UE20CS207 - DATA STRUCTURES AND ITS APPLICATIONS LABORATORY

Due on 29 Sept 2021

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Garage Assignment:

```
#include<stdio.h>
#include<stdlib.h>
#include<string.h>

typedef struct car
{
   char lp[50];
   char status;
   int count;
}car;

typedef struct stack
{
   car q[8];
   int top;
}stack;

void init(stack *ps);
int push_arrive(stack *ps, char *lp, char s,int c);
int departure(stack *ps, stack *stktemp,char *lp);
int pop(stack *ps);

int main()
{
   stack s,s2;
   init(&s);
   init(&s2);
   char lp[50];
   char st;
   int wish;

   do
   {
      int c=0;
      printf("License Plate Number: ");
      scanf("%s",lp);
      fflush(stdin);
      printf("Arrival/Departure(A/D): ");
```

```
      scanf("%c",&st);
      switch(st)
      {
         case 'A':
            if(push_arrive(&s,lp,st,c))
               printf("Space is available. The car of number %s has entered the garage.\n",lp);
            else
               printf("Garage is Full.Sorry.\n");
            break;

         case 'D':
            departure(&s,&s2,lp);
            break;

         default:
            printf("Invalid choice \n");
            break;
      }
      printf("--------------------------------------------------------------------------\n");
      printf("Choose 1 to continue and 0 to exit: ");
      scanf("%d",&wish);
   }while(wish);
}

void init(stack *ps)
{
   ps->top=-1;
}

int push_arrive(stack *ps, char *lp, char s,int c)
{
   if(ps->top==7)
   {
      return 0;
   }

   car *temp = (car*)malloc(sizeof(car));
   temp->count=c;
   strcpy(temp->lp,lp);
   temp->status=s;

   ps->top++;
   ps->q[ps->top]=*temp;
   return 1;
}

int departure(stack *ps, stack *stktemp,char *lp)
```

```
{
   if(ps->top==-1)
   {
      printf("No cars in the garage \n\r");
      printf("Empty.\n");
   }
   else
   {
      int p = ps->top;
      while(p!=-1)
      {
         if(strcmp(ps->q[p].lp,lp)==0)
         {
            break;
         }
         p--;
      }
      if(p==-1)
      {
         printf ("Sorry.License plate %s not found \n\r",ps->q[p].lp);
         return 0;
      }

      if(p==ps->top)
      {
         pop(ps);
         return 1;
      }

      for(ps->top; ps->top>p; (ps->top)--)
      {
         push_arrive(stktemp,ps->q[ps->top].lp,ps->q[ps->top].status,ps->q[ps-
>top].count++);
      }
      pop(ps);

      for(int i=(stktemp->top); i>-1; i--)
      {
         push_arrive(ps,stktemp->q[i].lp,stktemp->q[i].status,++(stktemp->q[i].count));
      }
      init(stktemp);
      return 0;
   }
   return 0;
}

int pop(stack *ps)
```

```
{
   printf("License plate : %s\n",ps->q[ps->top].lp);
   printf("Number of times car number %s has moved out of garage: %d\n",ps->q[ps-
>top].lp,ps->q[ps->top].count);
   (ps->top)--;
   return 1;
}
```

Output:

```
vanshikagoel@Vanshikas-MacBook-Air Lab4 % ./garage
License Plate Number: ABC123
Arrival/Departure(A/D): A
Space is available. The car of number ABC123 has entered the garage.
--------------------------------------------------------------------------
Choose 1 to continue and 0 to exit: 1
License Plate Number: ABC456
Arrival/Departure(A/D): A
Space is available. The car of number ABC456 has entered the garage.
--------------------------------------------------------------------------
Choose 1 to continue and 0 to exit: 1
License Plate Number: ABC789
Arrival/Departure(A/D): A
Space is available. The car of number ABC789 has entered the garage.
--------------------------------------------------------------------------
Choose 1 to continue and 0 to exit: 1
License Plate Number: XYZ123
Arrival/Departure(A/D): A
Space is available. The car of number XYZ123 has entered the garage.
--------------------------------------------------------------------------
Choose 1 to continue and 0 to exit: 1
License Plate Number: XYZ456
Arrival/Departure(A/D): A
Space is available. The car of number XYZ456 has entered the garage.
--------------------------------------------------------------------------
Choose 1 to continue and 0 to exit: 1
License Plate Number: XYZ789
Arrival/Departure(A/D): A
Space is available. The car of number XYZ789 has entered the garage.
--------------------------------------------------------------------------
Choose 1 to continue and 0 to exit: 1
License Plate Number: ABC101
Arrival/Departure(A/D): A
Space is available. The car of number ABC101 has entered the garage.
--------------------------------------------------------------------------
Choose 1 to continue and 0 to exit: 1
License Plate Number: XYZ101
Arrival/Departure(A/D): A
Space is available. The car of number XYZ101 has entered the garage.
--------------------------------------------------------------------------
Choose 1 to continue and 0 to exit: 1
License Plate Number: ABC789
Arrival/Departure(A/D): D
License plate : ABC789
Number of times car number ABC789 has moved out of garage: 0
--------------------------------------------------------------------------
Choose 1 to continue and 0 to exit: 1
License Plate Number: XYZ101
Arrival/Departure(A/D): D
License plate : XYZ101
Number of times car number XYZ101 has moved out of garage: 1
--------------------------------------------------------------------------
Choose 1 to continue and 0 to exit: ABC101
License Plate Number: Arrival/Departure(A/D): D
License plate : ABC101
Number of times car number ABC101 has moved out of garage: 1
--------------------------------------------------------------------------
Choose 1 to continue and 0 to exit: 0
vanshikagoel@Vanshikas-MacBook-Air Lab4 %
```