

SER 334 A Session

SI Session

Sunday, February 18th 2024

7:00 pm - 8:00 pm MST

Agenda



Review CPU Scheduling

Review Paging

Virtual Memory

Sample Problems

SI Session Expectations

Thanks for coming to the **SER 334** SI session. We have a packed agenda and we are going to try to get through as many of our planned example problems as possible. This session will be recorded and shared with others.

- If after this you want to see additional examples, please visit the drop-in tutoring center.
- We will post the link in the chat now and at the end of the session.
 - tutoring.asu.edu
- Please keep in mind we are recording this session and it will be made available for you to review 24-48 hours after this session concludes.
- Finally, please be respectful to each other during the session.

Interact with us:

Zoom Features



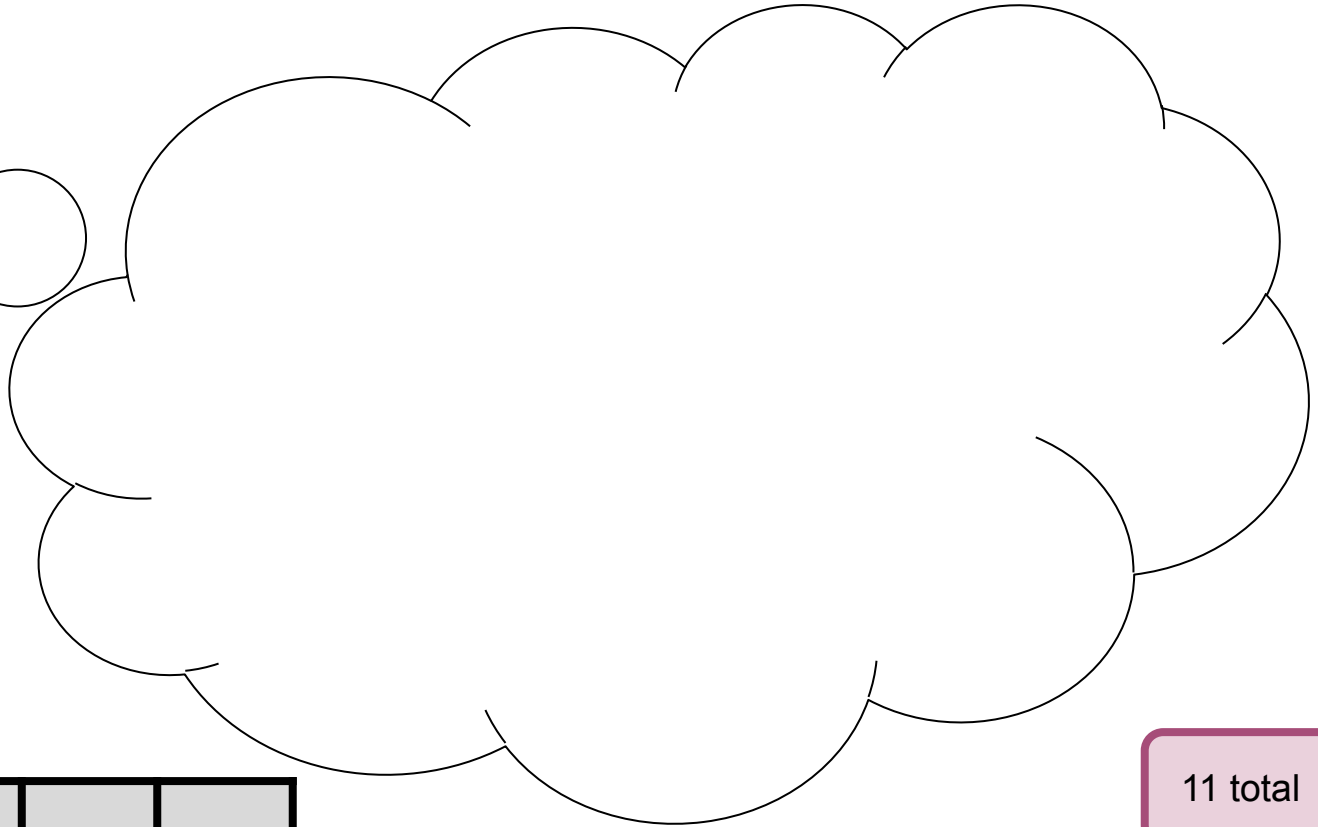
Zoom Chat

- Use the chat feature to interact with the presenter and respond to presenter's questions.
- Annotations are encouraged

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CPU Scheduling

Can we name all the CPU Scheduling algorithms we covered?



11 total

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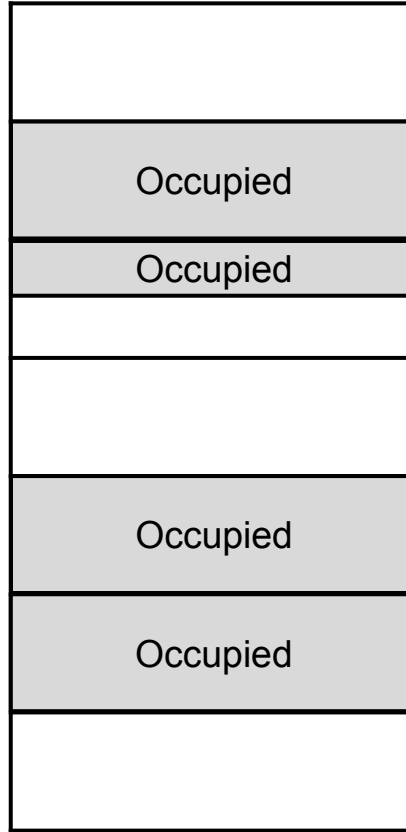
Memory

OUR DATA

Goal is to find a place to put our data; so we need to find...

A HOLE

Physical Memory



Three Types of Hole Selection:

First Fit

Best Fit

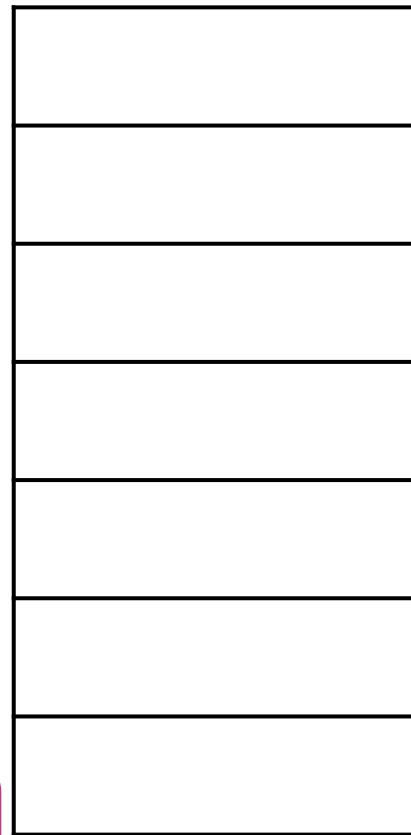
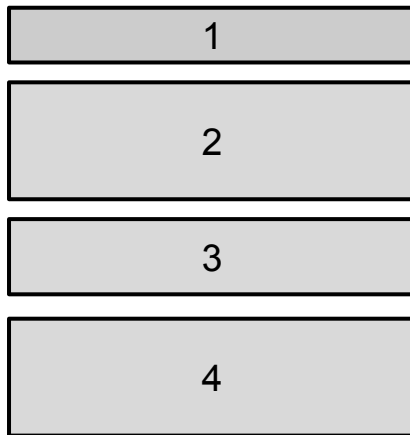
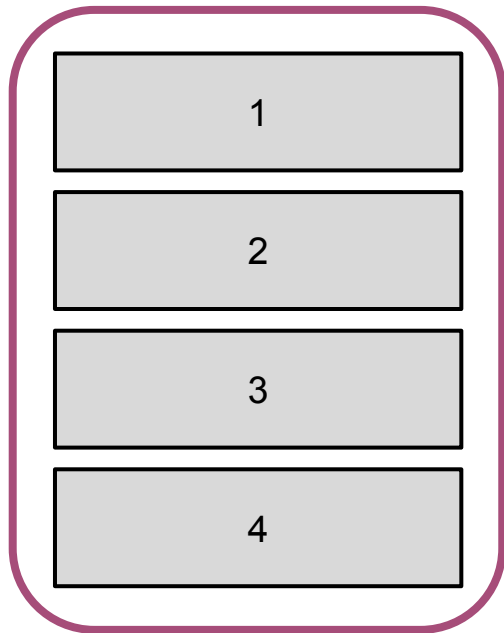
Worse Fit

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Memory

Two Methods for Memory Mapping...

Physical Memory



Split our program into chunks

Segmentation or Paging?

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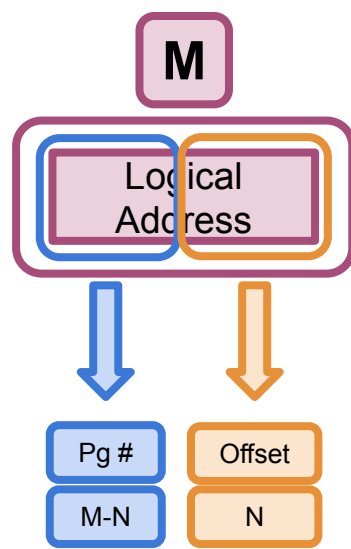
Paging

Logical Address Size: 2^M
Page Size: 2^N

EXAMPLE

- In each logical address, $n=2$ and $m=4$.
- Meaning, it uses 2-bits for offset and uses 2-bits for page #.
- Consider loading logical address 3 (0011) vs address 4 (0100).

How do we feel about
paging?



0	a
1	b
2	c
3	d
4	e
5	f
6	g
7	h
8	i
9	j
10	k
11	l
12	m
13	n
14	o
15	p

logical memory

0	5
1	6
2	1
3	2

page table

0	
4	i j k l
8	m n o p
12	
16	
20	a b c d
24	e f g h
28	

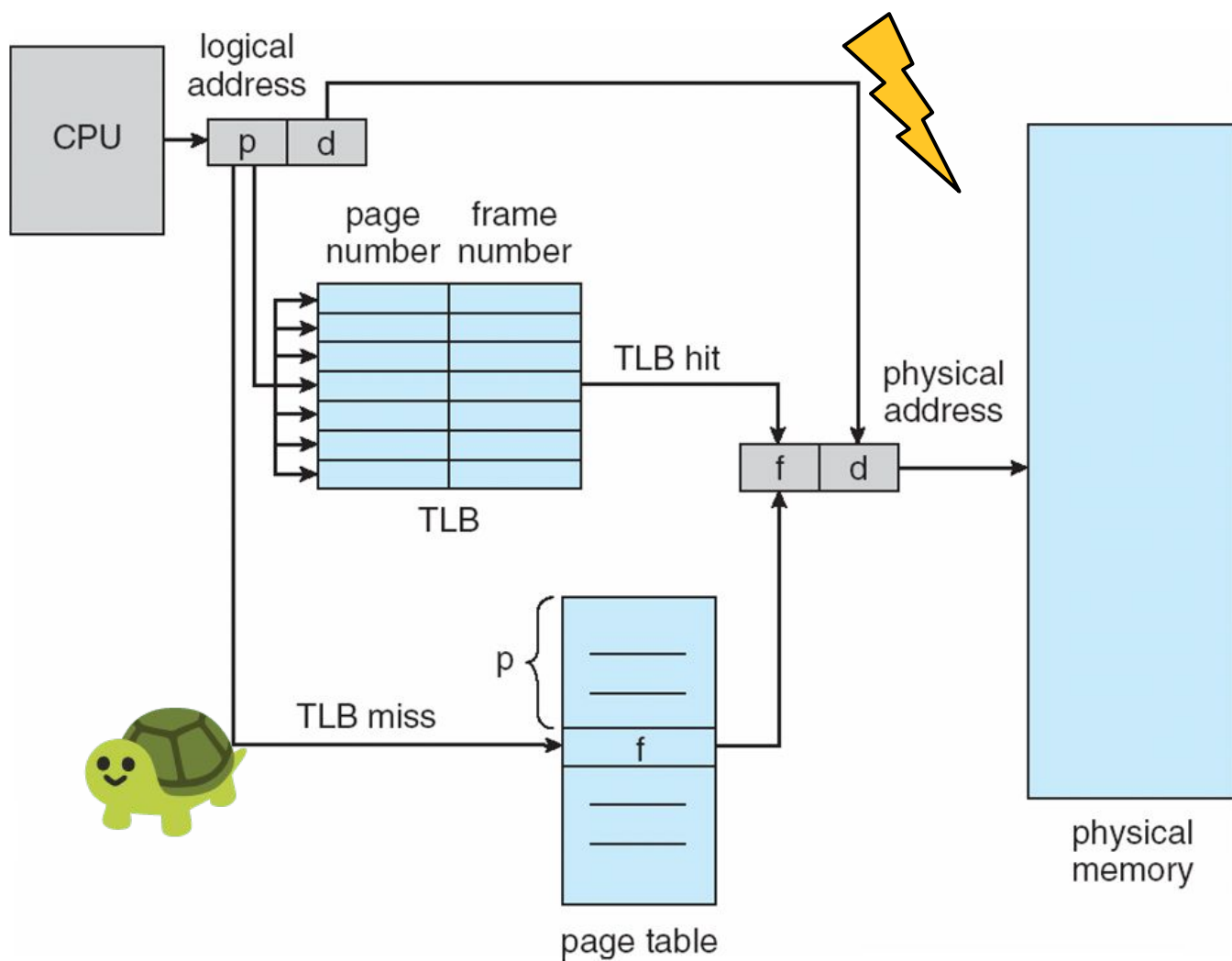
physical memory

11

01

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Paging

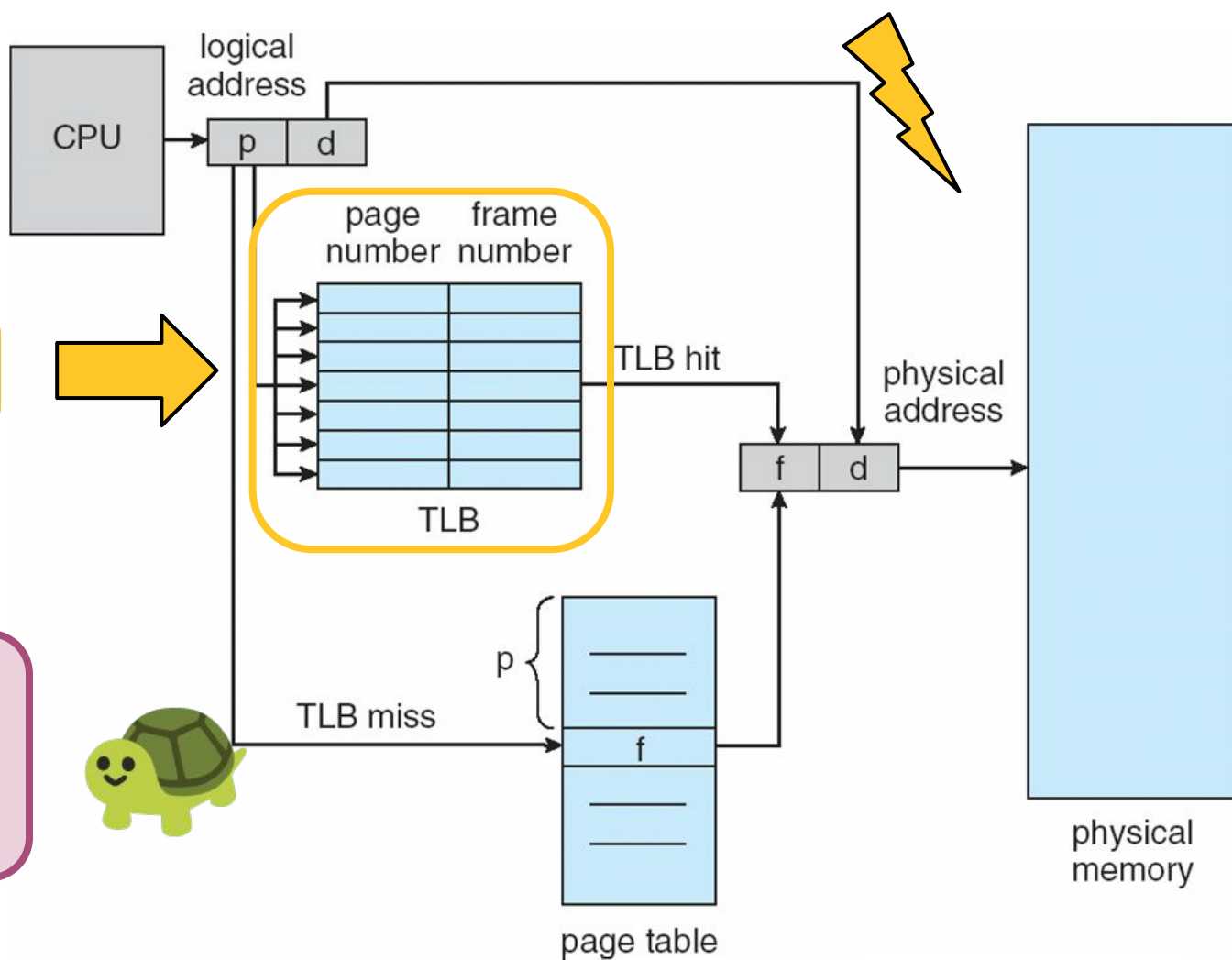


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Paging

Some stuff is
“wired down”

Suggestions for
ways to
remember the
difference?

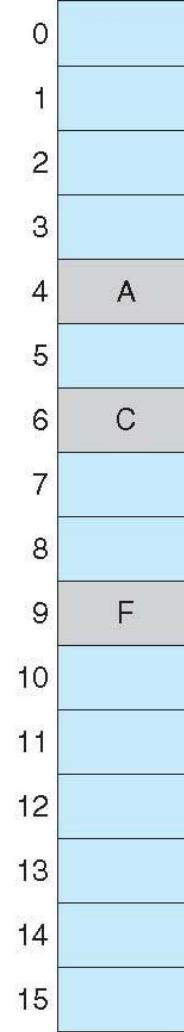
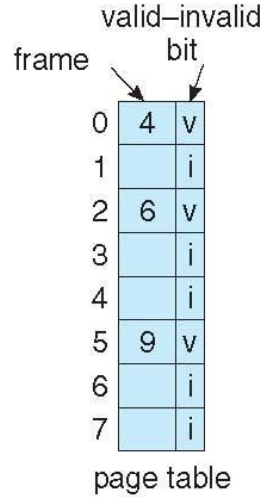


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Virtual Memory

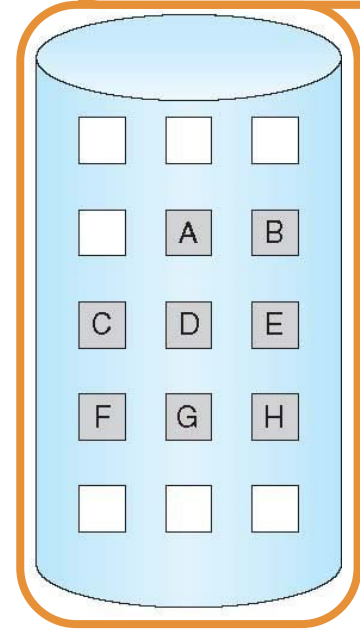


logical
memory



physical memory

Backing Store /
Secondary Storage



**Allows us to act as
if memory was
unlimited!**

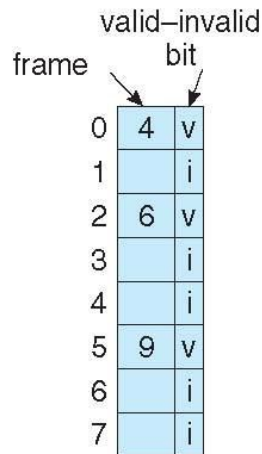
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Virtual Memory

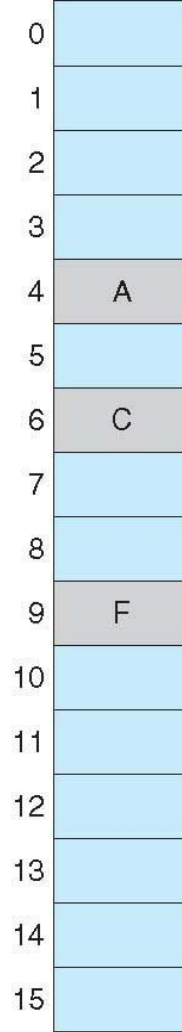
**Allows us to act as
if memory was
unlimited!**



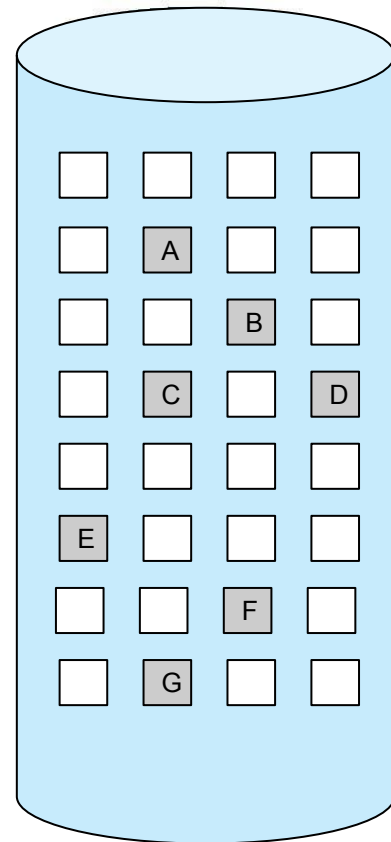
logical
memory



page table



physical memory



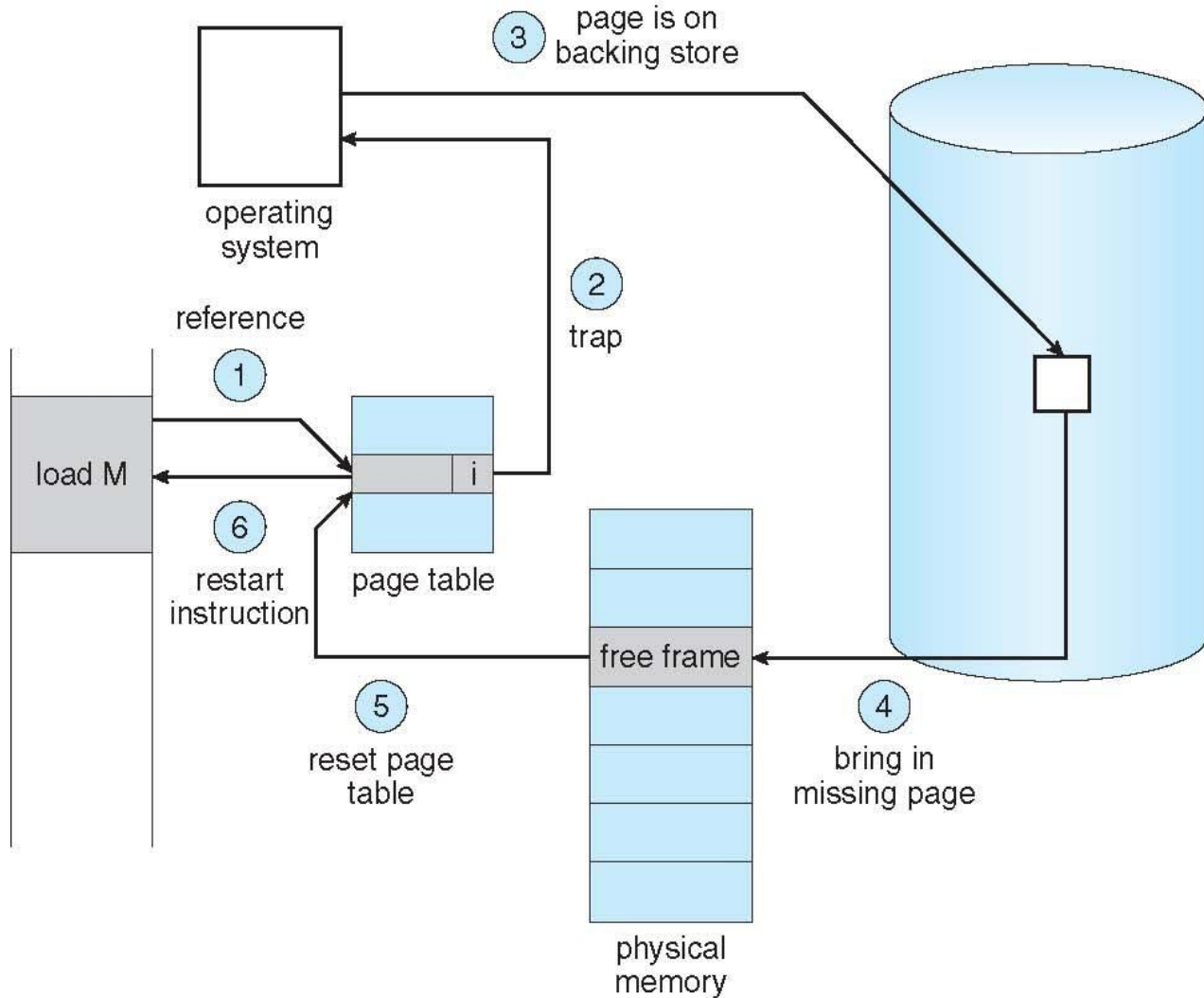
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Page Faults



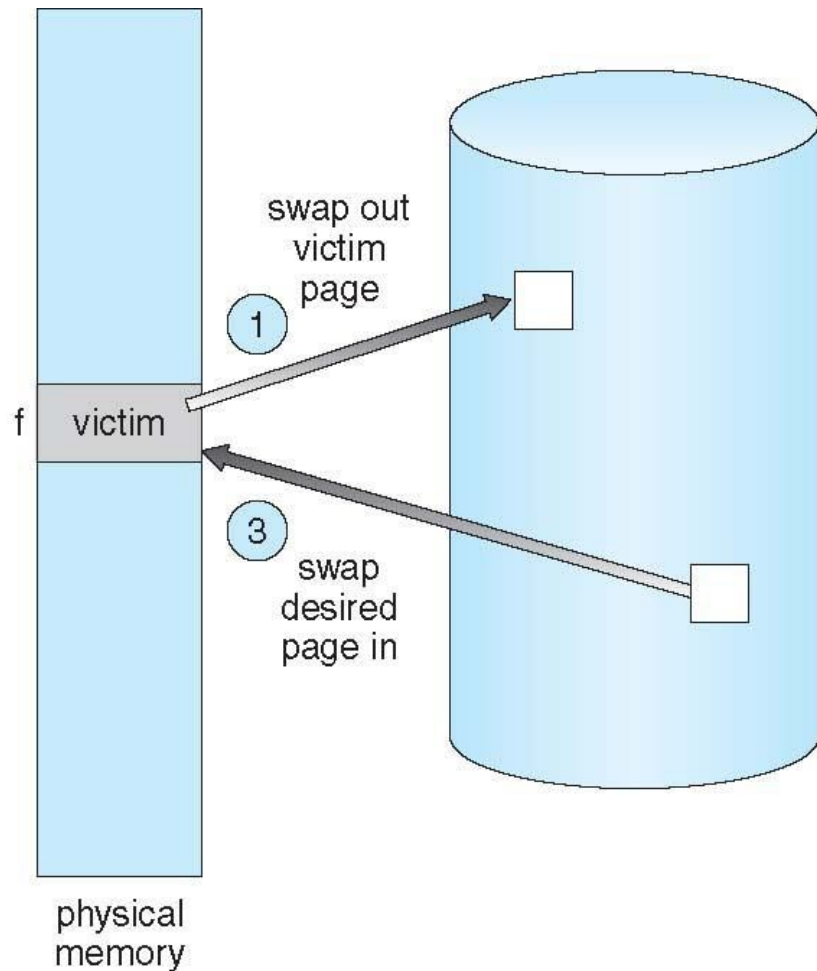
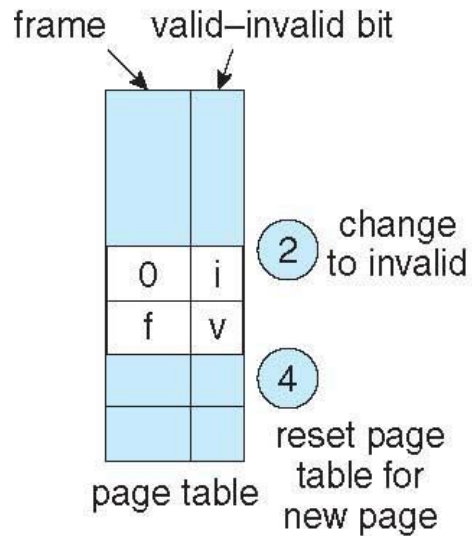
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Page Faults



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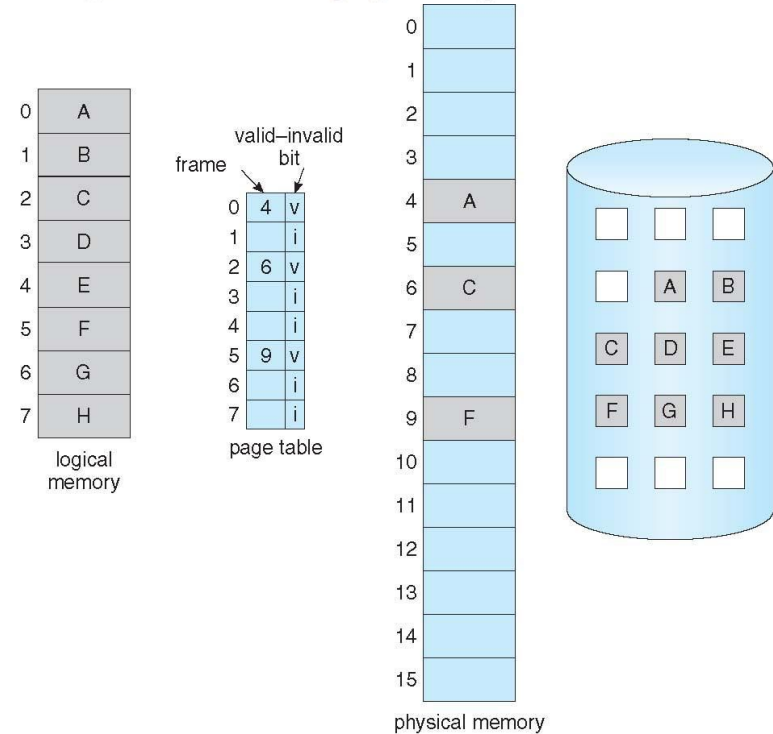
Virtual Memory



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Practice Problems

2. [Acuña] For the idea of *paging* that was used to previously implement main memory, we had a single page table. Does virtual memory require adding an entirely new table? [2 points]



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Practice Problems

6. [Acuña] Is it possible for a virtual memory system to have zero page faults? If so, **explain** when. [2 points]

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Practice Problems

12. [Bahremand] Consider the following reference string for page lookups: 1, 2, 3, 1, 4, 2, 2, 1, 3, 4. Compute the number of page faults that would occur with LRU and give a trace of the cache, assuming 3 pages may be kept in memory. [2 point]

Scratch Space

[illegible]

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Scratch Space



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Scratch Space

Upcoming Events

SI Sessions:

- Monday, February 19th at 7:00 pm MST
- Sunday, February 25th at 7:00 pm MST - Q&A Session before Exam 3

Review Sessions:

- Exam 3 Review: Thursday, February 22nd at 7:00 pm MST

Questions?

Survey:

<http://bit.ly/ASN2324>



More Questions?

Check out our other resources!

tutoring.asu.edu



Academic Support

Academic Support Network (ASN) provides a variety of free services in-person and online to help currently enrolled ASU students succeed academically.

Services



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1-

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2. Click on 'View the tutoring schedule' to see when tutors are available for specific courses.

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tutoring.asu.edu/online-study-hub

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Individual courses have an online peer community that allows you to connect with your peers to post and answer questions and to develop study groups.



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Videos can help supplement the learning you're doing in and outside of class and include step-by-step methods for how to understand concepts.



How does the Tutorbot work?

You can ask the Tutorbot questions about course concepts and the Tutorbot will recommend additional resources and examples to help address your questions.

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Business

ACC 231

Uses of Accounting Info I

 [Peer Community](#)

ACC 241

Uses of Accounting Info II

 [Peer Community](#)

CIS 105

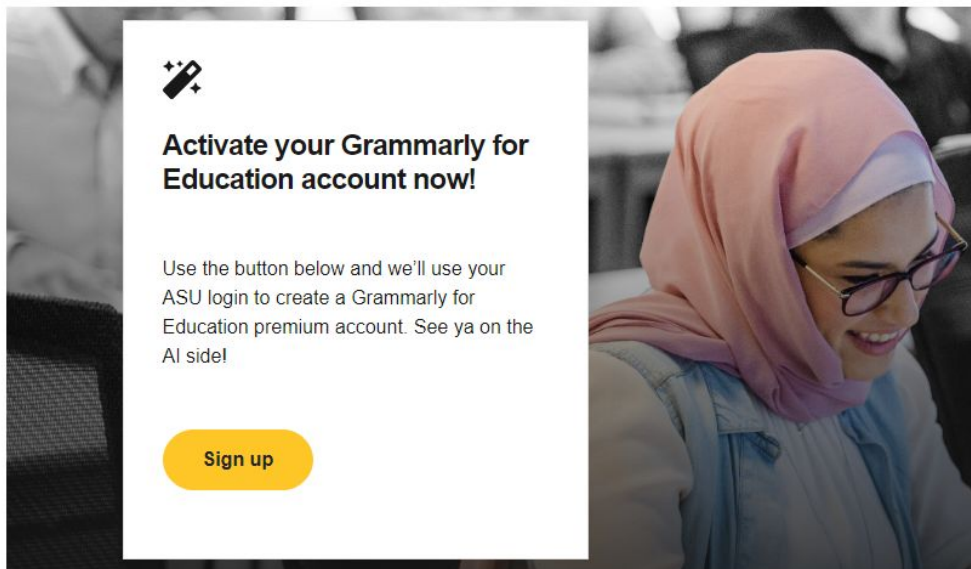
Computer Applications and Information Technology

 [Peer Community](#)

Don't forget to check out the Online Study Hub for additional resources!

Expanded Writing Support Available

Including Grammarly for Education, at no cost!



tutoring.asu.edu/expanded-writing-support

*Available slots for this pilot are limited

Additional Resources

- [Course Repo](#)
- [Course Discord](#)
- [BMP File Format \(Wiki\)](#)
- [Linux Kernel API](#)
- [Bootlin - Linux Cross Referencer](#)
- [Dining Philosophers Interactive](#)
- [Producer/Consumer Visual](#)
- [Dave's Garage Memory Video](#)