SNS COLLEGE OF ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE NAME : 23CST101 C PROGRAMMING AND DATA STRUCTURES

I YEAR / II SEMESTER

Unit 1- C PROGRAMMING FUNDAMENTALS- A REVIEW

Topic 14 : Function prototype, Function Definition

Brain Storming

1. How perform string manipulation operations?

Introduction

- A function is a group of statements that together perform a task.
- The function contains the set of programming statements enclosed by {}.
- The function is also known as *procedure* or *subroutine* in other programming languages.
- Every C program has at least one function, which is **main()**, and all the most trivial programs can define additional functions.

Advantage of functions in C

- By using functions, we can avoid rewriting same logic/code again and again in a program.
- We can call C functions any number of times in a program and from any place in a program.
- We can track a large C program easily when it is divided into multiple functions.
- Reusability is the main achievement of C functions.
- However, Function calling is always a overhead in a C program.

What is the purpose of a function prototype?

- function prototype specifies the input/output interlace to the function
- i.e. what to give to the function and what to expect from the function.
- It tells the return type of the data that the function will return.
- It tells the number of arguments passed to the function.
- It tells the data types of the each of the passed arguments.
- Also it tells the order in which the arguments are passed to the function.

Syntax

```
return_type function_name(data_type pa
rameter...)
{
//code to be executed
}
```

Example:

```
Void add()
{
//code to be executed
}
```

Conti...

```
int a = 10, b = 5, c;

int product(int x, int y);

int main(void)
{
   c = product(a,b);

   printf("%i\n",c);

   return 0;
}

int product(int x, int y)
{
   return (x * y);
}
```

Function Prototype

- int is the return type and int x and int y are the function arguments

Main Function

- int is always the return type and there are no arguments, hence the (void). Curly braces { } mark the start and end of the main function

Function call

- product(a,b); a and b are global variables the function is passed. Here the values returned by the function are assigned to the variable c

Function Definition

- contains the function statement return(x * y); the function returns x times y to the main function where it was called. Curly braces { } mark the start and end of the function

Conti...

Return Type – A function may return a value. The **return_type** is the data type of the value the function returns. Some functions perform the desired operations without returning a value. In this case, the return_type is the keyword **void**.

Function Name – This is the actual name of the function. The function name and the parameter list together constitute the function signature.

Conti...

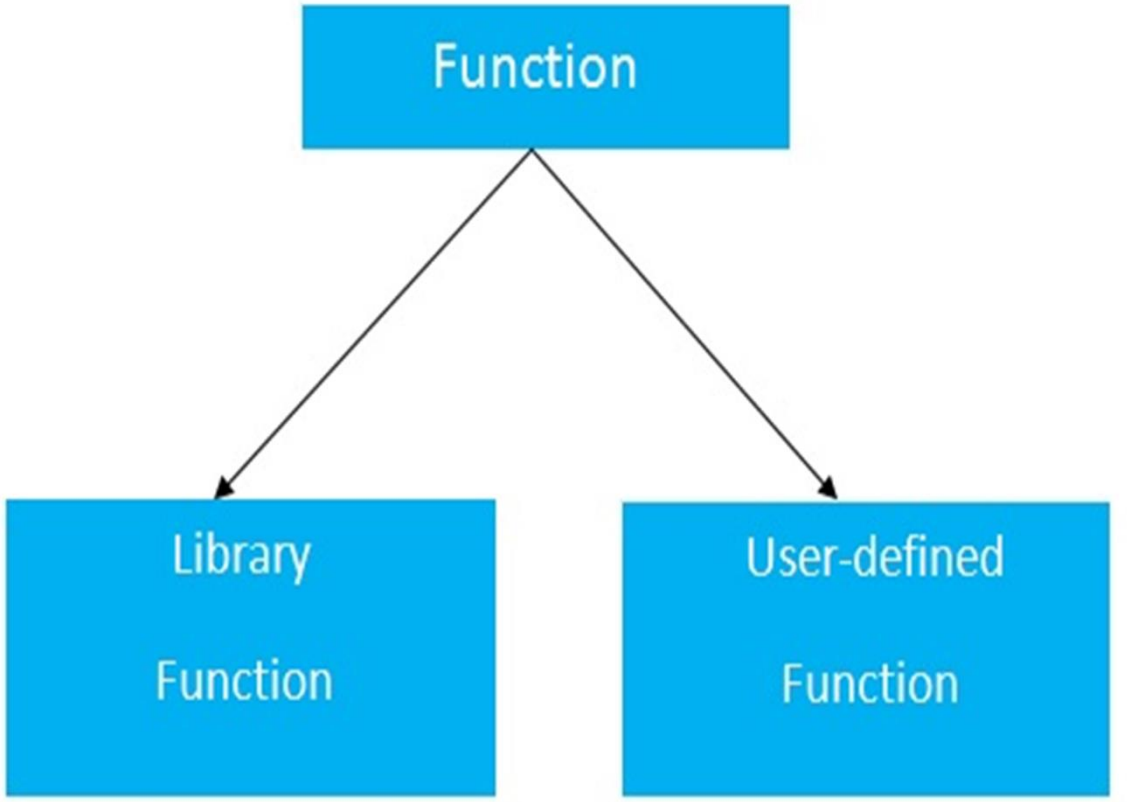
Parameters – A parameter is like a placeholder. When a function is invoked, you pass a value to the parameter. This value is referred to as actual parameter or argument. The parameter list refers to the type, order, and number of the parameters of a function. Parameters are optional; that is, a function may contain no parameters.

Function Body – The function body contains a collection of statements that define what the function does.

Example:without argument and return value

```
#include<stdio.h>
void printName();
void main ()
{
   printf("Hello ");
   printName();
}
void printName()
{
   printf(“This is function call example");
}
```

Types of Functions



Conti...

- There are two types of functions in C programming:
- **Library Functions**: are the functions which are declared in the C header files such as scanf(), printf(), gets(), puts(), ceil(), floor() etc.
- **User-defined functions**: are the functions which are created by the C programmer, so that he/she can use it many times. It reduces the complexity of a big program and optimizes the code.

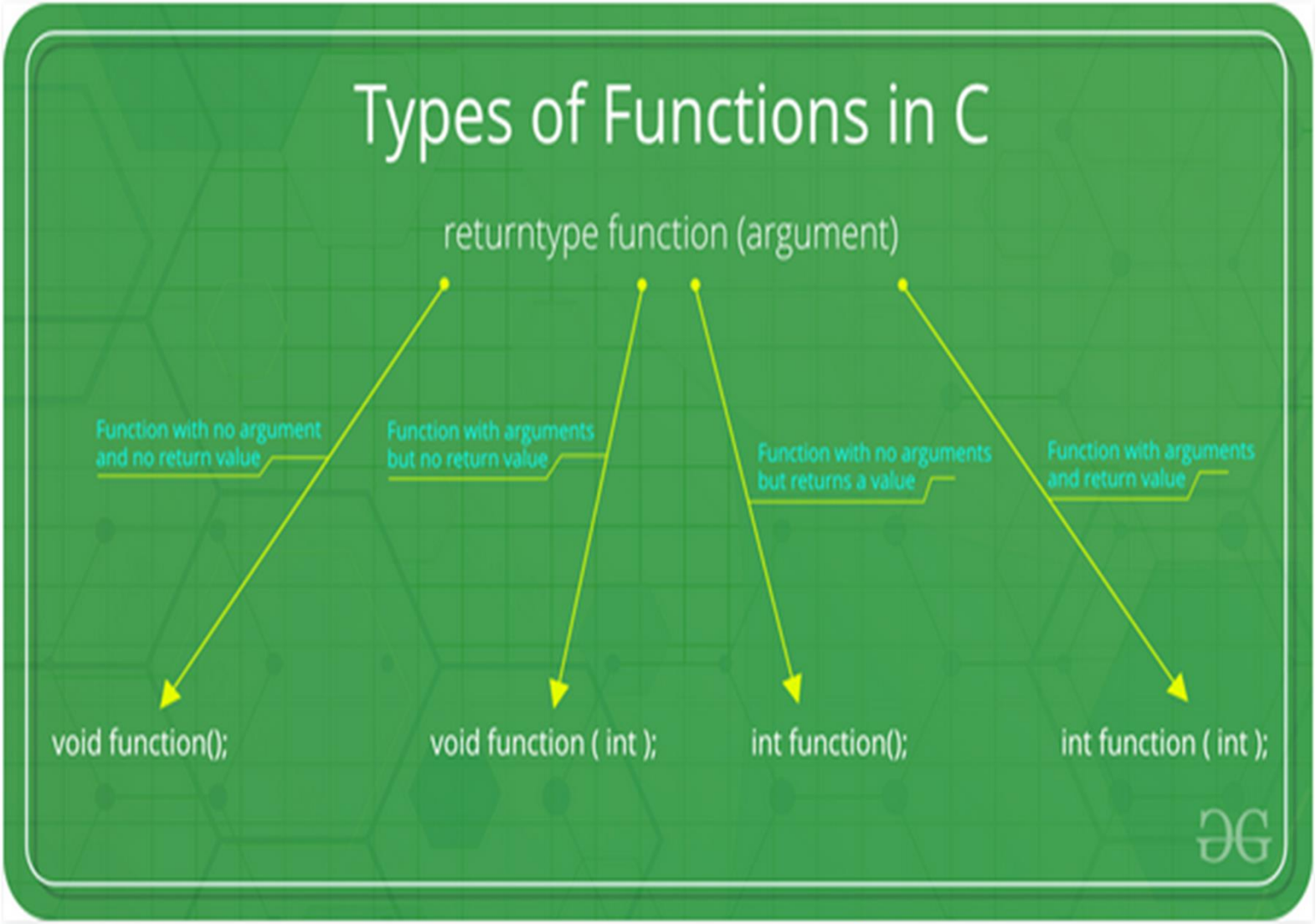
Function call

- The function call statement invokes the function. When a function is invoked the compiler jumps to the called function to execute the statements that are part of that function.
- There are four different aspects of function calls.

Types of function call

- function without arguments and without return value
- function without arguments and with return value
- function with arguments and without return value
- function with arguments and with return value

Conti...


Types of Functions in C
returntype function (argument)
Function with no argument and no return value
Function with arguments but no return value
Function with no arguments but returns a value
Function with arguments and return value
void function();
void function (int);
int function();
int function (int);

Example for Function without argument and return value

```
#include<stdio.h>
void printName();
void main ()
{
 printf("Hello ");
   printName();
}
void printName()
{
   printf("Javatpoint");
}
```

Example for Function without argument and with return value

```
#include<stdio.h>
int sum();
void main()
{
   int result;
   printf("\nGoing to calculate the sum of two num
    bers:");
   result = sum();
   printf("%d",result);
}
int sum()
{
   int a,b;
   printf("\nEnter two numbers");
   scanf("%d %d",&a,&b);
   return a+b;
}
```

Example for Function with argument and without return value

```
#include<stdio.h>
void sum(int, int);
void main()
{
   int a,b,result;
   printf("\nGoing to calculate the sum of tw
   o numbers:");
   printf("\nEnter two numbers:");
   scanf("%d %d",&a,&b);
   sum(a,b);
}
void sum(int a, int b)
{
   printf("\nThe sum is %d",a+b);
}
```

Example for Function with argument and with return value

```
#include<stdio.h>
int sum(int, int);
void main()
{
   int a,b,result;
   printf("\nGoing to calculate the sum of two num
    bers:");
   printf("\nEnter two numbers:");
   scanf("%d %d",&a,&b);
   result = sum(a,b);
   printf("\nThe sum is : %d",result);
}
int sum(int a, int b)
{
   return a+b;
}
```

Assessment 1

1. What is function?

Ans : _____

2. Write about function prototype?

Ans : _____

References

1. Reema Thareja, “Programming in C”, Oxford University Press, Second Edition, 2016

Thank You