LBYEC72

Computer Fundamentals : Programming 2

Pre-requisite: LBYEC71(Soft)

Engr. Melvin Kong Cabatuan

De La Salle University

Manila, Philippines

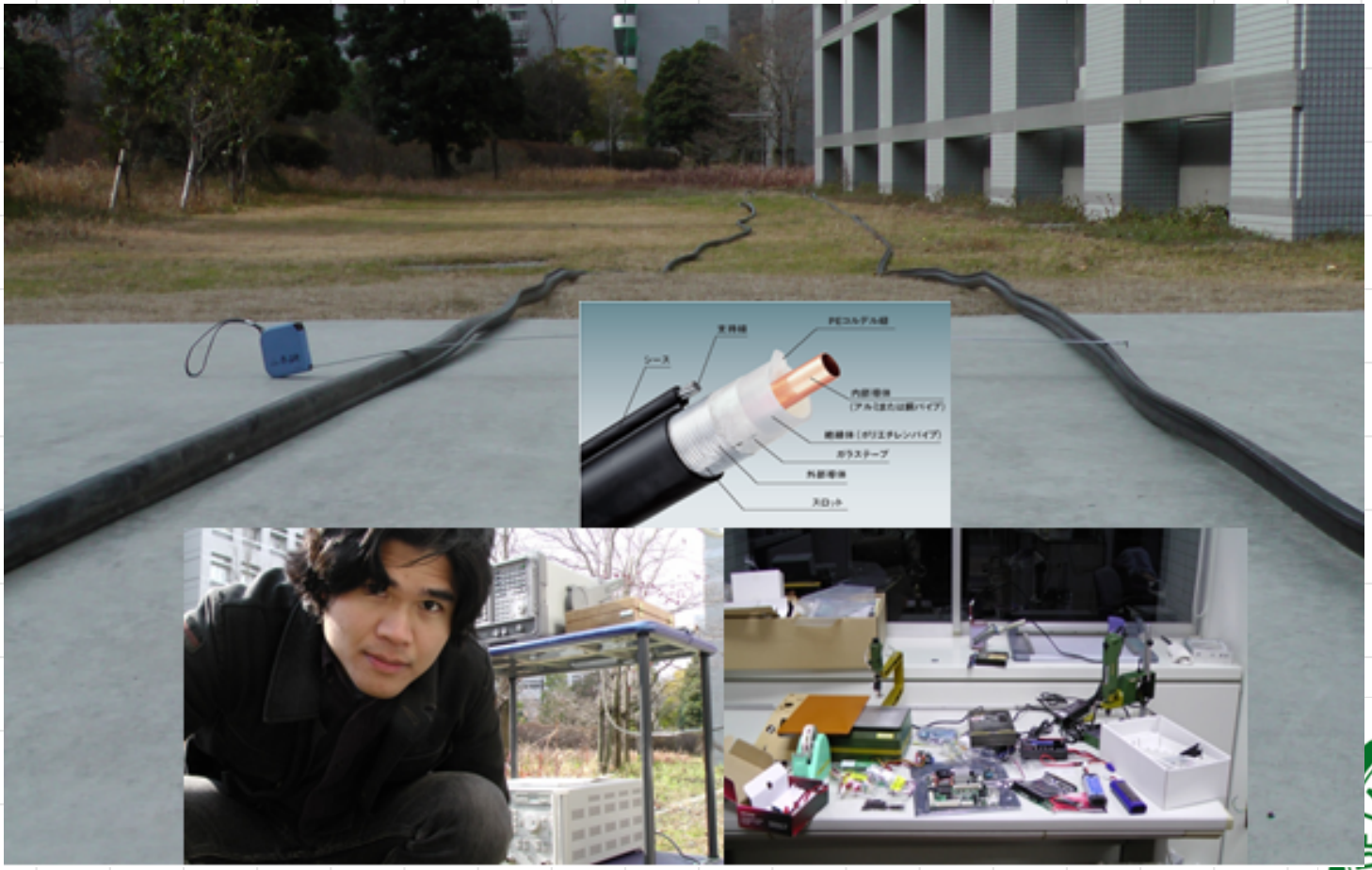
January 2013

Self Introduction

Melvin K. Cabatuan, MsE, Ph.D. Cand

- Masters of Engineering, NAIST (Japan)
- Thesis: Cognitive Radio (Wireless Communication)
- ECE Reviewer/Mentor (Since 2005)
- 2nd Place, Nov. 2004 ECE Board Exam
- Test Engineering Cadet, ON Semiconductors
- DOST Academic Excellence Awardee 2004
- Mathematician of the Year 2003
- DOST Scholar (1999-2004)
- Panasonic Scholar, Japan (2007-2010)

On Doing Research




DE LA SALLE UNIVERSITY
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MANILA

Course Contents

- Review of Conditional and Iterative Statements, Arrays, and Strings
- Topic 1: Nested Conditional and Iterative Statements
- Topic 2: Single-Dimensional and Multi-dimensional Arrays
- Topic 3: Strings, String Arrays, and String Manipulation Functions
- **Practical Exam 1**
- Discussion on Pointers, Functions, and Structures

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- Topic 4: Pointers
- Topic 5: Functions and Pass-by-value
- Topic 6: Functions and Pass-by-reference
- Topic 7: Structures, Structure Array, and Complex Data Type
- Topic 8: Structures, Structure Pointers, and Passing of References
- **Practical Exam 2**
- Discussion on Dynamic Memory Allocation and Exercise

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References

1. LBYEC72 Laboratory Manual
2. Books and other online sources

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Evaluation Criteria

Average of Preliminary Reports:	20%
Average of Final Reports:	20%
Project:	30%
Practical Examination I :	15%
Practical Examination II :	15%
Total:	100%

PASSING GRADE: 70%

Preliminary Report

1. Preliminary Reports are written and completed prior to the end of every laboratory sessions using your EC72 journal.
2. Preliminary Reports are checked 30 minutes before the end of every session.
3. Preliminary Reports are individual.

Final Report

1. Final Reports should be submitted one week after the topic.
2. Late reports will receive a 10 % deduction per week.
3. Final Reports are done by pair.

Project

1. Students may develop a project proposal or follow the project specifications given by the instructor.
2. Projects are done by groups with a maximum of three members.

Programming Review: Hello World!

Problem 1

Given the quadratic equation $ax^2 + bx + c = 0$. Write a simple program that implements the following quadratic formula:

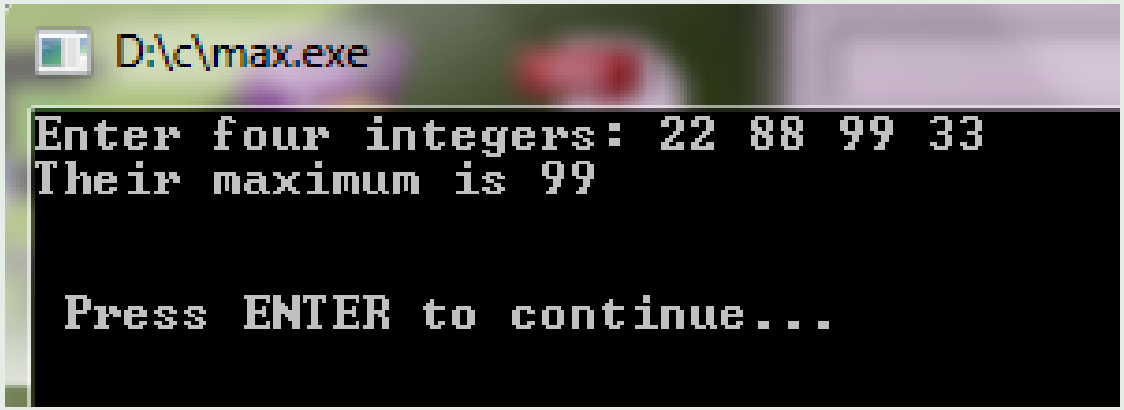
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Sample Answer:

```
int main()
{ // implements the quadratic formula
  double a,b,c;
  cout<<"Enter the coefficients of a quadratic equation:\n";
  cout<<"\t a =  "; cin>>a;
  cout<<"\t b =  "; cin>>b;
  cout<<"\t c =  "; cin>>c;
  cout<<" The equation is : " <<a<<"*x*x + "<<b<<"*x + "<<c<<" = 0 \n";
  double d = b*b - 4*a*c; //discriminant
  if (d<0)
  {
          cout<<"The discriminant, d = "<<d<<" < 0, so there are no real solution\n.";
          cin.ignore(256,'\n'); // scaffolding
          cout << "\n\n Press ENTER to continue..." << endl;
          cin.get();
          return 0;
  }
  double x1 = (-b+sqrt(d))/(2*a);
  double x2 = (-b-sqrt(d))/(2*a);
  cout<<"The solutions are: \n";
  cout<<"\t x1 = "<<x1<<endl;
  cout<<"\t x2 = "<<x2<<endl;
  cout<<"Check: \t a*x1*x1 + b*x1 + c = "<< a*x1*x1 + b*x1 + c ;
  cout<<"  \t a*x2*x2 + b*x2 + c = "<< a*x2*x2 + b*x2 + c ;
  cin.ignore(256,'\n'); // scaffolding
  cout << "\n\n Press ENTER to continue..." << endl;
  cin.get();
}
```

Problem 2

Write a program that prints the maximum of four given integers.

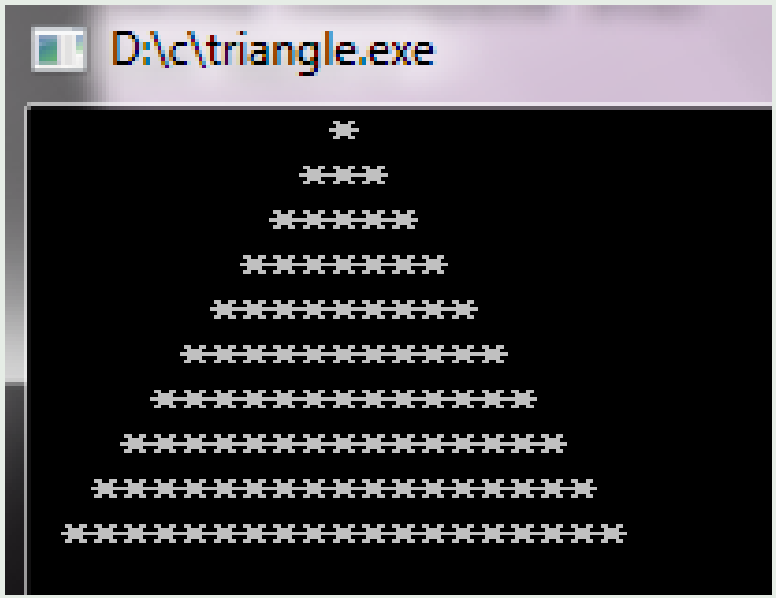


Sample Answer:

```
#include <iostream>
using namespace std;
int main()
{
    int n1, n2, n3, n4;
    cout<<"Enter four integers: "; cin>>n1>>n2>>n3>>n4;
    int max = n1;
    if (n2>max) max=n2;
    if (n3>max) max=n3;
    if (n4>max) max=n4;
    cout<<"Their maximum is "<<max<<"\n";
    cin.ignore(256,'\n'); // scaffolding
    cout << "\n\n Press ENTER to continue..." << endl;
    cin.get();
}
```

Problem 3

Write a program that prints a tringle of stars shown in the following figure:

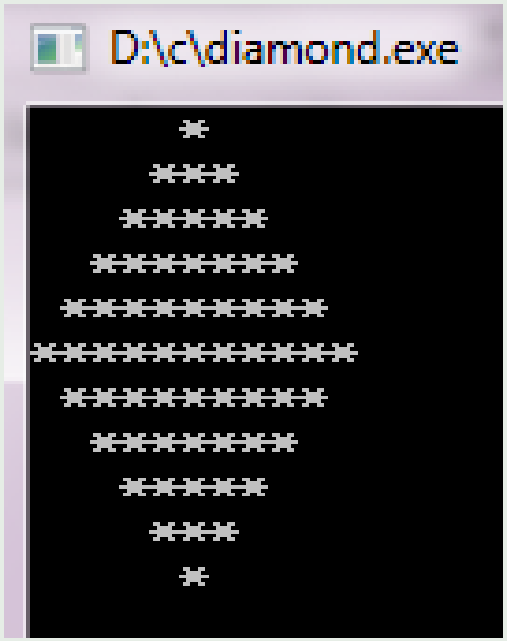


Sample Answer:

```
#include <iostream>
using namespace std;
int main()
{
    const int N=10;
    for (int i=0; i<N; i++)
    {
        for (int j=0; j<2*N; j++)
            if (j<N-i || j>N+i) cout << " ";
            else cout<<"*";
        cout <<"\n";
    }
    cin.ignore(256,'\n'); // scaffolding
    cout << "\n\n Press ENTER to continue..." << endl;
    cin.get();
}
```

Problem 4

Write a program that prints a diamond of stars shown in the following figure:



Sample Answer:

```
#include <iostream>
using namespace std;
int main()
{
    const int N=5;
    for (int i=0; i<=2*N; i++)
    {
        for (int j=0; j<=2*N; j++)

          if(i<=N)
            if (j<N-i || j>N+i) cout << " ";
            else cout<<"*";
          else
             if (j<i-N || j>3*N-i) cout << " ";
             else cout<<"*";

        cout <<"\n";
    }
    cin.ignore(256,'\n'); // scaffolding
    cout << "\n\n Press ENTER to continue..." << endl;
    cin.get();
}
```

END

“ Thank you for your attention ”