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OPERATING SYSTEM

TERM WORK

Name: Mohd Nasir

Sec: "F"

Roll No: 14

Student Id:20021595

Uni Roll No:2016855

Subject Name: Operating System Lab

Subject Code: PCS-502

Student Sign: **Professor Sign:**

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DATA BASE MANAGEMENT SYSTEM

TERM WORK

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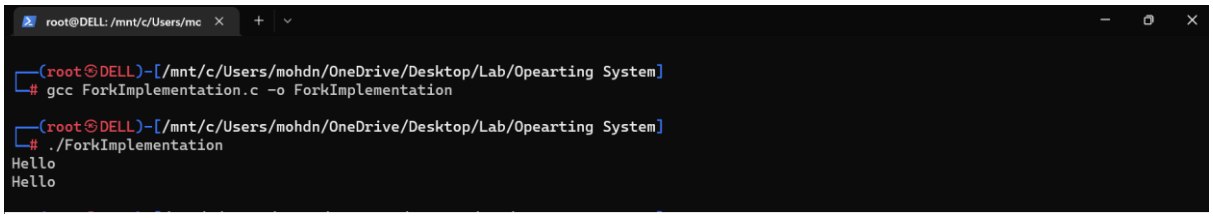
Subject Code: PCS-503

Student Sign: **Professor Sign:**

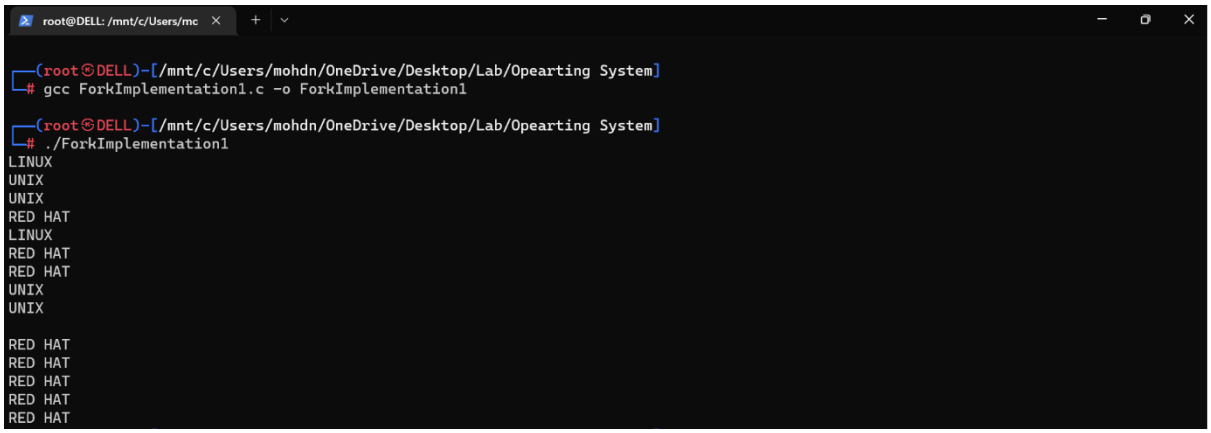
Ques. Write a program to Implemenet Frok() System Call.

```
#include <stdio.h>

#include <unistd.h>

int main()

{

   fork();

   printf("Hello\n");

   return 0;

}
```



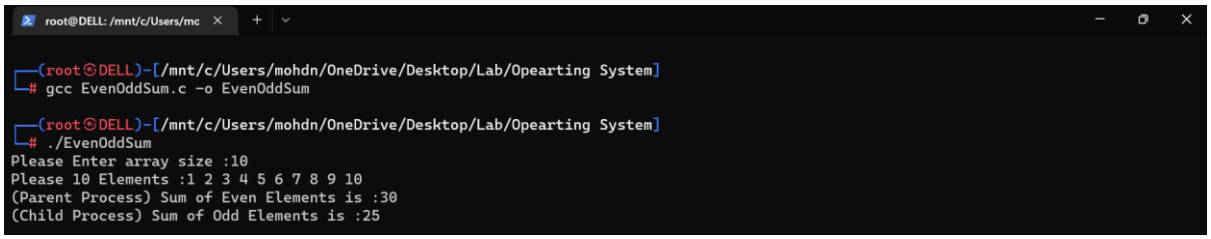
Ques. Write a Program to Implement More than Two Fork() System Call.

```
#include <stdio.h>

#include <unistd.h>

int main()

{

   fork();

   printf("LINUX\n");

   fork();

   printf("UNIX\n");

   fork();

   printf("RED HAT\n");

   return 0;

}
```



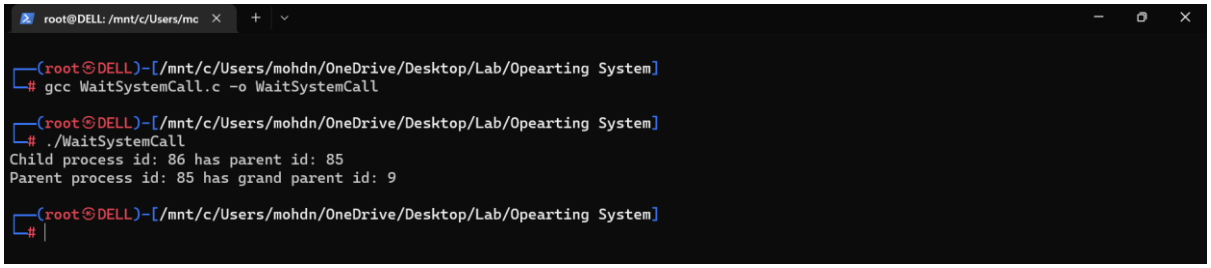
Ques. Write a program to print the sum of an array element using the fork () system call if the parent process executes the print sum of even elements if child process executes the print sum of odd elements.

```
#include <stdio.h>

#include <stdlib.h>

#include <unistd.h>

int main()

{

   int *arr, id, size, evensum = 0, oddsum = 0;

   printf("Please Enter array size :");

   scanf("%d", &size);

   arr = (int *)malloc(size * sizeof(int));

   printf("Please %d Elements :", size);

   for (int i = 0; i < size; i++)

   {

      scanf("%d", &arr[i]);

      if ((arr[i]) % 2 == 0)

         evensum += arr[i];

      else

         oddsum += arr[i];

   }

   id = fork();

   if (id == 0)

      printf("(Child Process) Sum of Odd Elements is :%d\n", oddsum);

   else if (id > 0)

      printf("(Parent Process) Sum of Even Elements is :%d\n", evensum);

}
```



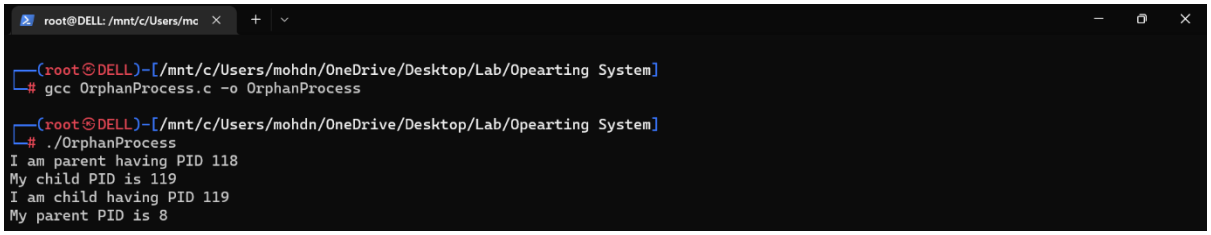
Ques. Write a program to Implement Wait () System Call.

```
#include <stdio.h>

#include <stdio.h>

#include <unistd.h>

#include <sys/wait.h>

int main()

{

   int pid = fork();

   if (pid == 0)

   {

      sleep(5);

      printf("Child process id: %d has parent id: %d\n", getpid(), getppid());

   }

   else if (pid > 0)

   {

      wait(NULL);

      printf("Parent process id: %d has grand parent id: %d\n", getpid(), getppid());

   }

   else

      printf("Process not created");

   return 0;

}
```



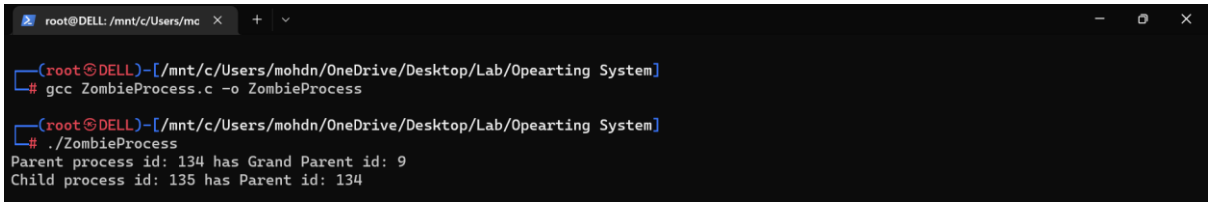
Ques. Write a Program for Orphan Process.

```
#include <stdio.h>

#include <unistd.h>

#include <sys/types.h>

int main()

{

   pid_t p;

   p = fork();

   if (p == 0) /*Child*/

   {

      sleep(50);

      printf("I am child having PID %d\n", getpid());

      printf("My parent PID is %d\n", getppid());

   }

   else /*Parent*/

   {

      printf("I am parent having PID %d\n", getpid());

      printf("My child PID is %d\n", p);

   }


   return 0;

}
```



Ques. Write a program for Zombie Process.

```
#include <stdio.h>

#include <unistd.h>

#include <sys/wait.h>

int main()

{

   int pid = fork();

   if (pid == 0)

   {

      printf("Child process id: %d has Parent id: %d\n", getpid(), getppid());

   }

   else if (pid > 0)

   {

      wait(NULL);

      sleep(60);

      printf("Parent process id: %d has Grand Parent id: %d\n", getpid(), getppid());

   }

   else

      printf("Process not created");

   return 0;

}
```



Ques. Write a program to implement FCFS (First Come First Serve) Scheduling Algorithm.

```
#include <iostream>
#include <vector>
#include <algorithm>
using namespace std;
class DataDetails
{
public:
   int ari, pno, bur;
   int ct, tat, wt;
};
bool comparator(DataDetails d1, DataDetails d2)
{
   if (d1.ari != d2.ari)
      return (d1.ari < d2.ari);
   else
      return (d1.pno < d2.pno);
}

bool comparatorPno(DataDetails d1, DataDetails d2)
{
   return (d1.pno < d2.pno);
}
int main()
{
   cout << "          FCFS SCHEDULING" << endl;
   int size, t = 0;
   float avgtat = 0, avgwt = 0;
   cout << "Enter no of process :";
   cin >> size;
```

```
cout << "AT BT" << endl;
vector<DataDetails> vrr(size);
for (int i = 0; i < size; i++)
{
    cin >> vrr[i].ari >> vrr[i].bur;
    vrr[i].pno = i + 1;
    vrr[i].ct = vrr[i].tat = vrr[i].wt = 0;
}
sort(vrr.begin(), vrr.end(), comparator);
for (int i = 0; i < size; i++)
{
    if (t >= vrr[i].ari)
    {
        t += vrr[i].bur;
        vrr[i].ct = t;
        vrr[i].tat = vrr[i].ct - vrr[i].ari;
        avgtat += vrr[i].tat;
        vrr[i].wt = vrr[i].tat - vrr[i].bur;
        avgwt += vrr[i].wt;
    }
    else
    {
        i--;
        t++;
    }
}
sort(vrr.begin(), vrr.end(), comparatorPno);
cout << "\n                    SOLUTION" << endl;
cout << "PN  " <<  "AT  " <<  "BT  " <<  "CT  " << "TAT  " << "WT  "  << endl;
for (int i = 0; i < size; i++)
```

```
        cout << "P" << vrr[i].pno << "   " << vrr[i].ari << "   " << vrr[i].bur << "   " << vrr[i].ct << "   " <<
vrr[i].tat << "   " << vrr[i].wt << "   " << endl;

    avgtat = avgtat / size;

    cout << "Average TurnAroundTime is :" << avgtat << endl;

    avgwt = avgwt / size;

    cout << "Average WaitingTime is :" << avgwt << endl;

    return 0;

}
```

Output Clear

```
            FCFS SCHEDULING
Enter no of process :5
AT BT
6  7
3  3
2  1
0  3
1  9

                SOLUTION
PN   AT   BT   CT   TAT   WT
P1   6    7    23   17    10
P2   3    3    16   13    10
P3   2    1    13   11    10
P4   0    3    3    3     0
P5   1    9    12   11    2
Average TurnAroundTime is :11
Average WaitingTime is :6.4
```

Output Clear

```
            FCFS SCHEDULING
Enter no of process :5
AT BT
3  4
5  3
0  2
5  1
4  3

                SOLUTION
PN   AT   BT   CT   TAT   WT
P1   3    4    7    4     0
P2   5    3    13   8     5
P3   0    2    2    2     0
P4   5    1    14   9     8
P5   4    3    10   6     3
Average TurnAroundTime is :5.8
Average WaitingTime is :3.2
```

Ques. Write a program to implement SJF (Shortest Job First) Scheduling Algorithm.

```
#include <iostream>
#include <vector>
#include <stdbool.h>
#include <algorithm>
using namespace std;
class DataDetails
{
public:
   int ari, pno, bur;
   int ct, tat, wt;
   int visit;
};
bool comparator(DataDetails d1, DataDetails d2)
{
   if (d1.bur != d2.bur)
      return (d1.bur < d2.bur);
   else
   {
      if (d1.ari != d2.ari)
         return (d1.ari < d2.ari);
      return (d1.pno < d2.pno);
   }
}

bool comparatorPno(DataDetails d1, DataDetails d2)
{
   return (d1.pno < d2.pno);
}
int main()
{
```

```
cout << "              SJF SCHEDULING" << endl;
int size, t = 0, ch = 0;
float avgtat = 0, avgwt = 0;
cout << "Enter no of process :";
cin >> size;
cout << "AT BT" << endl;
vector<DataDetails> vrr(size);
for (int i = 0; i < size; i++)
{
   cin >> vrr[i].ari >> vrr[i].bur;
   vrr[i].pno = i + 1;
   vrr[i].ct = vrr[i].tat = vrr[i].wt = 0;
   vrr[i].visit = 0;
}
sort(vrr.begin(), vrr.end(), comparator);
for (int k = 0; k < size; k++)
{
   int ch = 0;
   for (int i = 0; i < size; i++)
   {
      if ((vrr[i].visit == 0) && t >= vrr[i].ari)
      {
         t += vrr[i].bur;
         vrr[i].ct = t;
         vrr[i].tat = vrr[i].ct - vrr[i].ari;
         vrr[i].wt = vrr[i].tat - vrr[i].bur;
         avgtat += vrr[i].tat;
         avgwt += vrr[i].wt;
         vrr[i].visit = 1;
         ch = 1;
         break;
```

```
            }
        }
        if (!ch)
        {
            t++;
            k--;
        }
    }
    sort(vrr.begin(), vrr.end(), comparatorPno);
    cout << endl;
    cout << "              SOLUTION" << endl;
    cout << "PN  " << "AT  " << "BT  " << "CT  "  << "TAT  "  << "WT  "  << endl;
    for (int i = 0; i < size; i++)
        cout << "P" << vrr[i].pno << "   " << vrr[i].ari << "   " << vrr[i].bur << "   " << vrr[i].ct << "   " << vrr[i].tat << "   " << vrr[i].wt << "   " << endl;
    avgtat = avgtat / size;
    cout << "Average TurnAroundTime is :" << avgtat << endl;
    avgwt = avgwt / size;
    cout << "Average WaitingTime is :" << avgwt << endl;
    return 0;
}
```

Output Clear

```
                    SJF SCHEDULING
Enter no of process :5
AT BT
2  6
5  2
1  8
0  3
4  4

                 SOLUTION.
PN   AT   BT   CT   TAT   WT
P1   2    6    9    7    1
P2   5    2    11   6    4
P3   1    8    23   22   14
P4   0    3    3    3    0
P5   4    4    15   11   7
Average TurnAroundTime is :9.8
Average WaitingTime is :5.2
```

Output Clear

```
                    SJF SCHEDULING
Enter no of process :5
AT BT
5  7
3  2
9  1
1  3
2  2
                 SOLUTION
PN   AT   BT   CT   TAT   WT
P1   5    7    15   10   3
P2   3    2    8    5    3
P3   9    1    16   7    6
P4   1    3    4    3    0
P5   2    2    6    4    2
Average TurnAroundTime is :5.8
Average WaitingTime is :2.8
```