



UECS20CS254 - Operating Systems

Unit-2 Programming exercises

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Q1. Implement pipe operator in C with the following functionality:

- The parent process reads in a file "input.txt" and redirects the output to the pipe
- The child process must read the contents of the file and perform a word count

CODE :

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

#define BUF_SIZE 25
#define Read_END 0
#define WRITE_END 1

int main()
{
    char Read[BUF_SIZE]="";
    int fd[2];
    pid_t pid;

    if(pipe(fd) == -1)
    {
        printf("Pipe Failed\n");
        return 1;
    }
    pid = fork();
```

```

if(pid>0)
{
    FILE *fp;
    fp = fopen("input.txt","r");
    char buff[20],ch;
    int i=0;
    while((ch=fgetc(fp))!=EOF)
    {
        buff[i]=ch;
        i++;
    }
    buff[i]=0;
    close(fd[Read_END]);
    write(fd[WRITE_END],buff,strlen(buff)+1);
    close(fd[WRITE_END]);
    wait(NULL);
    fclose(fp);
}
else if(pid==0)
{
    int cnt = 0;
    close(fd[WRITE_END]);
    read(fd[Read_END],Read,BUF_SIZE);
    printf("%s\n",Read);
    char *token = strtok(Read," ");

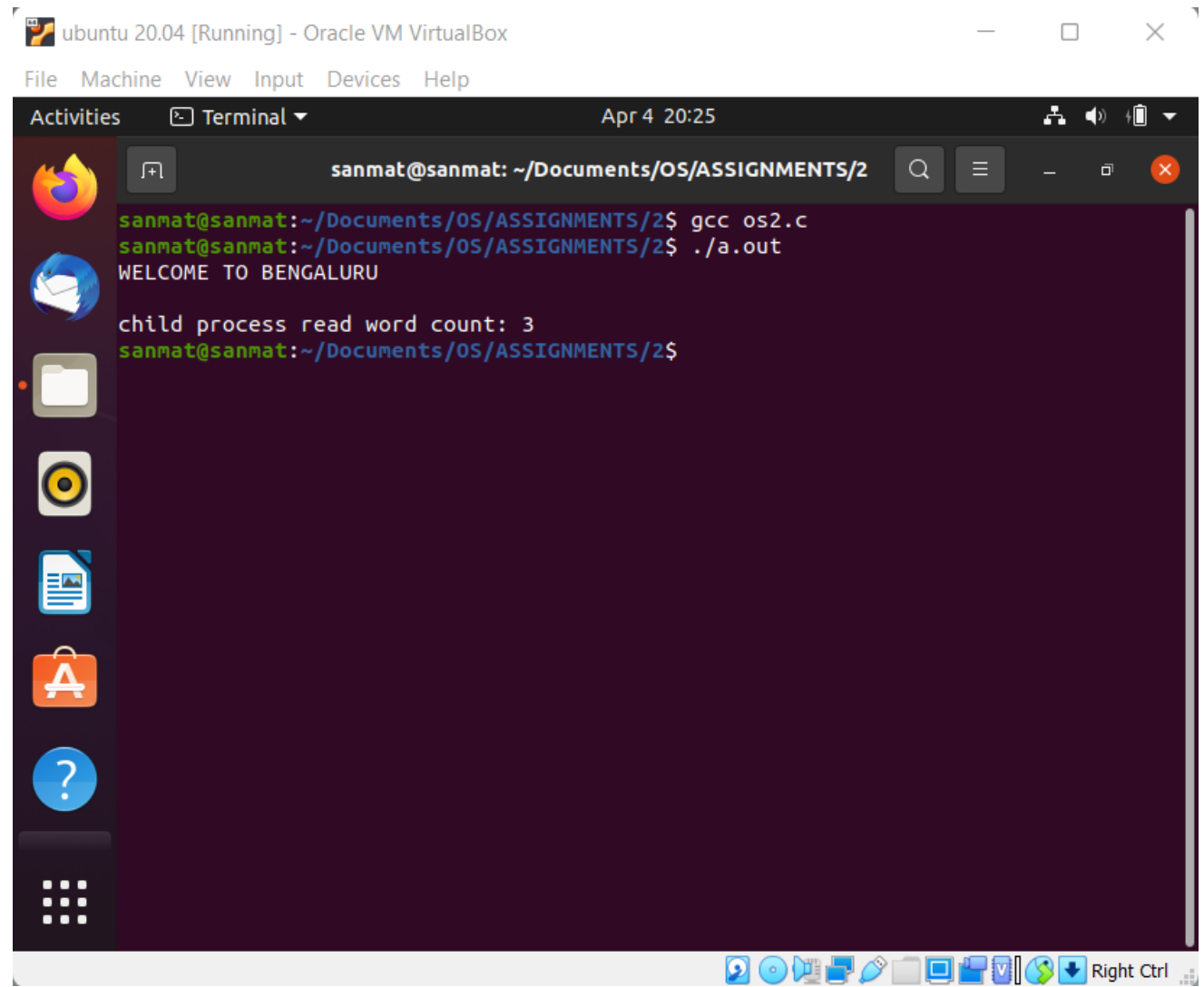
    while(token!=NULL)
    {
        cnt++;
        token = strtok(NULL," ");
    }
    printf("child process read word count: %d\n",cnt);
    close(fd[Read_END]);
}
else
{
    printf("Fork Failed\n");
    return 1;
}
}

```

INPUT TEXT FILE :

WELCOME TO BENGALURU

OUTPUT :



The screenshot shows a terminal window titled "ubuntu 20.04 [Running] - Oracle VM VirtualBox". The terminal output is as follows:

```
sanmat@sanmat: ~/Documents/OS/ASSIGNMENTS/2
sanmat@sanmat:~/Documents/OS/ASSIGNMENTS/2$ gcc os2.c
sanmat@sanmat:~/Documents/OS/ASSIGNMENTS/2$ ./a.out
WELCOME TO BENGALURU

child process read word count: 3
sanmat@sanmat:~/Documents/OS/ASSIGNMENTS/2$
```

The terminal window includes a sidebar with application icons (Firefox, Mail, Files, Music, Documents, Applications, and a question mark) and a top bar with the date and time "Apr 4 20:25". The bottom of the window shows a system tray with various icons and the text "Right Ctrl".