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DSA LAB 2 Assignment : Array and Structure

Q1-WCP to create employee record of size 5 with members –employee id, name,designation & salary. Find out the employee having kth highest salary among all and print his/her details.

```c
#include<stdio.h>
struct employee
{
    int eno;
    char ename[20];
    int salary;
}emp[10];
int main()
{
    int i,high,n;
    printf("/*How many employee info\nyou want to accept : ");
    printf("Enter Limit: ");
    scanf("%d",&n);
    printf("----------------------------\n");
    printf("Enter details for %d employees:",n);
    printf("\n--------------------------\n");
    for(i=0;i<n;i++)
    {
        printf("Employee Number: ");
        scanf("%d",&emp[i].eno);
        printf("Name            : ");
        scanf("%s",emp[i].ename);
        printf("Salary          : ");
        scanf("\n %d",&emp[i].salary);
        printf("----------------------------\n");
    }
    high=emp[0].salary;
    for(i=0;i<n;i++)
    {
        if(emp[i].salary>high)
        high=emp[i].salary;
```

```c
        }
    printf("Highest salary employee details:");
    printf("\n----------------------------\n");
    printf("EMPNO    NAME  SALARY\n");
    for(i=0;i<n;i++)
    {
        if(emp[i].salary==high)
        printf("\n %d\t%s\t%d",emp[i].eno,emp[i].ename,emp[i].salary);
    }
    return 0;
}
```

Output:

```
Output

/tmp/YIllJSicJJ.o
/*How many employee info
you want to accept : Enter Limit: 5
----------------------------
Enter details for 5 employees:
----------------------------
Employee Number: 1
Name          : Ankit
Salary        : 12000
----------------------------
Employee Number: 2
Name          : Arpit
Salary        : 13000
----------------------------
Employee Number: 3
Name          : Akshat
Salary        : 13456
----------------------------
Employee Number: 4
Name          : Aman
Salary        : 15975
----------------------------
Employee Number: 5
Name          : Arko
Salary        : 9874
----------------------------
Highest salary employee details:
----------------------------
EMPNO   NAME  SALARY

 4  Aman    15975
```

Q2: WCP to create a structure of the Time where members are hours, minutes and seconds. Find the subtraction between two time variable and print their difference.

```c
#include <stdio.h>
struct TIME {
    int seconds;
    int minutes;
    int hours;
};

void differenceBetweenTimePeriod(struct TIME t1,
                                 struct TIME t2,
                                 struct TIME *diff);

int main() {
    struct TIME startTime, stopTime, diff;

    printf("Enter the start time. \n");
    printf("Enter hours, minutes and seconds: ");
    scanf("%d %d %d", &startTime.hours,
          &startTime.minutes,
          &startTime.seconds);

    printf("Enter the stop time. \n");
    printf("Enter hours, minutes and seconds: ");
    scanf("%d %d %d", &stopTime.hours,
          &stopTime.minutes,
          &stopTime.seconds);


    differenceBetweenTimePeriod(startTime, stopTime, &diff);
    printf("\nTime Difference: %d:%d:%d - ", startTime.hours,
          startTime.minutes,
          startTime.seconds);
    printf("%d:%d:%d ", stopTime.hours,
          stopTime.minutes,
          stopTime.seconds);
    printf("= %d:%d:%d\n", diff.hours,
          diff.minutes,
          diff.seconds);
    return 0;
}
```

```c
void differenceBetweenTimePeriod(struct TIME start,
                                 struct TIME stop,
                                 struct TIME *diff) {
    while (stop.seconds > start.seconds) {
        --start.minutes;
        start.seconds += 60;
    }
    diff->seconds = start.seconds - stop.seconds;
    while (stop.minutes > start.minutes) {
        --start.hours;
        start.minutes += 60;
    }
    diff->minutes = start.minutes - stop.minutes;
    diff->hours = start.hours - stop.hours;
}
```

Output:

```
Output
/tmp/YIllJSicJJ.o
Enter the start time.
Enter hours, minutes and seconds: 12 45 54
Enter the stop time.
Enter hours, minutes and seconds: 14 06 34
Time Difference: 12:45:54 - 14:6:34 = -2:39:20
```

Q3: WAP to store n employees data such as employee name, gender, designation,department, basic pay. Calculate the gross pay of each employees as follows: Gross pay=basic pay + HR + DA HR=25% of basic, DA=75% of basic.

```c
#include <stdio.h>

int main()
{
    char name[60];
    float Basic, HRA_Per, DA_Per, HRA, DA, Gross_Salary,age;

    printf("\n Please Enter the Employee Name  :  ");
    gets(name);

    printf("\n Please enter age of Employee : ");
    scanf("%f",&age);
```

```c
    printf(" Please Enter the Basic Salary of an Employee  :  ");
    scanf("%f", &Basic);

    printf(" Please Enter the HRA Percentage of an Employee  :  ");
    scanf("%f", &HRA_Per);

    printf(" Please Enter the DA Percentage of an Employee  :  ");
    scanf("%f", &DA_Per);

    HRA = Basic * (HRA_Per /100);
    DA = Basic * (DA_Per / 100);

    Gross_Salary = Basic + HRA + DA;
    printf("\n Name = %s \n Basic Salary = %.2f \n HRA Amount   = %.2f \n DA
Amount   = %.2f \n Gross Salary = %.2f", name, Basic, HRA, DA, Gross_Salary);

    return 0;
}
```

Output:

```
Output

/tmp/YIllJSicJJ.o
Please Enter the Employee Name  :  Ankit
Please enter age of Employee : 13
Please Enter the Basic Salary of an Employee  :  12000
Please Enter the HRA Percentage of an Employee  :  2
Please Enter the DA Percentage of an Employee  :  3
Name = Ankit
 Basic Salary = 12000.00
 HRA Amount   = 240.00
 DA Amount   = 360.00
 Gross Salary = 12600.00
```

Q4: WAP to add two distances (in km-meter) by passing structure to a function.

```c
#include <stdio.h>

struct Distance {
    int km;
    float m;
} d1, d2, result;

int main() {
    // take first distance input
    printf("Enter 1st distance\n");
    printf("Enter kilometre: ");
    scanf("%d", &d1.km);
    printf("Enter metre: ");
    scanf("%f", &d1.m);

    // take second distance input
    printf("\nEnter 2nd distance\n");
    printf("Enter kilometre: ");
    scanf("%d", &d2.km);
    printf("Enter metre: ");
    scanf("%f", &d2.m);

    // adding distances
    result.km = d1.km + d2.km;
    result.m = d1.m + d2.m;

    // convert m to km if greater than 1000
    while (result.m >= 1000.0)
    {
        result.m = result.m/1000.0;
        ++result.km;
    }
    printf("\nSum of distances = %d-%f", result.km, result.m);
    return 0;
}
```

Output:

Q6: Write a C Program to enter two character arrays and print them combined. (without using the string library function) e.g. str1="INDIA" str2="patna", str3="IpNaDtInAa".

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

int main()
{
    char s1[1000],s2[1000];
    int i,j;

    printf("Enter  string1: ");
    gets(s1);
    printf("Enter  string2: ");
    gets(s2);
    j=strlen(s1);

    for(i=0;s2[i]!='\0';i++)
    {
        s1[i+j]=s2[i];
    }
    s1[i+j]='\0';

    printf("combined two strings ='%s'\n",s1);



    return 0;
}
```

OUTPUT:

```
Windows PowerShell
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PS C:\Users\KIIT\Music\trial_codes> cd "c:\Users\KIIT\Downloads\2nd year
Enter  string1: India
Enter  string2: patna
combined two strings ='Indiapatna'
PS C:\Users\KIIT\Downloads\2nd year DSA lab\Day 2> 
```

Q7: WCP to find the occurrences of a particular character in a given string input.

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

int main()
{
    char str[100];
    char temp;
    int i, len, count = 0;

    printf("Enter a string: ");
    gets(str);
    printf("Enter the character to be found : ");
    scanf("%c",&temp);
    len = strlen(str);

    for (i = 0; i < len; i++) {
        if (str[i] == temp)
            count++;
    }

    printf("Occurrences of %c in %s = %d",temp, str, count);

    return 0;
}
```

Output:

```
Output

/tmp/YIllJSicJJ.o
Enter a string: india
Enter the character to be found : i
Occurrences of i in india = 2
```

Q8-WCP to print the reverse of a given string (character array) input without using string library function.

```c
#include <stdio.h>
#include <string.h>
int main()
{
  char str[100];
  int i,n;
printf("\n Enter the string: ");
scanf("%s", str);
n=strlen(str);
printf("\nReverse of the string is: ");

for(i=n-1;i>=0;i--)
{
    printf("%c",str[i]);
}
}
```

Output:

```
Windows PowerShell
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PS C:\Users\KIIT\Music\trial_codes> cd "c:\Users\KIIT\

 Enter the string: Ankit

Reverse of the string is: tiknA
PS C:\Users\KIIT\Music\trial_codes>
```