**P2 OS EVALUATION  
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(1)

#include <stdio.h>

#include <stdlib.h>

#include <semaphore.h>

#include <unistd.h>

#include <pthread.h>

int h=0,o=0,count=0;

sem\_t formation;

pthread\_mutex\_t h\_lock = PTHREAD\_MUTEX\_INITIALIZER;

pthread\_mutex\_t o\_lock = PTHREAD\_MUTEX\_INITIALIZER;

void waterformation()

{

printf("Water molecule %d created \n",count);

}

void oxygen(void\* arg){

sem\_wait(&formation);

//cs

pthread\_mutex\_lock(&o\_lock);

o=o+1;

pthread\_mutex\_unlock(&o\_lock);

if (h>=2){

count++;

waterformation();

pthread\_mutex\_lock(&h\_lock);

pthread\_mutex\_lock(&o\_lock);

h=h-2;

pthread\_mutex\_unlock(&h\_lock);

o=o-1;

pthread\_mutex\_unlock(&o\_lock);

}

sem\_post(&formation);

}

void hydrogen(void\* arg){

pthread\_mutex\_lock(&h\_lock);

h=h+1;

pthread\_mutex\_unlock(&h\_lock);

}

int main()

{

//to create 10 molecules of water

pthread\_t h\_thread, o\_thread;

sem\_init(&formation, 0, 1);

for (int i=0; i<20; i++){

pthread\_create(&h\_thread, NULL, hydrogen, NULL);

pthread\_create(&o\_thread, NULL, oxygen, NULL);

}

pthread\_join(h\_thread, NULL);

pthread\_join(o\_thread, NULL);

printf("\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n");

printf("Total water molecules created = %d\n",count);

printf("Remaining oxygen molecules = %d\n",o);

printf("Remaining hydrogen molecules = %d\n",h);

printf("\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n");

exit(0);

}

OUTPUT:

