ET-580 – Classes II - Practice

1. Default Constructor and Accessors.
   a. Implement a class *Person*:
      1. Private data members: *name*, *age*
      2. Define these functions out-of-line:
         a. default constructor sets data member values: *"noname", 0*
         b. *name* accessor as a const member function
         c. *age* accessor as a const member function

   b. Instantiate one *Person* object and print the data

Example Output
```
noname 0
```

2. Modify the previous program. Multiple Constructors and inline.

   a. Convert all member functions to inline
   b. Implement a two-parameter constructor
   c. Update default constructor to use constructor delegation
   d. Instantiate two *Person* objects (one per constructor) and print data

Example Output
```
noname 0
Donald Duck 100
```

3. Modify the previous program. Composition by value.

   a. Implement a class *Address* above the *Person* class:
      1. Private data member: *location*
      2. Define these member functions:
         a. one-parameter constructor
         b. default constructor with constructor delegation,
            set data member value: *"location"*
         c. Accessor to return *location* as a const member function
         d. Mutator to modify *location*

   b. Add the following to the *Person* class:
      1. Private data member: *home* (type *Address*)
      2. Address accessor to return *home* as a string
      3. Three-parameter constructor to accept an *Address* as a string
      4. Three-parameter constructor to accept an *Address* object

c. Add a non-member output function to print a *Person* object (see example)

d. Create an *Address* object in main with the string
"222-05 56th Ave. Bayside NY"

e. Instantiate three *Person* objects in main with these functions:
1. Two-parameter *Person* constructor
2. Three-parameter *Person* constructor with *home* parameter as string
3. Three-parameter *Person* constructor with *Address* parameter as object

f. Print all *Person* objects using the output function

Example Output
```
Name: Minnie Mouse Age: 75
Address: location
Name: Donald Duck Age: 75
Address: 5150 Beech Street NoTown USA
Name: Mickey Mouse Age: 100
Address: 222-05 56th Ave. Bayside NY
```

4. Modify the previous program. Composition by reference.

a. Update the *Person* class:
1. Convert *home* to an *Address* reference
2. Remove all constructors
3. Add three-parameter constructor to accept an *Address* by reference
4. Add *getAddObj*() function to return *home* object by reference

b. Remove all existing code from main

c. Create an *Address* object in main with the string
"222-05 56th Ave. Bayside NY"

d. Print the memory address of this *Address* object

e. Create a *Person* object in main using the *Address* object

f. Print the *Person* object from main

g. Use *getAddObj*() to print the memory address of *home* in *Person*

h. Verify that the *Address* object in main and home are the same object
(they have the same memory address)

Example Output
```
Name: Mickey Mouse Age: 100
Address: 222-05 56th Ave. Bayside NY
```