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Experiment No.	8

AIM:	Apply the concepts of structures/union to solve a given problem.
Program 1	
PROBLEM STATEMENT:	A men's sports club keeps elaborate computerized records of all its members. The records contain typical information such as age, address, etc. of each person. But there is also information about whether a member is an active playing members, about whether he is married, and so on; if he is married the record contains information about his wife's name, the no. of children and their names. Write a program which demonstrates how such a system might be implemented. Show how the names of the wives of all active playing members might be printed.
ALGORITHM:	1. START 2. Define structure family with char array wife name, integer number of children and 2-D char array names as variables 3. Define union details with structure family and char array hobbies as variables 4. Define structure member with char array name, integer age, char array address characters active and married and union det as variables 5. Define void input function with member array c as variable 6. Loop from I = 0 to 1 Input all variables of members c[i] If c[i].married is equal to 'Y': Input all details of c[i].det.fam Else Input c[i].hobbies 7. Define function int main()

	8. Declare variable c[i] of data type member 9. Call input(c) 10. Loop from I = 0 to 1 if c[i].married is equal to Y and c[i].active is equal to Y print c[i].name and c[i].det.fam.wife_name 11. STOP

PROGRAM:	#include<stdio.h>
	typedef struct family
	{
	char wifename[20];
	int nc;
	char childnames[10][20];
	}family;
	typedef union details
	{
	family f;
	char hobby[30];
	}details;
	typedef struct member
	{
	char name[30];
	char adr[30];
	char active,married;
	int age;
	details det;
	}member;
	void input(int n, member m[n])
	{
	for (int i=0;i<n;i++)
	{
	printf("\nEnter the name of the member: ");
	scanf(" %s", m[i].name);
	printf("Enter the age: ");
	scanf("%d", &m[i].age);
	printf("Enter the address: ");

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        scanf(" %[^\n]s", m[i].adr);
        printf("Enter Active status (y/n): ");
        scanf(" %c", &m[i].active);
        printf("Enter Marital Status (y/n): ");
        scanf(" %c", &m[i].married);
        if (m[i].married == 'y')
        {
            printf("Enter name of the wife: ");
            scanf(" %s", m[i].det.f.wifename);
            printf("Enter the number of children: ");
            scanf("%d", &m[i].det.f.nc);
            for (int j=0;j<m[i].det.f.nc;j++)
            {
                printf("Enter name of the children: ");
                scanf(" %s", m[i].det.f.childnames[i]);
            }
        }
        else
        {
            printf("Enter the hobby of the member: ");
            scanf(" %[^\n]s", m[i].det.hobby);
        }
    }
}
int main()
{
    int i,n;
    printf("How many records do you want to enter: ");
    scanf("%d",&n);
    member m[n];
    input(n,m);
    printf("\nActive players and their wives' records:\n");
    printf("Name\tWife\n");
    for(i=0;i<n;i++)
    {
        if (m[i].active == 'y' && m[i].married == 'y')
```

```
            printf("%s\t%s", m[i].name, m[i].det.f.wifename);
        }
        return 0;
}
```

RESULT:

```
How many records do you want to enter: 2

Enter the name of the member: Hatim
Enter the age: 19
Enter the address: Marol
Enter Active status (y/n): y
Enter Marital Status (y/n): n
Enter the hobby of the member: coding

Enter the name of the member: Vineet
Enter the age: 25
Enter the address: Dahisar
Enter Active status (y/n): y
Enter Marital Status (y/n): y
Enter name of the wife: Shruti
Enter the number of children: 1
Enter name of the children: virinchi

Active players and their wives' records:
Name    Wife
Vineet  Shruti
PS D:\C Programming\C Practicals-SPIT\Experiment-8> con
conda: The term 'conda' is not recognized as a name of
Check the spelling of the name, or if a path was includ
PS D:\C Programming\C Practicals-SPIT\Experiment-8>
```

Program 2	
PROBLEM STATEMENT:	An airline reservation system maintains records for possible flights consisting of STARTING POINT 3 character code DESTINATION 3 character code STARTING TIME integer on scale 0001 – 2400 ARRIVAL TIME integer on scale 0001 – 2400 SEATS positive integer in suitable range. Your program is to read 20 such records followed by queries of the form STARTING POINT– DESTINATION, one to a line. For each query find whether there is a possible flight with a seat available; if so reduce the number of seats by one and print out the flight details (or an apology).
ALGORITHM:	START 2. Define structure airline_t with char array src, dest, integers start, arrive, seats and counts as variables 3. Define void function reset with airline_t variable c[] 4. Loop from I = 0 to 4 c[i].count is equal to 0 5. Define void function input with airline_t variable c[] 6. Loop from I = 0 to 4 Input all details of c[i] 7. Define int main() 8. Initialize airline_t variable c[5] 9. Call function input(c) 10. Do a. Input source and destination b. Flag = 0, D = 1 c. Loop from I = 0 to 4 If strcmp(c[i].src and source_) is equal to 0 and if strcmp(c[i].dest and dest) I. print c[i].start, c[i].arrive and c[i].seats II. c[i].count = d III. d++ IV. temp++ d.If temp is equal to 0 print sorry no flights available else I. input choice and number of seat II. Loop from 0 to 4

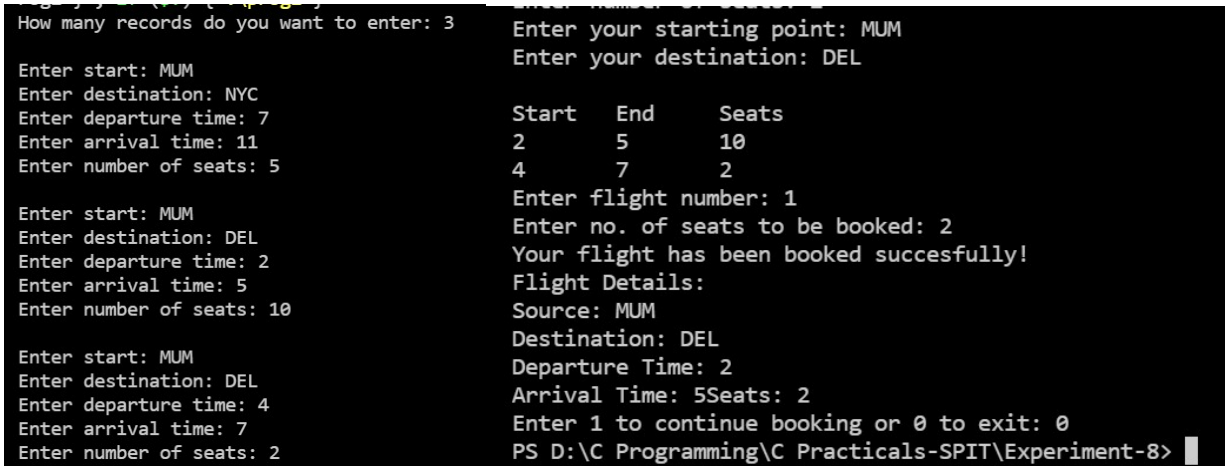
	if n is equal to c[i].count if c[i].seats – seat >=0 c[i].seats -= seat print Booked and remaining seats else print Seats not available e. Input flag f. call reset(c) while flag is equal to 0 11. Return 0 12. STOP

PROGRAM:	#include<stdio.h>
	#include<string.h>
	typedef struct flight
	{
	char strt[4];
	char dest[4];
	int start;
	int arrival;
	int seats;
	int count;
	}flight;
	void reset(int n,flight f[n])
	{
	for(int i=0;i<n;i++)
	f[i].count=0;
	}
	void input(int n,flight f[n])
	{
	for(int i=0;i<n;i++)
	{
	printf("\nEnter start: ");
	scanf("%s", f[i].strt);
	printf("Enter destination: ");
	scanf("%s", f[i].dest);
	printf("Enter departure time: ");

```
        scanf("%d", &f[i].start);
        printf("Enter arrival time: ");
        scanf("%d", &f[i].arrival);
        printf("Enter number of seats: ");
        scanf("%d", &f[i].seats);
        f[i].count = 0;
    }
}
int main()
{
    int i,j,n,flag=1,temp=0,c=1,ns,nf;
    printf("How many records do you want to enter: ");
    scanf("%d",&n);
    flight f[n];
    input(n,f);
    char stp[4],des[4];
    do
    {
        printf("Enter your starting point: ");
        scanf("%s",stp);
        printf("Enter your destination: ");
        scanf("%s",des);
        printf("\nStart\tEnd\tSeats\n");
        for(i=0;i<n;i++)
        {
            if(strcmp(f[i].strt, stp) == 0 && strcmp(f[i].dest, des) == 0 &&
f[i].seats>0)
            {
                printf("%d\t%d\t%d\n", f[i].start, f[i].arrival, f[i].seats);
                f[i].count = c;
                c++;
                temp++;
            }
        }
        if(temp==0)
            printf("Sorry we do not have any available flights.");
```

```
        else
        {
            printf("Enter flight number: ");
            scanf("%d",&nf);
            printf("Enter no. of seats to be booked: ");
            scanf("%d",&ns);
            for(j=0;j<n;j++)
            {
                if(nf==f[j].count)
                {
                    if(f[j].seats - ns >= 0)
                    {
                        f[j].seats -= ns;
                        printf("Your flight has been booked succesfully!\n");
                        printf("Flight Details:\nSource: %s\nDestination:
%s\n", f[j].strt, f[j].dest);
                        printf("Departure Time: %d\nArrival Time: %d",
f[j].start, f[j].arrival);
                        printf("Seats: %d", ns);
                    }
                    else
                    {
                        printf("The flight does not have %d seats available",
ns);
                        printf("\nPlease select a different flight.");
                    }
                }
            }
        }
        printf("\nEnter 1 to continue booking or 0 to exit: ");
        scanf("%d", &flag);
        reset(n,f);
    } while (flag==1);
    return 0;
}
```

RESULT:



Program 3	
PROBLEM STATEMENT:	A structure "Cricket" consisting of following: i) Player name ii) name of the country number of matches played iii) number of hundreds scored Make a programme to read records n players and to prepare list according to: i) players name ii) countries name iii) number of matches played iv) number of hundreds Scored
ALGORITHM:	1. START 2. Define a structure "cricket" with char player[20], char country[20], int matches and int hundreds 3. Define void input(n, cricket c[n]) 4. For i=0;i++] 5. Input c[i].player, c[i].country, c[i].matches, c[i].hundreds 6. Repeat step 5 till i<n 7. Define int main() 8. Input n 9. Initialize cricket c[n] 10. Input(n,c) 11. For i=0;i++ 12. Output c[i].player, c[i]country, c[i].matches, c[i].hundreds 13. Repeat step 12 till i<n 14. STOP

PROGRAM:

```
#include<stdio.h>
typedef struct cricket
{
   char player[20];
   char country[20];
   int matches;
   int hundreds;
}cricket;
void input(int n,cricket c[n])
{
   for(int i=0;i<n;i++)
   {
      printf("\nRecord #%d",i+1);
      printf("\nPlayer's Name: ");
      scanf("%s",c[i].player);
      printf("Country Name: ");
      scanf(" %s",c[i].country);
      printf("No. of matches played: ");
      scanf("%d",&c[i].matches);
      printf("No. of hundreds scored: ");
      scanf("%d",&c[i].hundreds);
   }
}
int main()
{
   int i,n;
   printf("How many records do you want to enter: ");
   scanf("%d",&n);
   cricket c[n];
   input(n,c);
   printf("Player\tCountry\tMatches\tHundreds\n");
   for (int i = 0; i < n; i++)
      printf("%s\t%s\t%d\t%d\n", c[i].player, c[i].country,
c[i].matches, c[i].hundreds);
   return 0;
}
```

RESULT:

```
How many records do you want to enter: 4

Record #1
Player's Name: Hatim
Country Name: India
No. of matches played: 53
No. of hundreds scored: 25

Record #2
Player's Name: Vineet
Country Name: England
No. of matches played: 45
No. of hundreds scored: 18

Record #3
Player's Name: Udit
Country Name: England
No. of matches played: 25
No. of hundreds scored: 7

Record #4
Player's Name: Onam
Country Name: India
No. of matches played: 69
No. of hundreds scored: 42
Player  Country Matches Hundreds
Hatim   India   53      25
Vineet  England 45      18
Udit    England 25      7
Onam    India   69      42
PS D:\C Programming\C Practicals-SPIT\Experiment-8>
```

CONCLUSION:	We learnt how to define structures and unions and use them to store records and develop database like programs. We learnt how to use typedef to define our own types and use variables/Arrays of those types in our program.