Tutorial No : 01

1) * A Programming Language is a set of rules and symbols used to construct a computer program for a special purpose.

*Programming language is used to convert a source code to machine code using compiler and interpreter.

*Programming language provide expressive capabilities to convey complex ideas and logic concisely.

*In addition to Programming Languages are used to database development,game development and hardware development etc.

2)

(a)

*** Source code vs Machine code***

-Source code : It is written by a programmer using any High Level Language or intermediate language which is human-readable.It contains comments that the programmer puts for better understanding.

-Machine code : It is the code that the computer can understand and execute.Machine Code does not contain comments and is not human- readable.

(b)

High Level Language vs Low Level Language

-High Level Language : This is closer to natural language and programmer friendly ,but cannot be directly interpreted by machines.High Level Languages are more readable and writable because they use familiar words ,phrases and syntax that resemble human language.

-Low Level Langugae : It is closer to the system hardware.Low Level Language use more cryptic symbols and instructions that directly correspond to machine operations.These are require more effort and time to write,debug and maintain code due to the coplexity and manual control required.

(c)

Compiler vs Interpreter

-Compiler : A compiler translates the entire source code into machine code.Compilers generally produce faster executable code since the translation is done upfront optimizing the code based on the target platform.

-Interpreter : Interpreter reads and execute the source code line by line ,translating and executing each instruction sequentially.

(d)

***C vs C++ ***

-C : C is a procedural programming language .C does not have built in support for OOP.This is a widely used programming language.

-C++ : This programming language supports both procedural and object-oriented programming paradigms.C++ is mostly compatible with c code.

(e)

C++ vs Java

-C++ : C++ is astaticay typed,compiled language that offers high performance,direct hardware access,and low-level control.It is popular for system –level programming,game development and performance-critical applications.

-Java : Java is a statically typed ,platform independent language that runs one the java virtual machine.This language is commonly usedfor enterprise software,web development and android app development.

(f)

Syntax error vs Logical error

-Syntax error : It occurs when code violates the rules of the programming language’s syntax.These errors are detected by the compiler or interpreter during the compiation or execution phase.

-Logical error : It occurs when the code does not produce the intented results due to flaws in the logic or algorithm.Logical errors are more challenging to detect as they do not cause the program to halt or produce

error messages.debugging and careful analysis of the code are required to identify and fix logical errors.

Tutorial No : 02

1)

In C programming ,comments are used to add explanatory or descriptive text within the source code that is ignored by the compiler.They are helpful for making the code more readable and for documenting the purpose of functionality of certain sections of code.There are two types of comments in c.

*single-line comments

*multi-line comments

2)

Main()

3)

The “scanf” function in C is used for reading formatted input from the user or from an input stream.The purpose of ‘scanf’ is to assign values to variables based on the user’s input.

4) Yes

5)

Valid identifiers:record1,return,name,name_and_address

6) a) False

B) False

C) True

D) False

E) True

F) False

G)False

7)

```
*
**
***
****
*****
```

8)

A) scanf(“d”,&value);

B) printf(“The product of %d and %d is %d\n”,x,y);

C) scanf(“%d”,&anInteger);

D) printf(“Remainder of %d divided by %d is %d\n”,x,y,x%y);

E) printf(“The sum is %d\n”,x+y);

F) printf(“The value you entered is: %d\n”,value);

9)

a.) 2

b.) 4

c.) x=

d.) x=2

e.) 5=5

f.) nothing

g.) nothing

h.) nothing

I.) a new line

10)

a.) True

b.) True

c.) False

* The statement printf(“a=5;”); is a printf statement that prints the value of “a=5;”as a string.It is not an ”assignment statement.

d.) True

e.) True

Tutorial No : 03

01)

```
x=x+1;
x+=1;
x++;
++x;
```

02)

```
a.) z=x++ +y;
b.) product *=2;
c.) product=product*2;
d.) if (count>10)
      {
       printf("Count is greater than 10");
      }
 e.) total-=--x;
f.) total+=x--;
g.) q %= diviser;
```

q=q % diviser;

h.) printf(“%.2f\n”,123,4567);

03)

a.) scanf(“%d”,&x);

b.) scanf(“%d”,&y);

c.) int i=1;

d.) int power=1;

e.) power*=x;

f.) i++;

g.) while(i<=y)

h.) printf(“%d”,power);

Tutorial no : 04

01)

```
if(numNeighbors>=3 || numNeighbors == 4)
{
 ++numNeighbors;
 printf(“You are dead! \n”);
 }
  Else
  {
      --numNeighbors;
  }
```

02)

```
No,I'm here!
No,actually,i'm here!
```

03)

```
if (doesSignificantWork)
{
    if (makesBreakthrough)
  nobelPrizeCandidate = true;
```

```
        else
      nobelPrizeCandidate = false;
     }
        else if
     (!doesSignificantWork)
  nobelPrizeCandidate = false;
```

04)

```
      - if (doesSignificantWork)
       {
        if (makesBreakthrough)
        nobelPrizeCandidate = true;
        else
         nobelPrizeCandidate = false;
       }
       else if (!doesSignificantWork)
       nobelPrizeCandidate = false;
```

- ```
  if (taxCode == 'T')
  {
  price += (taxRate / 100) * price;
   }
  ```

- ```
  if (opCode == 1) {
  double X, Y;
  scanf("%lf %lf", &X, &Y);
  double sum = X + Y;
  printf("Sum: %lf\n", sum);
  }
  ```

- ```
  if (currentNumber % 2 == 1)
  {
    currentNumber = (3 * currentNumber) + 1;
   }
  ```
  ```

```
    else
{
 currentNumber = currentNumber / 2;
 }
```

- ```
  if (year % 4 == 0 && (year % 100 != 0 || year % 400 == 0))
  {
    leapYear = true;
  }
  Else
  {
    leapYear = false;
  }
  ```

- ```
  if (distance <= 100)
  ```

```
 {
    cost = 5.00;
  }
   else if
      (distance <= 500)
  {
     cost = 8.00;
 }
   else if
   (distance < 1000)
{
  cost = 10.00;
}
   else
{
   cost = 12.00;
}
```

Tutorial No : 05

01)

```
#include <stdio.h>
int main()
{
    double num1, num2;
    int choice;

   printf("Enter two numbers: ");
   scanf("%lf %lf", &num1, &num2);

    printf("1. +\n");
    printf("2. -\n");
    printf("3. *\n");
     printf("4. /\n");

     printf("Please enter your choice: ");
```

```
        scanf("%d", &choice);

        switch (choice) {
    case 1:
        printf("Sum: %.2lf\n", num1 + num2);
        break;
    case 2:
        printf("Difference: %.2lf\n", num1 - num2);
        break;
    case 3:
        printf("Product: %.2lf\n", num1 * num2);
        break;
    case 4:
        if (num2 != 0) {
            printf("Quotient: %.2lf\n", num1 / num2);
        } else {
            printf("Error: Division by zero is not
allowed.\n");
        }
```

```
            break;
        default:
            printf("Invalid choice.\n");
            break;
    }

    return 0;
}
```

02) 1)

```
            #include <stdio.h>
        int main()
       {
      int num, countOdd = 0, countEven = 0;
       int i = 1;

      printf("Enter 10 numbers:\n");
      while (i <= 10) {
       printf("Number %d: ", i);
```

```
        scanf("%d", &num);

        if (num % 2 == 0) {
            countEven++;
        } else {
            countOdd++;
        }

        i++;
    }

    printf("Total odd numbers: %d\n", countOdd);
    printf("Total even numbers: %d\n", countEven);

    return 0;
}
```

3) *****

```
    #include <stdio.h>
    int main() {
```

```
    int num, countOdd = 0, countEven = 0;
    int i = 1;

   printf("Enter 10 numbers:\n");

   do {
    printf("Number %d: ", i);
    scanf("%d", &num);

    if (num % 2 == 0) {
        countEven++;
    } else {
        countOdd++;
    }

    i++;
} while (i <= 10);

printf("Total odd numbers: %d\n", countOdd);
printf("Total even numbers: %d\n", countEven);
```

```
    return 0;
}

    *****
#include <stdio.h>
 int main() {
  int num, countOdd = 0, countEven = 0;

    printf("Enter numbers (-99 to terminate):\n");

    do {
        printf("Number: ");
        scanf("%d", &num);

        if (num == -99) {
            break;
        }

        if (num % 2 == 0) {
            countEven++;
```

```
        } else {
            countOdd++;
        }
    } while (1);
   printf("Total odd numbers: %d\n", countOdd);
    printf("Total even numbers: %d\n", countEven);

    return 0;
}
```

03) 1)

```
    #include <stdio.h>
    int main() {
    int num, sum = 0;
    float average;

    printf("Enter 10 numbers:\n");

    for (int i = 1; i <= 10; i++) {
        printf("Number %d: ", i);
        scanf("%d", &num);
```

```
        sum += num;
    }

    average = (float) sum / 10;

    printf("Average value: %.2f\n", average);

    return 0;
}
```

03) 2)

```
        #include <stdio.h>
        int main() {
       int rows = 5;

       for (int i = 1; i <= rows; i++) {
        for (int j = 1; j <= i; j++) {
            printf("*");
```

```
        }
        printf("\n");
    }

    return 0;
}
```