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Course: BCA

Subject: Programming For Problem Solving

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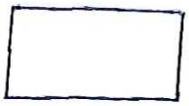
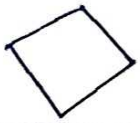
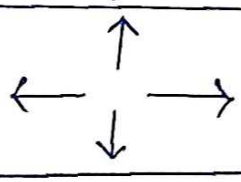
1.) Define Algorithm. Write an algorithm to print the Fibonacci series to n term. n will be provided as input by the user.

Ans → In programming, algorithm is a set of well defined instructions in sequence to solve the problem.

Step 1 = Start
Step 2 = declare variables a, b, c, n, i
Step 3 = Initialize variables a = 0, b = 1, i = 1
Step 4 = Input n from user.
Step 5 = WHILE (i <= n)
    5.1 ⇒ Print a
    5.2 ⇒ c = a + b
    5.3 ⇒ a = b
    5.4 ⇒ b = c
    5.5 ⇒ increase value of i each time by 1.
Step 6 = Stop

2.) Define flowchart. Discuss different shapes ~~that~~ that are used in flowchart.

Ans → A Pictorial representation of an algorithm is called flowchart. In flowchart the steps in algorithm are represented in the form of different shapes.

Symbol Name	Symbol	function
Oval		Used to represent start and end of flowchart
Parallelogram		Used for input or output operation
Rectangle		Processing : used for arithmetic operations and data manipulations
Diamond		Used for decision making
Arrows		Flow line used to indicate the flow of logic by connecting symbols

3) How Many types of errors are there in C Programming ? Discuss them.

Ans→ There are mainly five types of errors exist in C programming :

(a) Syntax error

(b) Run-time error

(c) Linker error

(d) Logical error

(e) Semantic error

(a) Syntax error = Syntax errors are known as the compilation errors as they occurred at the compilation times.

- if we miss the parenthesis (}) while writing the code.
- Display the value of variable without its declaration.
- if we miss the semicolon (;) at the end of statement.

(b) Run-time error = Sometimes the error exist during the execution-time even after the successful compilation known as run-time error.

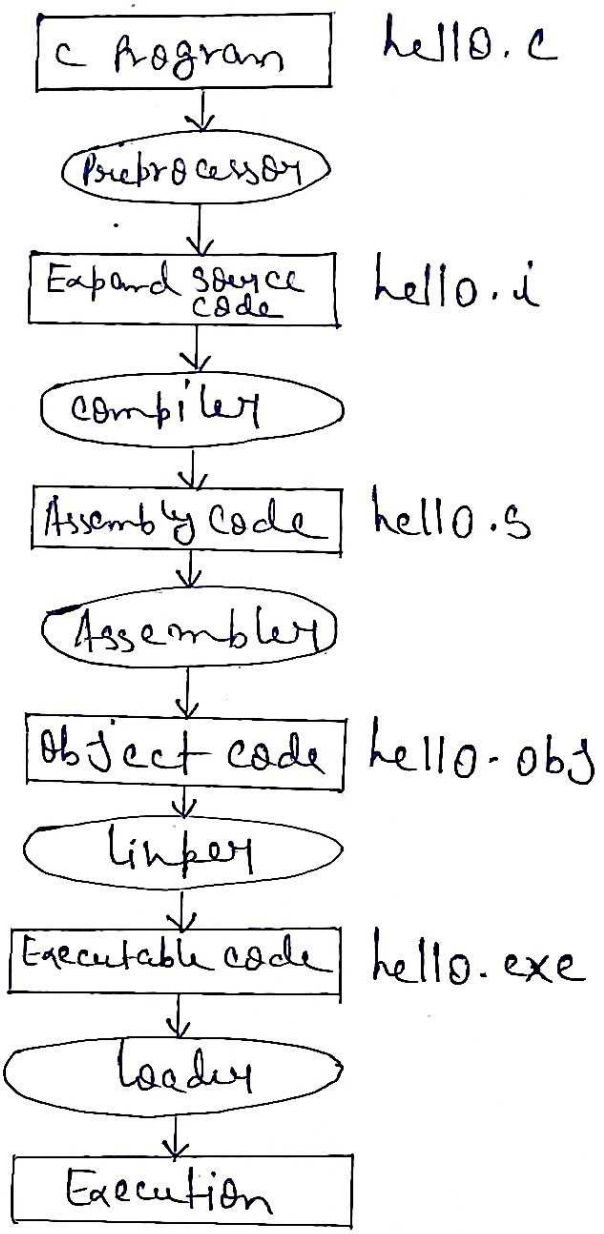
(c) Linker error = Linker errors are mainly generated when the executable file of the program is not created. This can be happened either due to the wrong function prototyping or usage of the wrong header file.

(d) Logical error = The logical error is an error that leads to an undesired output. These errors produce the incorrect output, but they are error-free, known as logical errors.

(e) Semantic error = Semantic errors are the errors that occured when the statements are not understandable by the compiler.

4.) Draw the compilation process of a program and discuss it.

Ans →



Firstly, the input file, i.e, hello.c, is passed to the preprocessor, and the preprocessor converts the source code into expanded source code. The extension of expanded source code would be hello.i

The expanded source code is passed to the compiler, and the compiler converts this expanded source code into assembly code. The extension of the assembly code would be hello.s.

This assembly code is then sent to the assembler, which converts the assembly code into object code.

After the creation of an object code, the linker creates the executable file. The loader will then load the executable file for the execution.

5. Write a C program that can check whether an input is an alphabet, digit, whitespace or special character.

Ans⇒

```
#include <stdio.h>
int main()
{
    char ch;
    printf("Enter a character: ");
    scanf("%c", &ch);
    if(ch>=97 && ch<=122 || ch>=65 && ch<=
                                    90)
      printf("%c is an alphabet", ch);
    else if (ch>=48 && ch<=57)
      printf("%c is a digit", ch);
    else if (ch==32)
      printf("%c is a whitespace", ch);
    else
      printf("%c is special character", ch);
    return 0;
}
```