6327 from node 51
I got 5543 from node 51
I got 5304 from node 51
I got 5262 from node 51
I got 4952 from node 51
I got 4102 from node 51
I got 5574 from node 51
I got 6926 from node 51
I got 6613 from node 51
I got 6801 from node 51
I got 5802 from node 51
I got 5143 from node 51
I got 5262 from node 51
I got 3820 from node 51
I got 4644 from node 51
I got 5292 from node 51
I got 5248 from node 51
```

```
I got 6732 from node 51
I got 7152 from node 51
I got 5157 from node 51
I got 4334 from node 51
I got 5531 from node 51
I got 5362 from node 52
I got 5680 from node 52
I got 5218 from node 52
I got 3806 from node 52
I got 5335 from node 52
I got 6141 from node 52
I got 5539 from node 52
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I got 6122 from node 73
I got 7253 from node 73
I got 5121 from node 73
I got 5969 from node 73
I got 5785 from node 73
I got 4289 from node 73
I got 6517 from node 73
I got 6056 from node 73
I got 6883 from node 73
I got 5846 from node 73
I got 5750 from node 73
I got 6087 from node 73
I got 5391 from node 73
```

```
I got 6188 from node 73
I got 5621 from node 73
I got 4656 from node 73
I got 5930 from node 73
I got 4230 from node 73
I got 4591 from node 73
I got 6005 from node 73
I got 7792 from node 73
I got 4552 from node 73
I got 4912 from node 74
I got 5146 from node 74
I got 6947 from node 74
I got 5557 from node 74
I got 6618 from node 74
I got 6324 from node 74
I got 4747 from node 74
I got 7242 from node 74
I got 5017 from node 74
I got 3789 from node 74
I got 4598 from node 74
I got 6732 from node 74
I got 5774 from node 74
I got 6774 from node 74
I got 4559 from node 74
I got 6156 from node 74
I got 5337 from node 74
I got 5297 from node 74
I got 7468 from node 74
I got 6419 from node 74
I got 5930 from node 74
I got 5159 from node 74
I got 4940 from node 74
I got 6211 from node 74
I got 5565 from node 74
I got 5936 from node 74
I got 5373 from node 74
I got 6999 from node 74
I got 7034 from node 74
I got 5989 from node 74
I got 5954 from node 74
I got 5038 from node 74
I got 6906 from node 74
I got 6460 from node 74
I got 4643 from node 74
I got 4361 from node 74
I got 4533 from node 74
```

```
I got 4273 from node 74
I got 4180 from node 74
I got 6777 from node 74
I got 5050 from node 74
I got 6131 from node 74
I got 6870 from node 75
I got 4957 from node 75
I got 4166 from node 75
I got 5578 from node 75
I got 5857 from node 75
I got 6176 from node 75
I got 4780 from node 75
I got 5176 from node 75
I got 3967 from node 75
I got 6269 from node 75
I got 5799 from node 75
I got 5547 from node 75
I got 5116 from node 75
I got 4632 from node 75
I got 7347 from node 75
I got 7794 from node 75
I got 4635 from node 75
I got 4078 from node 75
I got 4959 from node 75
I got 4429 from node 75
I got 6262 from node 75
I got 5815 from node 75
I got 5576 from node 75
I got 4362 from node 75
I got 7139 from node 75
I got 5465 from node 75
I got 5543 from node 75
I got 6923 from node 75
I got 5819 from node 75
I got 5055 from node 75
I got 3610 from node 75
I got 6834 from node 75
I got 5256 from node 75
I got 5012 from node 75
I got 3937 from node 75
I got 5235 from node 75
I got 6805 from node 75
I got 7179 from node 75
I got 6093 from node 75
I got 6668 from node 75
I got 3242 from node 75
```

```
I got 5799 from node 75
I got 5832 from node 76
I got 5413 from node 76
I got 4153 from node 76
I got 6656 from node 76
I got 5000 from node 76
I got 6742 from node 76
I got 6067 from node 76
I got 7071 from node 76
I got 5138 from node 76
I got 2468 from node 76
I got 5722 from node 76
I got 5784 from node 76
I got 4669 from node 76
I got 3528 from node 76
I got 3802 from node 76
I got 6491 from node 76
I got 5541 from node 76
I got 5375 from node 76
I got 5527 from node 76
I got 6413 from node 76
I got 4240 from node 76
I got 6003 from node 76
I got 4644 from node 76
I got 4316 from node 76
I got 4784 from node 76
I got 6937 from node 76
I got 4434 from node 76
I got 4479 from node 76
I got 4712 from node 76
I got 4225 from node 76
I got 6709 from node 76
I got 4728 from node 76
I got 5108 from node 76
I got 4458 from node 76
I got 4814 from node 76
I got 5411 from node 76
I got 5578 from node 76
I got 4749 from node 76
I got 3621 from node 76
I got 6412 from node 76
I got 6261 from node 76
I got 5748 from node 76
I got 6198 from node 77
I got 6927 from node 77
I got 5663 from node 77
```



```
I got 4792 from node 77
I got 4332 from node 77
I got 3585 from node 77
I got 4430 from node 77
I got 5216 from node 77
I got 6318 from node 77
I got 6281 from node 77
I got 5617 from node 77
I got 6205 from node 77
I got 5332 from node 77
I got 6353 from node 77
I got 5975 from node 77
I got 5170 from node 77
I got 5699 from node 77
I got 6290 from node 77
I got 7411 from node 77
I got 5681 from node 77
I got 5908 from node 77
I got 4747 from node 77
I got 4990 from node 77
I got 4467 from node 77
I got 5595 from node 77
I got 5523 from node 77
I got 4924 from node 77
I got 5412 from node 77
I got 6560 from node 77
I got 5581 from node 77
I got 5595 from node 77
I got 5550 from node 77
I got 5756 from node 77
I got 5040 from node 77
I got 5530 from node 77
I got 5084 from node 77
I got 5294 from node 77
I got 7171 from node 77
I got 6423 from node 77
I got 6359 from node 77
I got 5438 from node 77
I got 6406 from node 77
I got 7102 from node 78
I got 6145 from node 78
I got 5792 from node 78
I got 6859 from node 78
I got 6017 from node 78
I got 3916 from node 78
I got 4430 from node 78
```

```
I got 6004 from node 78
I got 6153 from node 78
I got 6075 from node 78
I got 5387 from node 78
I got 4978 from node 78
I got 4025 from node 78
I got 7074 from node 78
I got 4302 from node 78
I got 5871 from node 78
I got 6412 from node 78
I got 3642 from node 78
I got 6113 from node 78
I got 5054 from node 78
I got 6379 from node 78
I got 4794 from node 78
I got 5021 from node 78
I got 5184 from node 78
I got 5285 from node 78
I got 7821 from node 78
I got 3516 from node 78
I got 4191 from node 78
I got 5754 from node 78
I got 5301 from node 78
I got 6371 from node 78
I got 8296 from node 78
I got 7697 from node 78
I got 6092 from node 78
I got 5640 from node 78
I got 4994 from node 78
I got 6308 from node 78
I got 5329 from node 78
I got 3649 from node 78
I got 4065 from node 78
I got 7058 from node 78
I got 4431 from node 78
I got 2598 from node 79
I got 4917 from node 79
I got 5141 from node 79
I got 6162 from node 79
I got 4771 from node 79
I got 4311 from node 79
I got 4910 from node 79
I got 6366 from node 79
I got 4659 from node 79
I got 5069 from node 79
I got 6934 from node 79
```

```
I got 5029 from node 79
I got 4572 from node 79
I got 5849 from node 79
I got 6475 from node 79
I got 4260 from node 79
I got 5725 from node 79
I got 6225 from node 79
I got 6707 from node 79
I got 6086 from node 79
I got 5242 from node 79
I got 4668 from node 79
I got 5706 from node 79
I got 5429 from node 79
I got 5152 from node 79
I got 4562 from node 79
I got 5452 from node 79
I got 5127 from node 79
I got 4394 from node 79
I got 5188 from node 79
I got 4835 from node 79
I got 4922 from node 79
I got 4806 from node 79
I got 5747 from node 79
I got 5649 from node 79
I got 4457 from node 79
I got 6139 from node 79
I got 4335 from node 79
I got 5598 from node 79
I got 6287 from node 79
I got 5046 from node 79
I got 4957 from node 79
I got 5751 from node 80
I got 4563 from node 80
I got 4155 from node 80
I got 5209 from node 80
I got 4923 from node 80
I got 5471 from node 80
I got 4582 from node 80
I got 5265 from node 80
I got 4611 from node 80
I got 4771 from node 80
I got 6039 from node 80
I got 5046 from node 80
I got 7102 from node 80
I got 4646 from node 80
I got 6835 from node 80
```

```
I got 6249 from node 80
I got 5723 from node 80
I got 6298 from node 80
I got 6309 from node 80
I got 5596 from node 80
I got 6829 from node 80
I got 3963 from node 80
I got 4830 from node 80
I got 4835 from node 80
I got 4803 from node 80
I got 6912 from node 80
I got 6802 from node 80
I got 4757 from node 80
I got 6065 from node 80
I got 5446 from node 80
I got 4655 from node 80
I got 5175 from node 80
I got 5063 from node 80
I got 3895 from node 80
I got 5852 from node 80
I got 5934 from node 80
I got 4275 from node 80
I got 6621 from node 80
I got 4895 from node 80
I got 3913 from node 80
I got 6215 from node 80
I got 5020 from node 80
```

The sum is 500658.

```
I got 0 from node 80
I got 0 from node 88
I got 0 from node 81
I got 0 from node 84
I got 0 from node 82
I got 0 from node 83
I got 0 from node 87
I got 0 from node 85
I got 0 from node 1
I got 0 from node 86
I got 0 from node 90
I got 0 from node 91
I got 0 from node 92
I got 0 from node 89
I got 0 from node 15
I got 0 from node 93
I got 0 from node 94
I got 0 from node 2
```

```
I got 0 from node 3
I got 0 from node 4
I got 0 from node 5
I got 0 from node 6
I got 0 from node 7
I got 0 from node 8
I got 0 from node 9
I got 0 from node 10
I got 0 from node 11
I got 0 from node 12
I got 0 from node 13
I got 0 from node 14
I got 0 from node 95
I got 0 from node 16
I got 0 from node 17
I got 0 from node 18
I got 0 from node 19
I got 0 from node 20
I got 0 from node 21
I got 0 from node 22
I got 0 from node 23
I got 0 from node 24
I got 0 from node 25
I got 0 from node 26
I got 0 from node 27
I got 0 from node 28
I got 0 from node 29
I got 0 from node 30
I got 0 from node 31
I got 0 from node 32
I got 0 from node 33
I got 0 from node 34
I got 0 from node 35
I got 0 from node 36
I got 0 from node 37
I got 0 from node 38
I got 0 from node 39
I got 0 from node 40
I got 0 from node 41
I got 0 from node 42
I got 0 from node 43
I got 0 from node 44
I got 0 from node 45
I got 0 from node 46
I got 0 from node 47
I got 0 from node 48
```

```
I got 0 from node 49
I got 0 from node 50
I got 0 from node 51
I got 0 from node 52
I got 0 from node 53
I got 0 from node 54
I got 0 from node 55
I got 0 from node 56
I got 0 from node 57
I got 0 from node 58
I got 0 from node 59
I got 0 from node 60
I got 0 from node 61
I got 0 from node 62
I got 0 from node 63
I got 0 from node 64
I got 0 from node 65
I got 0 from node 66
I got 0 from node 67
I got 0 from node 68
I got 0 from node 69
```

```
[0/96]#122: adding...
```

```
I got 0 from node 70
I got 0 from node 71
I got 0 from node 72
I got 0 from node 73
I got 0 from node 74
I got 0 from node 75
I got 0 from node 76
I got 0 from node 77
I got 0 from node 78
I got 0 from node 79
I got 203 from node 0
```

```
[0/96]#129: calling reduce...
```

```
The sum is 203.
```

parsum.c

```

1  /* parsum.c
2  * -----
3  * Authors: Darwin Jacob Groskleg, Laurence T. Yang
4  * CSCI 455
5  * Lab #2: Parallel Sum
6  *
7  * Purpose: compute the sum of numbers read in from a file by distributing the
8  *           computation in blocks of 100 numbers over the processors.
9  *
10 *           Uses the "Broadcast/Reduce Routine", see Lecture 10, for
11 *           partitioning the summation.
12 *
13 * TODO:
14 * - [x] Fill in all missing parts of the code.
15 * - [x] Should find out the number of processors in the cluster and divide the
16 *       work evenly among them instead of assuming it has 10 processors doing
17 *       100 numbers each.
18 * - [ ] Modify the program so that it also computes the MIN and MAX values of
19 *       the data read in.
20 *       Tips: you'll write your own min/max routines that find the min/max of
21 *       each block of numbers, and then have a call to MPI reduce that finds
22 *       the min/max of all the "partial" results.
23 */
24 #include <stdio.h>
25 #include <string.h>
26 #include <math.h>
27 #include <stdlib.h>
28 #include <limits.h>
29 #include <stdbool.h>
30
31 #include <mpi.h>
32 #include "trace.h"
33
34 #define MAXSIZE 1000 // original limit
35 //#define MAXSIZE 100000
36 #define MAX(a,b) ((a) > (b) ? (a) : (b))
37 #define MIN(a,b) ((a) < (b) ? (a) : (b))
38
39 /* Initialize with a limit state. */
40 typedef struct {
41     int sum;
42     int min;
43     int max;
44 } range_sum_t;
45
46 range_sum_t minmaxadd(int *A, int low, int high);
47 int add(int *A, int low, int high);
48 int sign(int z);
49 int div_out(int num, int denom);
50 void show_usage(char* program);
51
52 int myid, cluster_size;
53
54 int main(int argc, char *argv[]) {
55     /* 4 Synchronized variables, requiring broadcasts from root */

```

```

56     int set_size = 0;
57     int data[MAXSIZE];
58     int max_partition_size;
59     bool file_contains_data = true;
60
61     MPI_Init(&argc, &argv);           /* Initialize MPI */
62     MPI_Comm_size(MPI_COMM_WORLD, &cluster_size); /* Find group size */
63     MPI_Comm_rank(MPI_COMM_WORLD, &myid);        /* Find process rank */
64     bool root_process = (myid == 0);
65
66     /* Root: open the data file */
67     char* datafilename = argv[1];
68     FILE *fp; /* file pointer, initialized by fopen */
69     if (root_process) {
70         if (argc != 2)
71             show_usage(argv[0]);
72         TRACE("starting");
73
74         TRACE("opening data file \n");
75         /* Open Input File and Initialize Data Array */
76         if ((fp = fopen(datafilename, "r")) == NULL) {
77             printf("Can't open the input file: %s\n\n", datafilename);
78             MPI_Abort(MPI_COMM_WORLD, 1);
79             exit(1);
80         }
81     }
82
83     /* only important to root */
84     long long global_sum = 0;
85     while (file_contains_data) {
86         /* Root Proc: copy numbers to an array from open data file. */
87         if (root_process) {
88             for (set_size=0; set_size<MAXSIZE && !feof(fp); set_size++)
89                 fscanf(fp, "%d", &data[set_size]);
90
91             if (feof(fp)) {
92                 TRACE("Reached end of data file, closing.\nAll ");
93                 fclose(fp);
94                 file_contains_data = false;
95             }
96             TRACE("data is read.\n");
97             max_partition_size = div_out(set_size, cluster_size);
98         }
99
100
101         /* Broadcast the partition size and data to all node processes */
102         if (root_process)
103             TRACE("calling MPI_Bcast\n");
104         MPI_Bcast(&file_contains_data, 1, MPI_C_BOOL, 0, MPI_COMM_WORLD);
105         MPI_Bcast(&set_size, 1, MPI_INT, 0, MPI_COMM_WORLD);
106         MPI_Bcast(&max_partition_size, 1, MPI_INT, 0, MPI_COMM_WORLD);
107         /* Bcast data[] */
108         MPI_Bcast(&data, set_size, MPI_INT, 0, MPI_COMM_WORLD);
109         if (root_process)
110             TRACE("MPI_Bcast done \n");
111

```



```

112
113     /* Do the calculating: sum and reduce */
114     MPI_Barrier(MPI_COMM_WORLD);
115     /* Calculate the low and high index for each processor */
116     int low_i, high_i;
117     low_i = myid * max_partition_size;
118     high_i = MIN(low_i + max_partition_size, set_size) - 1;
119
120     /* Local addition for all processes */
121     if (root_process)
122         TRACE("adding...\n");
123     long long node_sum = add(data, low_i, high_i);
124     printf("I got %lld from node %d\n", node_sum, myid);
125     MPI_Barrier(MPI_COMM_WORLD);
126
127     /* Global reduce */
128     if (root_process) {
129         TRACE("calling reduce...\n");
130     }
131     /* MPI_Reduce(
132      *     void* send_data,
133      *     void* recv_data,
134      *     int count,
135      *     MPI_Datatype datatype,
136      *     MPI_Op op,
137      *     int root,
138      *     MPI_Comm communicator)
139     */
140     MPI_Reduce( // Sum operation
141                 &node_sum,
142                 &global_sum, // receiver
143                 1, // count of elements in the recv/send arrays
144                 MPI_LONG_LONG,
145                 MPI_SUM,
146                 0, // root rank
147                 MPI_COMM_WORLD);
148     if (root_process)
149         printf("The sum is %lld.\n", global_sum);
150 }
151
152 /* MPI finalize */
153 MPI_Finalize();
154 return EXIT_SUCCESS;
155 }
156
157
158 void show_usage(char* program) {
159     printf("Usage: %s path/to/datafile.txt\n", program);
160     MPI_Abort(MPI_COMM_WORLD, 1);
161     exit(1);
162 }
163
164 range_sum_t minmaxadd(int *A, int low, int high) {
165     range_sum_t res = {0, INT_MAX, INT_MIN};
166     for (int i=low; i<=high; i++) {
167         res.sum += A[i];

```

```
168         res.min = MIN(res.min, A[i]);
169         res.max = MAX(res.max, A[i]);
170     }
171     return res;
172 }
173
174 /* Adds range within an array,
175 * between positions low and high, inclusive.
176 */
177 int add(int *A, int low, int high) {
178     int res = 0;
179     for (int i=low; i<=high; i++)
180         res += A[i];
181     return res;
182 }
183
184 /*
185 * Give me a sign!
186 * Range: (-1, 0, 1)
187 */
188 int sign(int z) {
189     return ((0 < z) - (z < 0));
190 }
191
192 /* Integer division '/', in C99 and up, truncates towards zero.
193 * We want to round away from zero so that we can ____
194 * when deciding how many numbers to give to each node for summation.
195 *
196 * int div in VS. int div out
197 */
198 int div_out(int num, int denom) {
199     div_t divresult = div(num, denom);
200     return num/denom + sign(divresult.rem);
201 }
```

seqsum.c

```
1  /* seqsum.c
2  * -----
3  * Authors: Darwin Jacob Groskleg
4  *
5  * Sums up numbers in a given file sequentially.
6  */
7  #include <stdio.h>
8  #include <stdlib.h>
9
10 void show_usage(char* pgm) {
11     printf("Usage: %s path/to/datafile.txt\n", pgm);
12     exit(1);
13 }
14
15 int main(int argc, char *argv[]) {
16     if (argc != 2) {
17         show_usage(argv[0]);
18     }
19
20     //char* datafilename = "given/rand_data.txt";
21     char* datafilename = argv[1];
22     FILE *fp;
23     if ((fp = fopen(datafilename, "r")) == NULL) {
24         printf("Can't open the input file: %s\n\n", datafilename);
25         exit(1);
26     }
27
28     int z, count = 0;
29     long long running_sum = 0;
30     fscanf(fp, "%d", &z);
31     while (!feof(fp)) {
32         count++;
33         running_sum += z;
34         fscanf(fp, "%d", &z);
35     }
36     fclose(fp);
37
38     printf("%s contains %d numbers.\n", datafilename, count);
39     printf("Global sum: %lld\n", running_sum);
40
41     return 0;
42 }
```

trace.h

```

1  /* trace.h
2  * -----
3  * Authors: Darwin Jacob Groskleg, Laurence T. Yang
4  * CSCI 455
5  * Lab #2: Parallel Sum
6  */
7  #ifndef TRACE_H_INCLUDED
8  #define TRACE_H_INCLUDED
9
10 #include <stdio.h>
11
12 /* on Windows we define debug mode to be when _DEBUG is set */
13 #ifdef _DEBUG
14 #define DEBUG_MODE 1
15 #endif
16
17 /* on UNIX we define debug mode to be when _GLIBCXX is set */
18 #ifdef _GLIBCXX_DEBUG
19 #define DEBUG_MODE 1
20 #endif
21
22 #ifdef DEBUG
23 #define DEBUG_MODE 1
24 #endif
25
26
27 /* Our assertion macros do nothing in production. */
28 #ifndef DEBUG_MODE
29
30 #define TRACE( X )
31 #define TRACEd(X, V)
32
33 #else /* DEBUG_MODE */
34
35 #define TRACE( X ) \
36     fprintf(stderr, "\n[%d/%d]#%d: %s", myid, cluster_size, __LINE__, X)
37 #define TRACEd(X, V) \
38     fprintf(stderr, "\n[%d/%d]#%d: %s%d", myid, cluster_size, __LINE__, X, V)
39
40 #endif /* DEBUG_MODE */
41
42
43 #endif /* TRACE_H_INCLUDED */

```