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CBS1006

Principles of Operating System

LAB CAT 1

Date 23-march -2021

2. a) Write a bash script to print the pattern given below. Accept input 'n' (number of lines of output in the pattern) from the standard input device.

```
1
2 4 6
1 3 5 7 9
2 4 6 8 10 12 14
1 3 5 7 9   11 13 15 17
```

CODE

```
#author siddhartha purwar
#date: 23-mar-2021
echo "Enter the number of lines"
read nums1
for(( i=1; $i<=$nums1; i++))
do
    echo -e "\n"
  if [ $(($i % 2)) != 0 ]
  then
  for((k = 1, k1 = 1; $k1 <= $(((2 * i) -1)); k = k + 2, k1++))
  do
    echo -e -n "$k\t"
  done
else
  for((j = 2, j1 = 1; $j1 <= $(((2 * i) -1)); j = j + 2, j1++))
  do
    echo -e -n  "$j\t"
  done
  fi
done
echo -e "\n"
```

OUTPUT

```
siddhartha@siddhartha-VirtualBox:/media/sf_D_DRIVE/shell/shell/lab/a3$ bash pattern.sh
Enter the number of lines
0

siddhartha@siddhartha-VirtualBox:/media/sf_D_DRIVE/shell/shell/lab/a3$ bash pattern.sh
Enter the number of lines
3


1

2       4       6

1       3       5       7       9
siddhartha@siddhartha-VirtualBox:/media/sf_D_DRIVE/shell/shell/lab/a3$ bash pattern.sh
Enter the number of lines
6


1

2       4       6

1       3       5       7       9

2       4       6       8       10      12      14

1       3       5       7       9       11      13      15      17

2       4       6       8       10      12      14      16      18      20      22
siddhartha@siddhartha-VirtualBox:/media/sf_D_DRIVE/shell/shell/lab/a3$ bash pattern.sh
```

b) Write a C program to create a child process. Let the child process create and print the words into an array from the string (sentence) input by the user. Ensure that the process creation is not leading to an orphan state. Finally print the array of words whose length is greater than 4 on the stdout.

Note: Do not use any of the built-in string manipulation functions.

CODE

```c
#include <sys/types.h>
#include <stdio.h>
#include <unistd.h>
#include <sys/wait.h>
#define MAXCHARACTER 1000
void array_operation();
int main()
{
pid_t  pid;
        pid = fork();
```

```c
        if (pid < 0) {
                fprintf(stderr, "Fork Failed");
                return 1;
        }
        else if (pid == 0) {
                printf("\nChild Process is executing\n");
                printf("Enter the sentence\n");
                array_operation();

        }
        else
        {
          wait(NULL);//this will ot stop child from becoming orphan

                printf("\nParent Process is executing\n");

        }
        return 0;
}

void array_operation(){
   int c, i, j, k, l, m;
   char ncharcte1[MAXCHARACTER][MAXCHARACTER];
   i = j = k = l = m = 0;
   fflush(stdin);
   while((c = getchar()) != '\n'){
     if(c == ' '){
       ncharcte1[i][j] = '\0';
            i++;
            j = 0;
            fflush(stdin);
            fflush(stdout);
     }
    ncharcte1[i][j] = c;
    j++;
}
fflush(stdin);
fflush(stdout);
printf("Printing word with length more than 4\n");
for(k = 0; k <= i; k++){
   for(l = 0; ncharcte1[k][l] != '\0'; l++){
     }
     l--;
   if(l > 4){//for printing only those aray whose length is more than 4
    for(m = 0; ncharcte1[k][m] != '\0'; m++){
      fflush(stdout);
      fflush(stdin);
      printf("%c",ncharcte1[k][m]);
      }
      m = 0;
   }
 }
```

}

OUTPUT

```
Parent Process is executing
siddhartha@siddhartha-VirtualBox:/media/sf_D_DRIVE/c_programming/OS/a3$ ./a.out

Child Process is executing
Enter the sentence
sidhartha is a student of vit vellore with reg number 19BBS0072
Printing word with length more than 4
sidhartha student vellore number 19BBS0072
Parent Process is executing
siddhartha@siddhartha-VirtualBox:/media/sf_D_DRIVE/c_programming/OS/a3$ ./a.out

Child Process is executing
Enter the sentence
123 1234 12345
Printing word with length more than 4
 12345
Parent Process is executing
siddhartha@siddhartha-VirtualBox:/media/sf_D_DRIVE/c_programming/OS/a3$ ./a.out

Child Process is executing
Enter the sentence
fou four fours
Printing word with length more than 4
 fours
Parent Process is executing
siddhartha@siddhartha-VirtualBox:/media/sf_D_DRIVE/c_programming/OS/a3$ ./a.out

Child Process is executing
Enter the sentence
123 fou 1234 four 12345 fours
Printing word with length more than 4
 12345 fours
Parent Process is executing
siddhartha@siddhartha-VirtualBox:/media/sf_D_DRIVE/c_programming/OS/a3$
```