PROJECT REPORT

Calendar APP In C

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1. Abstract

For this project, I chose to create a Calendar application. The purpose of the program was to create a clone of the original digital calendars with the existing features including adding a note and showing all days in a month to increase my knowledge in programming in C and getting familiar with project works.

2. Introduction

It is an individual programming project which requires significant effort and knowledge in C programming skills including file handling, pointers and functions.This report aims to provide a detailed look at the resulting output and the key features of the program.

2.1 Background

At the beginning of the project, I had some previous experience with C programming, but I invested a large portion of time to understand and apply its functionality, as well as looking at alternative implementations to figure out what I thought worked best. Ultimately, I would end up having to teach myself C programming, mostly relying on my ability to apply the knowledge I accumulated over the last two years at Swami Vivekananda Institute of Science and Technology to different scenarios. I have tried to keep a record for this in the code itself by including links to the appropriate documentation.

2.2 Project Brief

The purpose of the program was to create a clone of the original digital calendars with the existing features including adding a note and showing all days in a month to increase my knowledge in programming in C and getting familiar with project works.

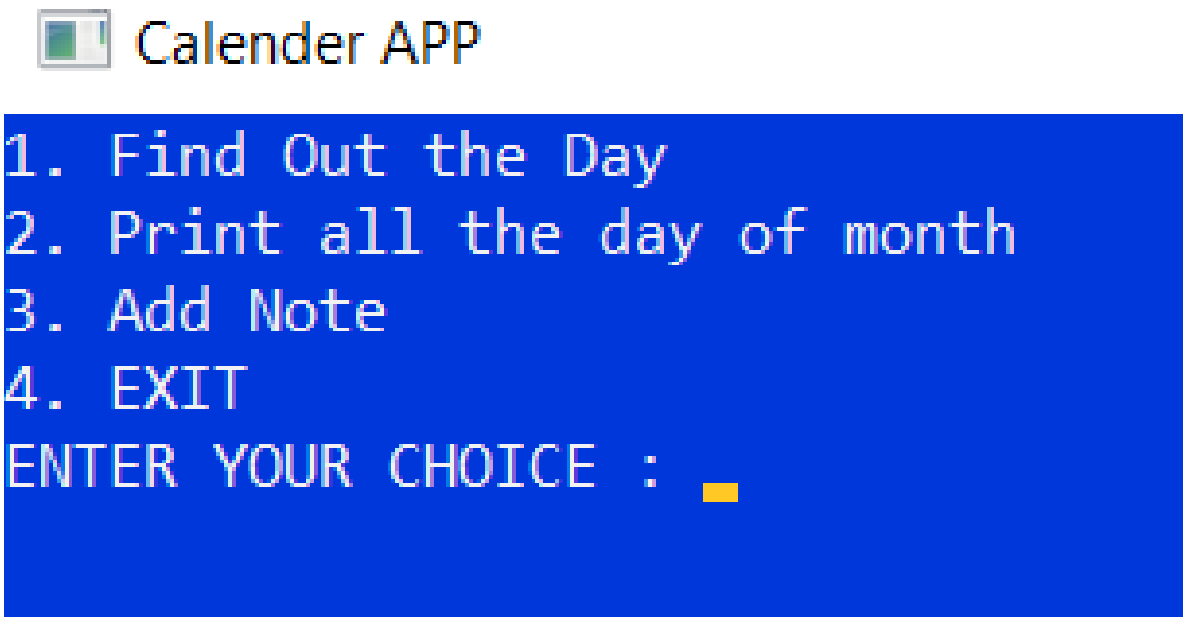
3. Project Details

3.1 Overview

Calendar app provides 4 options to the user as follows:

1. Find out the day.
2. Print all the days of month.
3. Add note.
4. Exit.

It is shown below:



The user needs to type the option number as input to get the required output.

3.2 Source code

```
#include<stdio.h>
#include<conio.h>
#include<windows.h>
```

```
struct Date{
    int dd;
    int mm;
    int yy;
};
struct Date date;

struct Remainder{
    int dd;
    int mm;
    char note[50];
};
struct Remainder R;


COORD xy = {0, 0};

void gotoxy (int x, int y)
{
        xy.X = x; xy.Y = y; // X and Y coordinates
        SetConsoleCursorPosition(GetStdHandle(STD_OUTPUT_HANDLE), xy);
}

//This will set the foreground color for printing in a console window.
void SetColor(int ForgC)
{
     WORD wColor;
     //We will need this handle to get the current background attribute
     HANDLE hStdOut = GetStdHandle(STD_OUTPUT_HANDLE);
     CONSOLE_SCREEN_BUFFER_INFO csbi;

     //We use csbi for the wAttributes word.
     if(GetConsoleScreenBufferInfo(hStdOut, &csbi))
     {
        //Mask out all but the background attribute, and add in the
foreground color
          wColor = (csbi.wAttributes & 0xF0) + (ForgC & 0x0F);
          SetConsoleTextAttribute(hStdOut, wColor);
     }
     return;
}

void ClearColor(){
```

```
    SetColor(15);
}

void ClearConsoleToColors(int ForgC, int BackC)
{
     WORD wColor = ((BackC & 0x0F) << 4) + (ForgC & 0x0F);
     //Get the handle to the current output buffer...
     HANDLE hStdOut = GetStdHandle(STD_OUTPUT_HANDLE);
     //This is used to reset the caret/cursor to the top left.
     COORD coord = {0, 0};
     //A return value... indicating how many chars were written
     //   not used but we need to capture this since it will be
     //   written anyway (passing NULL causes an access violation).
     DWORD count;

     //This is a structure containing all of the console info
     // it is used here to find the size of the console.
     CONSOLE_SCREEN_BUFFER_INFO csbi;
     //Here we will set the current color
     SetConsoleTextAttribute(hStdOut, wColor);
     if(GetConsoleScreenBufferInfo(hStdOut, &csbi))
     {
          //This fills the buffer with a given character (in this case
32=space).
          FillConsoleOutputCharacter(hStdOut, (TCHAR) 32, csbi.dwSize.X
* csbi.dwSize.Y, coord, &count);

          FillConsoleOutputAttribute(hStdOut, csbi.wAttributes,
csbi.dwSize.X * csbi.dwSize.Y, coord, &count );
          //This will set our cursor position for the next print
statement.
          SetConsoleCursorPosition(hStdOut, coord);
     }
     return;
}

void SetColorAndBackground(int ForgC, int BackC)
{
     WORD wColor = ((BackC & 0x0F) << 4) + (ForgC & 0x0F);;
     SetConsoleTextAttribute(GetStdHandle(STD_OUTPUT_HANDLE), wColor);
     return;
}
```

```
int check_leapYear(int year){ //checks whether the year passed is leap
year or not
    if(year % 400 == 0 || (year % 100!=0 && year % 4 ==0))
       return 1;
    return 0;
}

void increase_month(int *mm,  int *yy){ //increase the month by one
    ++*mm;
    if(*mm > 12){
        ++*yy;
        *mm = *mm - 12;
    }
}

void decrease_month(int *mm,  int *yy){ //decrease the month by one
    --*mm;
    if(*mm < 1){
        --*yy;
        if(*yy<1600){
            printf("No record available");
            return;
        }
        *mm = *mm + 12;
    }
}


int getNumberOfDays(int month,int year){ //returns the number of days
in given month
   switch(month){                          //and year
      case 1 : return(31);
      case 2 : if(check_leapYear(year)==1)
         return(29);
           else
         return(28);
      case 3 : return(31);
      case 4 : return(30);
      case 5 : return(31);
      case 6 : return(30);
      case 7 : return(31);
      case 8 : return(31);
      case 9 : return(30);
```

```
      case 10: return(31);
      case 11: return(30);
      case 12: return(31);
      default: return(-1);
   }
}

char *getName(int day){ //returns the name of the day
   switch(day){
      case 0 :return("Sunday");
      case 1 :return("Monday");
      case 2 :return("Tuesday");
      case 3 :return("Wednesday");
      case 4 :return("Thursday");
      case 5 :return("Friday");
      case 6 :return("Saturday");
      default:return("Error in getName() module.Invalid argument
passed");
   }
}

void print_date(int mm, int yy){ //prints the name of month and year
    printf("---------------------------\n");
    gotoxy(25,6);
    switch(mm){
        case 1: printf("January"); break;
        case 2: printf("February"); break;
        case 3: printf("March"); break;
        case 4: printf("April"); break;
        case 5: printf("May"); break;
        case 6: printf("June"); break;
        case 7: printf("July"); break;
        case 8: printf("August"); break;
        case 9: printf("September"); break;
        case 10: printf("October"); break;
        case 11: printf("November"); break;
        case 12: printf("December"); break;
    }
    printf(" , %d", yy);
    gotoxy(20,7);
    printf("---------------------------");
}
int getDayNumber(int day,int mon,int year){ //returns the day number
```

```
    int res = 0, t1, t2, y = year;
    year = year - 1600;
    while(year >= 100){
        res = res + 5;
        year = year - 100;
    }
    res = (res % 7);
    t1 = ((year - 1) / 4);
    t2 = (year-1)-t1;
    t1 = (t1*2)+t2;
    t1 = (t1%7);
    res = res + t1;
    res = res%7;
    t2 = 0;
    for(t1 = 1;t1 < mon; t1++){
        t2 += getNumberOfDays(t1,y);
    }
    t2 = t2 + day;
    t2 = t2 % 7;
    res = res + t2;
    res = res % 7;
    if(y > 2000)
        res = res + 1;
    res = res % 7;
    return res;
}

char *getDay(int dd,int mm,int yy){
    int day;
    if(!(mm>=1 && mm<=12)){
        return("Invalid month value");
    }
    if(!(dd>=1 && dd<=getNumberOfDays(mm,yy))){
        return("Invalid date");
    }
    if(yy>=1600){
        day = getDayNumber(dd,mm,yy);
        day = day%7;
        return(getName(day));
    }else{
        return("Please give year more than 1600");
    }
}
```

```
int checkNote(int dd, int mm){
    FILE *fp;
    fp = fopen("note.dat","rb");
    if(fp == NULL){
        printf("Error in Opening the file");
    }
    while(fread(&R,sizeof(R),1,fp) == 1){
        if(R.dd == dd && R.mm == mm){
            fclose(fp);
            return 1;
        }
    }
    fclose(fp);
    return 0;
}

void printMonth(int mon,int year,int x,int y){ //prints the month with
all days
    int nod, day, cnt, d = 1, x1 = x, y1 = y, isNote = 0;
    if(!(mon>=1 && mon<=12)){
        printf("INVALID MONTH");
        getch();
        return;
    }
    if(!(year>=1600)){
        printf("INVALID YEAR");
        getch();
        return;
    }
    gotoxy(20,y);
    print_date(mon,year);
    y += 3;
    gotoxy(x,y);
    printf("S   M   T   W   T   F   S   ");
    y++;
    nod = getNumberOfDays(mon,year);
    day = getDayNumber(d,mon,year);
    switch(day){ //locates the starting day in calendar
        case 0 :
            x=x;
            cnt=1;
            break;
```

```
        case 1 :
            x=x+4;
            cnt=2;
            break;
        case 2 :
            x=x+8;
            cnt=3;
            break;
        case 3 :
            x=x+12;
            cnt=4;
            break;
        case 4 :
            x=x+16;
            cnt=5;
            break;
        case 5 :
            x=x+20;
            cnt=6;
            break;
        case 6 :
            x=x+24;
            cnt=7;
            break;
        default :
            printf("INVALID DATA FROM THE getOddNumber()MODULE");
            return;
    }
    gotoxy(x,y);
    if(cnt == 1){
        SetColor(12);
    }
    if(checkNote(d,mon)==1){
            SetColorAndBackground(15,12);
    }
    printf("%02d",d);
    SetColorAndBackground(15,1);
    for(d=2;d<=nod;d++){
        if(cnt%7==0){
            y++;
            cnt=0;
            x=x1-4;
        }
```

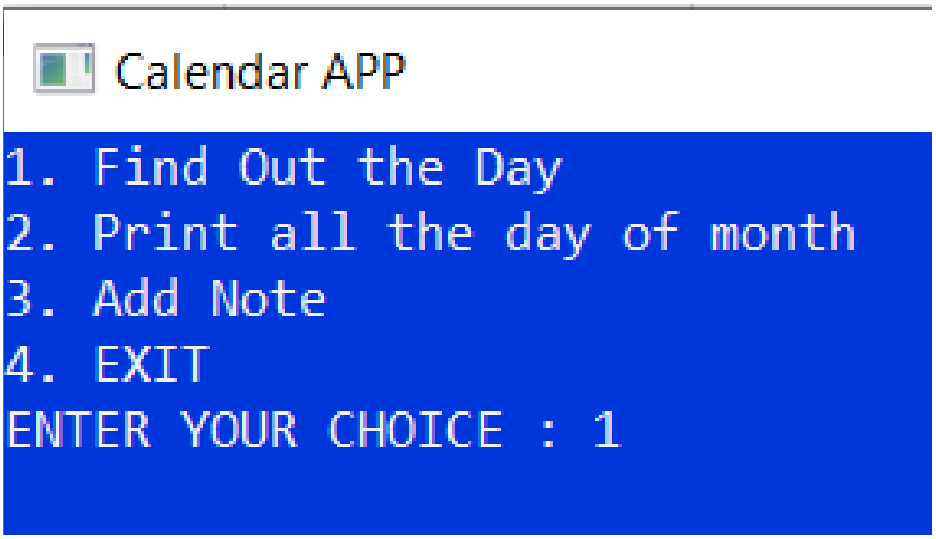
```
        x = x+4;
        cnt++;
        gotoxy(x,y);
        if(cnt==1){
            SetColor(12);
        }else{
            ClearColor();
        }
        if(checkNote(d,mon)==1){
            SetColorAndBackground(15,12);
        }
        printf("%02d",d);
        SetColorAndBackground(15,1);
    }
    gotoxy(8, y+2);
    SetColor(14);
    printf("Press 'n'  to Next, Press 'p' to Previous and 'q' to
Quit");
    gotoxy(8,y+3);
    printf("Red Background indicates the NOTE, Press 's' to see note:
");
    ClearColor();
}

void AddNote(){
    FILE *fp;
    fp = fopen("note.dat","ab+");
    system("cls");
    gotoxy(5,7);
    printf("Enter the date(DD/MM): ");
    scanf("%d%d",&R.dd, &R.mm);
    gotoxy(5,8);
    printf("Enter the Note(50 character max): ");
    fflush(stdin);
    scanf("%[^\n]",R.note);
    if(fwrite(&R,sizeof(R),1,fp)){
        gotoxy(5,12);
        puts("Note is saved successfully");
        fclose(fp);
    }else{
        gotoxy(5,12);
        SetColor(12);
        puts("\aFail to save!!\a");
```

```
        ClearColor();
    }
    gotoxy(5,15);
    printf("Press any key.....");
    getch();
    fclose(fp);
}

void showNote(int mm){
    FILE *fp;
    int i = 0, isFound = 0;
    system("cls");
    fp = fopen("note.dat","rb");
    if(fp == NULL){
        printf("Error in opening the file");
    }
    while(fread(&R,sizeof(R),1,fp) == 1){
        if(R.mm == mm){
            gotoxy(10,5+i);
            printf("Note %d Day = %d: %s", i+1, R.dd,  R.note);
            isFound = 1;
            i++;
        }
    }
    if(isFound == 0){
        gotoxy(10,5);
        printf("This Month contains no note");
    }
    gotoxy(10,7+i);
    printf("Press any key to back.......");
    getch();

}

int main(){
    ClearConsoleToColors(15, 1);
    SetConsoleTitle("Calendar APP");
    int choice;
    char ch = 'a';
    while(1){
        system("cls");
        printf("1. Find Out the Day\n");
        printf("2. Print all the day of month\n");
```

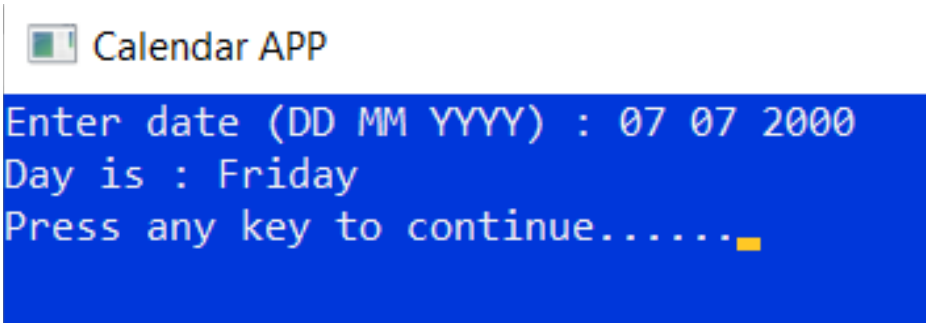
```
        printf("3. Add Note\n");
        printf("4. EXIT\n");
        printf("ENTER YOUR CHOICE : ");
        scanf("%d",&choice);
        system("cls");
        switch(choice){
            case 1:
                printf("Enter date (DD MM YYYY) : ");
                scanf("%d %d %d",&date.dd,&date.mm,&date.yy);
                printf("Day is : %s",getDay(date.dd,date.mm,date.yy));
                printf("\nPress any key to continue......");
                getch();
                break;
            case 2 :
                printf("Enter month and year (MM YYYY) : ");
                scanf("%d %d",&date.mm,&date.yy);
                system("cls");
                while(ch!='q'){
                    printMonth(date.mm,date.yy,20,5);
                    ch = getch();
                    if(ch == 'n'){
                        increase_month(&date.mm,&date.yy);
                        system("cls");
                        printMonth(date.mm,date.yy,20,5);
                    }else if(ch == 'p'){
                        decrease_month(&date.mm,&date.yy);
                        system("cls");
                        printMonth(date.mm,date.yy,20,5);
                    }else if(ch == 's'){
                        showNote(date.mm);
                        system("cls");
                    }
                }
                break;
            case 3:
                AddNote();
                break;
            case 4 :
                exit(0);
        }
    }
    return 0;
}
```

4. Functionality

4.1 Finding out the day

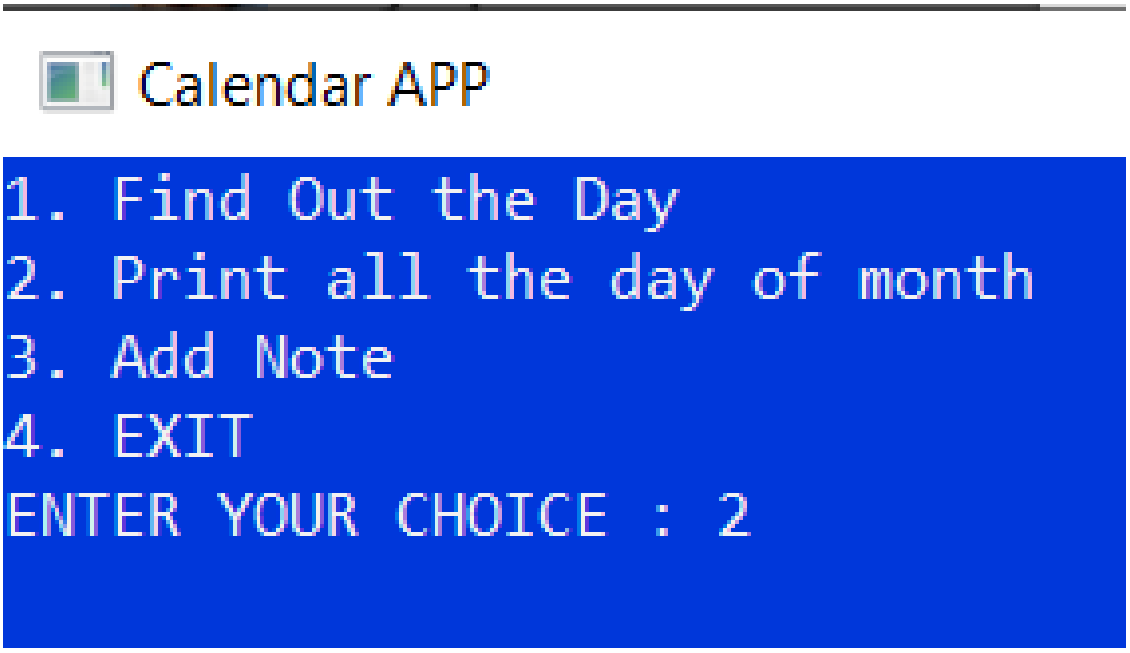


The user selects option 1 that finds out the day when a date is given as input. After the option is entered through the keyboard the following screen shows up.

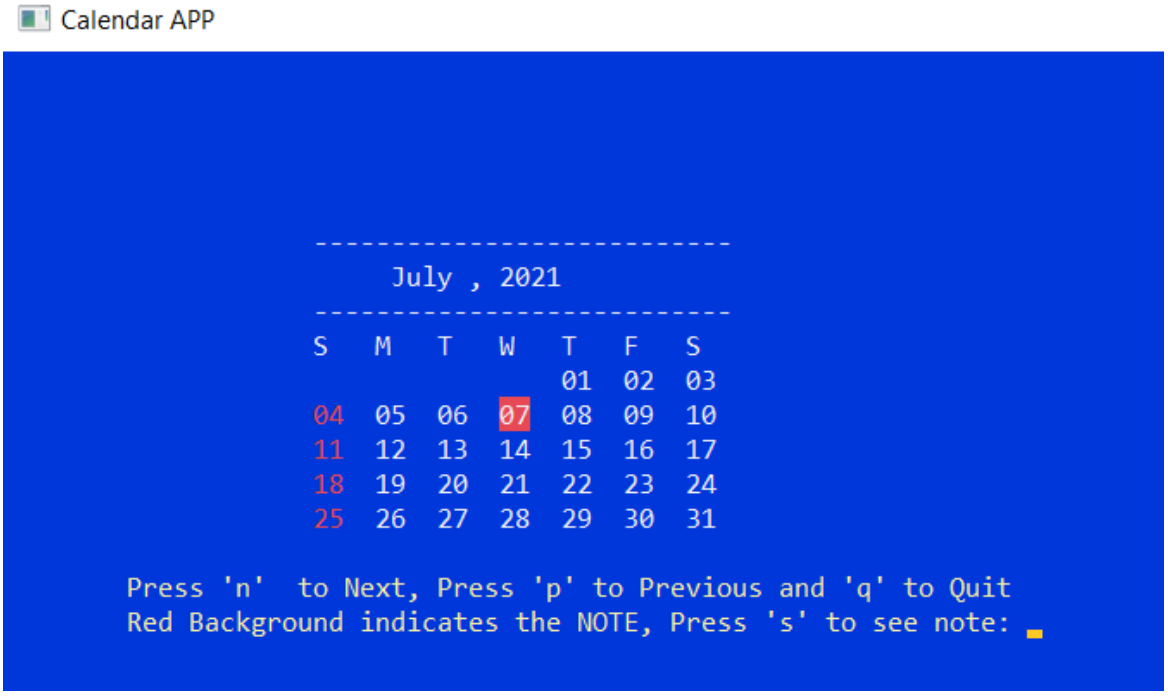


Thus, when the particular date of any year or any month or any day is entered, the output provides the day the particular date was. For example, as shown above in the output, the date 07 07 2000 was Friday.

4.2 Printing all day of month

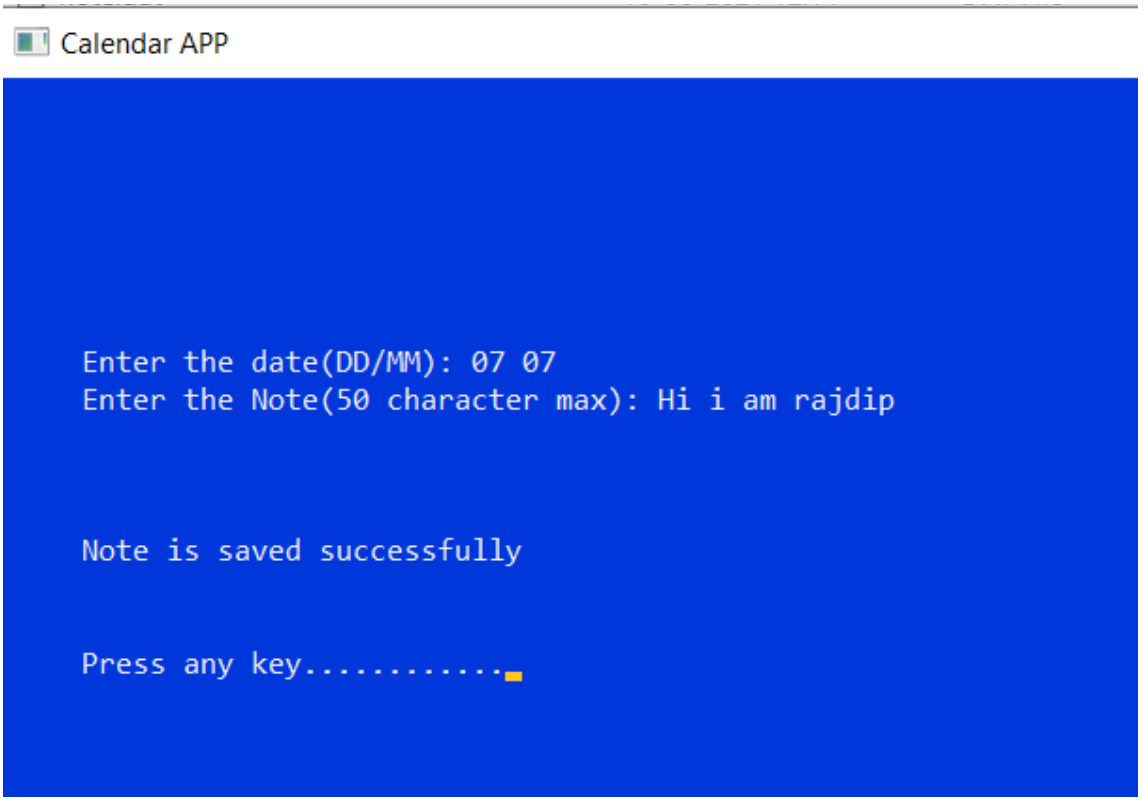


When the user selects option 2, all days in a month are printed just as it is shown in a calendar. After the option is entered through the keyboard the following screen shows up.



Thus, when a month and year is entered, for example 07 2020 i.e. July 2020, the column shows up where all dates are shown.
Here, the user can enter ‘n’ to go to next month or ‘p’ to go to the previous month and ‘q’ to quit.
The date with the red background contains a note which can be accessed by entering ‘s’.

4.3 Adding a note



For adding a note, select option 3 which says “Add a Note”. After that, enter the date and enter the note. You will see that the note is saved in the form of ‘note.dat’ in the folder which further can be accessed through option 2 which shows all dates in a month and can be shown by entering ‘s’.

5. Future Concerns

5.1 Errors/Bugs

This program has a bug when the note.dat is not present and there is an error accessing the file which shows the calendar dates. Otherwise, there are no bugs provided the options are limited.

6. Conclusion

It was an exciting project to work on and there is a lot I learnt from it, above and beyond its original scope. I was able to study and train myself on development in an environment which was new to me, which I believe I have been reasonably successful with. Although I was not able to complete some of the functionality, I believe there is still a lot of potential for this program, and will continue development in the future.