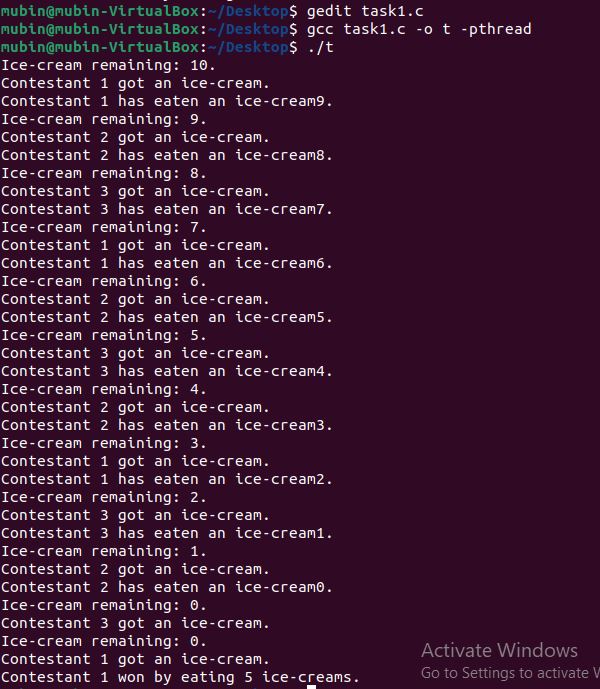
OS LAB#9

M.Mubin Farid 21K-4827

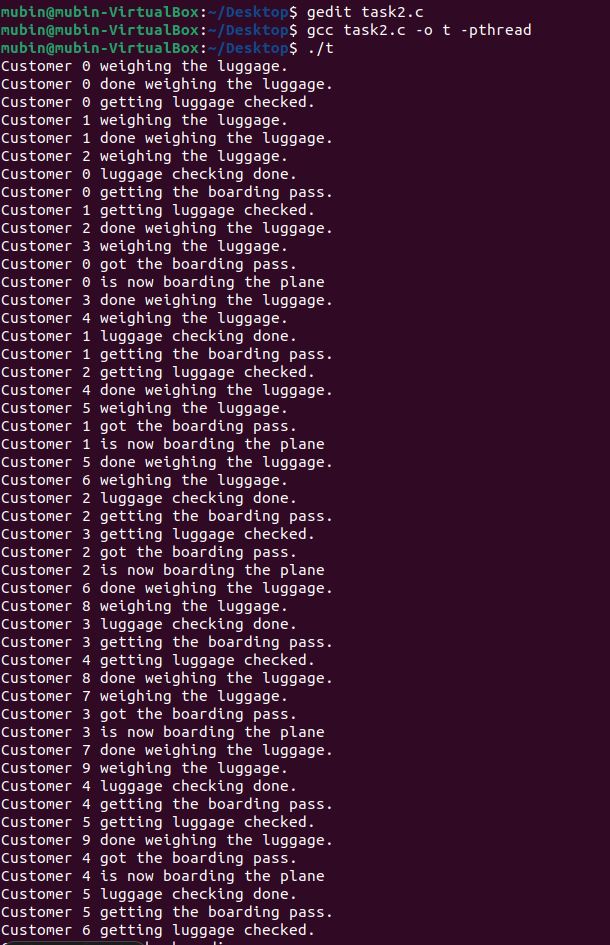
Task 1)

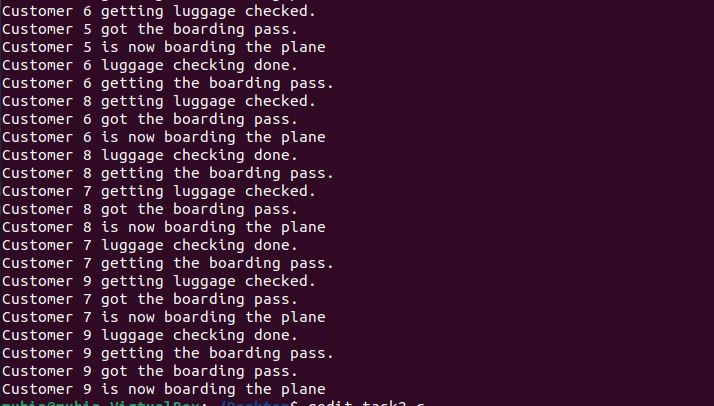
#include<stdio.h>  
#include<unistd.h>  
#include<semaphore.h>  
#include<pthread.h>  
  
int contestant[3],id,lg=-1000;  
int icecreamremaining=10;  
sem\_t get\_icecream;  
sem\_t counting;  
  
void \*seller(void \*num){  
 int cnum = \*((int \*)num);  
 cnum++;  
 while (icecreamremaining > 0) {  
 if(icecreamremaining > 0){  
 sem\_wait(&counting);  
 sleep(1);  
 sem\_post(&counting);  
 sem\_wait(&get\_icecream);  
 }  
 printf("Ice-cream remaining: %d.\n",icecreamremaining);   
 printf("Contestant %d got an ice-cream.\n",cnum);  
 if (icecreamremaining <= 0) {  
 sem\_post(&get\_icecream);  
 break;  
 }  
   
 if(icecreamremaining > 0){  
 icecreamremaining--;  
 id=cnum;  
 id--;  
 contestant[id]++;  
 printf("Contestant %d has eaten an ice-cream%d.\n",cnum,icecreamremaining);}  
   
 sem\_post(&get\_icecream);  
   
 }  
 pthread\_exit(NULL);  
}  
  
int main(){  
 sem\_init(&get\_icecream,0,1);  
 sem\_init(&counting,0,3);  
 pthread\_t p[3];  
 for(int i=0;i<3;i++){  
 contestant[i]=i;  
 if(pthread\_create(&p[i],NULL,seller,&contestant[i])!=0)  
 perror("Thread creation failed.");  
 }  
 for(int i=0;i<3;i++){  
 pthread\_join(p[i],NULL);  
 }  
 for(int i=0;i<3;i++){  
 if (contestant[i]>lg) {  
 lg=contestant[i];  
 id=i;  
 }  
 }  
 printf("Contestant %d won by eating %d ice-creams.\n",id,lg);  
 sem\_destroy(&get\_icecream);  
 sem\_destroy(&counting);  
}



Task 2)

#include<stdio.h>  
#include<unistd.h>  
#include<semaphore.h>  
#include<pthread.h>  
  
int customerarr[10];  
sem\_t weighluggage;  
sem\_t checkluggage;  
sem\_t getbdpass;  
  
void \*customer(void \*num){  
 int cnum = \*((int \*)num);  
 cnum++;  
   
 sem\_wait(&weighluggage);  
 printf("Customer %d weighing the luggage.\n",cnum);  
 sleep(4);  
 printf("Customer %d done weighing the luggage.\n",cnum);  
 sem\_post(&weighluggage);  
 sem\_wait(&checkluggage);  
 printf("Customer %d getting luggage checked.\n",cnum);  
 sleep(7);  
 printf("Customer %d luggage checking done.\n",cnum);  
 sem\_post(&checkluggage);  
 sem\_wait(&getbdpass);  
 printf("Customer %d getting the boarding pass.\n",cnum);  
 sleep(3);  
 printf("Customer %d got the boarding pass.\n",cnum);  
 sem\_post(&getbdpass);  
   
 printf("Customer %d is now boarding the plane\n",cnum);  
 pthread\_exit(NULL);  
}  
  
int main(){  
 sem\_init(&weighluggage,0,1);  
 sem\_init(&checkluggage,0,1);  
 sem\_init(&getbdpass,0,1);  
 pthread\_t p[10];  
 for(int i=0;i<10;i++){  
 customerarr[i]=i;  
 if(pthread\_create(&p[i],NULL,customer,&customerarr[i])!=0)  
 perror("Thread creation failed.");  
 }  
 for(int i=0;i<10;i++){  
 pthread\_join(p[i],NULL);  
 }  
 sem\_destroy(&weighluggage);  
 sem\_destroy(&checkluggage);  
 sem\_destroy(&getbdpass);  
}





Task 3)

#include<stdio.h>  
#include<unistd.h>  
#include<semaphore.h>  
#include<pthread.h>  
  
int sellerarr[10];  
sem\_t ticket;  
  
void \*seller(void \*num){  
 int cnum = \*((int \*)num);  
 cnum++;  
   
 sem\_wait(&ticket);  
 printf("seller %d selling the ticket.\n",cnum);  
 sleep(1);  
 printf("seller %d sold the ticket.\n",cnum);  
 sem\_post(&ticket);  
   
 pthread\_exit(NULL);  
}  
  
int main(){  
 sem\_init(&ticket,0,1);  
 pthread\_t p[10];  
 for(int i=0;i<10;i++){  
 sellerarr[i]=i;  
 if(pthread\_create(&p[i],NULL,seller,&sellerarr[i])!=0)  
 perror("Thread creation failed.");  
 }  
 for(int i=0;i<10;i++){  
 pthread\_join(p[i],NULL);  
 }  
 sem\_destroy(&ticket);  
}

