Operating Systems: Training session

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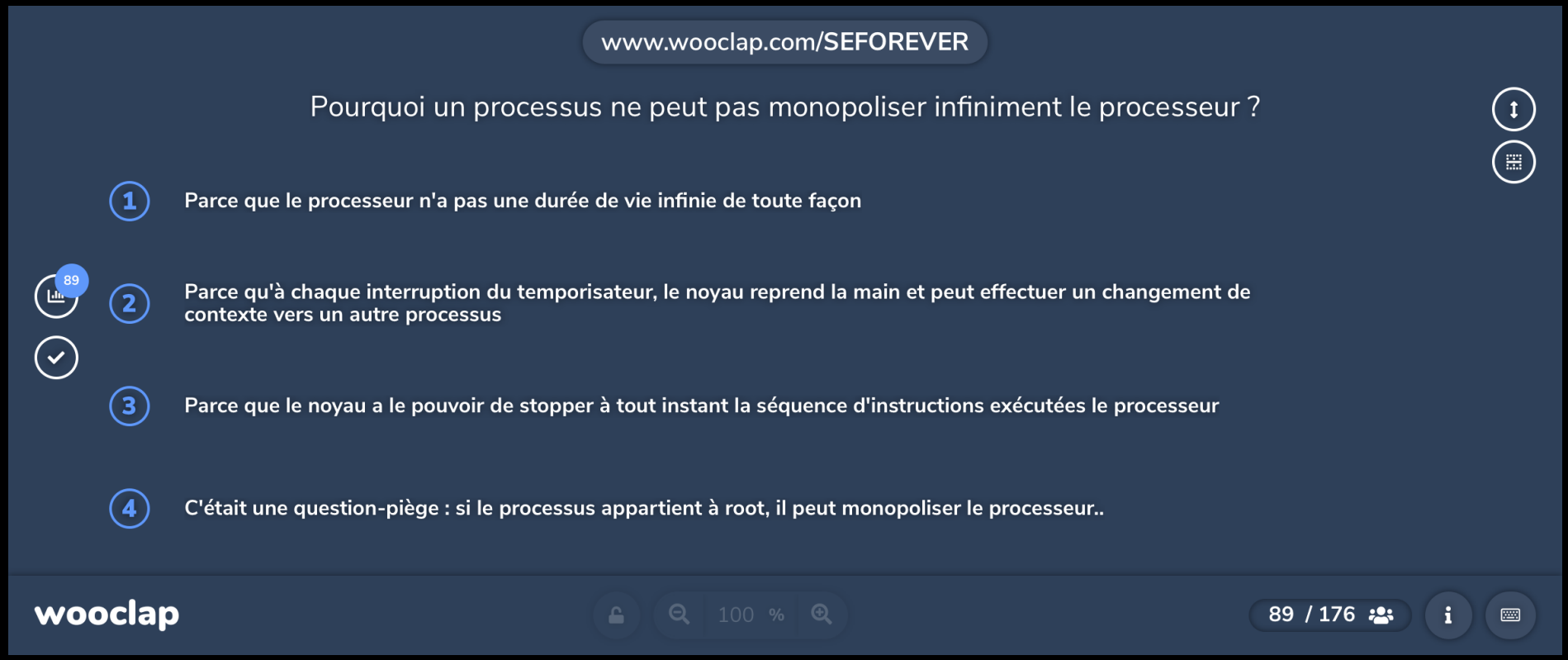
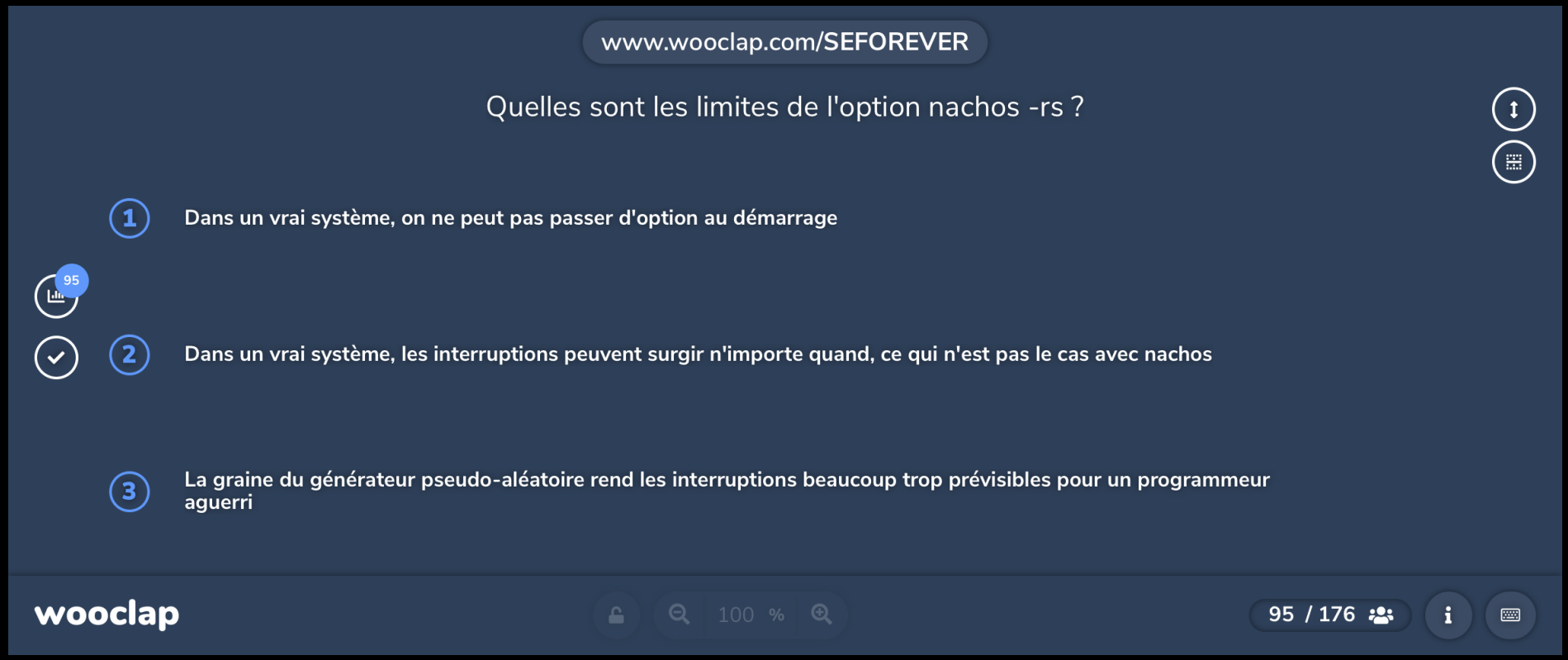
https://gforgeron.gitlab.io/se/

Question de cours



Question de cours



Tram et voitures

```
While (1) {
  sleep (PERIODE_SANS_TRAM);
  rouge_clignotant = TRUE;
  while (voitures_engagées > 0)
    /* rien */ ;
  sleep (TEMPS_PASSAGE_DU_TRAM);
  rouge_clignotant = FALSE;
}
```

```
While (rouge_clignotant)
  /* rien */ ;
voitures_engagées++;
sleep(TEMPS_TRAVERSEE);
voitures_engagées--;
```

```
boolean rouge_clignotant = FALSE;
int voitures_engagées = 0;
```

Tram et voitures

```
While (1) {
  sleep (PERIODE_SANS_TRAM);
  mutex_lock (&m);
  rouge_clignotant = TRUE;
  while (voitures_engagées > 0)
    cond_wait (&wait_tram, &m) ;
  mutex_unlock(&m);
  sleep (TEMPS_PASSAGE_DU_TRAM);
  mutex_lock (&m);
  rouge_clignotant = FALSE;
  cond_bcast (&wait_car);
  mutex_unlock(&m);
}
```

```
boolean rouge_clignotant = FALSE;
int voitures_engagées = 0;
mutex_t m;
cond_t wait_tram, wait_car;
```

```
mutex_lock (&m);
While (rouge_clignotant)
  cond_wait (&wait_car, &m) ;
voitures_engagées++;
mutex_unlock(&m);
sleep(TEMPS_TRAVERSEE);
mutex_lock (&m);
voitures_engagées--;
cond_signal (&wait_tram);
mutex_unlock(&m);
```

Histoires de groupes

```
thread_func (grp);

  P(mutex[grp]);
  nb[grp]++;
  if (nb[grp] == 1)
    P(jeton);
  V(mutex[grp]);

  do_compute(grp);

  P(mutex[grp]);
  nb[grp]--;
  if (nb[grp] == 0)
    V(jeton);
  V(mutex[grp]);
```

unsigned nb[N] = { 0, … , 0 };
semaphore mutex[N](1), jeton(1);

Reminder: Reader/Writer problem

```
Semaphore writeToken(1);
int nbr = 0;
Semaphore mutexR(1);
Semaphore waitingRoom(1);
```

```
P(waitingRoom);
P(mutexR);
if (++nbr == 1) // pathfinder
  P(writeToken);
V(mutexR);
V(waitingRoom);

 read();

P(mutexR);
if(--nbr == 0) // last to leave
  V(writeToken);
V(mutexR);
```

```
P(waitingRoom);
P(writeToken);
V(waitingRoom);

   write();

V(writeToken);
```

Histoires de groupes

```
thread_func (grp);

 P(sas);
 P(mutex[grp]);
 nb[grp]++;
 if (nb[grp] == 1)
   P(jeton);
 V(mutex[grp]);
 V(sas);

    do_compute(grp);

 P(mutex[grp]);
 nb[grp]--;
 if (nb[grp] == 0)
   V(jeton);
 V(mutex[grp]);
```

unsigned nb[N] = { 0, … , 0 };
semaphore mutex[N](1), jeton(1);
semaphore sas(1);

Histoires de groupes

```
thread_func (grp);

P(sas);
P(mutex[grp]);
nb[grp]++;
if (nb[grp] == 1)
  P(jeton);
V(mutex[grp]);
V(sas);

  P(limite);
  do_compute(grp);
  V(limite);

P(mutex[grp]);
nb[grp]--;
if (nb[grp] == 0)
  V(jeton);
V(mutex[grp]);
```

```
unsigned nb[N] = { 0, … , 0 };
semaphore mutex[N](1), jeton(1);
semaphore sas(1);
semaphore limite(MAX);
```

Additional resources available on http://gforgeron.gitlab.io/se/