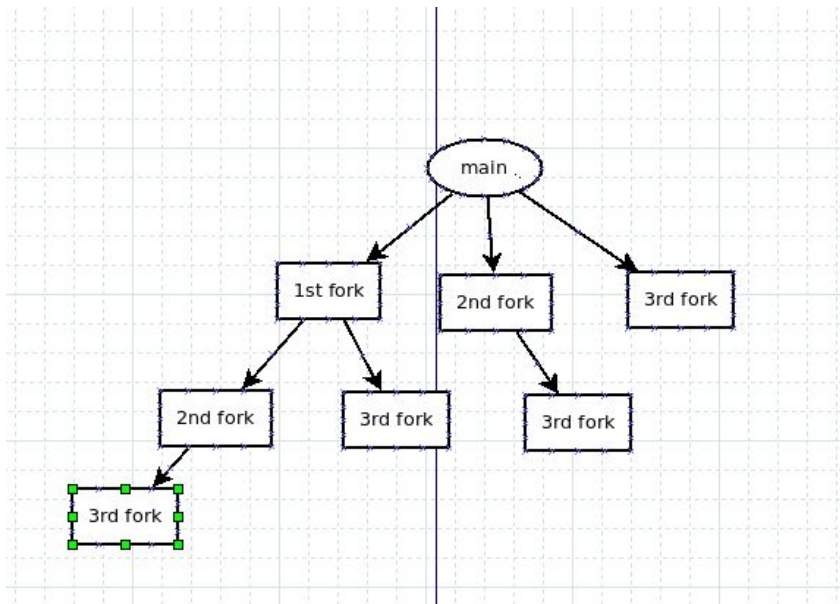


Homework 1

I think I earned a perfect score of 40/40 on this lab. I put in all my effort into this

- 1) There should be a total of 7 processes or 8 including the main process.



The main process forks into three, the 1st fork can fork into two more, 2nd fork can fork into another fork, and the 3rd fork can not progress further. This forking will continue for the depth 2 and end at depth 3 totaling in 8 processes.

Homework 1

2)

```
1 #include <iostream>
2 #include <unistd.h>
3 #include <stack>
4 #include <cstdlib>
5
6 using namespace std;
7
8 /* This creates a chain of processes that forks only once.
9  */
10
11 //prints all ancestors
12 void print(stack<int> s) {
13     cout << "This PID is " << getpid() << endl;
14
15     if(s.empty())
16         cout << "This is the parent process" << endl;
17     else {
18         cout << "The ancestors of this process are: " << endl;
19         while(!s.empty()) {
20             cout << s.top() << endl;
21             s.pop();
22         }
23     }
24 }
25
26 //chains processes
27 void chain() {
28     stack<int> ancestors;
29     int pid = 0;
30
31     for(int i = 0; i < 10; i++) {
32         pid = fork();
33         if(pid == 0)
34             ancestors.push(getppid());
35         else {
36             print(ancestors);
37             sleep(1);
38             exit(0);
39         }
40     }
41 }
42
43 int main() {
44     chain();
45     return 0;
46 }
```

Homework 1

```
[004893625@csusb.edu@jb359-23 HW1]$ ./a.out
This PID is 9671
This is the parent process
This PID is 9672
The ancestors of this process are:
9671
This PID is 9673
The ancestors of this process are:
9672
9671
This PID is 9674
The ancestors of this process are:
9673
9672
9671
This PID is 9675
The ancestors of this process are:
9674
9673
9672
9671
This PID is 9676
The ancestors of this process are:
9675
9674
9673
9672
9671
This PID is 9677
```

Homework 1

2 part b)

```
1 #include <iostream>
2 #include <unistd.h>
3 #include <stack>
4 #include <cstdlib>
5
6 using namespace std;
7
8 void print(stack<int> s) {
9     cout << "This PID is " << getpid() << endl;
10
11     if(s.empty())
12         cout << "This is the parent process" << endl;
13     else {
14         cout << "The ancestors of this process are: " << endl;
15         while(!s.empty()) {
16             cout << s.top() << endl;
17             s.pop();
18         }
19     }
20 }
21
22
23 void fan() {
24     stack<int> ancestors;
25     int pid = getpid();
26
27     for(int i = 0; i < 10; i++) {
28
29         if(pid == 0) {
30
31             ancestors.push(getppid());
32             print(ancestors);
33             exit(0);
34
35         } else {
36
37             pid = fork();
38             sleep(1);
39
40         }
41     }
42 }
43
44
45 int main(){
46     fan();
47     return 0;
48 }
```

Homework 1

```
[004893625@csusb.edu@jb359-23 HW1]$ g++ fanning.cpp
[004893625@csusb.edu@jb359-23 HW1]$ ./a.out
This PID is 9722
The ancestors of this process are:
9721
This PID is 9723
The ancestors of this process are:
9721
This PID is 9724
The ancestors of this process are:
9721
This PID is 9725
The ancestors of this process are:
9721
This PID is 9726
The ancestors of this process are:
9721
This PID is 9727
The ancestors of this process are:
9721
This PID is 9728
The ancestors of this process are:
9721
This PID is 9729
The ancestors of this process are:
9721
This PID is 9730
The ancestors of this process are:
9721
```

Homework 1

3)

```
1 process=$(ps auxw | grep "test1" | grep -v grep | awk '{print $2}')
2 if [-z $process ];
3 then echo;
4 echo "Process test1 does not exist";
5 echo;
6 else kill $process;
7 echo "Process test1 killed!";
8 echo;
9 fi
```

```
004893625@csusb.edu@jlb359-23 HW1]$ ps
  PID TTY          TIME CMD
 7636 pts/0        00:00:00 bash
 9543 pts/0        00:00:00 ps
004893625@csusb.edu@jlb359-23 HW1]$ ./test1 &
1] 9551
004893625@csusb.edu@jlb359-23 HW1]$ ./test1 &
2] 9558
004893625@csusb.edu@jlb359-23 HW1]$ ./test1 &
3] 9565
004893625@csusb.edu@jlb359-23 HW1]$ ./test1 &
4] 9572
004893625@csusb.edu@jlb359-23 HW1]$ ./killprocess
./killprocess: line 2: [-z: command not found
Process test1 killed!

1] Terminated          ./test1
2] Terminated          ./test1
3]- Terminated         ./test1
4]+ Terminated         ./test1
004893625@csusb.edu@jlb359-23 HW1]$ ps
  PID TTY          TIME CMD
 7636 pts/0        00:00:00 bash
 9592 pts/0        00:00:00 ps
004893625@csusb.edu@jlb359-23 HW1]$
```