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Roll. No. 31118

Batch. k-1

laboratory Proutices -1

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1.0	Title Process Synchronization
D	19 Land evereticus risculti 14 sanales
(2)11	Problem statement son son -
<u>+</u>	write a program to solve classical problems of
11-2 NO	Synchronization using nutex & semaphose.
	o it beginstern to the
	soffware & Hardware Requirements:
	Soffware: ECLIPS & IDE (version 20.03)
	WINDOW-10 (64-bit 05)
	Java SE 14 Otto
	Hardware: Intel core is 8th gen (6285V) 4-(ore cpu,
	8GBSSD & 512GB HDP.
	1 Reviewing Cool
	learning objectives:
	17 should get to know about semaphore & nutex
	2) hour how synchronization is done in operating
	alt taysfemsontion of not part
W HJ	Leaning Obs Outcomes: bus
2.002 01	
+ A Localisa	17 Student will be able to use of threads, semaphores
[0] 93/30/	2) student will lean synchronization in operating
ero b	system.
Janicin	rook schicked over certagn
at nous	Theory Concepts:
Martin Lu	vid to that a serence at a las of the
9.11 10	At Process Synchronization.
	- A critical certion execution is hondled by a
	semaphore. As



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	-A semaphore is symply a variable that stores as
	integer value. This integer is accessed by
	two overations work () 4 signal ().
	- when a process enters the critical religion, As)
के अ	U invoked of the semaphore 5 4 fet to 2.
36	- After the process exits the critical section s is
	re-initialized to o.
	Example shown below:
	(2000 Moone vode
	(20 PCS) 21 01 wants 101
	11 critical section
4.1016 (10)	Mexit from critical section
	CON S NCC) S 622 2/18
	11 remaining code.
	1 losvitus de princes!
xutex	- There are two types of semaphores:
partorige	
	They can be either 0 @ I. They are
	known as muter locks, as locks can
	provide muthal exclusion
25 WIGGE	All the processes on share the same
	mutex semaphore that is initialized to 1.
podoge	
	They can have any value and are
	not gespicted over certain domain.
	They can be used to control arress to
	the resource that has a limitation
	on the number of instances of the
- 0	1 holden 1 9 es our (e. of ship)
	SA India in

Laboratay Paratres -1



MARA	aroute unaroute and other with book log of
	B) classical problems of synchromation.
_ was	p Produce - consumer problem
- 466 =	> solution to this problem involves creating two
	sensaphores 'full' & "empty" to keep
3-1 10	track of the averent number of full 4
	empty buffers respectively.
	1)> Producer produce a product 4 consumers
	tonsumes the product but both we one
er char	of the containers each time.
	NI NIBOL OF SERVICE TO COMMANDE
993/2 6	2) Dirring philosopher problem
	> This problem states that k-philosophers seated
Enited a	around a circular table with one chopstick
ं ते त	kutween cach jeafe of philosophers.
	in There is one chopstick between each
	philosopher so he may eat by my one
	of them.
	A) One chopstick may be picked by two
	philosophers but on philosopher an bick
	only one chapstrok at a time.
	to This problem involves the allocation of
	limited resources to a group of
	processes in a deadlock- free & showathan
they dail	brown free manner. I will sim will
	th Deinoy Ruspins
	3) Reader- & writer Problem!
	is suppose that a database is to be shared among
	several concurs ent processes.
	112 some of these processes may wont only



PICT, PUNE	
	to be read the database whereas others may
	wont only to be read the database.
	no he distinguish between these two processes
nout mai	by referring to the former as readers & the
69	latter one as writers.
> h	10> precisely in os, he call this situation as the
	readers viriters problem.
2.430	in Pendinter produite a priduit & concur
900	4) Sleeping basher problem.
	, Barbar shop with one karbar, one barber char
1000	en chairs to wan in.
	1) when no conformers, the booker goes to sleep
botos us	in barber chare 4
chapstick	my when austonier comes in when barber is cutting
	hair new customers take empty seats to
	waif @ leave of no varancy.
	justosophed so he may eat, by an
	Syrtax:
Jut	to the chapter's may be picked by
Sa bick	Wait function
	int Sen wout (Sen t a sem)
to AS	1) Egnal Function:
	int sem-post(sen-f "sem)
. entiruran	113 Semaphore initialization:
	sem-init (sen-to-sem, int pahared, rungred int val).
	145 Destroy Cemaphore
	sem destroy (sem f & sen),
Sugar by	is a poor that a database is to be these
	wind full and thought
the gala	THE STREET STREET, STR



	Algorithm: -
	1) Define number of philosophers
	2) Declare semaphores for all chopsticks & initialize to to "I"
	3) reduce objects of philosopher class of pain philosophers
	ID, left chopsticks, 20 & right chopstice 15 10 11.
	4> start the all threads.
	Algorithm for philosophers:
	1> Define Hink method
	Define method for picking up left chopstick. 3) pefine method for picking up zight chopstick.
	3) pefine method for picking up zight chopstick
	4) Define eat method.
	5> While "Frue" call all above newtioned methods.
	Applications: to solve classical problems of synchronization
	Testcases
	Testcases Suparate file with code & output is cutached.
1726	
	Conclusion:
	We have successfully solved the classical problem of synchronizations using mutes of sunaphone
	of synchronical sy