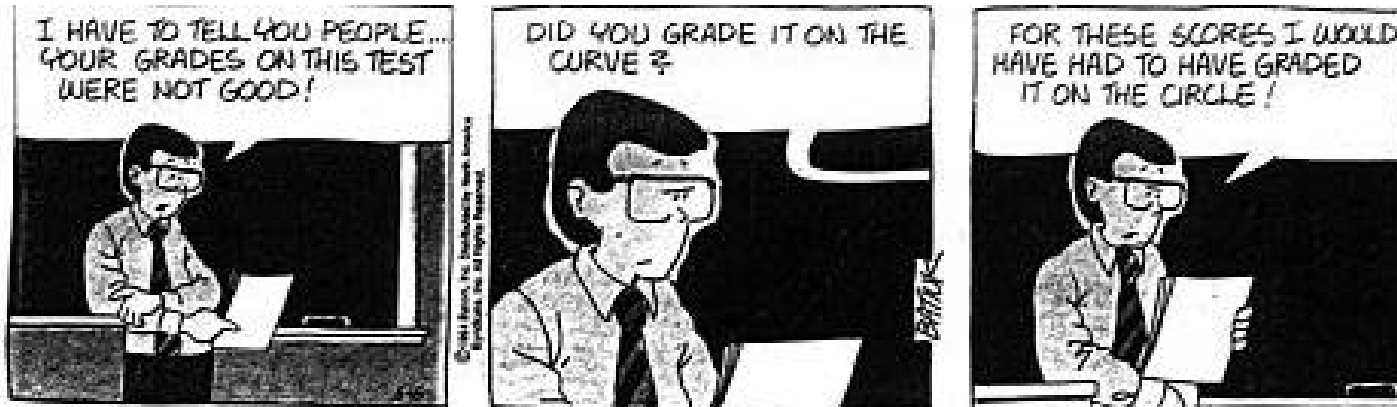


ORF 201
COMPUTER METHODS FOR PROBLEM SOLVING

Lecture 12
Post Review



(C) Princeton University

Inner Product

```
int j;  
double z;  
  
z = 0;  
for (j=0; j<n; j++) {  
    z += x[j]*y[j];  
}
```

Avg.java

```
import myutil.*;
import ccj.*;

public class Avg
{
    public static void main(String[] args)
    {
        double avg;
        avg = (1.+2.+3.+4.+5.+6.+7.+8.+7.+6.+5.
              +4.+3.+2.+1.)/15;
        System.out.println("average = "+avg);
    }
}
```

Avg2.java – Brute Force

```
import myutil.*;
import ccj.*;

public class Avg2
{
    public static void main(String[] args)
    {
        int n;
        double x0, x1, x2, x3, x4, x5, x6, x7, x8,
                x9, x10, x11, x12, x13, x14;
        double avg;
        n = 15;
        x0 = 1.; x1 = 2.; x2 = 3.; x3 = 4.; x4 = 5.;
        x5 = 6.; x6 = 7.; x7 = 8.; x8 = 7.; x9 = 6.;
        x10 = 5.; x11 = 4.; x12 = 3.; x13 = 2.; x14 = 1.;
        avg = 0;
        avg = avg + x0;
        avg = avg + x1;
        avg = avg + x2;
        avg = avg + x3;
        :
        avg = avg + x11;
        avg = avg + x12;
        avg = avg + x13;
        avg = avg + x14;

        avg = avg/n;

        System.out.println("average = "+avg);
    }
}
```

Avg3.java – Arrays

```
import myutil.*;
import ccj.*;

public class Avg3
{
    public static void main(String[] args)
    {
        int n;
        double[] x;
        double avg;

        n = 15;
        x = new double[n];

        x[0] =1.; x[1] =2.; x[2] =3.; x[3] =4.; x[4] =5.;
        x[5] =6.; x[6] =7.; x[7] =8.; x[8] =7.; x[9] =6.;
        x[10]=5.; x[11]=4.; x[12]=3.; x[13]=2.; x[14]=1.;

        avg = 0;
        avg = avg + x[0];
        avg = avg + x[1];
        avg = avg + x[2];
        avg = avg + x[3];
        .
        avg = avg + x[11];
        avg = avg + x[12];
        avg = avg + x[13];
        avg = avg + x[14];

        avg = avg/n;

        System.out.println("average = "+avg);
    }
}
```

Avg4.java – Arrays with Loops

```
import myutil.*;
import ccj.*;

public class Avg4
{
    public static void main(String[] args)
    {
        int i;
        int n;
        double[] x;
        double avg;

        n = Console.in.readInt("Enter how many numbers: ");
        x = new double[n];

        for(i=0; i<n; i++) {
            x[i] = Console.in.readDouble("Enter x["+i+"]: ");
        }

        avg = 0;
        for(i=0; i<n; i++) {
            avg = avg + x[i];
        }
        avg = avg/n;

        System.out.println("average = "+avg);
    }
}
```

Avg5.java – Method

```
import myutil.*;
import ccj.*;
public class Avg5
{
    public static void main(String[] args)
    {
        int i, n;
        double[] y;
        double myaverage;
        n = Console.in.readInt("Enter how many numbers: ");
        y = new double[n];
        for(i=0; i<n; i++) {
            y[i] = Console.in.readDouble("Enter y["+i+"]: ");
        }
        myaverage = computeAvg(y, n);
        System.out.println("average = "+avg);
    }
    static double computeAvg(double[] x, int n)
    {
        int i;
        double avg;
        avg = 0;
        for(i=0; i<n; i++) {
            avg = avg + x[i];
        }
        avg = avg/n;
        return avg;
    }
}
```

Power

```
double pow (double z, int n)
{
    int j;
    double p = 1.0;
    if (n>0) {
        for (j=0; j<n; j++) {
            p *= z;
        }
    } else {
        for (j=0; j<-n; j++) {
            p /= z;
        }
    }
    return p;
}
```

PassArray.java

```
import java.io.*;

public class PassArray {
    static String output;
    public static void main(String[] args)
    {
        int i, n=5;
        int a[] = { 1, 2, 3, 4, 5 };
        System.out.println("Effect of passing an array:");
        System.out.println("Values of the original array are: ");
        output = "";
        for (i=0; i<n; i++) {
            output += " "+a[i];
        }
        System.out.println(output);
        modifyArray( a, n );
        System.out.println("Values of the modified array are: ");
        output = "";
        for (i=0; i<n; i++) {
            output += " "+a[i];
        }
        System.out.println(output);
        System.out.println("Effect of passing an array element:");
        System.out.println("a[3] before modifyElement: " + a[3]);
        modifyElement(a[3]);
        System.out.println("a[3] after modifyElement: " + a[3]);
    }
}
```

PassArray.java -- Continued

```
static public void modifyArray( int b[], int m )
{
    int j;
    for (j=0; j<m; j++) {
        b[j] *= 2;
    }
}
static public void modifyElement( int e )
{
    e *= 2;
}
}
```