Prvi kolokvijum iz Operativnih sistema 1
Odsek za računarsku tehniku i informatiku
Maj 2022.

1. (10 poena)

```
void* createRegion (RegionDesc* phead, size_t sz) {
  if (!phead || !sz) return nullptr;

  RegionDesc* prev = phead;
  while (prev->next && prev->addr+prev->size+sz>prev->next->addr)
    prev = prev->next;

  byte* addr = prev->addr + prev->size;
  if (!prev->next && addr+sz-1>MAX_VADDR) return nullptr;

  RegionDesc* dsc = (RegionDesc*)kmalloc(sizeof(RegionDesc));
  if (!dsc) return nullptr;
  dsc->addr = addr; dsc->size=sz; dsg->next = prev->next;
  prev->next = dsc;
  return addr;
}
```

2. (10 poena)

```
const uint32 offsetw = 10;
const uint32 pagew = 12;
const uint32 PMT_size = 4096;
const uint32 SMT_size = 1024;

typedef uint32 PMT[PMT_SIZE];
typedef uint32 SMT[SMT_SIZE][2];

void* v2pAddr (SMT smt, void* vaddr) {
  uint32 seg = (uint32)vaddr >> (pagew + offsetw);
  uint32 page = ((uint32)vaddr >> offsetw)) & ~((uint32)-1<<pagew);
  uint32 offset = (uint32)vaddr & ~((uint32)-1<<offsetw);
  uint32* pmt = (uint32*)smt[seg][0];
  if (!pmt) return nullptr;
  uint32 limit = smt[seg][1] >> 3;
  if (page>limit) return nullptr;
  uint32 frame = pmt[page];
  if (!frame) return nullptr;
  uint32 paddr = (frame<<offsetw) + offset;
  return (void*)paddr;
}
```

3. (10 poena)

a)(3) VA: Page(16):Offset(16); PA: Frame(14):Offset(16)

b)(7)

```
ushort MAXPAGE = -1;

int sharePages (PMT pmt1, ushort pg1, PMT pmt2, ushort pg2, ushort cnt) {
  if (MAXPAGE-cnt<=pg1 || MAXPAGE-cnt<=pg2) return -1; // Overflow
  for (ushort i=0; i<cnt; i++)
    if (pmt1[pg1+i]!=0 || pmt2[pg2+i]==0) return -1;
  for (ushort i=0; i<cnt; i++)
    pmt1[pg1+i] = pmt2[pg2+i];
  return 0;
}
```