

Homework Assignment #1

1 Watch this 14 minutes long YouTube (Pre-Algebra 3- Decimal, Binary, Octal and Hexadecimal) (at <https://www.youtube.com/watch?v=5sS7w-CMHkU>) which explains the different numbers system very well! Afterwards, practice converting numbers between difference bases.

(a) $(89)_{10} = (?)_2$, i.e., converting 89 in decimal to binary

(b) $(534)_8 = (?)_{10}$ i.e., from octal to decimal

(c) $(1A3)_{16} = (?)_{10}$

(d) $(1A3)_{16} = (?)_2$ Note that you can just write every hexadecimal digit using 4 binary digits.

2 Find and fix logic errors in the following statements.

(a)

```
// if x is 1, increase y by 1; if x is 2, increase y by 2
if (x=1) y++; else if (x=2) y=y+2;
```

(b)

```
//test if x does fall inside the range of [1,10] ...
if (1 <=x <=10) cout <<"x is in the range of [1,10]\n";
```

(c)

```
//Check if string variable s stores a valid US coin name
if (s != "nickel" || s!="penny" || s!="dime" || s!="quarter")
    cout <<"Wrong name for coins\n";
```

(d)

```
//by default language is English. If the country is USA and the state is
//PR, then set the language to Spanish. If the country is Germany, set the language
//to German.
string language="English";

if (country=="USA")
```

```

    if (state=="PR") language="Spanish";
    else if (country=="Germany")
        language="German";

```

- 3 For each of the variables in the following program, indicate its scope by stating the lines in the code where its visible. Then determine what the program displays in the terminal.

```

1. int a=0;
2. int b=0;

3. int f (int c)
4. {
5.     int n = 0;
6.     a = c;
7.     if (n < c)
8.         n = a + b;
9.     return n;
10.}
11.
12. int g (int c)
13.{
14.    int n = 0;
15.    int a = c;
16.    if (n < f(c))
17.        n = a + b;
18.    return n;
19.}

20. int main ()
21. {
22.     int i = 1;
23.     int b = g(i);
24.     cout << a + b + i << endl;
25.     return 0;
26. }

```

- 4 Complete the function declaration for a function that updates the **largest** parameter, if the **current** parameter value is greater than that of **largest**. The function body is shown here:

```

//If the value of current is larger than largest, set largest to
// current; otherwise, largest remains the same
// e.g.,
// int max=0;
// SetLargest (max, 100); //should set max to 100
// SetLargest (max, 87); //should not change max, as 87 is smaller than max
void SetLargest (
)
{
    if (largest < current)
    {
        largest = current;
    }
}

```

5 What does each of the following code snippets display in the terminal? Explain by showing your work in tracing the program (please refer to the handout about code tracing).

- ```
#include <iostream>
void prevnext(int a, int& prv, int nxt)
{
 prv = a - 1;
 nxt = a + 1;
}
int main()
{
 int a = 100;
 int b = 0;
 int c = 0;
 prevnext(a, b, c);
 cout << "Previous = " << b << ", Next = " << c;
 return 0;
}
```

- ```
int main()
{
    int num=278;
    int d[4]={0,0,0,0};
    int i=0, d_len=0;

    while (num!=0){
        d[i] = num % 10;
        num = num/10;
        i++;
    }

    cout <<"Content of d" <<endl;
    for (i=0;i<4;i++)
        cout <<d[i]<<endl;
}
```