

## Assignment 2

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**SRN : PES1UG20CS435**

**Section : H**

**Code :**

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

#define ARRAY_SIZE 8
#define BUFFER_SIZE 8 // should be greater than expected number of digits in sum
#define READ_END 0
#define WRITE_END 1

int main()
{
    int numArray[] = {1, 2, 3, 4, 5, 6, 7, 8};
    int sumChild = 0;
    int sum = 0;

    char write_msg[BUFFER_SIZE] = "";
    char read_msg[BUFFER_SIZE] = "";
    int fd[2];
    pid_t pid;

    if (pipe(fd) == -1)
    {
        printf("pipe failure\n");
        return 1;
    }

    pid = fork();

    if (pid > 0) // parent process - calculates sum of first half and stores in pipe
    {
        for(int i = 0; i < (ARRAY_SIZE / 2); i++) sum += numArray[i];
        snprintf(write_msg, BUFFER_SIZE, "%d", sum); // converts integer to string
        (itoa not supported)
        printf(".... parent process is storing %s in pipe ....\n", write_msg);

        close(fd[READ_END]);
        write(fd[WRITE_END], write_msg, strlen(write_msg) + 1);
        close(fd[WRITE_END]);
        wait(NULL);
    }
```

```

    }

    else if (pid == 0) // child process - calculates sum of second half, adds to the sum in
the pipe and prints
    {
        close(fd[WRITE_END]);
        read(fd[READ_END], read_msg, BUFFER_SIZE);

        for(int i = (ARRAY_SIZE / 2); i < ARRAY_SIZE; i++) sumChild +=
numArray[i];
        sumChild += atoi(read_msg);

        printf("child process summation : %d\n", sumChild);
        close(fd[READ_END]);
    }

    else
    {
        printf("fork failure\n");
        return 1;
    }

    return 0;
}

```

**Output (window highlighted in red) :**

```

sr42@sr42-VirtualBox: ~/Desktop/os_lab/assg2
sr42@sr42-VirtualBox:~/Desktop/os_lab$ cd Desktop/os_lab
sr42@sr42-VirtualBox:~/Desktop/os_lab$ ls
assg1 lab1 lab2 lab3 lab4 lab5 lab6 lab7
sr42@sr42-VirtualBox:~/Desktop/os_lab$ mkdir assg2
sr42@sr42-VirtualBox:~/Desktop/os_lab$ cd assg2
sr42@sr42-VirtualBox:~/Desktop/os_lab/assg2$ gedit sunArrayWithPipes.c

sr42@sr42-VirtualBox:~/Desktop/os_lab/assg2$ gcc sunArrayWithPipes.c
sunArrayWithPipes.c: In function 'main':
sunArrayWithPipes.c:36:21: warning: implicit declaration of function 'itoa' [-Wimplicit-function-decl
eration]
   36 |     strcpy(write_msg, itoa(sum));
      |                     ^~~~~
   36 |     strcpy(write_msg, itoa(sum));
      |                     ^~~~~
      |                     |
      |                     int
In file included from sunArrayWithPipes.c:2:
/usr/include/string.h:122:14: note: expected 'const char * restrict' but argument is of type 'int'
   122 | extern char *strcpy (char *__restrict __dest, const char *__restrict __src)
      |                  ^~~~~
sunArrayWithPipes.c:51:29: error: expected ';' before 'printf'
   51 |     sumChild += atoi(read_msg)
      |                             ^
   52 |
   53 |     printf("child process summation : %d\n", sumChild);

sr42@sr42-VirtualBox:~/Desktop/os_lab/assg2$ gcc sunArrayWithPipes.c
sunArrayWithPipes.c: In function 'main':
sunArrayWithPipes.c:36:21: warning: implicit declaration of function 'itoa' [-Wimplicit-function-decl
eration]
   36 |     strcpy(write_msg, itoa(sum));
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      |                  ^~~~~
/usr/bin/ld: /tmp/ccW2wql.o: in function 'main':
sunArrayWithPipes.c:(.text+0xd4): undefined reference to 'itoa'
collect2: error: ld returned 1 exit status
sr42@sr42-VirtualBox:~/Desktop/os_lab/assg2$ ^C
sr42@sr42-VirtualBox:~/Desktop/os_lab/assg2$ gcc sunArrayWithPipes.c
sr42@sr42-VirtualBox:~/Desktop/os_lab/assg2$

```