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Fundamentals of Computers

C language Assignment (A1)

Instructor : Mr. Mrinal Paliwal Sir

Q. 1 Write algorithm for the following :
a) to check whether an entered number is odd / even.
b) to calculate sum of three numbers.

Q1.A.1 Using the Conditional or Ternary operator

Code:

```
#include <stdio.h>

void main()
{
    int user_in = 0;
    printf("Please enter a number to cheack whether an Odd or Even\n");
    scanf("%d", &user_in);
    (user_in%2==0)?printf("Given Input is Even"):printf("Given Input is Odd");
}
```

Result :

```
Please enter a number to cheack whether an Odd or Even
2
Given Input is Even

...Program finished with exit code 19
Press ENTER to exit console.
```

```
Please enter a number to cheack whether an Odd or Even
5
Given Input is Odd

...Program finished with exit code 18
Press ENTER to exit console.
```

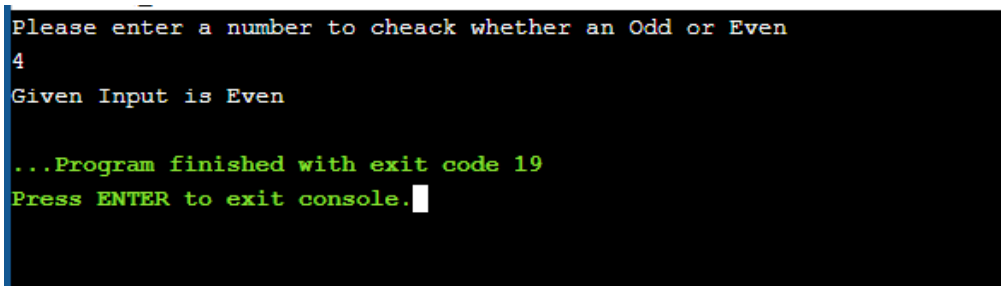
Q. 1 Write algorithm for the following :
a) to check whether an entered number is odd / even.
b) to calculate sum of three numbers.

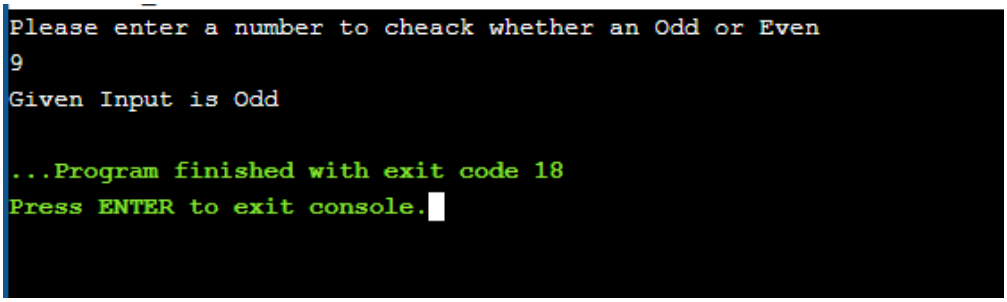
Q1.A.2 Using the if else

Code:

```
#include <stdio.h>

void main(){
    int user_in = 0;
    printf("Please enter a number to cheack whether an Odd or Even\n");
    scanf("%d", &user_in);
        if(user_in%2==0)
    {     printf("Given Input is Even");
       }
     else{
       printf("Given Input is Odd");
       }
}
```

Result :





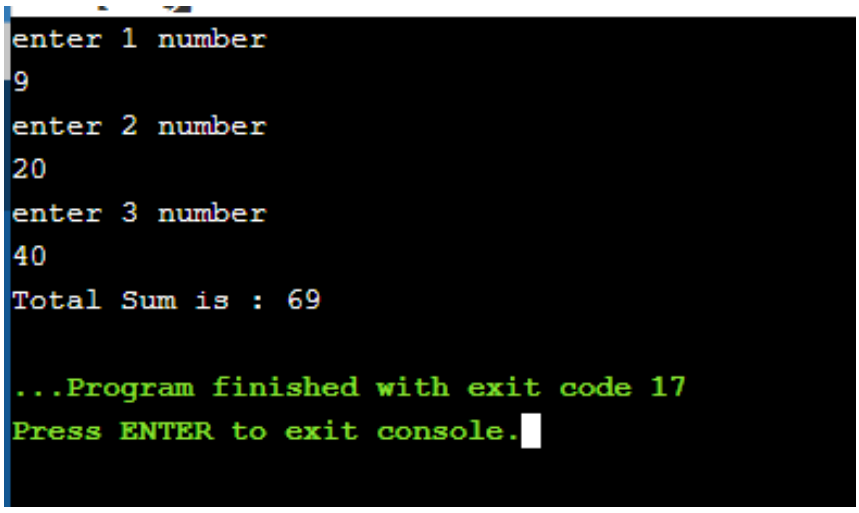
Q. 1 Write algorithm for the following :
a) to check whether an entered number is odd / even.
b) to calculate sum of three numbers.

Q1.B Using for Loop

Code:

```
#include <stdio.h>

void main(){
int num_in,sum;
for (int i=1; i<=3;i++){
    printf("enter %d number\n",I);
    scanf("%d",&sum);
    num_in = num_in+sum;
}
printf("Total Sum is : %d",num_in);
}
```

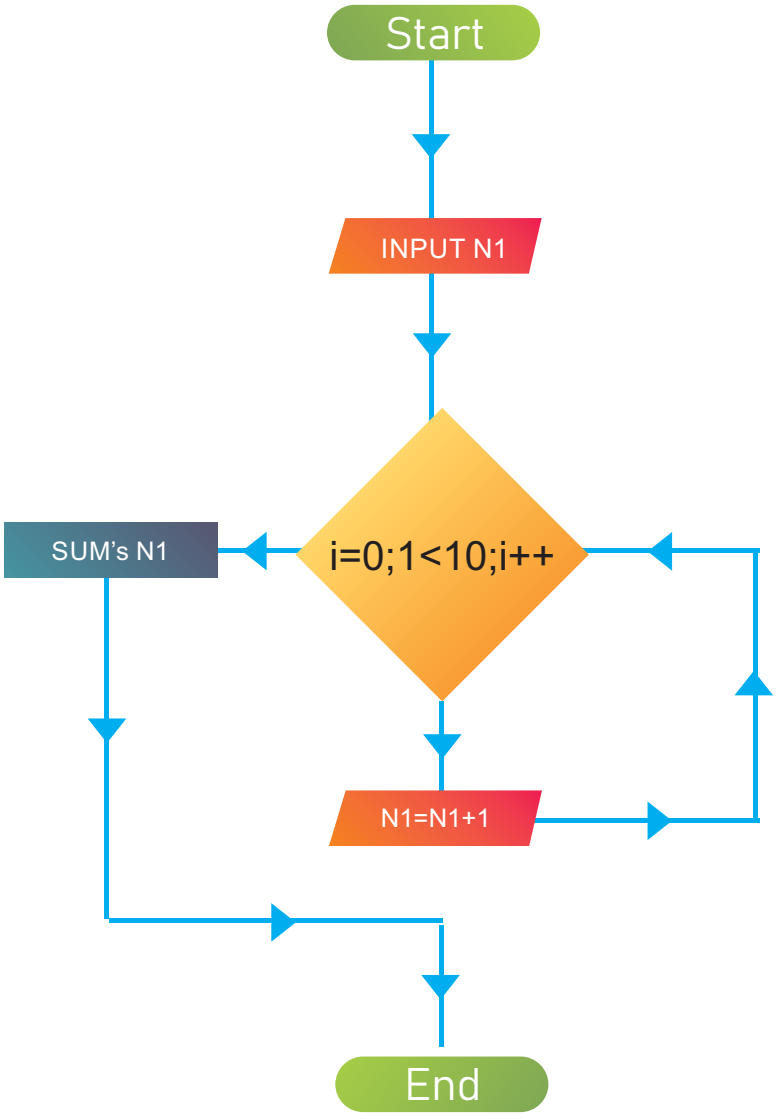
Result :



Q. 2 Draw a flowchart for the following :
a) to find greater and smaller number from given two numbers.
b) to calculate sum of first 10 odd numbers.

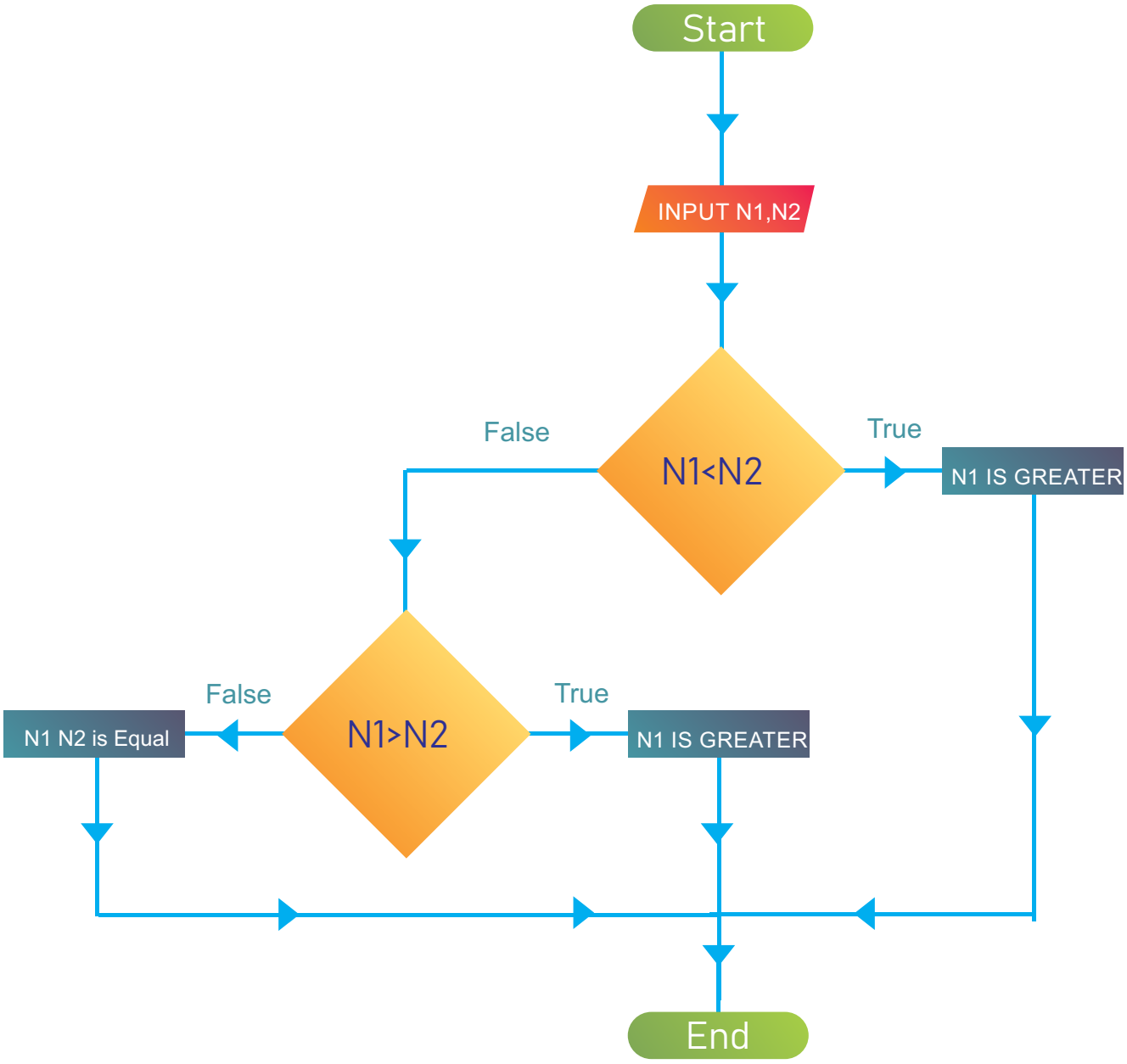
Q2

Code:



Q. 2 Draw a flowchart for the following :
a) to find greater and smaller number from given two numbers.
b) to calculate sum of first 10 odd numbers.

Q2.A Flow Chart



Q. 3 Write short notes on the following :
a) Structure of C Program
b) C data types

Q3.A Structure of C Program

Code:

```
/* Name of the Program
   Name os the Author */

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

#define Pi 3.14

int add();
int Val_0 = 5;

void main()
{
int Val_1;

printf("Please enter a numbers");
scanf("%d",&Val_1);
printf("%d",add(Val_1));
}

int add(int Val_In){
return(Val_0 + Val_In);
}
```

Documentation Section

Preprocessor Directive

Definition Section

Global Declaration Section

Main() Function or Entry_Point Section

Variable Declaration

Body of Main Function

Function Definition

Documentation Section : Here we write about aim of program, Author, Version and may more things. I t is write in comment form.
Ex: /*Add two Nums program by Dushyant Singh*/

Preprocessor Directive : These section instruct the compiler to include pre-processors such as header files, functions from the system library and symbolic constants before compiling the program.
Ex: #include<stdio.h>

Definition Section : Here we can define Constant variables, It is responsible to fix/constante our variables value in whole program.
Ex: #define Pi 3.14

Global Declaration Section : These section is used for define global variable and function prototype.
Ex: int Num_0;
float add();

Main() Function : It is a Entry Point of every program, the compiler firstly comae hare then go after other. it is very important section of every program. Variable Declaration : here we can declare local' variable. Body of Main Function : here we can write out operations, statement to perform task.

Function Definition : here we can define user define function. User-defined functions are generally placed immediately after the main () function,

Q. 3 Write short notes on the following :
a) Structure of C Program
b) C data types

Q3.A Structure of C Program

ANSI C provides three types of data types:
Primary(Built-in) Data Types
void, int, char, double and float.
Derived Data Types:
Array, References, and Pointers.
User Defined Data Types:
Structure, Union, and Enumeration.

Data Type	Size	Examples
int	4 bytes	int i=10
float	4 bytes	float j=9.5
char	1 bytes	char k= ‘a’
double	8 bytes	double l = 9.1

Primary(Built-in) Data Types:

Every C compiler supports five primary data types:

void : As the name suggests, it holds no value and is generally used for specifying the type of function or what it returns. If the function has a void type, it means that the function will not return any value.
int “ Used to denote an integer type. char Used to denote a character type.
float, double : Used to denote a floating point type. int *, float *,
char *Used to denote a pointer type.

Derived Data Types:

C supports three derived data types: Data Types

Arrays : Arrays are sequences of data items having homogeneous values. They have adjacent memory locations to store values.
References : Function pointers allow referencing functions with a particular signature.
Pointers : These are powerful C features which are used to access the memory and deal with their addresses.

User Defined Data Types:

C allows the feature called type definition which allows programmers to define their identifier that would represent an existing data type. There are three such types: Data Types

Structure : It is a package of variables of different types under a single name. This is done to handle data efficiently. "struct" keyword is used to define a structure.
Union : These allow storing various data types in the same memory location. Programmers can define a union with different members, but only a single member can contain a value at a given time. It is used for
Enum : Enumeration is a special data type that consists of integral constants, and each of them is assigned with a specific name. "enum" keyword is used to define the enumerated data type.

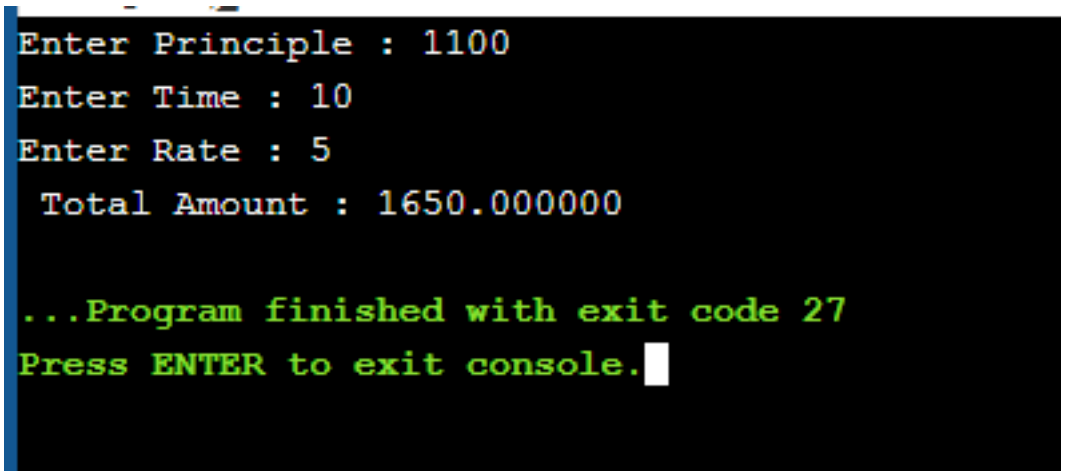
Q. 4 Accept principal amount, rate of interest, and duration from the user. Display Interest Amount and Total Amount (Principal + Interest).

Q4

Code:

```
#include<stdio.h>


void main(){

float principal, rate, time, sub_total, total;

printf("Enter Principle : \n");
scanf("%f ", &principal);
printf("Enter Time :  \n");
scanf("%f /n", &time);
printf("Enter Rate :  \n");

scanf("%f /n", &rate);
sub_total = (principal * rate * time) /100;
total = principal + sub_total;

printf(" Total Amount : %f", total);
}
```

Result :



Q. 5 Accept the salary of an employee from the user. Calculate the gross salary on the following basis:

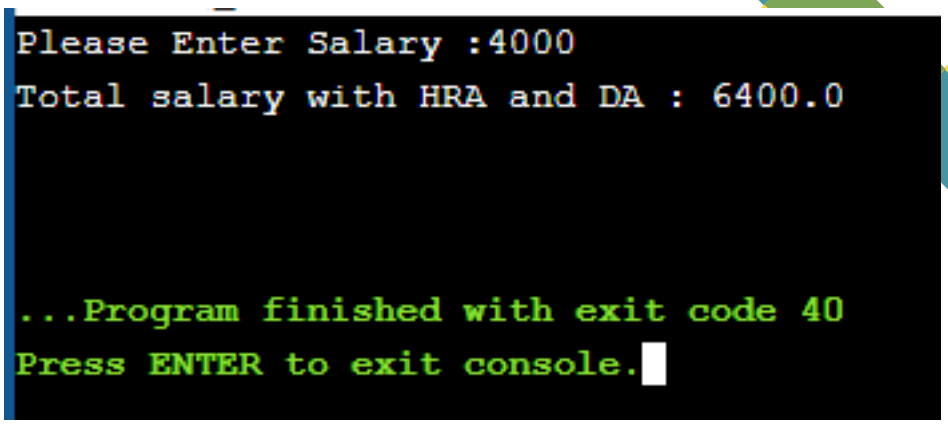
MIN.	MAX	HRA	DA
1	4000	10%	50%
4001	8000	20%	60%
8001	12000	25%	70%
12000	<	30%	80%

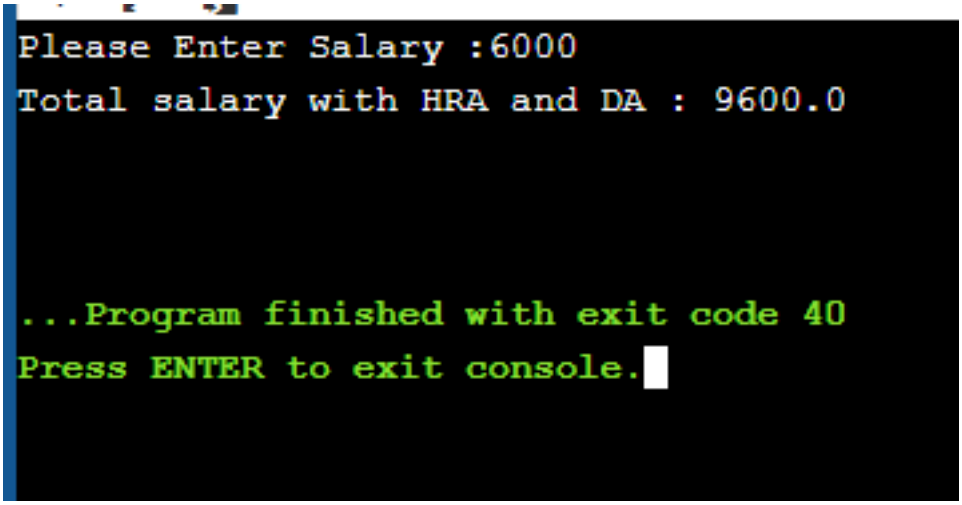
Q5

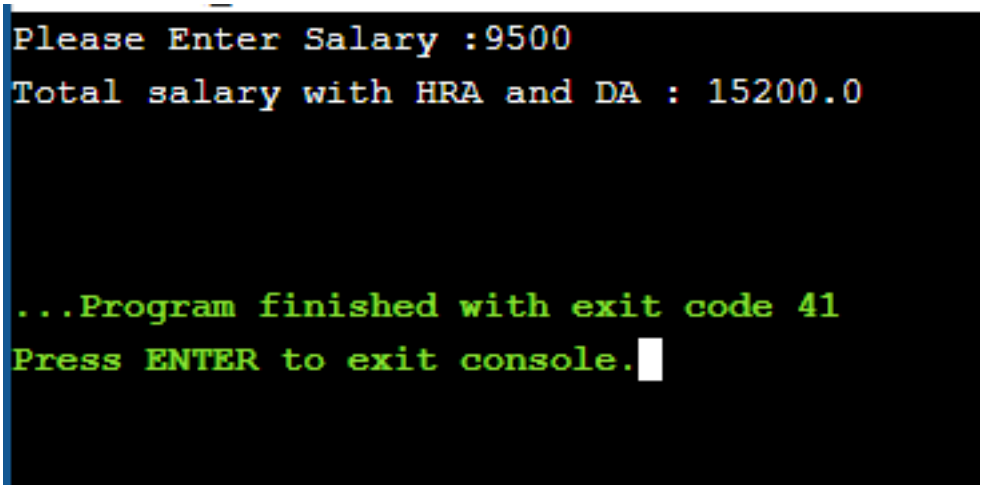
Code:

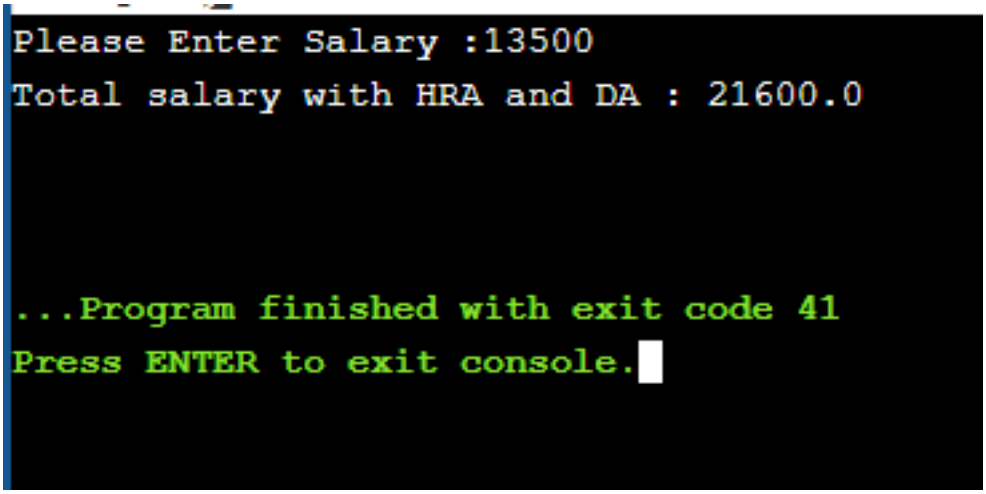
```
#include<stdio.h>

void main(){
float es=0,hra=0,da=0,tot=0;

printf("Please Enter Salary :");
scanf("%f",&es);
if(es<1 || es>=4000){
hra = (es/100)*10;
da = (es/100)*50;
} else
if(es<=4001 || es>=8000){
hra = (es/100)*20;
da = (es/100)*60;
} else
if(es<=8001 || es>12000){
hra = (es/100)*25;
da = (es/100)*70;
 } else {
hra = (es/100)*30;
da = (es/100)*80;
 }
tot = es+hra+da;
printf("Total salary with HRA and DA : %4.1f \n\n",tot);
}
```

Result :


Please Enter Salary :4000
Total salary with HRA and DA : 6400.0
...Program finished with exit code 40
Press ENTER to exit console.


Please Enter Salary :6000
Total salary with HRA and DA : 9600.0
...Program finished with exit code 40
Press ENTER to exit console.


Please Enter Salary :9500
Total salary with HRA and DA : 15200.0
...Program finished with exit code 41
Press ENTER to exit console.


Please Enter Salary :13500
Total salary with HRA and DA : 21600.0
...Program finished with exit code 41
Press ENTER to exit console.

Q. 6 Accept any number from the user. Display whether the number is divisible by 100 or not.

Q6

Code:

```
#include<stdio.h>

void main(){

float Num_In;

printf("Please Enter Any Number :");
scanf("%f",&Num_In);

if((int) Num_In % 100==0){
 printf("Divisible by 100");
} else{
    printf("Not Divisible by 100");
 }
}
```

Result :

```
Please Enter Any Number :604
Not Divisible by 100

...Program finished with exit code 20
Press ENTER to exit console.
```

```
Please Enter Any Number :1000
Divisible by 100

...Program finished with exit code 16
Press ENTER to exit console.
```

Q. 7 Accept a month in digit from the user. Display the month in words.
If number is not between 1 and 12 display message “Invalid Month”.
(Use ‘switch’)

Q7 Using Switch()

Code:

```
#include<stdio.h>

void main(){

int Num_In;

printf("Please Enter Any Number :");
scanf("%d",&Num_In);

switch(Num_In)
{
   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;

    default :printf("Invalid Choice. Enter a no between 1 and 12");break;
}
}
```

Result :