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FACULTY OF ENGINEERING & TECHNOLOGY

CSPS103: Object Oriented Programming

Lecture-29

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OBJECTIVES

In this lecture, you will learn to:

- **Pure virtual functions**
- **Example Of Pure Virtual Functions**

PURE VIRTUAL FUNCTIONS

- Sometimes when a virtual function is declared in the base class, there is no meaningful operation for it to perform.
- This situation is common because often a base class does not define a complete class by itself.
- Instead, it simply supplies a core set of member functions and variables to which the derived class supplies the remainder.
- When there is no meaningful action for a base class virtual function to perform, the implication is that any derived class must override this function.
- To ensure that this will occur, C++ supports pure virtual functions.
- A pure virtual function has no definition relative to the base class.
- Only the function prototype is included.

PURE VIRTUAL FUNCTIONS (Contd.)

Pure virtual function can be defined as:

virtual type func-name(parameter-list) = 0;

- The key part of this declaration is the setting of the function equal to 0. This tells the compiler that no body exists for this function relative to the base class.
- When a virtual function is made pure, it forces any derived class to override it.
- If a derived class does not, a compile-time error results.
- Thus,making a virtual function pure is a way to guaranty that a derived class will provide its own redefinition.

EXAMPLE OF PURE VIRTUAL FUNCTIONS

```
#include <iostream.h>
class Base
{
    public:
    virtual void show() = 0;
};
class Derived : public Base
{
    public:
    void show()
    {
        std::cout << "Derived class is derived from the base class." << std::endl;
    }
};
```

EXAMPLE OF PURE VIRTUAL FUNCTIONS (Contd.)

```
int main()
{
    Base *bptr;
    //Base b;
    Derived d;
    bptr = &d;
    bptr->show();
    return 0;
}
```

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Multiple Choice Question:

Q1. Which class is used to design the base class?

a) abstract class

b) derived class

c) base class

d) derived & base class

Multiple Choice Question:

Q2. Which is used to create a pure virtual function?

a) $

b) =0

c) &

d) !

Multiple Choice Question:

Q3. Which is also called as abstract class?

a) virtual function

b) pure virtual function

c) derived class

d) base class

Multiple Choice Question:

Q4. What is meant by pure virtual function?

a) Function which does not have definition of its own

b) Function which does have definition of its own

c) Function which does not have any return type

d) Function which does not have any return type & own definition

Multiple Choice Question:

Q5. Pick out the correct option.

a) We cannot make an instance of an abstract base class

b) We can make an instance of an abstract base class

c) We can make an instance of an abstract super class

d) We can make an instance of an abstract derived class

Summary

In this lecture, you learned that:

- A virtual function is not used for performing any task. It only serves as a placeholder.
- When the function has no definition, such function is known as "do-nothing" function.
- The "do-nothing" function is known as a pure virtual function. A pure virtual function is a function declared in the base class that has no definition relative to the base class.