

Prvi kolokvijum iz Operativnih sistema 1

Odsek za softversko inženjerstvo

Mart 2022.

1. (10 poena)

```
int createRegion (RegionDesc** phead, byte* addr, size_t sz) {
    if (!phead || !sz || addr+sz-1>MAX_VADDR) return -1;

    RegionDesc *prev = nullptr, *next = *phead;
    while (next && addr>=next->addr) prev = next, next = next->next;

    if (prev && prev->addr+prev->size>addr) return -1;
    if (next && addr+sz>next->addr) return -1;

    RegionDesc* dsc = (RegionDesc*)kmalloc(sizeof(RegionDesc));
    if (!dsc) return -2;
    dsc->addr = addr; dsc->size=sz; dsc->next = next;
    if (prev) prev->next = dsc;
    else *phead = dsc;
    return 0;
}
```

2. (10 poena)

```
const uint32 offsetw = 12;
const uint32 pagelw = 10;
const uint32 PMT0_size = 1024;
const uint32 PMT1_size = 1024;

typedef uint32 PMT1[PMT1_SIZE];
typedef uint32 PMT0[PMT0_SIZE];

void* v2pAddr (PMT0 pmt, void* vaddr) {
    uint32 page = (uint32)vaddr >> offsetw;
    uint32 offset = (uint32)vaddr & ~((uint32)-1<<offsetw);
    uint32 page0 = page>>pagelw;
    uint32 page1 = page & ~((uint32)-1<<pagelw);
    uint32* pmt1 = (uint32*)pmt[page0];
    if (!pmt1) return nullptr;
    uint32 dsc = pmt1[page1];
    uint32 frame = dsc>>3;
    if (!frame) return nullptr;
    uint32 paddr = (frame<<offsetw) + offset;
    return (void*)paddr;
}
```

3. (10 poena)

a)(3) VA: Segment(16):Offset(16)

b)(7)

```
int shareSeg (SMT smt1, unsigned seg1, SMT smt2, unsigned seg2) {
    if (smt1[seg1] || !smt2[seg2]) return -1;
    smt1[seg1] = smt2[seg2];
    return 0;
}
```