GROUP 57 Assignment - 4

MEMBERS :

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DESCRIPTION
It sets up signal handlers handle page faults which will occur when the compiler tries to access a
an address using the page table which has not been allocated yet .
This will generate a SIGSEGV which will be handled in the seg_fault handler . It finds the segment corresponding to the page fault and marks its offset p_offset from the beginning of the file using the file descriptor and the read call to navigate to the p_offset in the ELF binary .
It then maps the segment present in the ELF to an address in the virtual address space using start_address which is the starting address of the page on which the fault has occured .
This calculation is done using fault_addr & ~(PAGE_SIZE - 1 ) which is an incredibly useful algorithm for calculating floor when the divisor is a power of two like PAGE_SIZE = 4096 -> 2 ^ 12 .
After mmaping we make corresponding changes in the
1 . total number of page_faults
2 . total number of page_allocations
3 . internal fragmentation which is calculated only when the page_fault occurs in the last page of the concerned segment .
the loader cleans up the phdr pointer , ehdr pointer and also the mmaped segments using the mmap_addr array of pointer to the virtual addresses corresponding to the mmaps .

CONTRIBUTIONS

Keshav Chhabra
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Made the ReadME file for this assignment.
Collaborated on the mmap parameter scheme.
Wrote the code for signal handler implementation .

Karik Prasad
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Collaborated on the mmap parameter scheme .
took care of loader cleanup segments and calculating internal fragmentation .
Also took care of calculating the
-- page_faults
-- page_allocations
did testing for the code .