Viva must

OS কি

Race Condition কি

Process থেকে প্রশ্ন করবে

Kernel থেকে

Thread থেকে

Deadlock থেকে (condition)

critical section problem

Deadlock handling
↓
algorithm

Deadlock condition*

Coffman condition কি?

Ostrich
~~austrics~~ → উটপাখি

☐ Deadlock condition from slide

Banker's Algorithm. → এর সব theory পড়া / formula
↓
Available, Max, Need, Allocation

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Lab 1 : Name: Working of OS with process

(i) Process showing

(ii) gpedit.msc ← details + example

(iii) regedit ← details of example

(iv) process / task kill

(v) File sharing

DOP → 18.11.24

DOS → 25.11.24

Lab 2 : Name: [Windows command practice]

(1) Windows command

1. Introduction
2. Objectives
3. Theory (details)
4. Results
   SS (processing)
5. Conclusion

7.11.24 → CT

Syllabus = Till RR

size → 12
Font → Times New Romar
heading - 14
section/subsection

Robin Round

process	AT	BT	CT	TAT	WT	Response tim
P_1	5	11	53	48	37	19
P_2	0	4	4	4	0	0
P_3	0	14	47	47	33	4
P_4	1	9	33	32	23	8
P_5	2	21	59	57	36	12

ART =

~~TT~~AT = 188 TWT = 129

ATAT = 188/5 AWT = 129/5

= 37.6 = 25.8

II

Process Id	Arrival time	BT
P_1	0	5
P_2	1	3
P_3	2	1
P_4	3	2
P_5	4	3

ATAt = 8.6
AWt = 5.8

Q.T = 2

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11-11-24 Lab 2nd class

Command

1. help
2. cls
3. cd = same drive

C → D

C: → D:

D: এর অন্য একটি location এ যেতে চাইলে

D:\File\

4. del (file delete)

rmdir (remove directory name)

5. Ctrl+C → skip line in cmd

18-11-24 Lab

1. Command practice
2. File sharing
3. Software/device enable/disable
4. Task kill

regedit

gpedit.msc

indows +R

Preemptive

7) Round Robin Scheduling Algorithm

Q.T = 5

Process	AT	BT	Remaining BT
P_1	5	~~11~~	~~6~~ ~~1~~ 0
P_2	0	~~4~~	0
P_3	0	~~14~~	~~9~~ ~~4~~ 0
P_4	1	~~9~~	~~4~~ 0
P_5	2	~~21~~	~~16~~ ~~11~~ ~~6~~ ~~1~~ 0

Ready queue:

~~P_2~~ ~~P_3~~ ~~P_4~~ ~~P_5~~ ~~P_1~~ ~~P_3~~ ~~P_4~~ ~~P_5~~ ~~P_1~~ ~~P_3~~ ~~P_5~~ ~~P_1~~ ~~P_5~~ ~~P_5~~

RR

chance

Before other process

After self

Gantt chart:

P_2	P_3	P_4	P_5	P_1	P_3	P_4	P_5	P_1	P_3	P_5	P_1	P_5

0 4 9 14 19 24 29 33 38 43 47 52 53

P_5

58 5

H.W

~~Ans = 4.6 AWT~~

Preemptive

Process	AT	BT	CT	TAT	WT	RT
P_1	2	6	15	13	7	1
P_2	5	2	7	2	0	0
P_3	1	8	23	22	14	14
P_4	0	3	3	3	0	0
P_5	4	4	10	6	2	0

TTAT = 46

ATAT = 46/5

$\boxed{ATAT = 9.2}$

TWT = 23

AWT = $\frac{23}{5}$

$\boxed{AWT = 4.6}$

Gantt Chart :

P_4	P_3	P_1	P_5	P_2	P_4	P_5	P_1	P_3

0 1 2 4 5 7 9 12 16 23

P_4	P_4	P_4	P_1	P_5	P_2	P_5	P_1	P_3

0 1 2 3 4 5 7 10 15 23

Preemptive :

Process	AT	BT	CT	TAT	WT	RT
P_1	2	5	7	5	0	0
P_2	3	13	40	37	24	24
P_3	0	8	17	17	9	0
P_4	5	4	11	6	2	[illegible]
P_5	1	10	27	26	16	1[illegible]

TTAT = 91 TWT = 51

= 91/5 AWT = $\frac{51}{5}$ = 10[illegible]

= 18.2

Gantt Chart :

RQ → P_3, P_5, P_1, P_2, P_4

P_3	P_5	P_1	P_2	P_4

0 1 2 3 5 9

P_3	P_3	P_1	P_1	P_1	P_4	P_3	P_5	P_2

0 1 2 3 5 7 11 17 27 40

W Non-preemptive

Process Queue	AT	BT	CT	TAT	WT
P_1	2	6	9	7	1
P_2	5	2	11	6	4
P_3	1	8	23	22	14
P_4	0	3	3	3	0
P_5	4	4	15	11	7

TWT $= 26$

AWT $= \frac{26}{5}$

$= 5.2$

Gantt chart:

P_4	P_1	P_2	P_5	P_3

0 3 9 11 15 23

iii) Shortest Job First (SJF)

① Non-preemptive SJF

② preemptive SJF

Burst → Burst
Small → High

shortest Remaining time first

Non-preemptive

Process	AT	BT	CT	TAT	WT	RT
P_1	2	5	17	15	10	10
P_2	3	13	40	37	24	24
P_3	0	8	8	8	0	0
P_4	5	4	12	7	3	3
P_5.	1	10	27	26	16	16

TWT = 53

= 10.6

Gantt chart :

P_3	P_4	P_1	P_5	P_2

0 8 12 17 27 40

D

H → L

priority	AT	BT	CT	TAT	WT	RT
1	0	5	12	12	7	0
2	1	4	8	7	3	0
3	2	2	4	2	0	0
4	4	1	5	1	0	0

TTAT = 22

ATAT = $\frac{22}{4}$

= 5.5

TWT = 10

AWT = 10/4 = 2.5

Gantt chart:

P_1	P_2	P_3	P_4	P_2	P_1

0 1 2 4 5 8 12

Priority Scheduling (Preemptive)

Process Id	priority	Arrival time	Burst time
P_1	2(L)	0	1
P_2	6	1	7
P_3	3	2	3
P_4	5	3	6
P_5	4	4	5
P_6	10	5	15
P_7	9	6	8

Gantt Chart :

P_1	P_2	P_3	P_5	P_4	P_2	P_7	P_6

0 1 2 5 10 16 22 30 45

RT = CPU execution Time − AT

Process Id	AT	BT	CT	TAT	WT	RT
P_1	0	1	1	1	0	0
P_2	1	7	22	21	14	0
P_3	2	3	5	3	0	0
P_4	3	6	16	13	7	7
P_5	4	5	10	6	1	1
P_6	5	15	45	40	25	25
P_7	6	8	30	24	16	16

TWT = 63

$AWT = \frac{63}{7}$

$= 9.$

- process scheduling calculator online

↓

Website : Process scheduling Solver
bonnsven.com

$RT = \{ CPU \text{ first time} - AT \}$

process	AT	BT	priority
P_1	0	11	2
P_2	5	28	0
P_3	12	2	3
P_4	2	10	1
P_5	9	16	4

Non-preemptive

Low-High

Gantt chart :

P_1	P_2	P_4	P_3	P_5

0 11 39 49 51 67

Process	AT	BT	CT	TAT CT-AT	WT TAT-BT
P_1	0	11	11	11	0
P_2	5	28	39	34	6
P_3	12	2	51	39	37
P_4	2	10	49	47	37
P_5	9	16	67	58	42

TWT $= 122$

AWT $\frac{122}{5} = 24.4$

Time Remaining (RT) same 24

2 **Priority Scheduling**

(for non-preemptive type) By default → low-

process	P_1	P_2	P_3	P_4	P_5
BT	5	13	8	6	12
priority	1	3	0	4	2

Gantt chart

P_3	P_1	P_5	P_2	P_4

0 8 13 25 38 44

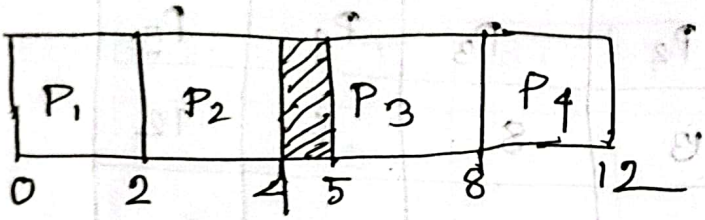
process	~~AT~~ BT	CT	TAT	WT
P_1	5	13	13	8
P_2	13	38	38	25
P_3	8	8	8	0
P_4	6	44	44	38
P_5	12	25	25	13
			=128	=84

A.T.A.T $= \frac{128}{5}$ $= 25.6$

→ WT = 84

~~process~~

Gantt chart:



process	AT	BT	CT ~~CT-AT~~	TAT CT-AT	WT
P_1	0	2	2	2	0
P_2	1	2	4	3	1
P_3	5	3	8	3	0
P_4	6	4	12	6	2

~~TWT = 29~~ TWT = 3

~~AWT = 9/4~~ AWT = $\frac{3}{4}$ = 0.75, ~~Ans~~

⑨ ping (for communicating with IP Address)

ping IPname/domain name

MAC → Media Access control.

⑩ ncpa.cpl (win+R) → showing IP

⑪ getmac → showing mac address (48 digit bit)

⑫ cd../../../ (3 directory back)

- Alter+f4 → shut down

-

Process	AT	BT
P_1	0	2
P_2	1	2
P_3	5	3
P_4	6	4

$TWT = 31$

$AWT = \frac{31}{5}$

$= 6.2$

Date: 04 / 11 / 24

Lab:

command prompt

Win+R → cmd

command:

① dir → directory name (dir) [Directory Information

② whoami

③ cd → change directory

④ cd.. → one directory back

⑤ D: → get D directory (D drive)

⑥ E:

⑦ cd directory Name (change dir)

⑧ ~~cd~~ command for making directory
mkdir directory name

Process ID	Arrival Time	Burst Time
0	0	2
1	1	6
2	2	4
3	3	9
4	6	12

Solution:

Gantt chart

0	1	2	3	4

0 2 8 12 21 33

Process ID	AT	BT	CT	TAT CT−AT	WT TAT−BT
0	0	2	2	2	0
1	1	6	8	7	1
2	2	4	12	10	6
3	3	9	21	18	9
4	6	12	33	27	15

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□ Find the average waiting time by using FCFS scheduling algorithm :-

process	Arival time	Burst time
P_1	2	6
P_2	5	2
P_3	1	8
P_4	0	3
P_5	4	4

Solution:

Gantt chart

P_4	P_3	P_1	P_5	P_2

0 3 11 17 21 23

Process	AT	BT	CT	TAT CT−AT	WT TAT−BT
P_1	2	6	17	15	9
P_2	5	2	23	18	16
P_3	1	8	11	10	2
P_4	0	3	3	3	0
P_5	4	4	21	17	13

TWT = 40

$AWT = \frac{40}{5}$

$= 8$ Ans

∴ Average waiting time = 8 Ans

1) First come First Serve (FCFS)

- Arival time
- Burst time
- complete time
- waiting time → Total waiting time
  → Average " "
- Turn-around time → Total Turn-around time
  → Average " " "
-

➤ Gantt chart →

P_1	P_2	P_3	P_1	P_4

0 3 5 7 10 15 → time

→ process

Arival time → process in Ready Queue

Burst time → process in CPU for execution

Complete time → ~~Burst time – Arival time~~ ~~BT – AT~~ process টি কোন সময়ে শেষ হয়েছে সেটিই CT

Turn arount time → CT – AT

Waiting time → TAT – BT

Arrival Time : Time at which the process arrives in the ready queue.

BT : Time required by a process for CPU execution

CT : Time at which process completes its execution

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Process Scheduling Algorithm :

Non-preemptive 1) First Come First Serve (FCFS) Scheduling Algorithm

Non-prem. 2) Priority Scheduling Algorithm " "

Non-prem. 3) Shortest job First (SJF) " "

preemptive 4) Round Robin scheduling algorithm.

Scheduling algorithm mainly two types :

Definition { i) Non- preemptive ((কোন process কে wait করা না)
ii) preemptive (wait করায়)

viva **Thread :** The thread is a lightweight process.

A process contain multiple thread.

Example

Google Chrome → process

youtube, tutorial point, twitter → Thread

MO — Word → process

Font, Design, View ....

Thread thread thread

Differentce between process and Thread → H.W

Process → program in execution

Not lightweight

Not shared memory

Example →

Thread → path of execution / segment of process

Light weight

Share memory

Example →

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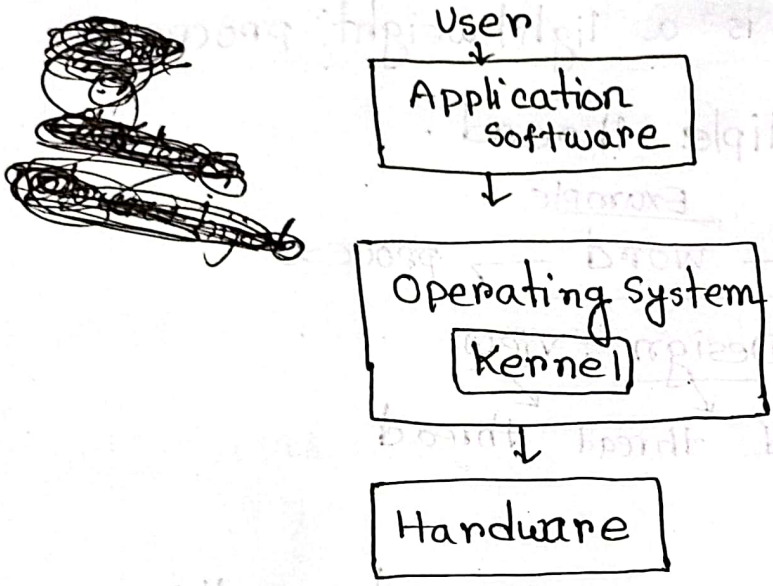


Kernel = core part of OS

Viva

i) OS कि?
ii) Kernel कि?
iii) process कि

Kernel

Diff H.W
- (i) Microkernel
- (ii) Monolithic Kernel

Process control Block : (PCB)

process state
process number
process counter
register
memory limits
List of open files
....

Process:

A process is a program in execution.

- It is not same as a program but more than it.

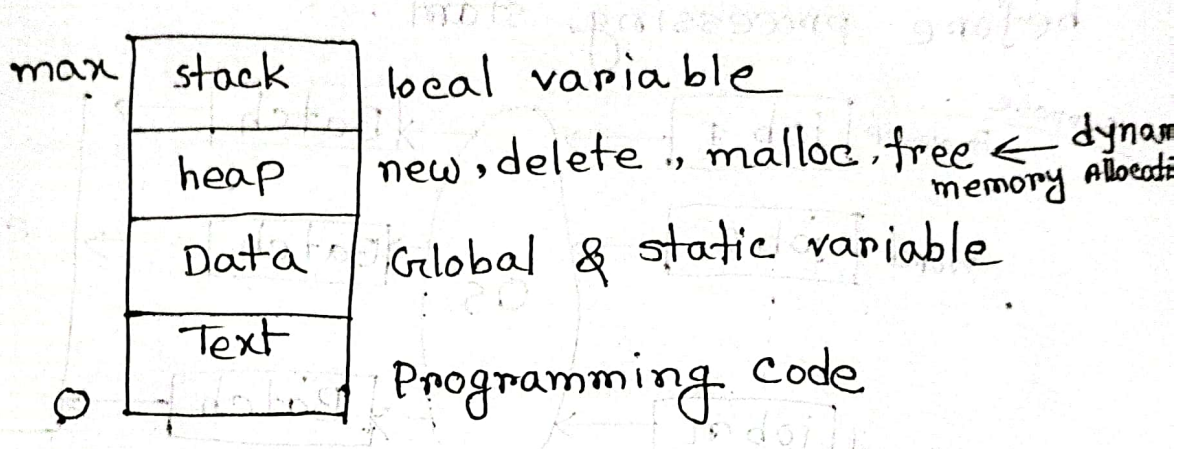
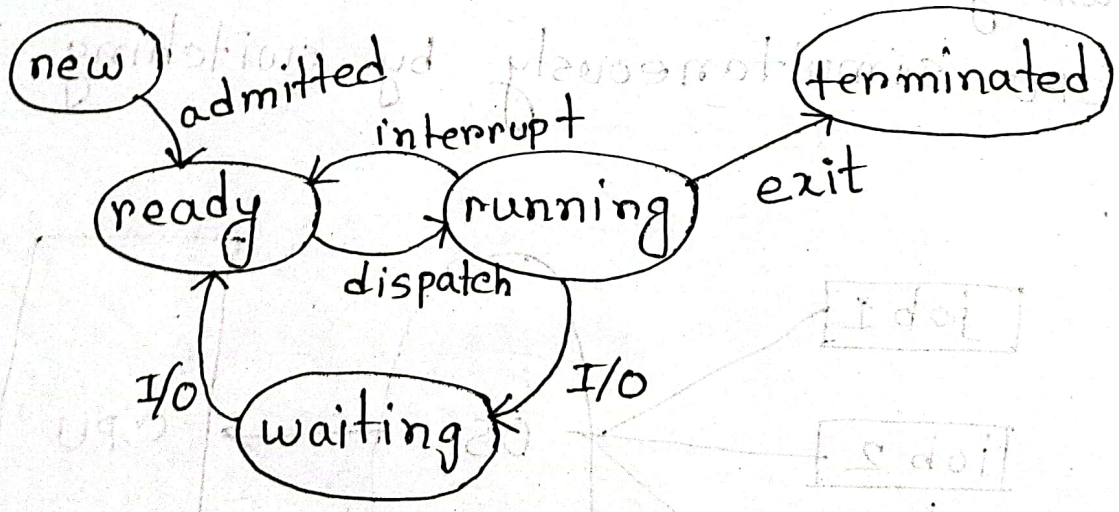


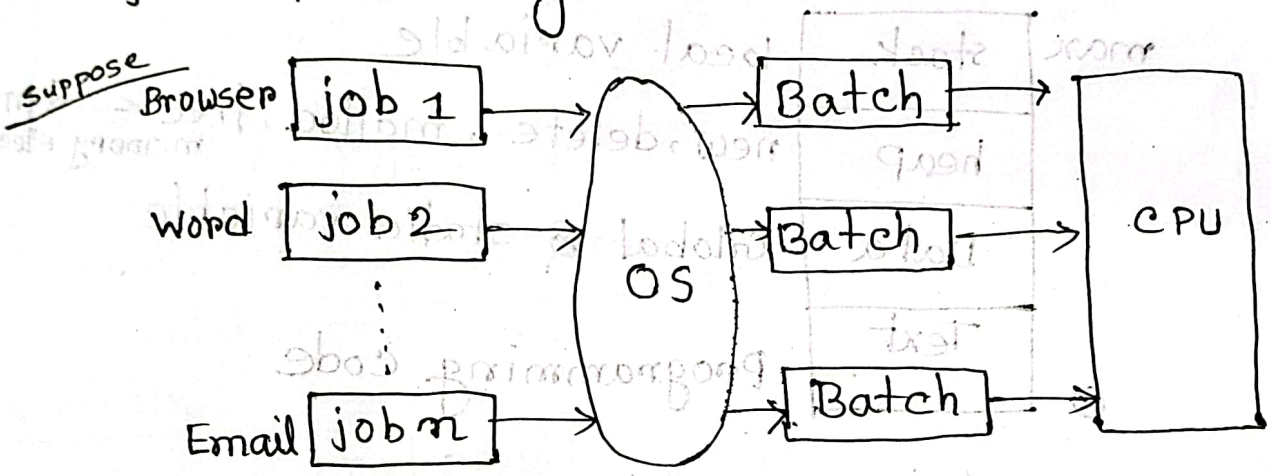
Fig: Process in memory

Process State:



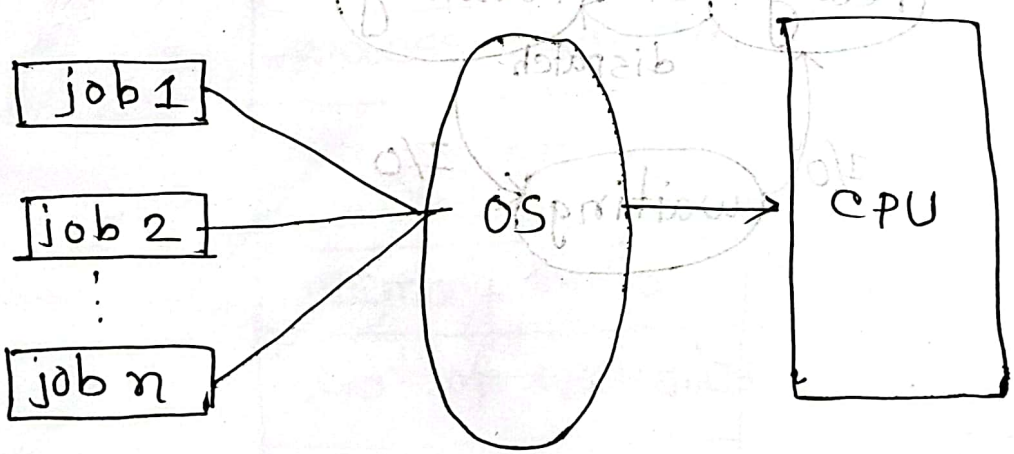
Batch Processing :

Batch processing is a technique in which OS collect the programs and data together in a batch before processing start.



Multitasking :

Multitasking is when multiple job are executed b the CPU simultaneously by switching between them.



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Functions of OS:

1. Memory Management (Resource allocation, deallocati
2. Processor Management / Scheduling
3. Device Management
4. File Management
5. Security
6. Control over system performance.
7. Error detecting Aids
8. Booting process, etc.

Types of OS:

1. Batch OS (Group of similar types of jobs)
2. Time-shared OS (Example: UNIX)
3. Real Time OS (Example: Missile, Robots)
4. Distributed OS
5. Network OS (Microsoft Windows Server 2008)

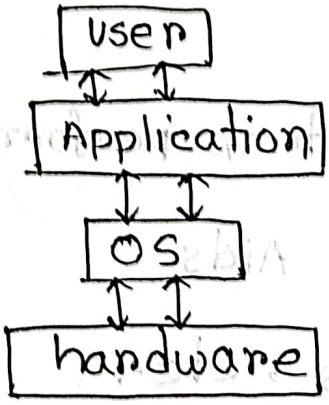
CS CamScanner

Operating System

An operating system is a program that act as interface between user and system hardware.

→ It handles interaction between software and hardware

Example: Windows, Linux, MacOS, Android, ios etc



Block-diagram

Goal of OS:

1. convenience
2. Efficient
3. Ability to evolve
4. Management of system Resource

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