

Assignment No.: 12

Q) What is mean by reference in C++? Explain with an example.

→ Reference is new added data type in C++.
The concept of reference is application in C++ & Java.

Reference is considered as derived data type.
when we create reference to an existing variable
it just considered as another name to that variable.
It is just another name so that there is no
separate memory allocation for variable.

To create a reference we use $\&$ (reference operator).

If the $\&$ operator use after assignment operator (RHS) then it considered as address of operator.

= $\&$ (Address of operator)

= RHS.

If the $\&$ operator used before assignment operator then is used as reference operator.

(Reference operator) $f =$

LHS $f =$

- we can also create reference which refer to any primitive data type.

- we can also create a reference which refer to pointers.

- when we create references The name of reference as well as name of original variable refer to same memory location. that's why address and value of both is same.

- If we change value of variable using its original name the value of reference variable changes automatically.

when we create reference variable its entry get inside the symbol table.
 Symbol table contain one column name as another name if contain reference name of variable.

e.g.

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
```

```
{ int no = 11;
```

```
 int & noref = no;
```

```
 int mrahul = 99;
```

```
 int & paplu = mrahul;
```

```
 int *ptr = &no;
```

```
 int *(&ptrref) = ptr;
```

```
 cout << "no :: " << no << "\n";
```

```
 cout << "noref :: " << noref << "\n";
```

```
 cout << "& no :: " << & no << "\n";
```

```
 cout << "& noref :: " << & noref << "\n";
```

```
 cout << "*ptr :: " << ptr << "\n";
```

```
 cout << "& ptrref :: " << *ptrref << "\n";
```

```
 no ++;
```

```
 cout << "no :: << no << "\n";
```

```
 cout << "noref :: " << noref << "\n";
```

```
 return 0;
```

```
}
```

Name	Address	Size	Value	Data Type	another name
no	100	4	11	int	
mrahul	200	4	99	int	noref
ptr	300	8	100	pointer	paplu ptrref

Q2) what's the difference pointer and reference?

→ Reference - The variable cannot be reassigned in reference.

Pointer - The variable can be reassigned in pointers.

Reference - It shares the same address as the original variable.

Pointer - pointers have their own memory address

Reference - It is referring to another variable.

Pointer - It storing the address of the variable.

Reference - It does not have null variable.

Pointer - It can have value assigned as null.

reference - this variable is referenced by the method pass by value.

Pointer - The pointer does it work by the method known as pass by reference.

Q3) Explain different ways to call a function in C++.

→ Call by value.

A copy of the actual parameter is passed to the function.

Any changes made to the parameter inside the function do not affect the original value.

call by Reference -

The actual parameter is passed to the function using references. changes made to the parameter inside the function directly affect the original variable.

Call by Pointer -

The address of the actual parameter is passed to the function. changes made using the pointer directly affect the original variable.

Call by Object

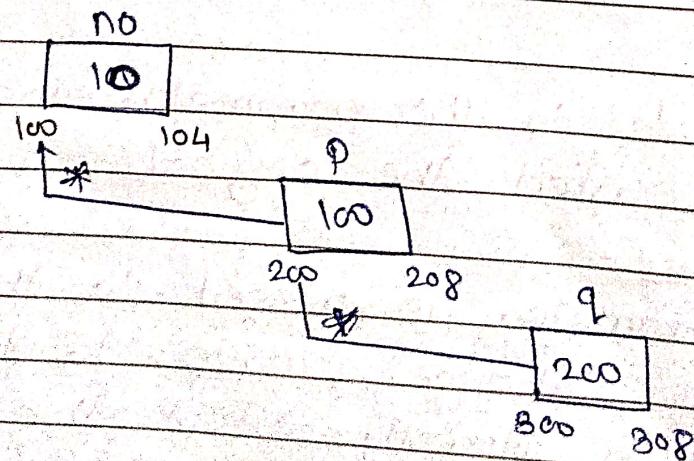
objects can be passed by value, reference, pointer, similar to primitive data types.

(Q4) Draw Symbol table for below Syntax.

I) `int no = 10;` // consider address of no as 100
`int * p = &no;` 1 200
`int **q = &p;` 1 300

name	Address	Size	Value	Data Type
no	100	4	10	int
p	200	8	100	Pointer
q	300	8	200	Pointer

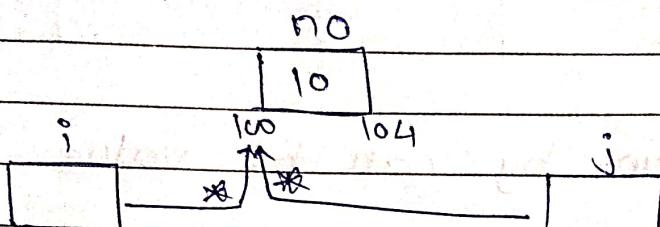
Q5) `int no = 10;` 1 100
`int * p = &no;` 1 200
`int **q = &p;` 1 300



Q6] int no = 10; // 100

int &i = no;

int &j = no;



Name

Address

size

value

Datatype

no

100

4

10

int

i

100

4

no

int

j

100

4

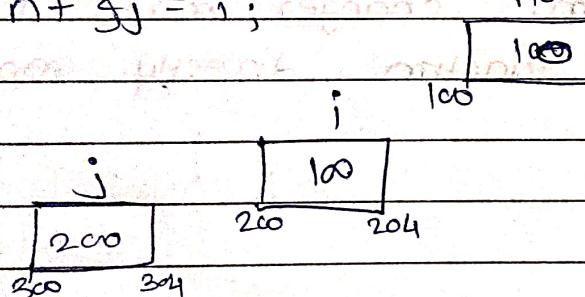
no

int

Q7] int no = 10; // 100

int &i = no;

int &j = i;



Name

Address

size

Value

Datatype

no

100

4

i

200

4

j

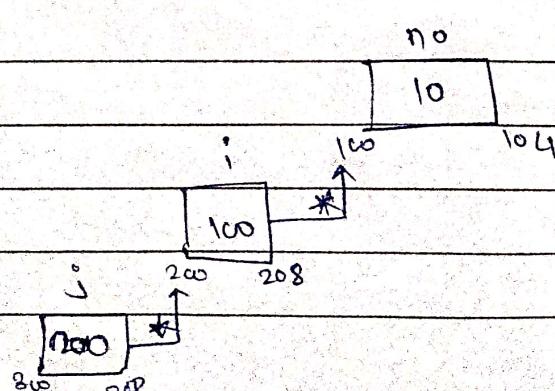
300

4

Q8] int no = 10;

int &i = &no;

int *(&j) = i;



Name	Address	Size	Value	datatype.

Q10) What is mean by call by value and call by reference.

→ Call by value -

In this a copy of the actual argument is passed to the function.

changes made to the parameter inside the function do not affect the original variable.

Call by Reference -

In this reference of the actual argument is passed to the function. changes made to the parameter inside the function directly modify the original variable.