Name: Jibika Gautam

Q1. What is the purpose of the main() function in a C program? Explain its significance.

The purpose of the main() function in a C program is to be a bridge between operating system and code.

Without it, a standard C program can't run. It is mandatory and acts as an entry point.

Q2. Explain the difference between a variable declaration and a variable initialization in C.

Variable declaration reserves a space for the variable and specifies its data type whereas variable initialization assigns a starting value. The declaration is required prior to being used whereas the initialization is optional but eliminates bugs with undefined values. The random data are stored in local variables which have not been initialized, in contrast to globals which are initialized as zeros.

Q3. Write a C program to display a personalized greeting message. (Should contain 'hello' or 'welcome' in the message)

```c
#include <stdio.h>


int main() {
   //Enter your code here//
   printf("Hello,Welcome to C programming");
   return 0;
}
```

```
-1-jeeya-sketch\src\" ; if ($?) { gcc q3.c -o q3 } ; if ($?) { .\
Hello,Welcome to C programming
PS C:\Users\acer\OneDrive\Desktop\assignment-1-jeeya-sketch\src>
```

Q4. What are the different data types available in C? Provide examples of each data type.

The different data types available in C are integer, character, float and double float. Some of the examples are:

1. Integer: age=25
2. Character: name=Jiya
3. Float: Pi=3.18
4. Double float: double gravity=9.845652

Q5. Explain the concept of type conversions in C. Provide examples of implicit and explicit type conversions.

Type conversions in C change a value from one data type to another, either automatically or manually.

There are two types:

- **Implicit conversion** : The compiler does it automatically to avoid data loss, usually promoting smaller types to larger ones. Example: int + float → result is float.
- **Explicit conversion** : The programmer forces it using expression. Example: (float)10 / 3 → gives 3.333… instead of 3 (integer division).

Q6. Write a C program to calculate the area of a rectangle. Prompt the user to enter the length and width, and display the result.

```c
#include<stdio.h>

int main(){

   float length;

   float width;

   float area;

   printf("Enter length and width of rectangle:");

   scanf("%f %f", &length, &width);

   area=length*width;

   printf("The area of rectangle is: %2f",area);

   return 0;

}
```

```
Enter length and width of rectangle: 6
5
The area of rectangle is: 30.000000
PS C:\Users\acer\OneDrive\Desktop\assignment-1-jeeya-sketch\src>
```

Q7. What is the role of the scanf() function in C? Provide an example of its usage.

The scanf() function in C reads formatted input (usually from the keyboard) and stores the values in variables. It uses format specifiers like %d, %f, %c, %s to match the type of data expected, and requires the address of variables so it can modify them directly.

Example: int age;

scanf(“%d”, &age);

Q8. Write a C program to convert temperature from Celsius to Fahrenheit. Prompt the user for a temperature in Celsius and display the equivalent temperature in Fahrenheit. (Formula: fahrenheit = (celsius * 9 / 5) + 32)

```c
#include <stdio.h>

int main() {

   float celsius;

   float fahrenheit;

   printf("Enter temperature in celsius:");

   scanf("%f",&celsius);



   fahrenheit=(celsius*9/5)+32;

   printf("The temperature in Fahrenheit is:%.2f\n",fahrenheit);

   return 0;

}
```

```
ment-1-jeeya-sketch\src\" ; if ($?) { gcc tempCodeRunnerFile.c -o tempCodeRunnerFi
odeRunnerFile }
Enter temperature in celsius:104
The temperature in Fahrenheit is:219.20
PS C:\Users\acer\OneDrive\Desktop\assignment-1-jeeya-sketch\src>
```

Q9. Input a number representing days and print the equivalent number of weeks and days.

(Example: 10 days = 1 week and 3 days)

```c
#include<stdio.h>

int main(){

    int days;

    printf("Enter number of days: ");

    scanf("%d", &days);

    int weeks = days/7;

    int remaining_days = days%7;

    printf("%d weeks and %d days\n", weeks, remaining_days);

     return 0;

}
```

```
Enter number of days: 9
1 weeks and 2 days
```

Q10. Write a C program to swap the values of two variables using a temporary variable.

```c
#include<stdio.h>

int main() {

   int x, y;

   int temp;

   printf("Enter two number");

   scanf("%d %d", &x, &y);



   temp=x;
```

```
  x=y;

  y=temp;



  printf("Value of x after swap is %d and y is %d", x, y);




  return 0;

}
```

```
Enter two number3
4
Value of x after swap is 4 and y is 3
PS C:\Users\acer\OneDrive\Desktop\assignment-1-jeeya-sketch\src> S
```

Q11. Write a C expression that performs the following operations in a single line: increment a variable by 1, multiply it by 3, and subtract 10.

```
#include<stdio.h>

int main(){

  int num, result;

  printf("Enter a number: ");

  scanf("%d", &num);

  result= ((num+1)*3)-10;

  printf("%d\n ",result);

return 0;
```

```
}
```

```
Enter a number: 7
30

PS C:\Users\acer\OneDrive\Desktop\assignment-1-jeeya-sketch\src>
```

Q12. Given three variables a, b, and c, write an expression that checks if a is greater than b and c is not equal to 0.

```c
#include<stdio.h>

int main(){

   int a,b,c;

   printf("Enter three number a,b,and c: ");

   scanf("%d %d %d",&a,&b,&c);

   printf("%d\n",(a>b) && (c!=0));

   return 0;

}
```

```
Enter three number a,b,and c: 3 7 2
0
```

Q13. Write a C expression that evaluates whether a number is divisible by both 2 and 3 (without using the modulus operator).

```c
#include<stdio.h>

int main() {
```

```
    int num;
    int result;
    printf("Enter a number:");
    scanf("%d", &num);
    result=(num%2==0)&&(num%3==0);
    printf("The result is %d\n",result);
    return 0;
}
```

```
Enter a number:6
The result is 1
PS C:\Users\acer\OneDrive\Desktop\assignment-1-jeeya-sketch\src>
```

Q14. Create an expression that swaps the values of two variables x and y without using a temporary variable.

```
#include<stdio.h>
int main(){
    int x, y;
    printf("Enter the value of x and y");
    scanf("%d %d",&x,&y);
    x=x+y;
    y=x-y;
    x=x-y;
```

```
  printf("Value before x is %d and y is %d\n",x,y);

  return 0;

}
```

```
Enter the value of x and y 3
4
Value before x is 4 and y is 3
PS C:\Users\acer\OneDrive\Desktop\assignment-1-jeeya-sketch\src>
```

Q15. Write an expression that checks if a number is both positive and even.

```
include<stdio.h>

int main(){

  int num;

  printf("Enter a number: ");

  scanf("%d",&num);

  printf("Is positive and even? %d\n", (num > 0) && (num % 2 == 0));

  return 0;
```

```
Enter a number: 7
Is positive and even? 0
PS C:\Users\acer\OneDrive\Desktop\assignment-1-jeeya-s
```

Q16. Given two variables x and y, write an expression that calculates the average of their values.

```
#include <stdio.h>

int main(){
```

```
   int num1, num2;

   printf("Enter any two number: ");

   scanf("%d %d", &num1,&num2);

   int average=((num1+num2)/2);

   printf("the average of two given number is:%d\n ",average);

   return 0;

}
```

```
Enter any two number: 7 3
the average of two given number is:5
```

Q17. Create an expression that checks if a given character is an uppercase letter.

```
#include<stdio.h>

int main(){

   char letter;

   int result;

   printf("Enter any letter: ");

   scanf(" %c", &letter);

   result = (letter>='A')&&(letter<='Z');

   printf("%s\n", result ? "Yes" : "No");



   return 0;

}
```

```
Enter any letter: A
Yes
PS C:\Users\acer\OneDrive\Desktop\assignment-1-jeeya-sketch\src>
```

Q18. Write a C expression that calculates the sum of the squares of three different numbers.

```c
#include<stdio.h>

int main(){

   int num1, num2, num3, result;

   printf("Enter three numbers; ");

   scanf("%d %d %d",&num1,&num2,&num3);

   result = (num1 * num1) + (num2 * num2) + (num3 * num3);

   printf("%d\n",result);

   return 0;

}
```

```
Enter three numbers; 2 1 3
14
PS C:\Users\acer\OneDrive\Desktop\assignment-1-jee
```

Q19. Given three variables a, b, and c, write an expression that checks if a is equal to b and b is not equal to c.

```c
int main() {

   int a, b, c;
```

```
    printf("Enter three integers (a, b, c): ");
    scanf("%d %d %d", &a, &b, &c);

    printf("Condition result: %d\n", a == b && b != c);

    return 0;
}
```

```
Enter three integers (a, b, c): 4 4 5
Condition result: 1
```

Q20. Write an expression that checks if a number is a multiple of either 3 or 5.

```
#include<stdio.h>
int main(){
    int num;
    printf("Enter a number: ");
    scanf("%d",&num);
    printf("Is multiple of 3 or 5: %d\n", num % 3 == 0 || num % 5 == 0);
    return 0;
}
```

```
Enter a number: 6
Is multiple of 3 or 5: 1
```

Q21. Create an expression that swaps the values of three variables x, y, and z in a cyclic order (i.e., x becomes y, y becomes z, and z becomes x).

```c
#include<stdio.h>

int main() {

   int x, y, z, temp;

   printf("Enter three numbers: ");

   scanf("%d %d %d",&x,&y,&z);

   temp=x, x=y, y=z, z=temp;

   printf("After cyclic swap: x=%d, y=%d, z=%d\n", x, y, z);

   return 0;

}
```

```
Enter three numbers: 5 3 6
After cyclic swap: x=3, y=6, z=5
```

Q22. Write a C expression that calculates the square root of the sum of two numbers, rounded to the nearest integer.

```c
#include<stdio.h>

#include<math.h>

int main(){

   double num1,num2;

   printf("Enter any two number: ");
```

```
    scanf("%lf %lf",&num1,&num2);

    printf("Result: √(sum) = %d (nearest integer)\n", (int)round(sqrt(num1 + num2)));

    return 0;

}
```

```
Enter any two number: 10 15
Result: ΓêÜ(sum) = 5 (nearest integer)
```

Q23. Given a variable num, write an expression that checks if it is a power of 2.

```
#include<stdio.h>

#include<math.h>

int main(){

    int num;

    int result;

    printf("Enter any number: ");

    scanf( "%d",&num);

    result = !(num &(num-1));

    printf("The result is %d\n,",result);

    return 0;

}
```

```
Enter any number: 4
The result is 1
```

Q24. Create an expression that checks if a given number is a perfect square.

```c
#include<stdio.h>

#include<math.h>

int main(){

   int num;

   int result;

   printf("Enter any number: ");

   scanf( "%d",&num);

   int x=sqrt(num);

   result= (x*x == num);

   printf("The result is %d\n",result);

   return 0;

}
```

```
Enter any number: 25
The result is 1
```