

## CSC209H Worksheet: Fork

Consider the program below that runs without errors. In the table to the right, indicate how many times the name of each fruit is printed.

```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>

int main(void) {
    printf("Mangoes\n");
    int r = fork();
    printf("Apples\n");
    if (r == 0) {
        sleep(1);
        printf("Oranges\n");
        int k = fork();
        if (k >= 0) {
            printf("Bananas\n");
        }
    } else if (r > 0) {
        printf("Peaches\n");
        for (int i = 0; i < 3; i++) {
            if ((r = fork()) == 0) {
                sleep(1);
                printf("Pears\n");
                exit(0);
                printf("Nectarines\n");
            } else if (r > 0) {
                printf("Plums\n");
            }
        }
    }
}

return 0;
}
```

Fruit Name	Times Printed
Mangoes	
Apples	
Oranges	
Bananas	
Peaches	
Pears	
Nectarines	
Plums	

Several orderings of the fruit names are possible valid output. Some of these orderings even have the shell prompt displaying before the final fruit name (or names). Explain why this happens.

Not all of the fruit names could appear after the prompt in a valid output. For example the word **Mangoes** will never appear after the prompt. List all the fruit names that could occur after the prompt.