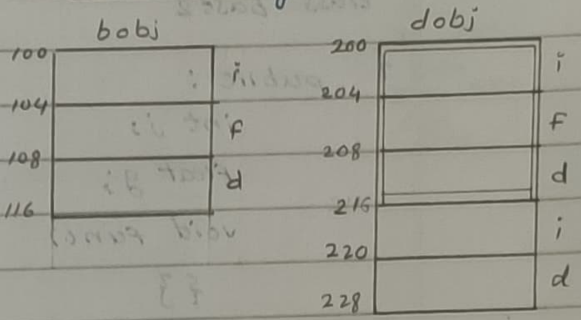
Assignment - 20

1. Draw object layout of below code snippets and explain its internal working.

1.

```
class    base
  {
       public:
        int i;
         float f;
          double d:
          void fun()
           {}
           void gun()
           {}
  };
class derived : public base
  {
       public:
        int i;
        double d;
          void gun()
          {}
          void fun()
          {}
  }:
  int    main()
  {    base bobj;
       derived dobj;
       return 0;
  }
```

- Object Layout:



- All function stored on text section.

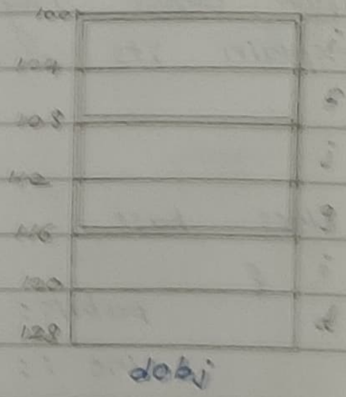
- Internal working:

- In above code. single level inheritance used.
- class derived inherites properties of its parent. base class.
-

2.
```
class base1
{ public:
      int i;
      Float f:
      void gun()
        { }
};

class base2
{  public:
        int j;
        Float g;
        void fun()
          { }
};
class derived : public base1, base2
{
   public:
      int i;
      double d:
      void sun()
        { }
      void fun()
        { }
 };
int main()
{
   derived dobj;
      return 0;
 }
```

- object layout:



- Internal working:

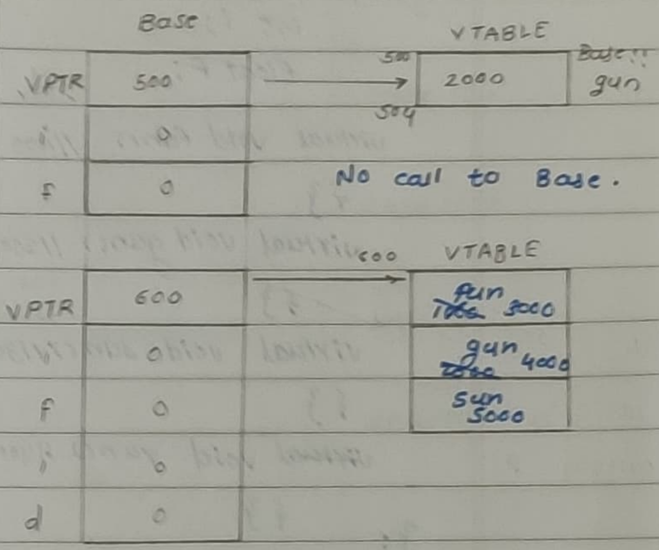
- in above code snippet multiple inheritance is used.

- class base1 and base share their data with class derived.

3.
```
class base
{
    public:
        int i;
        float f;
        void fun()      //1000
        {}
        virtual void gun()  //2000
        {}
};
class derived : public base
{
    public:
        int i;
        double d;
    virtual void fun() // 3000
        {}
        void gun()  //4000
        {}
        virtual void sun() //5000
        {}

int main ()
{
    derived dobj;
    return 0;
}
```

- Object Layout



- internal working
- The above code snippet demotstrates the concept of overriding.

- internal working

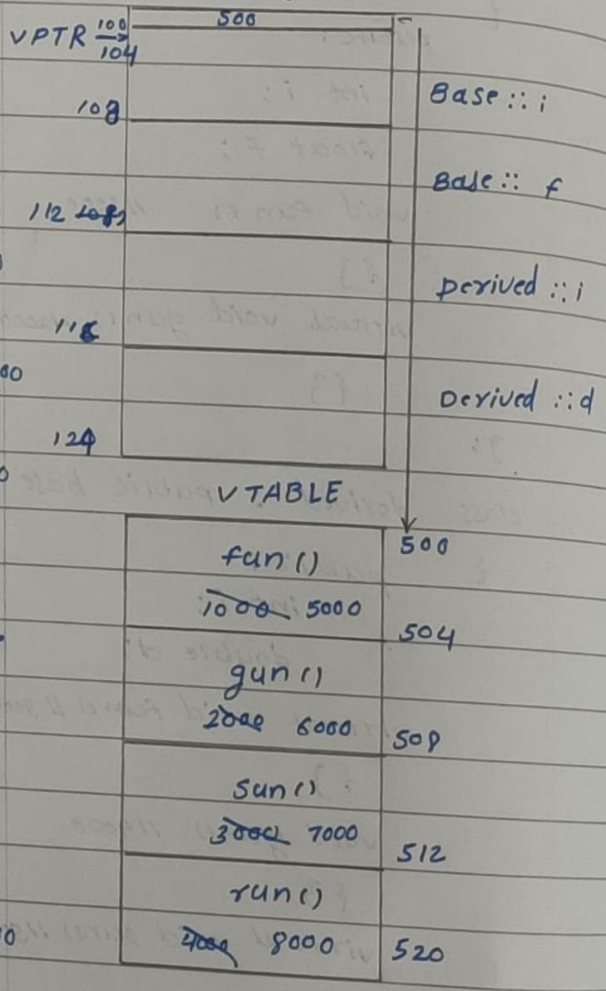
```
4.    class base
    { public:
          int i;
          float f;
      virtual void fun()  //1000
        {}
       virtual void gun() //2000
          {}
       virtual void sun() //3000
        {}
      ~~virtual~~ void run() //4000
            {}
    };

   class derived : public base
     {
        public:
           int i:
             double d:
       virtual void fun() //5000
            {}
         virtual void gun() //6000
          {}
      virtual void sun() //7000
            {}
        Virtual void run() //8000
           {}
   }:

    int main () {
          derived ~~d~~obj;
            return 0;
     }
```

• object Layout :

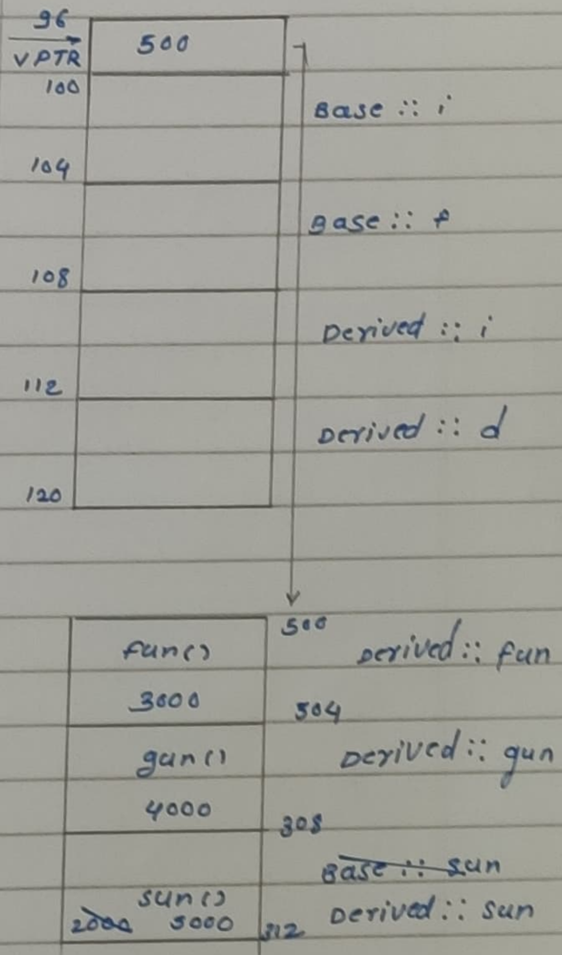
dobj



```
5.     class  base
   {
        public:
            int i;
            float f;
       void  gun()     //1000
        {}
       virtual void  sun() //2000
          {}
   };
   class  derived  :  public base
    {
        public:
             int i;
             double d;
       virtual void  fun() //8000
           {}
           void  gun() // 4000
            {}
           virtual void  sun() //5000
            {}
    };
     int   main()
     {
           derived dobj;
              return 0;

     }
```

• object Layout :


96
VPTR
500
100
Base :: i
104
Base :: f
108
Derived :: i
112
Derived :: d
120
500
fun()
Derived :: fun
3000
504
gun()
Derived :: gun
4000
308
~~Base :: sun~~
sun()
Derived :: sun
~~2000~~
5000
312