# GE3 COMPUTER SCIENCE

## C AND C ++ LECTURE SERIES *FOR*

## B.SC 3RD SEMESTER *BY*

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**LECTURE 5**

# COMPILE AND RUN A C CODE

Overall program strategy

The details associated with the individual program

The "*top-down*" programming

The *pseudocode*

# COMPILE AND RUN A C CODE

## Compound Interest Calculation

```
#include <stdio.h>
#include <math.h>

main()

{
    float p, r, n, i, f;

    /* read input data (including prompts) */

    printf("Please enter a value for the principal (P): ");
    scanf("%f", &p);
    printf("Please enter a value for the interest rate (r): ");
    scanf("%f", &r);
    printf("Please enter a value for the number of years (n): ");
    scanf("%f", &n);

    /* calculate i, then f */

    i = r/100;
    f = p * pow((1 + i),n);

    /* display the output */

    printf("\nThe final value (F) is: %.2f\n", f);
}
```

# COMPILE AND RUN A C CODE

## ERROR DIAGNOSTICS

1. The second include statement does not begin with a # sign.
2. The control string in the second p r i n t f statement does not have a closing quotation mark.
3. The last scanf statement does not end with a semicolon.
4. The assignment statement for f contains unbalanced parentheses.
5. The last comment closes improperly (it ends with / * instead of * /).

```
#include <stdio.h>
include <math.h>

main()

{
    float p, r, n, i, f;

    /* read input data (including prompts) */

    printf("Please enter a value for the principal (P): ");
    scanf("%f", &p);
    printf("Please enter a value for the interest rate (r): );
    scanf("%f", &r);
    printf("Please enter a value for the number of years (n): ");
    scanf("%f", &n)

    /* calculate i, then f */

    i = r/100;
    f = p * pow(1 + i),n);

    /* write output /*

    printf("\nThe final value (F) is: %.2f\n", f);
}
```

# COMPILE AND RUN A C CODE

## Real Roots of a Quadratic Equation

$$ax^2 + bx + c = 0$$

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

```
a=1.0       b=2.0       c=3.0

sqrt: DOMAIN error
```

```
#include <stdio.h>
#include <math.h>

main()

{
    float a, b, c, d, x1, x2;

    /* read input data */

    printf("a = ");
    scanf("%f", &a);
    printf("b = ");
    scanf("%f", &b);
    printf("c = ");
    scanf("%f", &c);

    /* carry out the calculations */

    d = sqrt(b * b - 4 * a * c);
    x1 = (-b + d) / (2 * a);
    x2 = (-b - d) / (2 * a);

    /* display the output */

    printf("\nx1 = %e      x2 = %e", x1, x2);
}
```

# COMPILE AND RUN A C CODE

## Error Isolation

Locating an error resulting in a diagnostic message

If the general location of the error is not known

Delete a portion temporarily

If the error message then disappears

Deleted portion contains the error

```
printf("Debugging - line 1\n");
printf("Debugging - line 2\n");
```

# COMPILE AND RUN A C CODE

## Breakpoint

Temporary stopping point

- The execution may then be resumed, until the next breakpoint is encountered.
- To set a breakpoint in Turbo **C++,**

1. **Add Breakpoint** from the **Debug menu**
2. **Resulting dialog box**

OR

1. **Select a particular line**
2. **Function key F5.**

# COMPILE AND RUN A C CODE

## Stepping

The execution of one instruction at a time.

Function key F7  OR function key F8

Allows you to trace the entire history of a program

# COMPILE AND RUN A C CODE

# Thank You

End of Lecture 5

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