Started on	Monday, 7 March 2022, 7:00:30 PM
State	Finished
Completed on	Monday, 7 March 2022, 8:17:36 PM
Time taken	1 hour 17 mins
Grade	**11.17** out of 15.00 (**74**%)

Question **1**

Complete

Mark 1.00 out of 1.00

What does userinit() do ?

○ a. sets up the 'initcode' process to start execution in trapret()

○ b. sets up the 'initcode' process to start execution in forkret ()

○ c. initializes the users

● d. sets up the 'initcode' process to start execution in forkret()

○ e. sets up the 'init' process to start execution in forkret()

○ f. initializes the process 'init' and starts executing it

The correct answer is: sets up the 'initcode' process to start execution in forkret()

Question **2**

Complete

Mark 0.00 out of 1.00

Select the statement that most correctly describes what setupkvm() does

○ a. creates a 1-level page table for the use by the kernel, as specified in kmap[] global array

● b. creates a 2-level page table setup with virtual->physical mappings specified in the kmap[] global arrray and makes kpgdir point to it

○ c. creates a 2-level page table setup with virtual->physical mappings specified in the kmap[] global arrray

○ d. creates a 2-level page table for the use of the kernel, as specified in gdtdesc

The correct answer is: creates a 2-level page table setup with virtual->physical mappings specified in the kmap[] global arrray

Question **3**

Complete

Mark 1.50 out of 1.50

Arrange the following in the correct order of execution (w.r.t. 'init')

initcode() calls exec("/init", ...)	8
scheduler() schedules initcode() process	5
userinit() is called	1
mpmain() calls scheduler()	4
'initcode' struct proc is created	2
'initcode' process is marked RUNNABLE	3
initcode() returns in forkret()	6
initcode() returns from trapret()	7

The correct answer is: initcode() calls exec("/init", ...) → 8, scheduler() schedules initcode() process → 5, userinit() is called → 1, mpmain() calls scheduler() → 4, 'initcode' struct proc is created → 2, 'initcode' process is marked RUNNABLE → 3, initcode() returns in forkret() → 6, initcode() returns from trapret() → 7

Question **4**

Complete

Mark 0.75 out of 1.00

Map the virtual address to physical address in xv6

KERNBASE	0
80108000	0x108000
0xFE000000	0x80000000
KERNLINK	0x100000

The correct answer is: KERNBASE → 0, 80108000 → 0x108000, 0xFE000000 → 0xFE000000, KERNLINK → 0x100000

Question **5**

Complete

Mark 1.33 out of 2.00

exec() does this: curproc->tf->eip = elf.entry, but userinit() does this: p->tf->eip = 0; Select all the statements from below, that collectively explain this

☑ a. elf.entry is anyways 0, so both statements mean the same

☑ b. exec() loads from ELF file and the address of first instruction to be executed is given by 'entry'

□ c. the code of 'initcode' is loaded at physical address 0

□ d. the 'entry' in initcode is anyways 0

☑ e. the initcode is created using objcopy, which discards all relocation information and symbols (like entry)

☑ f. In userinit() the function inituvm() has mapped the code of 'initcode' to be starting at virtual address 0

The correct answers are: exec() loads from ELF file and the address of first instruction to be executed is given by 'entry', In userinit() the function inituvm() has mapped the code of 'initcode' to be starting at virtual address 0, the initcode is created using objcopy, which discards all relocation information and symbols (like entry)

Question **6**

Complete

Mark 0.67 out of 1.00

Which of the following is done by mappages()?

□ a. create page table mappings to the range given by "pa" and "pa + size"

□ b. allocate page directory if required

□ c. allocate page frame if required

☑ d. allocate page table if required

☑ e. create page table mappings for the range given by "va" and "va + size"

The correct answers are: create page table mappings for the range given by "va" and "va + size", allocate page table if required, create page table mappings to the range given by "pa" and "pa + size"

Question **7**

Complete

Mark 1.00 out of 1.00

Why is there a call to kinit2? Why is it not merged with knit1?

○ a. Because there is a limit on the values that the argumets to knit1() can take.

○ b. When kinit1() is called there is a need for few page frames, but later knit2() is called to serve need of more page frames

● c. knit2 refers to virtual addresses beyond 4MB, which are not mapped before kvalloc() is called

○ d. call to seginit() makes it possible to actually use PHYSTOP in argument to kinit2()

The correct answer is: knit2 refers to virtual addresses beyond 4MB, which are not mapped before kvalloc() is called

Question **8**

Complete

Mark 1.00 out of 1.00

Does exec() code around clearptau() lead to wastage of one page frame?

● a. yes

○ b. no

The correct answer is: yes

Question **9**

Complete

Mark 1.00 out of 1.00

The variable 'end' used as argument to kinit1 has the value

○ a. 8010a48c

● b. 801154a8

○ c. 80110000

○ d. 80102da0

○ e. 81000000

○ f. 80000000

The correct answer is: 801154a8

Question **10**

Complete

Mark 0.00 out of 1.00

The approximate number of page frames created by kinit1 is

○ a. 4

○ b. 16

○ c. 4000

● d. 1000

○ e. 10

○ f. 2000

○ g. 3000

The correct answer is: 3000

Question **11**

Complete

Mark 1.00 out of 1.00

What does seginit() do?

● a. Adds two additional entries to GDT corresponding to Code and Data segments, but to be used in privilege level 3

○ b. Adds two additional entries to GDT corresponding to Code and Data segments, but to be used in privilege level 0

○ c. Nothing significant, just repetition of earlier GDT setup but with free frames list created now

○ d. Nothing significant, just repetition of earlier GDT setup but with kernel page table allocated now

○ e. Nothing significant, just repetition of earlier GDT setup but with 2-level paging setup done

The correct answer is: Adds two additional entries to GDT corresponding to Code and Data segments, but to be used in privilege level 3

Question **12**

Complete

Mark 1.50 out of 1.50

Which of the following is DONE by allocproc() ?

- □ a. ensure that the process starts in trapret()
- □ b. setup kernel memory mappings for the process
- ☑ c. ensure that the process starts in forkret()
- ☑ d. allocate PID to the process
- ☑ e. allocate kernel stack for the process
- □ f. setup the contents of the trapframe of the process properly
- ☑ g. Select an UNUSED struct proc for use
- ☑ h. setup the trapframe and context pointers appropriately

The correct answers are: Select an UNUSED struct proc for use, allocate PID to the process, allocate kernel stack for the process, setup the trapframe and context pointers appropriately, ensure that the process starts in forkret()

Question **13**

Complete

Mark 0.42 out of 1.00

Select all the correct statements about initcode

- □ a. code of 'initcode' is loaded along with the kernel during booting
- ☑ b. the size of 'initcode' is 2c
- ☑ c. The data and stack of initcode is mapped to one single page in userinit()
- □ d. initcode is the 'init' process
- ☑ e. initcode essentially calls exec("/init",...)
- ☑ f. code of initcode is loaded in memory by the kernel during userinit()
- □ g. code of initcode is loaded at virtual address 0

The correct answers are: code of 'initcode' is loaded along with the kernel during booting, the size of 'initcode' is 2c, The data and stack of initcode is mapped to one single page in userinit(), initcode essentially calls exec("/init",...)

◄ Questions for test on kalloc/kfree/kvmalloc, etc.

Jump to...

(Optional Assignment) Slab allocator in xv6 ►