**COP4610.01** **Brandon Thompson** Prof. Jaimes Due Date: 1/23/20

**Programming Assignment 1**

**Deliveries:**

- **Code:** a .c program following the problem statement.
- **Report:** Brief report explaining how you address the problem, and screenshots of the output.

**Requirements:** The program should use the POSIX api from unix/linux, and should run in the university UNIX system (ember).
**Note:** Use your student ID number as your program name.

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I certify that I coded this program by myself and this code doesn't correspond to the intellectual work of someone else.

Signature: _____

**Problem**

Write a program that takes integer $n$ and a list of integers $A$ where size of $A$ is a multiple of $n$ where $n \leq 10$ and $n$ is the number of children to create. Each child will compute the sum of subarray $a \in A$ and return the partial sum to the parent. Parent will print the total sum.

**Steps**

1. Verify that size of $A$ is a multiple of $n$.
2. Pull arguments from argument list `char *argv[]`.
3. Split $A$ into $n$ subarrays.
4. Initialize communication between processes with pipes, `p[childNum][P/C][R/W]`.
5. Pass $a$ from parent to child.
6. Child returns partial sum to parent.
7. Parent adds partial sum to final sum.
8. Repeat steps 5,6,7 for each child.
9. Parent prints final sum.

```
[bthompson5517@ember os_concepts]$ ./5517 4 1 2 3 4 5 6 7 8
Child process: 1272, from: 1271 recieving:
1, 2,
child 1272: sending 3 to parent
parent recieved 3 from child 0
Child process: 1273, from: 1271 recieving:
3, 4,
child 1273: sending 7 to parent
parent recieved 7 from child 1
Child process: 1274, from: 1271 recieving:
5, 6,
child 1274: sending 11 to parent
parent recieved 11 from child 2
Child process: 1276, from: 1271 recieving:
7, 8,
child 1276: sending 15 to parent
parent recieved 15 from child 3
Sum is: 36
```

Figure 1: Screenshot of program creating 4 children.