Week6
Lec3 :-

```
int a = 5;
int *p = &a;
int **q = &p
```

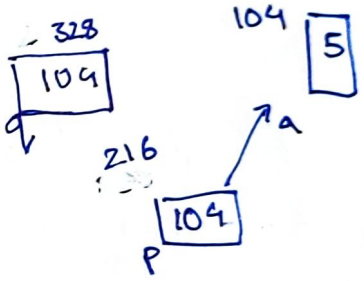
p is a pointer to int data

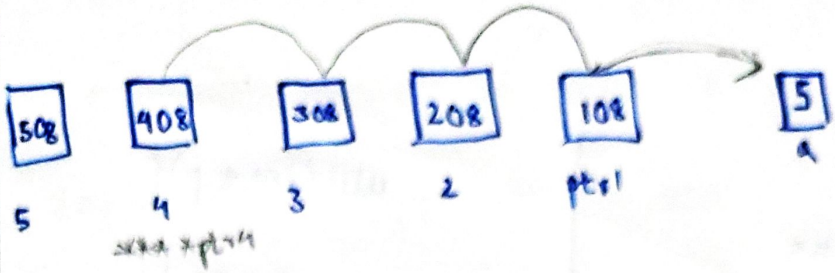
q is a pointer to int* data

Double Pointers :

```
int main(){
    int a = 5
    int * p = &a;
    int ** q = &p;

cout - &a - 104
       a - 5
       p - 104
       &p - 216
      *p - 5
       q - 216
      &q - 328
      *q - 104
     **q - 5
```





Function: -

```
void util (int * p){
    p = p+1;
}
int main(){
    int a = 5;
    int*p = &a;
    cout<<" before " << endl;
    cout <<a << endl;
    cout << p
         *p
    util (p);
    cout <<"after" <<endl;
    cout <<a
         <<p
         <<*p
    return 0;
}
```

```
main()
{
    int a=5
    int *p=&a
```

print a —— 5
p —— 104
*p —— 5

util(p)

print → a —— 5 — 6
p —— 104 — 104
*p —— 5 — 6

```
util(int* p){
    p = p+1;
    *p = *p+1;
}
```

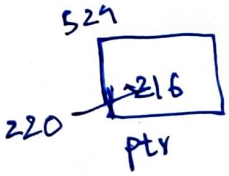
*104 = *104 + 1
5 + 1
*104 = 6

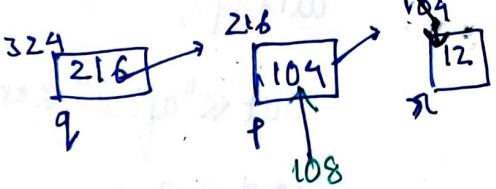
```
main(){
    int x=12;
    int* p=&x;
    int** q=&p
    solve(q)
    cout<<x<<endl;
}
```

no change

```
solve(int** ptr){
    ptr = ptr+1;
    *ptr = *ptr+1;
    // *(216)= *(216)+1;
    **ptr = **ptr+1;
}
```

12 13





*p → value present at loc^{n} stored in p

**q → value present at location stored in *q

Reference variable :- Same memory, different name - locations

- We cannot set reference variable to '0' (NULL).
- Pointers are difficult to understand.
- ✓ Readibility easy hoti hai.
- Generally pass by reference ~~vatta~~ k liye use hota hai.

```
main()
{
    int a = 5
    int &b = a;
    →print a - 5
     print b - 5

    a++;
    print a → 6
    print b → 6
```

```
    b++;
    → print a - 7
      print b - 7
```

Pass by value

```
main() {
    int a=5;
    solve(a)
    cout<<a;
}
```

```
solve(int a) {
    a++;
}
```

a: 5 → 6

5 // print hoga

Pass by reference

```
main() {
    int a=5;
    solve(a);
    cout<<a
}
```

```
solve(int & value){
    value++;
}
```

value → 6

6

```
void solve ( int *& p) {
    p++;
}
int main(){
    int a=5;
    int* p=&a;
    cout<<" before "<<p<<endl;
    solve(p);
    cout<<" after "<<p<<endl;
    return 0;
}
```

jo bhi pointer pass hua hai use by reference pass krdo

before 0x7ffc23166780

after 0x7ffc23166790

H.W: Return by reference

HW:

```
int * solve( ){
        int a=5;
        int *ans =&a;
        return ans;
}
```

Bhot dhyan se solve krna hai!
Interview mei askta hai!
Differentiating factor!