National University of Computer and Emerging Sciences

Lab Manual 10
Object Oriented Programming – CL1004

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Lab Manual 10 – Inheritance

Important Note:

- **You may find the syntax to accomplish these exercises from lecture demo.**
- **Add Necessary Comments in you code to justify your logic.**
- **Comment exercise number or statement at the start of your code**
- **Save each exercise in .cpp file with your roll no, ex and lab number e.g.**
- **22LXXXX_EX01_Lab01.cpp**
- **Place all of your exercises in a folder a Zip it (Do not create .rar file) with roll no and lab no. e.g. 22LXXX_Lab01.zip**
- **Make sure that the interface of your program is user friendly i.e. properly display information.**
- **Properly follow the coding standards.**

1. Exercise:

Implement a class called Tool. It should have an int field called strength and a char field called type. You may make them either private or protected. The Tool class should also contain the function void setStrength(int), which sets the strength for the Tool.

Create 3 more classes called Rock, Paper, and Scissors, which inherit from Tool. Each of these classes will need a constructor which will take in an int that is used to initialize the strength field. The constructor should also initialize the type field using 'r' for Rock, 'p' for Paper, and 's' for Scissors.

These classes will also need a public function bool fight(Tool) that compares their strengths in the following way:

- Rock's strength is doubled (temporarily) when fighting scissors, but halved (temporarily) when fighting paper.
- In the same way, paper has the advantage against rock, and scissors against paper.
- The strength field shouldn't change in the function, which returns true if the original class wins in strength and false otherwise.

You may also include any extra helping functions and/or fields in any of these classes. Run the program without changing the main function, and verify that the results are correct.

```
#include <iostream>

using namespace std;

class Tool {
    /* Fill in */
};

/*
```

```
	Implement class Scissors
*/

/*
	Implement class Paper
*/

/*
	Implement class Rock
*/

int main() {
	// Example main function
	// You may add your own testing code if you like

	Scissors s1(5);
	Paper p1(7);
	Rock r1(15);
	cout << s1.fight(p1) << p1.fight(s1) << endl;
	cout << p1.fight(r1) << r1.fight(p1) << endl;
	cout << r1.fight(s1) << s1.fight(r1) << endl;

	return 0;
}
```