Tutorial - Week 2

Objectives:
To discuss basic elements of C such as
- general structure of a C program
- variable declarations and data types
- input / output
- arithmetic expressions

1. Which of the following declarations are correct? If incorrect, give the reason:

```
a. int numStudents = 370;
b. int numLabs = 45.5;
c. double    1value, 2value;
d. char grade = 'P';
e. char stLevel = A;
f. char pinNum = 117;
g.      number = 24;
h. #define PI = 3.1416;
```

2. Assuming the following variable declarations, what output is produced by `printf()`?

```
int numOfModules = 15, moduleCode = 7; float
width = 65.243, height=38.159;
char secLevel = 'B';
```

a. printf("Number of Modules=%6d\n", numOfModules);

   Displayed Output: [   ]

b. printf("Module Code = %04d\n", moduleCode);

   Displayed Output: [   ]

c. printf("Width = %-8.2fHeight = %-8.2f\n", width, height);

   Displayed Output: [   ]
d. printf("Dimensions = %.1f x %.1f mm\n", width, height);

   Displayed Output: [   ]

e. printf("Security Level:%3c\n", secLevel);

   Displayed Output: [   ]

3. Is `scanf()` used correctly?

```
    float x, y;

    a. scanf("Enter a number: %f", &x);
    b. scanf( "%d" , &x);
    c. scanf( "%3f", &x);
    d. scanf( "%f, %f", &x, &y);
```

4. **Correct mistakes in the program that converts a temperature in Fahrenheit to Celsius: Celsius = 0.55*(fahrenheit − 32)**

```
#include <stdio.h>
#define   COEFF = 0.55
int main(void)
{
    float celsTemp, fahrTemp

    printf(' Enter the temperature in Fahrenheits: ');
    scanf("%f",    fahrTemp );
    celsTemp = COEFF *    fahrTemp - 32;
    printf("Celsius temperature = %.1f" , fahrtemp );

    return 0;
}
```

5. **Which of the following declarations are correct? If incorrect, give the reason:**

```
a. char productType = 'V';
b. char minutes = 45;
c. char days = 172;
d. char value = -15;
e. float width = 32.157e2;
f. int length = width;
```

6. **What value will be assigned to the variables (taking into account all preceding operations)**

```
int intRes, number = 5;
float fpRes;
char     grade = 'A';
```

```
a. intRes = 10/3;
b. intRes = 10%3;
c. intRes = 15/2/3;
d. fpRes = 15.0/2;
e. intRes = number++;
f. intRes = ++number;
g. intRes = (7 + 3)/2;
h. intRes += 4;
i. fpRes = intRes/2;
j. fpRes = (float)intRes/2;
k. grade += 2;
```

7. **Evaluate the following:**

```
float fa = 29.0, fb = 10.0, fc = 10.37;
int ia;

a. ia = (int)(fa/fb);
b. ia = fa/fb;
c. How to round a float to the nearest int?
d. How to assign only the integer part of fc to fa?
```

8. **Specify the** lvalue **and** rvalue **in the following statements?**

```
int a, b=1;

a. a = 1;
b. ++a;
c. b = b + a;
d. a = b++;
e. b = 10++;
f. b = ++(1-a);
```

9. **Write the #define preprocessor directive and declarations for a program that has a constant macro for PI (3.14159) and variables radius, area, and circumf declared as double, variable num_circ as an int, and variable circ_name as a char.**

10. **Write a statement that displays the following line with the value of the type int variable n before the period.**

```
The value of n is _____.
```

11. **Assuming that side and area are type double variables containing the length of one side in cm and the area of a square in square cm, write a statement that will display this information in this form:**

```
The area of a square whose side length is _____ cm is _____ square cm.
```

12. **Show how the value −3.6175 would be printed using the formats %8.4f, %8.3f, %8.2f, %8.1f, %8.0f, %.2f.**