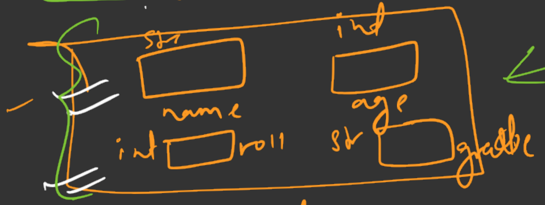
Object Oriented Programming

It is an approach or a programming pattern where the program are structured around Object rather than Function and Logic

```
int main () {
    string name;
    int age, roll nu. ;
    string grade;
```

— Student

Student S10



```
{ String name1
  int age1 , roll1
  String grade1 }
```

Student2

Student 3

Student — data type

$\boxed{\text{user defined data type}}$

Student S1

$\boxed{\text{Object}}$

Object

Student Season1

```
Class   Student
{  Private:
   String  name;
   int     age, roll_nu;
   string  grade;
   Public:
   void Setname (String n) {
       name = n;
   }
};
```

```
void setage( int age){
   age = age
}
```

```
int  main () {
   Student  S1;
   S1.setname ("Mohit")
   S1. setage (24)


}
```

Public
Private
Protected

$$\begin{tikzcd}
 & \text{Class} \arrow[dl, dash] \arrow[dr, dash] & \\
\underline{\text{data}} & & \underline{\text{fun}} \\
\text{Attribute} & & \text{method}
\end{tikzcd}$$

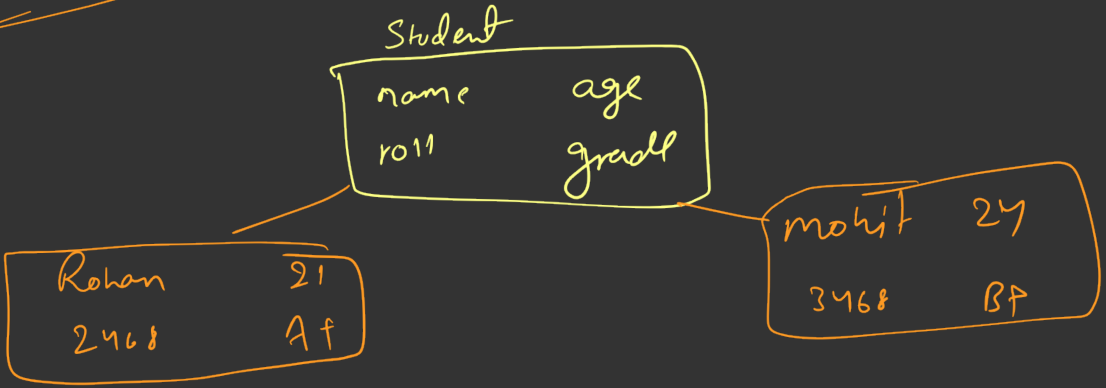
Class

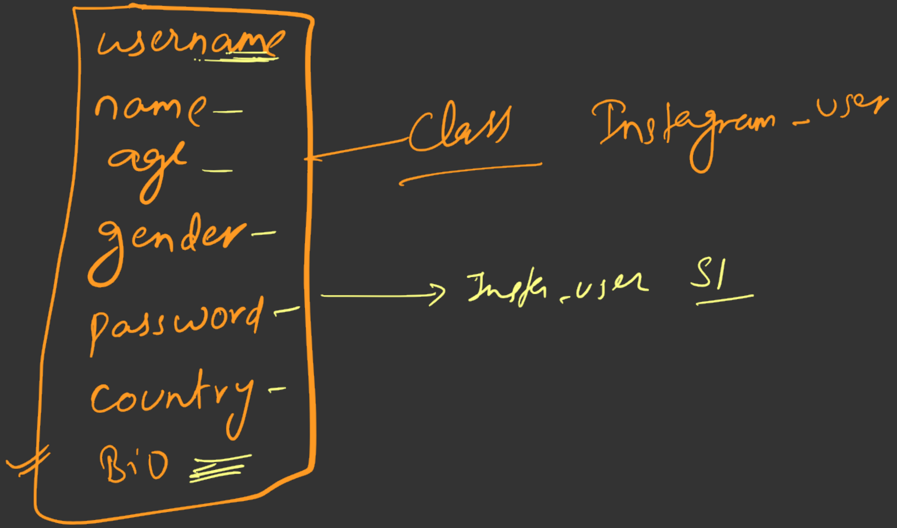
It is user defined data type Blueprint for creating objects

$\boxed{S1}$

Object

It is an Entity that has a state and behavior
Anything that exit in physical world




username
name –
age –
gender –
password –
country –
Bio
Class Instagram_user
Insta_user S1

car

name
Tyre
Model

Punch, i10, Bolero, GLC 300, X1, X5

Name - punch

Tyre - MRF 4
model - β

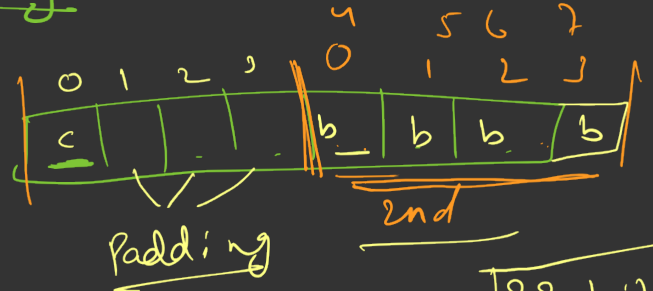
```
Class   a {
      .          ,
      char c;
      int  b;
};

int  main ( )
  {
     a   obj1;
     cout << sizeof (obj)
  }
```

~~Sizeof~~   8 byte

4 byte
5 byte

Padding

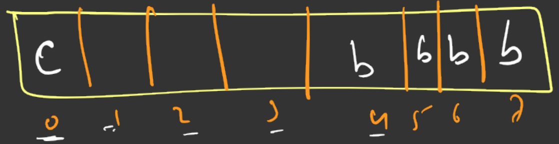
```
{
  char c
  int b
};
```



cycle

8 byte

8 byte



b

4 byte

32 bit OS
64 bit OS

128 bit OS

1 byte = Mul

1 byte : multi of 1
2 byte = " " 2
4 byte = " " 4
8 byte = " " 8

8 byte

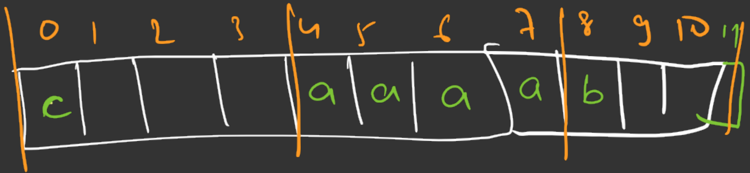
char c	1byte
int a	4byte
char b	1byte

8byte

12byte

$\boxed{4}$ allinment

char c
char b
int a

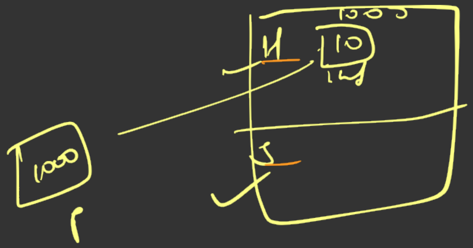


Greedy allign

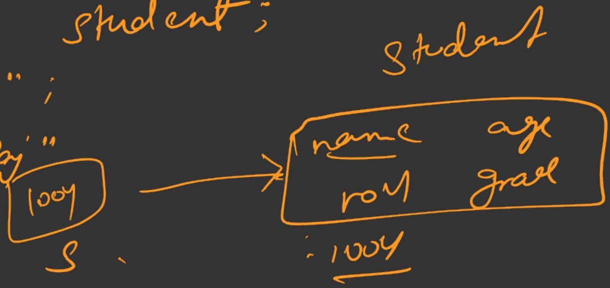
int a
char b
char c

Static vs Dynamic Memory Allocation

```
int *p = new int

*p = 10;

student *s = new student;
(*s).name = "Raj";
s -> name = "Raj"
```



1000
1000
p
H
10
int
S



student
1004
s
name
age
roll
grad
1004