HomeWork1
CSC4320

#002-34-4677
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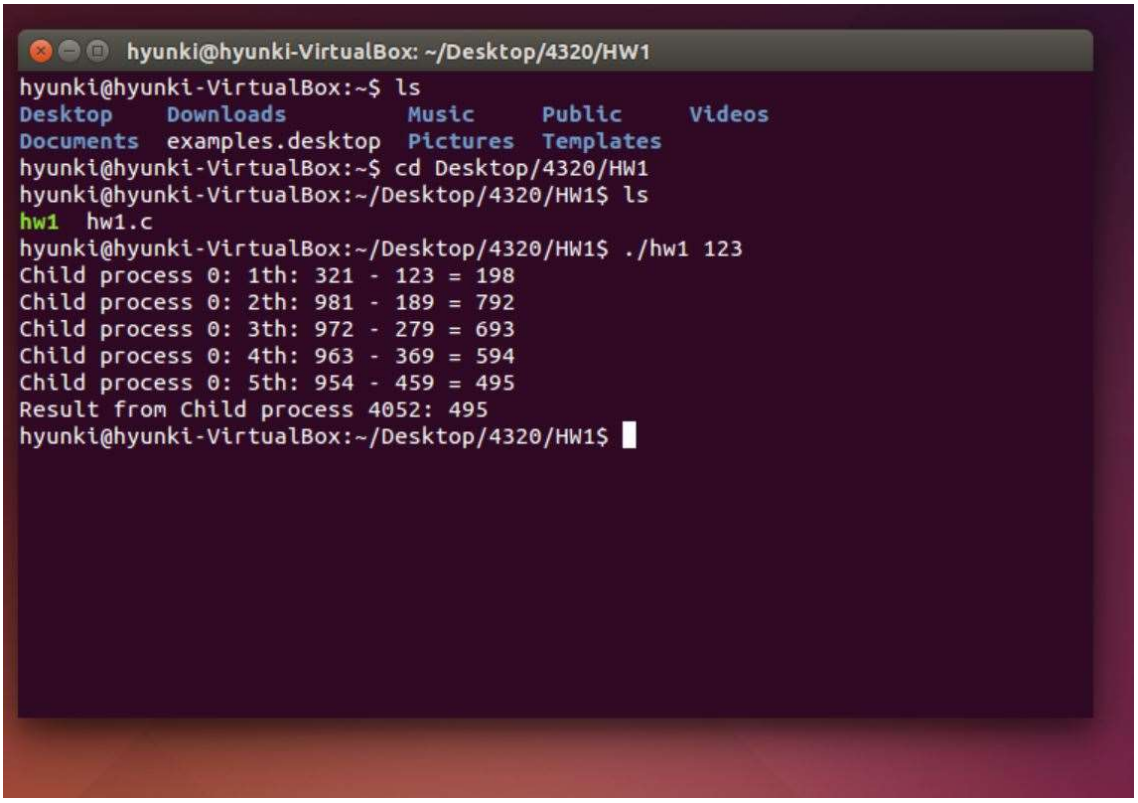
1. Output Screenshot



2. Copy of my C source code

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


#define BUFFER_SIZE 10
#define READ_END 0
#define WRITE_END 1

int main(int argc, char *argv[])
{
char buff[BUFFER_SIZE]; //create buffer
int n;
int fd[2]; //need 2 factors in order to read and write pipe
pid_t pid = 0; // process identifier
int high; // to store descending order from input
int low; // to store ascending order from input
int k = 1;

	if (argc == 1) {
		fprintf(stderr,"Usage: ./hw1 <starting value>\n");

		return -1;
	}

	n = atoi(argv[1]); //	n is the input starting value
```

```
//input must be positive number.
if(n < 0) {
        printf("Number must be positive");
        return -1;
}

// create pipe
if (pipe(fd) == -1) {
        fprintf(stderr, "Pipe failed");
        return -1;
}
//call fork; creates new process
pid = fork();

// wrong value
if(pid < 0) {
        fprintf(stderr,"Failed");
        return -1;
}
//child process; Kaprekar's Operation algorithm
else if (pid ==0){
        //495 is Kaprekar's constant number when the number is 3 digit.
        while (n !=495) {
                int array[3] = {0,0,0}; //define array for 3 digit
                int m = 0;
                int i = 0;
                int j = 0;
                int temp;
                temp = n; //store input value
```

```
// divide the input number by each digit.
// 1th digit, 10th digit 100th digit.
while (temp > 0){
        array[m] = temp % 10;
        temp = temp / 10;
        m++;
}

// sort the digits by ascending order
for (i = 0; i < m; i++){
        for (j = 0; j < m-1; j++){
                if (array[j] > array[j+1]){
                        temp = array[j];
                        array[j] = array[j+1];
                        array[j+1] = temp;
                }
        }
}

high = array[0] + array[1] * 10 + array[2] * 100;
low = array[0] * 100 + array[1] * 10 + array[2];

// n is the result
n = high - low;

//pipe cannot transfer numbers, thus change the
//type from int to string
sprintf(buff, "%d", n);
printf("Child process %d: %dth: %d - %d = %d\n", pid, k, high, low,
n);
```

```
                k++;     //count the number of while

            }
            //I will send result from child to parent
            //Therefore close read pipe and open write pipe
            close(fd[READ_END]);
            write(fd[WRITE_END],buff,25);
        }
        // parent process
        else {
            wait (NULL);    //waiting the child process
            close(fd[WRITE_END]); //close write pipe
            read(fd[READ_END],buff,BUFFER_SIZE); //open read pipe
            printf("Result from Child process %d: %s\n", pid, buff);
        }


        return 0;
}
```