

Lab 1: How a child process gets its environment variables from its parent

I created a new process by duplicating a process called child process, referred from parent process. In Unix, **fork()** command create a new process which has a unique ID from a parent process's descriptors. We can find more information Typing the following command: **man fork** in cmd/terminal.

In xcode on my MacBook I run following C++ code program.

```
#include <iostream>
#include <unistd.h>
#include <stdio.h>
#include <stdlib.h>
using namespace std;

extern char **environ;

void printenv()
{
    int i = 0;
    while (environ[i] != NULL) {
        cout<< environ[i] <<endl;
        i++; }
}

int main()
{
    pid_t childPid;
    switch(childPid = fork()) {
        case 0: /* child process */
            printenv();
            break;
        default: /* parent process */
            //printenv();
            break;
    }
}
```

```
    return 0;
}
```

output:

```
CA_ASSERT_MAIN_THREAD_TRANSACTIONS=0
SSH_AUTH_SOCK=/private/tmp/com.apple.launchd.Qh5hZwjckP/Listeners
__XPC_DYLD_FRAMEWORK_PATH=/Users/mdroney/Library/Developer/Xcode/DerivedData/childUID-
bwgwxwyfpugjokzhfskrnycphycdz/Build/Products/Debug
Apple_PubSub_Socket_Render=/private/tmp/com.apple.launchd.Cp2JQZAqil/Render
__XPC_DYLD_LIBRARY_PATH=/Users/mdroney/Library/Developer/Xcode/DerivedData/childUID-
bwgwxwyfpugjokzhfskrnycphycdz/Build/Products/Debug
__XCODE_BUILT_PRODUCTS_DIR_PATHS=/Users/mdroney/Library/Developer/Xcode/DerivedData/childUID-
bwgwxwyfpugjokzhfskrnycphycdz/Build/Products/Debug
CA_DEBUG_TRANSACTIONS=0
XPC_FLAGS=0x0
DYLD_FRAMEWORK_PATH=/Users/mdroney/Library/Developer/Xcode/DerivedData/childUID-
bwgwxwyfpugjokzhfskrnycphycdz/Build/Products/Debug
SHELL=/bin/bash
DYLD_LIBRARY_PATH=/Users/mdroney/Library/Developer/Xcode/DerivedData/childUID-
bwgwxwyfpugjokzhfskrnycphycdz/Build/Products/Debug:/usr/lib/system/introspection
SQLITE_ENABLE_THREAD_ASSERTIONS=1
NSUnbufferedIO=YES
OS_ACTIVITY_DT_MODE=YES
PATH=/Applications/Xcode.app/Contents/Developer/usr/bin:/usr/bin:/bin:/usr/sbin:/sbin
DISPLAY=/private/tmp/com.apple.launchd.YJTGEcJFkz/org.macosforge.xquartz:0
MallocNanoZone=0
HOME=/Users/mdroney
TMPDIR=/var/folders/dm/862vfs_j2xd9v2j8t5wwmtdm0000gn/T/
USER=mdroney
XPC_SERVICE_NAME=0
LOGNAME=mdroney
__CF_USER_TEXT_ENCODING=0x1F5:0x0:0x0
PWD=/Users/mdroney/Library/Developer/Xcode/DerivedData/childUID-
bwgwxwyfpugjokzhfskrnycphycdz/Build/Products/Debug
Program ended with exit code: 0
```

Conclusion:

The child process has a copy of same parent's descriptors which referred the underlying objects that are shared by child and parent so that the child process can affect a subsequent read or write by the parent. Shell used this descriptor of child process to build a standard IO system and set up pipes.