University of California, Berkeley
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Computer Science Division – EECS

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CS162 Operating Systems

Quiz #3

Your Name:	
SID:	
Circle the letters of your CS162 login:	a b c d e f g h i j k l m n o p q r s t u v w x y z a b c d e f g h i j k l m n o p q r s t u v w x y z
TA name / Disc. Section:	
Score:	

This is a **closed book** ten-minute quiz. Write all of your answers directly on this paper.

Good Luck!!

1. Nachos True/False Questions. *Circle the correct answer.* (9 points total):

a. Both the kernel and user programs run in the main memory array.

True / False

b. Nachos only handles interrupts when interrupts transition from the disabled to enabled state.

True / False

c. A syscall causes a hardware interrupt handler to run.

True / False

2. For each program fragment, specify the kind of locality exhibited by the accesses to *Array ar1*. Assume a demand paged memory system with 4096 byte pages. The random function returns a uniformly distributed random number between 0 and its argument. *Explain each answer in 25 words or less.* (11 points total)

```
size = 100000;
ar1 = new IntArray[size+1];
int i = 0;
```

Fragment A:

```
a = random(size);
b = random(size);
c = random(size);
d = random(size);
while (1) {
  i += ar1[a];
  i += ar1[b];
  i += ar1[c];
  i += ar1[d];
}
```

a. Type of locality for ar1 and why:

Fragment B:

```
while (1) {
  i += ar1[random(size)];
  i += ar1[random(size)];
  i += ar1[random(size)];
  i += ar1[random(size)];
}
```

b. Type of locality for ar1 and why: