CS 3305A

Process

Lecture 3

Sept 16 2019
Process Creation Using Fork: Examples

- fork1.c
- fork2.c
- fork3.c
- fork4.c
- fork5.c
- Multiple fork example diagram
fork5.c Example

```c
#include <stdio.h>
#include <sys/types.h>
#include <unistd.h>

int main()
{
    pid_t pid;
    int i;
    pid = fork();
    if( pid > 0 )
    {
        /* parent */
        for( i=0; i < 10; i++ )
            printf("\t\t\tPARENT %d\n", i);
    }
    else
    {
        /* child */
        for( i=0; i < 10; i++ )
            printf("CHILD %d\n", i);
    }
    return 0;
}
```

Example: fork3.c

What is the possible output?
fork3.c Example: Possible Output

PARENT 0
PARENT 1
PARENT 2
PARENT 3
PARENT 4
PARENT 5
PARENT 6
PARENT 7
PARENT 8
PARENT 9

CHILD 0
CHILD 1
CHILD 2
CHILD 3
CHILD 4
CHILD 5
CHILD 6
CHILD 7
CHILD 8
CHILD 9
Fork3.c Example: Possible Output

```
PARENT 0
PARENT 1
PARENT 2
PARENT 3
PARENT 4
PARENT 5
PARENT 6

CHILD 0
CHILD 1
CHILD 2
    | PARENT 7
    | PARENT 8
    | PARENT 9

CHILD 3
CHILD 4
CHILD 5
CHILD 6
CHILD 7
CHILD 8
CHILD 9

Lots of possible outputs!!
```
Execution

- Processes get a share of the CPU to give another process a turn

- The switching between the parent and child depends on many factors:
  - machine load, process scheduling

- Output interleaving is nondeterministic
  - Cannot determine output by looking at code
How many Processes are Created by this Program?

```c
#include <stdio.h>
#include <unistd.h>
int main()
{
    fork();
    fork();
    fork();
    fork();
    fork();
}
```