Α.Μ : 1115201600163 Στρουμπάκου Δήμητρα

Η εργασία είναι υλοποιημένη σε γλώσσα C.

Η κοινή μνήμη που χρησιμοποιούν οι διεργασίες αναπαριστάται απο μία δομη η οποια περιέχει εναν πίνακα Ν θέσεων (όσες και οι εγγραφές) , ώστε να γνωρίζουμε κάθε στιγμή πόσους readers έχει μέσα η κάθε εγγραφή και μια λίστα απο δομές τύπου "εγγραφή". Η δομή εγγραφή περιέχει το id της κάθε εγγραφής , καθώς και πόσοι readers/ writers την έχουν επισκεφτεί.

Δημιουργώ μέσω 2 semget , 2 πίνακες απο σημαφόρους Ν θέσεων (όσες και οι εγγραφές) , έναν για τους readers και έναν για τους writers.

Δεσμεύω μέσω shmget και shmat κατάλληλα τις διαμοιραζόμενες μνήμες.

Για όσες διεργασίες μου λέει ο coordinator, δημιουργώ μέσω της fork() , τόσα παιδία , τα οποία τρέχουν συγκεκριμένες φορές και σε κάθε επανάληψη είναι είτε reader είτε writer με βάση μια εσωτερική ραντ.

Στο τέλος αποδεσμεύονται οι σημαφόροι και η διαμοιραζόμενη μνήμη

Τα εσωτερικά και τα εξωτερικά στατιστικά αθροίζουν σωστά.

Ορισματα : 1ο) ριθμός εγγραφών (entries),
           2ο) αριθμός διεργασιών που δημιουργούνται ,
           3ο) αναλογία readers/writers , 0 < ratio < 1
            4ο) αριθμός επαναλήψεων για τις οποίες τρέχει το κάθε παιδί

// Παρατήρηση : οι διεργασίες , οι επαναλήψεις και οι εγγραφές είναι από 0 μέχρι entry (πχ) για να είναι όσο ο αριθμός που δίνω . Αν δώσω 5 entries , έχω τα : 0 ,1 2, 3, 4, όχι το 5!

Ενδεικτικές εκτελέσεις και σχόλια

./project 5 100 0.3 3
οι διεργασίες είναι πολύ περισσότερες απο τις εγγραφές με αποτέλεσμα να αυξάνεται
ο χρόνος αναμονής μια διεργασίας για να μπεί σε ένα entry
οι χρόνοι που παίρνω κυμαίνονται από 0.000001 μέχρι 24.001518
και τα στατιστικά στο τέλος :

entry 0 has 23 readers and 37 writers
entry 1 has 18 readers and 42 writers
entry 2 has 27 readers and 44 writers
entry 3 has 14 readers and 36 writers
entry 4 has 24 readers and 35 writers

./project 100 5 0.3 3

οι διεργασίες είναι πολύ λιγότερες απο τις εγγραφές με αποτέλεσμα να ο χρόνος αναμονής να είναι πολύ μικρός . Συγκεκριμένα κυμαίνονται από   0.000001 μέχρι 0.000007

στατιστικά:

entry 0 has 0 readers and 0 writers
entry 1 has 0 readers and 1 writers
entry 2 has 0 readers and 0 writers
entry 3 has 0 readers and 0 writers
entry 4 has 0 readers and 1 writers
entry 5 has 0 readers and 1 writers
entry 6 has 0 readers and 0 writers
entry 7 has 0 readers and 0 writers
entry 8 has 0 readers and 0 writers
entry 9 has 0 readers and 0 writers
entry 10 has 0 readers and 0 writers
entry 11 has 0 readers and 0 writers
entry 12 has 0 readers and 0 writers
entry 13 has 0 readers and 0 writers
entry 14 has 0 readers and 0 writers
entry 15 has 0 readers and 1 writers
entry 16 has 0 readers and 0 writers
entry 17 has 0 readers and 0 writers
entry 18 has 0 readers and 0 writers
entry 19 has 0 readers and 0 writers
entry 20 has 0 readers and 1 writers
entry 21 has 0 readers and 1 writers
entry 22 has 0 readers and 0 writers
entry 23 has 0 readers and 0 writers
entry 24 has 0 readers and 0 writers
entry 25 has 0 readers and 0 writers
entry 26 has 0 readers and 0 writers
entry 27 has 0 readers and 0 writers
entry 28 has 0 readers and 0 writers
entry 29 has 0 readers and 0 writers
entry 30 has 0 readers and 0 writers
entry 31 has 0 readers and 0 writers
entry 32 has 0 readers and 0 writers
entry 33 has 0 readers and 0 writers
entry 34 has 0 readers and 0 writers

entry 35 has 0 readers and 0 writers
entry 36 has 0 readers and 0 writers
entry 37 has 0 readers and 0 writers
entry 38 has 0 readers and 0 writers
entry 39 has 0 readers and 0 writers
entry 40 has 0 readers and 0 writers
entry 41 has 0 readers and 0 writers
entry 42 has 0 readers and 0 writers
entry 43 has 0 readers and 0 writers
entry 44 has 0 readers and 0 writers
entry 45 has 0 readers and 0 writers
entry 46 has 0 readers and 0 writers
entry 47 has 0 readers and 0 writers
entry 48 has 0 readers and 0 writers
entry 49 has 0 readers and 0 writers
entry 50 has 0 readers and 1 writers
entry 51 has 0 readers and 0 writers
entry 52 has 0 readers and 1 writers
entry 53 has 0 readers and 0 writers
entry 54 has 0 readers and 0 writers
entry 55 has 0 readers and 1 writers
entry 56 has 0 readers and 0 writers
entry 57 has 0 readers and 1 writers
entry 58 has 0 readers and 0 writers
entry 59 has 0 readers and 1 writers
entry 60 has 0 readers and 0 writers
entry 61 has 0 readers and 0 writers
entry 62 has 0 readers and 0 writers
entry 63 has 0 readers and 0 writers
entry 64 has 0 readers and 0 writers
entry 65 has 0 readers and 0 writers
entry 66 has 0 readers and 0 writers
entry 67 has 0 readers and 0 writers
entry 68 has 0 readers and 1 writers
entry 69 has 0 readers and 0 writers
entry 70 has 0 readers and 0 writers
entry 71 has 0 readers and 0 writers
entry 72 has 0 readers and 0 writers
entry 73 has 0 readers and 0 writers
entry 74 has 0 readers and 0 writers
entry 75 has 0 readers and 0 writers
entry 76 has 0 readers and 0 writers
entry 77 has 1 readers and 0 writers
entry 78 has 0 readers and 0 writers
entry 79 has 0 readers and 0 writers

entry 80 has 0 readers and 0 writers
entry 81 has 0 readers and 0 writers
entry 82 has 0 readers and 0 writers
entry 83 has 0 readers and 0 writers
entry 84 has 1 readers and 0 writers
entry 85 has 0 readers and 0 writers
entry 86 has 0 readers and 0 writers
entry 87 has 0 readers and 0 writers
entry 88 has 1 readers and 0 writers
entry 89 has 0 readers and 0 writers
entry 90 has 0 readers and 0 writers
entry 91 has 0 readers and 0 writers
entry 92 has 0 readers and 0 writers
entry 93 has 0 readers and 0 writers
entry 94 has 0 readers and 0 writers
entry 95 has 0 readers and 0 writers
entry 96 has 0 readers and 0 writers
entry 97 has 0 readers and 0 writers
entry 98 has 0 readers and 0 writers
entry 99 has 0 readers and 0 writers

./project 5 5 0.7 5

Με ίδια αναλογία και ποσοστό 0.7 παίρνουμε τα εξής αποτελέσματα:
χρόνοι από 0.000001 μέχρι 1.000008
και στατιστικά τελικά:

entry 0 has 7 readers and 1 writers
entry 1 has 2 readers and 2 writers
entry 2 has 1 readers and 0 writers
entry 3 has 4 readers and 1 writers
entry 4 has 5 readers and 2 writers.

/project 3 4 0.5 3

χρόνοι : 0.000001 μέχρι 0.666690
entry 0 has 4 readers and 1 writers
entry 1 has 3 readers an d 1 writers
entry 2 has 3 readers and 0 writers