COMP1602: Computer Programming II
Lab #9

1. Without using a C++ compiler, determine what is the output produced by the following two programs.

(a)

```
#include <iostream>
using namespace std;

int main() {

        int x;
        int * num1;
        int * num2;

        num1 = new int;

        x = 10;
        *num1 = 20;
        num2 = &x;

        cout << "*num1 = " << *num1;
        cout << " and *num2 = " << *num2;
        cout << endl;

        return 0;
}
```

(b)

```
#include <iostream>
using namespace std;

int main() {
        int y;
        int * num1;
        int * num2;

        num1 = new int;
        num2 = num1;

        *num1 = 20;
        num1 = &y;
        y = 100;

        cout << "*num1 = " << *num1;
        cout << " and *num2 = " << *num2;
        cout << endl;

        return 0;
}
```

2. Without using a C++ compiler, determine what is the output produced by the following two programs.

(a)

```
#include <iostream>
using namespace std;

int foo (int x) {
        int * y;

        y = &x;
        *y = *y + 25;

        cout << "x = " << x;
        cout << " and *y = " << *y;
        cout << endl;

        return x;
}

int main() {

        int x = 10;
        int y;

        y = foo (x);

        cout << "x = " << x;
        cout << " and y = " << y;
        cout << endl;

        return 0;
}
```

(b)

```
#include <iostream>
using namespace std;

int * foo (int x) {
        int * y;

        y = new int;
        *y = x * 10;

        return y;
}

int main() {

        int x = 10;
        int * y;

        y = foo (x);

        cout << "x = " << x;
        cout << " and *y = " << *y;
        cout << endl;

        return 0;
}
```

3. Without using a C++ compiler, determine what is the output produced by the following two programs.

(a)

```
#include <iostream>
using namespace std;

void foo (int x, int y) {

        int temp;

        temp = x;
        x = y;
        y = temp;

        cout << "x = " << x;
        cout << " and y = " << y;
        cout << endl;
}

int main() {
        int num1 = 10;
        int num2 = 20;

        foo(num1, num2);

        cout << "num1 = " << num1;
        cout << " and num2 = " << num2;
        cout << endl;

        return 0;
}
```

(b)

```
#include <iostream>
using namespace std;

void foo (int * x, int y) {
        *x = 100;
        y = 200;

        cout << "*x = " << *x;
        cout << " and y = " << y;
        cout << endl;
}

int main() {
        int num1 = 10;
        int num2 = 20;

        foo(&num1, num2);

        cout << "num1 = " << num1;
        cout << " and num2 = " << num2;
        cout << endl;

        return 0;
}
```

4. We wish to store the following information on a video game: the name of the video game, its genre, its user rating (out of 10), and its sales ranking (a unique number from 1 to 10) [See Question 2 from Coursework Exam #1].

(a) Write a struct called *Game* to store the data on a video game.

(b) Write a function with the following heading which accepts the address of *Game* struct as a parameter and displays all the information stored about the game on the monitor:

```
void displayGame (Game * game)
```

(c) Write a function with the following heading which accepts the address of *Game* struct and a value for the user rating as parameters and updates the user rating of the *Game* struct:

```
void updateUserRating (Game * game, int userRating)
```

(d) Write a *main* function which creates memory for a *Game* struct using the **new** operator, requests data for the struct from the user, and stores the data in the relevant fields of the *Game* struct. Your program should then display the data stored about the *Game* struct on the monitor.

Finally, your program should request the user to enter a new value for *userRating*, update the *Game* struct accordingly, and then re-display the data stored about the *Game* struct on the monitor.

5. (a) Write a function *swap* with accepts the addresses of two integer variables as parameters and exchanges the values stored at these addresses. The function has the following heading:

```
void swap (int * x, int * y)
```

(b) Write a *main* function which stores two integer values entered by the user at the keyboard in the variables *num1* and *num2* and then exchanges the values in *num1* and *num2* by calling the function *swap*.

6. Question 1 from Coursework Exam 1.

End of Lab #9