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/ [Topic-wise Quiz-4 \(Virtual Memory\)](#)

**Started on** Saturday, 26 February 2022, 5:17:31 PM

**State** Finished

**Completed on** Saturday, 26 February 2022, 6:32:09 PM

**Time taken** 1 hour 14 mins

**Grade** 9.11 out of 15.00 (61%)

Question **1**

Complete

Mark 0.00 out of 1.00

Select all the correct statements, w.r.t. Copy on Write

- ☒ a. Fork() used COW technique to improve performance of new process creation.
- ☐ b. use of COW during fork() is useless if child called exit()
- ☒ c. use of COW during fork() is useless if exec() is called by the child
- ☐ d. COW helps us save memory
- ☒ e. If either parent or child modifies a COW-page, then a copy of the page is made and page table entry is updated
- ☐ f. Vfork() assumes that there will be no write, but rather exec()

The correct answers are: Fork() used COW technique to improve performance of new process creation., If either parent or child modifies a COW-page, then a copy of the page is made and page table entry is updated, COW helps us save memory, Vfork() assumes that there will be no write, but rather exec()

Question **2**

Complete

Mark 0.25 out of 1.00

Order the following events, related to page fault handling, in correct order

1. MMU detects that a page table entry is marked "invalid"
2. Disk interrupt handler runs
3. Page fault interrupt is generated
4. Page faulted process is moved to ready-queue
5. Page fault handler detects that it's a page fault and not illegal memory access
6. Empty frame is found
7. Disk read is issued
8. Disk Interrupt occurs
9. Page faulting process is made to wait in a queue
10. Other processes scheduled by scheduler
11. Page fault handler in kernel starts executing
12. Page table of page faulted process is updated

The correct order for these items is as follows:

1. MMU detects that a page table entry is marked "invalid"
2. Page fault interrupt is generated
3. Page fault handler in kernel starts executing
4. Page fault handler detects that it's a page fault and not illegal memory access
5. Empty frame is found
6. Disk read is issued
7. Page faulting process is made to wait in a queue
8. Other processes scheduled by scheduler
9. Disk Interrupt occurs
10. Disk interrupt handler runs
11. Page table of page faulted process is updated
12. Page faulted process is moved to ready-queue

Question **3**

Complete

Mark 0.43 out of 0.50

Map the parts of a C code to the memory regions they are related to

global initialized variables	data
local variables	stack
static variables	heap
global un-initialized variables	bss
malloced memory	heap
functions	code
function arguments	stack

The correct answer is: global initialized variables → data, local variables → stack, static variables → data, global un-initialized variables → bss, malloced memory → heap, functions → code, function arguments → stack

Question **4**

Complete

Mark 0.67 out of 1.00

Shared memory is possible with which of the following memory management schemes ?

Select one or more:

- ☒ a. paging
- ☐ b. continuous memory management
- ☒ c. segmentation
- ☐ d. demand paging

The correct answers are: paging, segmentation, demand paging

Question **5**

Complete

Mark 1.00 out of 1.00

Page sizes are a power of 2 because

Select one:

- ☐ a. Power of 2 calculations are highly efficient
- ☐ b. Certain bits are reserved for offset in logical address. Hence page size =  $2^{(32 - \text{no.of offset bits})}$
- ☐ c. operating system calculations happen using power of 2
- ☐ d. MMU only understands numbers that are power of 2
- ☒ e. Certain bits are reserved for offset in logical address. Hence page size =  $2^{(\text{no.of offset bits})}$

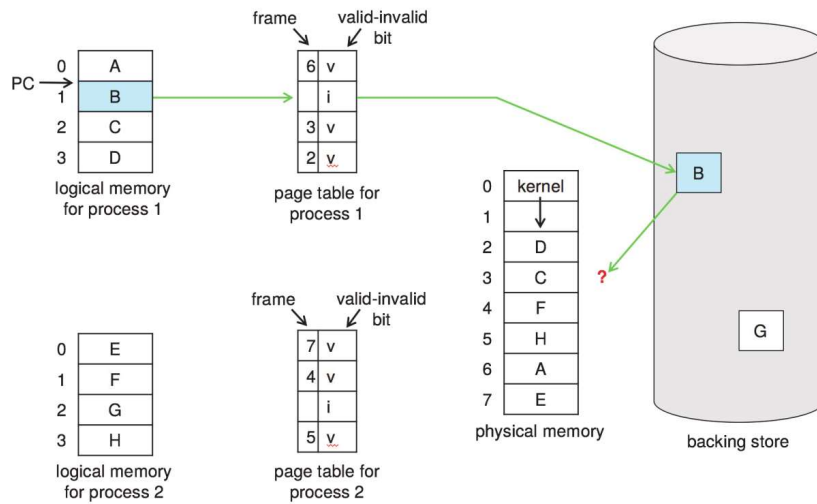
The correct answer is: Certain bits are reserved for offset in logical address. Hence page size =  $2^{(\text{no.of offset bits})}$

## Question 6

Complete

Mark 0.88 out of 1.00

W.r.t the figure given below, mark the given statements as True or False.



**Figure 10.9** Need for page replacement.

True	False	
<input type="radio"/>	<input checked="" type="radio"/>	Local replacement means chose any of the frame from 2 to 7
<input checked="" type="radio"/>	<input type="radio"/>	Kernel occupies two page frames
<input type="radio"/>	<input checked="" type="radio"/>	Global replacement means chose any of the frame from 0 to 7
<input type="radio"/>	<input checked="" type="radio"/>	Handling this scenario demands two disk I/Os
<input checked="" type="radio"/>	<input type="radio"/>	The kernel's pages can not used for replacement if kernel is not pageable.
<input checked="" type="radio"/>	<input type="radio"/>	Page 1 of process 1 needs a replacement
<input checked="" type="radio"/>	<input type="radio"/>	Local replacement means chose any of the frames 2, 3, 6
<input checked="" type="radio"/>	<input type="radio"/>	Global replacement means chose any of the frame from 2 to 7

Local replacement means chose any of the frame from 2 to 7: False

Kernel occupies two page frames: True

Global replacement means chose any of the frame from 0 to 7: False

Handling this scenario demands two disk I/Os: True

The kernel's pages can not used for replacement if kernel is not pageable.: True

Page 1 of process 1 needs a replacement: True

Local replacement means chose any of the frames 2, 3, 6: True

Global replacement means chose any of the frame from 2 to 7: True

Question **7**

Complete

Mark 0.00 out of 1.00

Suppose two processes share a library between them. The library consists of 5 pages, and these 5 pages are mapped to frames 9, 15, 23, 4, 7 respectively. Process P1 has got 6 pages, first 3 of which consist of process's own code/data and 3 correspond to library's pages 0, 2, 4. Process P2 has got 7 pages, first 3 of which consist of processe's own code/data and remaining 4 correspond to library's pages 0, 1, 3, 4. Fill in the blanks for page table entries of P1 and P2.

Page table of P1, Page 3	15
Page table of P2, Page 3	3
Page table of P2, Page 1	23
Page table of P1, Page 4	4
Page table of P1, Page 5	23
Page table of P2, Page 0	0
Page table of P2, Page 4	4

The correct answer is: Page table of P1, Page 3 → 9, Page table of P2, Page 3 → 4, Page table of P2, Page 1 → 15, Page table of P1, Page 4 → 23, Page table of P1, Page 5 → 7, Page table of P2, Page 0 → 9, Page table of P2, Page 4 → 7

Question **8**

Complete

Mark 0.75 out of 1.00

which of the following, do you think, are valid concerns for making the kernel pageable?

- ☒ a. The kernel must have some dedicated frames for it's own work
- ☒ b. The disk driver and disk interrupt handler should not be pageable
- ☐ c. The page fault handler should not be pageable
- ☐ d. No data structure of kernel should be pageable
- ☐ e. No part of kernel code should be pageable.
- ☒ f. The kernel's own page tables should not be pageable

The correct answers are: The kernel's own page tables should not be pageable, The page fault handler should not be pageable, The kernel must have some dedicated frames for it's own work, The disk driver and disk interrupt handler should not be pageable

Question **9**

Complete

Mark 1.00 out of 1.00

For the reference string

3 4 3 5 2

the number of page faults (including initial ones) using

FIFO replacement and 2 page frames is :

FIFO replacement and 3 page frames is :

Question **10**

Complete

Mark 0.60 out of 1.00

Given below is the "maps" file for a particular instance of "vim.basic" process.

Mark the given statements as True or False, w.r.t. the contents of the map file.

```

55a43501b000-55a435049000 r--p 00000000 103:05 917529 /usr/bin/vim.basic
55a435049000-55a435248000 r-xp 0002e000 103:05 917529 /usr/bin/vim.basic
55a435248000-55a4352b6000 r--p 0022d000 103:05 917529 /usr/bin/vim.basic
55a4352b7000-55a4352c5000 r--p 0029b000 103:05 917529 /usr/bin/vim.basic
55a4352c5000-55a4352e2000 rw-p 002a9000 103:05 917529 /usr/bin/vim.basic
55a4352e2000-55a4352f0000 rw-p 00000000 00:00 0
55a436bc9000-55a436e5b000 rw-p 00000000 00:00 0 [heap]
7f275b0a3000-7f275b0a6000 r--p 00000000 103:05 917901 /usr/lib/x86_64-linux-
gnu/libnss_files-2.31.so
7f275b0a6000-7f275b0ad000 r-xp 00003000 103:05 917901 /usr/lib/x86_64-linux-
gnu/libnss_files-2.31.so
7f275b0ad000-7f275b0af000 r--p 0000a000 103:05 917901 /usr/lib/x86_64-linux-
gnu/libnss_files-2.31.so
7f275b0af000-7f275b0b0000 r--p 0000b000 103:05 917901 /usr/lib/x86_64-linux-
gnu/libnss_files-2.31.so
7f275b0b0000-7f275b0b1000 rw-p 0000c000 103:05 917901 /usr/lib/x86_64-linux-
gnu/libnss_files-2.31.so
7f275b0b1000-7f275b0b7000 rw-p 00000000 00:00 0
7f275b0b7000-7f275b8f5000 r--p 00000000 103:05 925247 /usr/lib/locale/locale-archive
7f275b8f5000-7f275b8fa000 rw-p 00000000 00:00 0
7f275b8fa000-7f275b8fc000 r--p 00000000 103:05 924216 /usr/lib/x86_64-linux-
gnu/libogg.so.0.8.4
7f275b8fc000-7f275b901000 r-xp 00002000 103:05 924216 /usr/lib/x86_64-linux-
gnu/libogg.so.0.8.4
7f275b901000-7f275b904000 r--p 00007000 103:05 924216 /usr/lib/x86_64-linux-
gnu/libogg.so.0.8.4
7f275b904000-7f275b905000 ---p 0000a000 103:05 924216 /usr/lib/x86_64-linux-
gnu/libogg.so.0.8.4
7f275b905000-7f275b906000 r--p 0000a000 103:05 924216 /usr/lib/x86_64-linux-
gnu/libogg.so.0.8.4
7f275b906000-7f275b907000 rw-p 0000b000 103:05 924216 /usr/lib/x86_64-linux-
gnu/libogg.so.0.8.4
7f275b907000-7f275b90a000 r--p 00000000 103:05 924627 /usr/lib/x86_64-linux-
gnu/libvorbis.so.0.4.8
7f275b90a000-7f275b921000 r-xp 00003000 103:05 924627 /usr/lib/x86_64-linux-
gnu/libvorbis.so.0.4.8
7f275b921000-7f275b932000 r--p 0001a000 103:05 924627 /usr/lib/x86_64-linux-
gnu/libvorbis.so.0.4.8
7f275b932000-7f275b933000 ---p 0002b000 103:05 924627 /usr/lib/x86_64-linux-
gnu/libvorbis.so.0.4.8
7f275b933000-7f275b934000 r--p 0002b000 103:05 924627 /usr/lib/x86_64-linux-
gnu/libvorbis.so.0.4.8
7f275b934000-7f275b935000 rw-p 0002c000 103:05 924627 /usr/lib/x86_64-linux-
gnu/libvorbis.so.0.4.8
7f275b935000-7f275b937000 rw-p 00000000 00:00 0
7f275b937000-7f275b938000 r--p 00000000 103:05 917914 /usr/lib/x86_64-linux-

```



```

gnu/libutil-2.31.so
7f275b938000-7f275b939000 r-xp 00001000 103:05 917914 /usr/lib/x86_64-linux-
gnu/libutil-2.31.so
7f275b939000-7f275b93a000 r--p 00002000 103:05 917914 /usr/lib/x86_64-linux-
gnu/libutil-2.31.so
7f275b93a000-7f275b93b000 r--p 00002000 103:05 917914 /usr/lib/x86_64-linux-
gnu/libutil-2.31.so
7f275b93b000-7f275b93c000 rw-p 00003000 103:05 917914 /usr/lib/x86_64-linux-
gnu/libutil-2.31.so
7f275b93c000-7f275b93e000 r--p 00000000 103:05 915906 /usr/lib/x86_64-linux-
gnu/libz.so.1.2.11
7f275b93e000-7f275b94f000 r-xp 00002000 103:05 915906 /usr/lib/x86_64-linux-
gnu/libz.so.1.2.11
7f275b94f000-7f275b955000 r--p 00013000 103:05 915906 /usr/lib/x86_64-linux-
gnu/libz.so.1.2.11
7f275b955000-7f275b956000 ---p 00019000 103:05 915906 /usr/lib/x86_64-linux-
gnu/libz.so.1.2.11
7f275b956000-7f275b957000 r--p 00019000 103:05 915906 /usr/lib/x86_64-linux-
gnu/libz.so.1.2.11
7f275b957000-7f275b958000 rw-p 0001a000 103:05 915906 /usr/lib/x86_64-linux-
gnu/libz.so.1.2.11
7f275b958000-7f275b95c000 r--p 00000000 103:05 923645 /usr/lib/x86_64-linux-
gnu/libexpat.so.1.6.11
7f275b95c000-7f275b978000 r-xp 00004000 103:05 923645 /usr/lib/x86_64-linux-
gnu/libexpat.so.1.6.11
7f275b978000-7f275b982000 r--p 00020000 103:05 923645 /usr/lib/x86_64-linux-
gnu/libexpat.so.1.6.11
7f275b982000-7f275b983000 ---p 0002a000 103:05 923645 /usr/lib/x86_64-linux-
gnu/libexpat.so.1.6.11
7f275b983000-7f275b985000 r--p 0002a000 103:05 923645 /usr/lib/x86_64-linux-
gnu/libexpat.so.1.6.11
7f275b985000-7f275b986000 rw-p 0002c000 103:05 923645 /usr/lib/x86_64-linux-
gnu/libexpat.so.1.6.11
7f275b986000-7f275b988000 r--p 00000000 103:05 924057 /usr/lib/x86_64-linux-
gnu/libltdl.so.7.3.1
7f275b988000-7f275b98d000 r-xp 00002000 103:05 924057 /usr/lib/x86_64-linux-
gnu/libltdl.so.7.3.1
7f275b98d000-7f275b98f000 r--p 00007000 103:05 924057 /usr/lib/x86_64-linux-
gnu/libltdl.so.7.3.1
7f275b98f000-7f275b990000 r--p 00008000 103:05 924057 /usr/lib/x86_64-linux-
gnu/libltdl.so.7.3.1
7f275b990000-7f275b991000 rw-p 00009000 103:05 924057 /usr/lib/x86_64-linux-
gnu/libltdl.so.7.3.1
7f275b991000-7f275b995000 r--p 00000000 103:05 921934 /usr/lib/x86_64-linux-
gnu/libtdb.so.1.4.3
7f275b995000-7f275b9a3000 r-xp 00004000 103:05 921934 /usr/lib/x86_64-linux-
gnu/libtdb.so.1.4.3
7f275b9a3000-7f275b9a9000 r--p 00012000 103:05 921934 /usr/lib/x86_64-linux-
gnu/libtdb.so.1.4.3
7f275b9a9000-7f275b9aa000 r--p 00017000 103:05 921934 /usr/lib/x86_64-linux-
gnu/libtdb.so.1.4.3
7f275b9aa000-7f275b9ab000 rw-p 00018000 103:05 921934 /usr/lib/x86_64-linux-
gnu/libtdb.so.1.4.3
7f275b9ab000-7f275b9ad000 rw-p 00000000 00:00 0

```

```

7f275b9ad000-7f275b9af000 r--p 00000000 103:05 924631 /usr/lib/x86_64-linux-
gnu/libvorbisfile.so.3.3.7
7f275b9af000-7f275b9b4000 r-xp 00002000 103:05 924631 /usr/lib/x86_64-linux-
gnu/libvorbisfile.so.3.3.7
7f275b9b4000-7f275b9b5000 r--p 00007000 103:05 924631 /usr/lib/x86_64-linux-
gnu/libvorbisfile.so.3.3.7
7f275b9b5000-7f275b9b6000 ---p 00008000 103:05 924631 /usr/lib/x86_64-linux-
gnu/libvorbisfile.so.3.3.7
7f275b9b6000-7f275b9b7000 r--p 00008000 103:05 924631 /usr/lib/x86_64-linux-
gnu/libvorbisfile.so.3.3.7
7f275b9b7000-7f275b9b8000 rw-p 00009000 103:05 924631 /usr/lib/x86_64-linux-
gnu/libvorbisfile.so.3.3.7
7f275b9b8000-7f275b9ba000 r--p 00000000 103:05 924277 /usr/lib/x86_64-linux-
gnu/libpcre2-8.so.0.9.0
7f275b9ba000-7f275ba1e000 r-xp 00002000 103:05 924277 /usr/lib/x86_64-linux-
gnu/libpcre2-8.so.0.9.0
7f275ba1e000-7f275ba46000 r--p 00066000 103:05 924277 /usr/lib/x86_64-linux-
gnu/libpcre2-8.so.0.9.0
7f275ba46000-7f275ba47000 r--p 0008d000 103:05 924277 /usr/lib/x86_64-linux-
gnu/libpcre2-8.so.0.9.0
7f275ba47000-7f275ba48000 rw-p 0008e000 103:05 924277 /usr/lib/x86_64-linux-
gnu/libpcre2-8.so.0.9.0
7f275ba48000-7f275ba6d000 r--p 00000000 103:05 917893 /usr/lib/x86_64-linux-
gnu/libc-2.31.so
7f275ba6d000-7f275bbe5000 r-xp 00025000 103:05 917893 /usr/lib/x86_64-linux-
gnu/libc-2.31.so
7f275bbe5000-7f275bc2f000 r--p 0019d000 103:05 917893 /usr/lib/x86_64-linux-
gnu/libc-2.31.so
7f275bc2f000-7f275bc30000 ---p 001e7000 103:05 917893 /usr/lib/x86_64-linux-
gnu/libc-2.31.so
7f275bc30000-7f275bc33000 r--p 001e7000 103:05 917893 /usr/lib/x86_64-linux-
gnu/libc-2.31.so
7f275bc33000-7f275bc36000 rw-p 001ea000 103:05 917893 /usr/lib/x86_64-linux-
gnu/libc-2.31.so
7f275bc36000-7f275bc3a000 rw-p 00000000 00:00 0
7f275bc3a000-7f275bc41000 r--p 00000000 103:05 917906 /usr/lib/x86_64-linux-
gnu/libpthread-2.31.so
7f275bc41000-7f275bc52000 r-xp 00007000 103:05 917906 /usr/lib/x86_64-linux-
gnu/libpthread-2.31.so
7f275bc52000-7f275bc57000 r--p 00018000 103:05 917906 /usr/lib/x86_64-linux-
gnu/libpthread-2.31.so
7f275bc57000-7f275bc58000 r--p 0001c000 103:05 917906 /usr/lib/x86_64-linux-
gnu/libpthread-2.31.so
7f275bc58000-7f275bc59000 rw-p 0001d000 103:05 917906 /usr/lib/x86_64-linux-
gnu/libpthread-2.31.so
7f275bc59000-7f275bc5d000 rw-p 00000000 00:00 0
7f275bc5d000-7f275bcce000 r--p 00000000 103:05 917016 /usr/lib/x86_64-linux-
gnu/libpython3.8.so.1.0
7f275bcce000-7f275bf29000 r-xp 00071000 103:05 917016 /usr/lib/x86_64-linux-
gnu/libpython3.8.so.1.0
7f275bf29000-7f275c142000 r--p 002cc000 103:05 917016 /usr/lib/x86_64-linux-
gnu/libpython3.8.so.1.0
7f275c142000-7f275c143000 ---p 004e5000 103:05 917016 /usr/lib/x86_64-linux-
gnu/libpython3.8.so.1.0

```

```

7f275c143000-7f275c149000 r--p 004e5000 103:05 917016 /usr/lib/x86_64-linux-
gnu/libpython3.8.so.1.0
7f275c149000-7f275c190000 rw-p 004eb000 103:05 917016 /usr/lib/x86_64-linux-
gnu/libpython3.8.so.1.0
7f275c190000-7f275c1b3000 rw-p 00000000 00:00 0
7f275c1b3000-7f275c1b4000 r--p 00000000 103:05 917894 /usr/lib/x86_64-linux-
gnu/libdl-2.31.so
7f275c1b4000-7f275c1b6000 r-xp 00001000 103:05 917894 /usr/lib/x86_64-linux-
gnu/libdl-2.31.so
7f275c1b6000-7f275c1b7000 r--p 00003000 103:05 917894 /usr/lib/x86_64-linux-
gnu/libdl-2.31.so
7f275c1b7000-7f275c1b8000 r--p 00003000 103:05 917894 /usr/lib/x86_64-linux-
gnu/libdl-2.31.so
7f275c1b8000-7f275c1b9000 rw-p 00004000 103:05 917894 /usr/lib/x86_64-linux-
gnu/libdl-2.31.so
7f275c1b9000-7f275c1bb000 rw-p 00000000 00:00 0
7f275c1bb000-7f275c1c0000 r-xp 00000000 103:05 923815 /usr/lib/x86_64-linux-
gnu/libgpm.so.2
7f275c1c0000-7f275c3bf000 ---p 00005000 103:05 923815 /usr/lib/x86_64-linux-
gnu/libgpm.so.2
7f275c3bf000-7f275c3c0000 r--p 00004000 103:05 923815 /usr/lib/x86_64-linux-
gnu/libgpm.so.2
7f275c3c0000-7f275c3c1000 rw-p 00005000 103:05 923815 /usr/lib/x86_64-linux-
gnu/libgpm.so.2
7f275c3c1000-7f275c3c3000 r--p 00000000 103:05 923315 /usr/lib/x86_64-linux-
gnu/libacl.so.1.1.2253
7f275c3c3000-7f275c3c8000 r-xp 00002000 103:05 923315 /usr/lib/x86_64-linux-
gnu/libacl.so.1.1.2253
7f275c3c8000-7f275c3ca000 r--p 00007000 103:05 923315 /usr/lib/x86_64-linux-
gnu/libacl.so.1.1.2253
7f275c3ca000-7f275c3cb000 r--p 00008000 103:05 923315 /usr/lib/x86_64-linux-
gnu/libacl.so.1.1.2253
7f275c3cb000-7f275c3cc000 rw-p 00009000 103:05 923315 /usr/lib/x86_64-linux-
gnu/libacl.so.1.1.2253
7f275c3cc000-7f275c3cf000 r--p 00000000 103:05 923446 /usr/lib/x86_64-linux-
gnu/libcanberra.so.0.2.5
7f275c3cf000-7f275c3d9000 r-xp 00003000 103:05 923446 /usr/lib/x86_64-linux-
gnu/libcanberra.so.0.2.5
7f275c3d9000-7f275c3dd000 r--p 0000d000 103:05 923446 /usr/lib/x86_64-linux-
gnu/libcanberra.so.0.2.5
7f275c3dd000-7f275c3de000 r--p 00010000 103:05 923446 /usr/lib/x86_64-linux-
gnu/libcanberra.so.0.2.5
7f275c3de000-7f275c3df000 rw-p 00011000 103:05 923446 /usr/lib/x86_64-linux-
gnu/libcanberra.so.0.2.5
7f275c3df000-7f275c3e5000 r--p 00000000 103:05 924431 /usr/lib/x86_64-linux-
gnu/libselinux.so.1
7f275c3e5000-7f275c3fe000 r-xp 00006000 103:05 924431 /usr/lib/x86_64-linux-
gnu/libselinux.so.1
7f275c3fe000-7f275c405000 r--p 0001f000 103:05 924431 /usr/lib/x86_64-linux-
gnu/libselinux.so.1
7f275c405000-7f275c406000 ---p 00026000 103:05 924431 /usr/lib/x86_64-linux-
gnu/libselinux.so.1
7f275c406000-7f275c407000 r--p 00026000 103:05 924431 /usr/lib/x86_64-linux-
gnu/libselinux.so.1

```

```

7f275c407000-7f275c408000 rw-p 00027000 103:05 924431 /usr/lib/x86_64-linux-
gnu/libselinux.so.1
7f275c408000-7f275c40a000 rw-p 00000000 00:00 0
7f275c40a000-7f275c418000 r--p 00000000 103:05 924540 /usr/lib/x86_64-linux-
gnu/libtinfo.so.6.2
7f275c418000-7f275c427000 r-xp 0000e000 103:05 924540 /usr/lib/x86_64-linux-
gnu/libtinfo.so.6.2
7f275c427000-7f275c435000 r--p 0001d000 103:05 924540 /usr/lib/x86_64-linux-
gnu/libtinfo.so.6.2
7f275c435000-7f275c439000 r--p 0002a000 103:05 924540 /usr/lib/x86_64-linux-
gnu/libtinfo.so.6.2
7f275c439000-7f275c43a000 rw-p 0002e000 103:05 924540 /usr/lib/x86_64-linux-
gnu/libtinfo.so.6.2
7f275c43a000-7f275c449000 r--p 00000000 103:05 917895 /usr/lib/x86_64-linux-
gnu/libm-2.31.so
7f275c449000-7f275c4f0000 r-xp 0000f000 103:05 917895 /usr/lib/x86_64-linux-
gnu/libm-2.31.so
7f275c4f0000-7f275c587000 r--p 000b6000 103:05 917895 /usr/lib/x86_64-linux-
gnu/libm-2.31.so
7f275c587000-7f275c588000 r--p 0014c000 103:05 917895 /usr/lib/x86_64-linux-
gnu/libm-2.31.so
7f275c588000-7f275c589000 rw-p 0014d000 103:05 917895 /usr/lib/x86_64-linux-
gnu/libm-2.31.so
7f275c589000-7f275c58b000 rw-p 00000000 00:00 0
7f275c5ae000-7f275c5af000 r--p 00000000 103:05 917889 /usr/lib/x86_64-linux-gnu/ld-
2.31.so
7f275c5af000-7f275c5d2000 r-xp 00001000 103:05 917889 /usr/lib/x86_64-linux-gnu/ld-
2.31.so
7f275c5d2000-7f275c5da000 r--p 00024000 103:05 917889 /usr/lib/x86_64-linux-gnu/ld-
2.31.so
7f275c5db000-7f275c5dc000 r--p 0002c000 103:05 917889 /usr/lib/x86_64-linux-gnu/ld-
2.31.so
7f275c5dc000-7f275c5dd000 rw-p 0002d000 103:05 917889 /usr/lib/x86_64-linux-gnu/ld-
2.31.so
7f275c5dd000-7f275c5de000 rw-p 00000000 00:00 0
7ffd22d2f000-7ffd22d50000 rw-p 00000000 00:00 0 [stack]
7ffd22db0000-7ffd22db4000 r--p 00000000 00:00 0 [vvar]
7ffd22db4000-7ffd22db6000 r-xp 00000000 00:00 0 [vdso]
fffffffff600000-fffffffff601000 --xp 00000000 00:00 0 [vsyscall]

```

True	False	
<input checked="" type="radio"/>	<input type="radio"/>	The size of the stack is one page
<input checked="" type="radio"/>	<input type="radio"/>	The 5th entry 55a4352c5000-55a4352e2000 <b>may</b> correspond to "data" of the vim.basic
<input type="radio"/>	<input checked="" type="radio"/>	The size of the heap is one page
<input type="radio"/>	<input checked="" type="radio"/>	vim.basic uses the math library
<input checked="" type="radio"/>	<input type="radio"/>	This is a virtual memory map (not physical memory map)

The size of the stack is one page: False

The 5th entry 55a4352c5000-55a4352e2000 **may** correspond to "data" of the vim.basic: True

The size of the heap is one page: False

vim.basic uses the math library: True

This is a virtual memory map (not physical memory map): True

### Question 11

Complete

Mark 0.75 out of 1.00

Given below is the output of the command "ps -eo minflt,majflt,cmd" on a Linux Desktop system. Select the statements that are consistent with the output

```
626729 482768 /usr/lib/firefox/firefox -contentproc -parentBuildID 20220202182137 -prefsLen 9256 -
prefMapSize 264738 -appDir /usr/lib/firefox/browser 6094 true rdd
2167 687 /usr/sbin/apache2 -k start
1265185 222 /usr/bin/gnome-shell
102648 111 /usr/sbin/mysqld
9813 0 bash
15497 370 /usr/bin/gedit --gapplication-service
```

- ☒ a. All of the processes here exhibit some good locality of reference
- ☐ b. The bash shell is mostly busy doing work within a particular locality
- ☒ c. Firefox has likely been running for a large amount of time
- ☒ d. Apache web-server has not been doing much work

The correct answers are: Firefox has likely been running for a large amount of time, Apache web-server has not been doing much work, The bash shell is mostly busy doing work within a particular locality, All of the processes here exhibit some good locality of reference

### Question 12

Complete

Mark 1.00 out of 1.00

Assuming a 8- KB page size, what is the page numbers for the address 26583 reference in decimal :  
(give answer also in decimal)

Answer:

The correct answer is: 3

## Question 13

Complete

Mark 0.00 out of 1.00

Calculate the EAT in NANO-seconds (upto 2 decimal points) w.r.t. a page fault, given

Memory access time = 191 ns

Average page fault service time = 11 ms

Page fault rate = 0.5

Answer:

The correct answer is: 5500095.50

## Question 14

Complete

Mark 0.29 out of 1.00

Compare paging with demand paging and select the correct statements.

Select one or more:

- ☒ a. Paging requires some hardware support in CPU
- ☐ b. Both demand paging and paging support shared memory pages.
- ☐ c. With demand paging, it's possible to have user programs bigger than physical memory.
- ☐ d. Calculations of number of bits for page number and offset are same in paging and demand paging.
- ☐ e. TLB hit ration has zero impact in effective memory access time in demand paging.
- ☐ f. Paging requires NO hardware support in CPU
- ☐ g. Demand paging always increases effective memory access time.
- ☐ h. Demand paging requires additional hardware support, compared to paging.
- ☐ i. With paging, it's possible to have user programs bigger than physical memory.
- ☒ j. The meaning of valid-invalid bit in page table is different in paging and demand-paging.

The correct answers are: Demand paging requires additional hardware support, compared to paging., Both demand paging and paging support shared memory pages., With demand paging, it's possible to have user programs bigger than physical memory., Demand paging always increases effective memory access time., Paging requires some hardware support in CPU, Calculations of number of bits for page number and offset are same in paging and demand paging., The meaning of valid-invalid bit in page table is different in paging and demand-paging.

## Question 15

Complete

Mark 0.50 out of 0.50

Map the technique with it's feature/problem

dynamic linking    small executable file

static loading    wastage of physical memory

static linking    large executable file

dynamic loading    allocate memory only if needed

The correct answer is: dynamic linking → small executable file, static loading → wastage of physical memory, static linking → large executable file, dynamic loading → allocate memory only if needed

## Question 16

Complete

Mark 1.00 out of 1.00

Given six memory partitions of 300 KB , 600 KB , 350 KB , 200 KB , 750 KB , and 125 KB (in order), how would the first-fit, best-fit, and worst-fit algorithms place processes of size 115 KB and 500 KB (in order)?

worst fit 500 KB    635 KB

best fit 500 KB    600 KB

first fit 115 KB    300 KB

best fit 115 KB    125 KB

first fit 500 KB    600 KB

worst fit 115 KB    750 KB

The correct answer is: worst fit 500 KB → 635 KB, best fit 500 KB → 600 KB, first fit 115 KB → 300 KB, best fit 115 KB → 125 KB, first fit 500 KB → 600 KB, worst fit 115 KB → 750 KB

◀ (Code) mmap related programs

Jump to...

Points from Mid-term feedback ▶