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Output of C++ Program | Set 8

Predict the output of following C++ programs.

Question 1

```
#include<iostream>
using namespace std;

class Test1
{
    int x;
public:
    void show() { }
};

class Test2
{
    int x;
public:
    virtual void show() { }
};

int main(void)
{
    cout<<sizeof(Test1)<<endl;
    cout<<sizeof(Test2)<<endl;
    return 0;
}
```

Output:

4

8

There is only one difference between Test1 and Test2. show() is non-virtual in Test1, but virtual in Test2. When we make a function virtual, compiler adds an extra pointer vptr to objects of the class. Compiler does this to achieve run time polymorphism (See chapter 15 of [Thinking in C++ book](#) for more details). The extra pointer vptr adds to the size of objects, that is why we get 8 size of Test2.





QUESTION 2

```
#include<iostream>
using namespace std;
class P
{
public:
    virtual void show() = 0;
};

class Q : public P {
    int x;
};

int main(void)
{
    Q q;
    return 0;
}
```

Output: Compiler Error

We get the error because we can't create objects of abstract classes. P is an abstract class as it has a pure virtual method. Class Q also becomes abstract because it is derived from P and it doesn't implement show().

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