References

References

- Reference is alias for variable
- How to declare and define reference

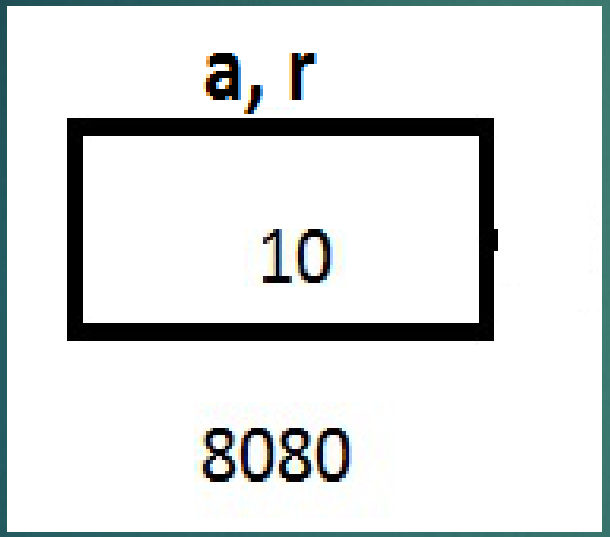
  int a=10;

  int &r =a;

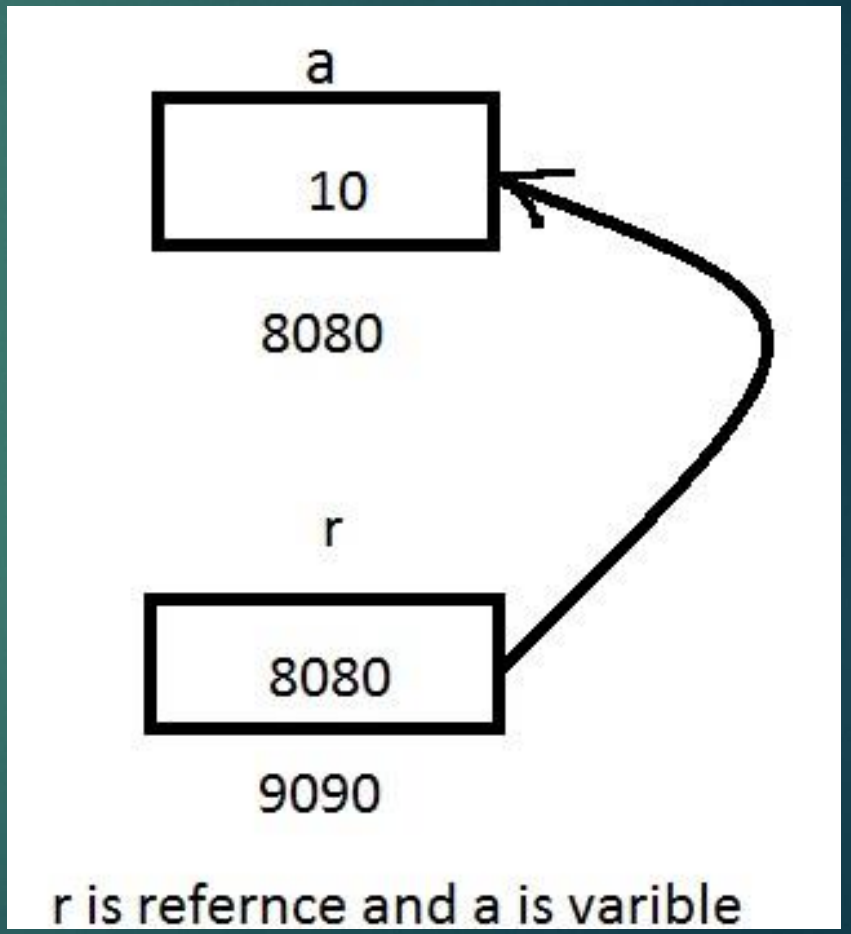
  Here r is reference to a(alias)
- Reference has to be initialized where it is declared but cannot be initialized with NULL
- Reference is internally a constant pointer hence needs to be initialized where it is declared

References

Conceptual representation



Internal representation



References

- References are auto dereferenced
- Change in reference will change original variable value.

```
int a=10;
int &r =a;
r = r+1;
cout<<"\n"<<r<<" "<<a; // will print 11 11
```

- Reference to const is also possible. It is also known as const reference.

```
const int &r = 12;
int k =10;
const int &r1=k;
```

References

- We can not access dynamically allocated memory using reference.
- We can change value of variable/constant using reference if reference is const reference.

```
const int &r = 12;
r = r+1; // Will generate error
```

- Pointer and reference declaration difference

```
int a=10;
int *p = &a;
int &r =a ; // only  LHS * is replaced by  RHS &
```

References

- Address of reference variable and variable is same.

```
int a=10;  //Lets us assume address of a is 8080
int &r =a; // Lets us assume address of r is 9090
cout<<&a; // Will print 8080
cout<<&r; // Will print 8080
// As reference is constant ptr internally and it is
   auto dereferenced  (&r) turns out to &(*r)
(*r) ==> a and hence (&r) becomes &a
```

References

- **Passing reference to function (pass by ref)**

```
void swap( int &ra , int &rb)
{ int  k = ra;
ra = rb;
rb =k; }
int main()
{ int a= 10; int b =20;
swap(a,b);
cout<<"\n"<<a<<"\n"<<b;
return 0;
}
```

References

- **Returning reference from function**

Returning reference of local variable from function will result in dangling pointer problem.

```
int&  sum(int a, int b)
{ int s = a+b;
return s;}
int main(){
int  c = sum(10,20);
cout<< c;
return 0;
} // This program will result in compilation error &segmentation fault
```

References

- Advantages of reference
  - Reference has clear and clean syntax
  - Reference is auto dereferenced
  - Minimize use of pointers

Thank You

Be happy, I minimize use of pointers!!!!

…… Reference