CHAPTER ELEVEN

Data Types Revisited

[A] What will be the output of the following programs:

(a)
```
# include <stdio.h>
int main( )
{
    int i ;
    for ( i = 0 ; i <= 50000 ; i++ )
        printf ( "%d\n", i ) ;
    return 0 ;
}
```

Output:

```
0
1
..
..
50000
```

(b)
```
# include <stdio.h>
int main( ) .
{
    float a = 13.5 ;
    double b = 13.5 ;
    printf ( "%f %lf\n", a, b ) ;
    return 0 ;
}
```

Output:

```
13.500000  13.500000
```

(c)
```
# include <stdio.h>
int  i = 0 ;
void val( ) ;
int main( )
{
    printf ( "main's i = %d\n", i ) ;
    i++ ;
    val( ) ;
    printf ( "main's i = %d\n", i ) ;
    val( ) ;
    return 0 ;
}
void val( )
{
    i = 100 ;
    printf ( "val's i = %d\n", i ) ;
    i++ ;
}
```

Output:

```
main's i = 0
val's i = 100
main's i = 101
val's i = 100
```

(d)
```
# include <stdio.h>
int f ( int ) ;
int g ( int ) ;
int main( )
{
    int  x, y, s = 2 ;
    s *= 3 ;
    y = f ( s ) ;
    x = g ( s ) ;
```

```
    printf ( "%d %d %d\n", s, y, x ) ;
    return 0 ;
}
int t = 8 ;

int f ( int a )
{
    a += -5 ;
    t -= 4 ;
    return ( a + t ) ;
}
int g ( int a )
{
    a = 1 ;
    t += a ;
    return ( a + t ) ;
}
```

Output:

```
6  5  6
```

(e)

```
# include <stdio.h>
int main( )
{
    static int  count = 5 ;
    printf ( "count = %d\n", count-- ) ;
    if ( count != 0 )
        main( ) ;
    return 0 ;
}
```

Output:

```
count = 5
count = 4
count = 3
count = 2
count = 1
```

(f)
```
# include <stdio.h>
int g ( int ) ;
int main( )
{
    int i, j ;
    for ( i = 1 ; i < 5 ; i++ )
    {
        j = g ( i ) ;
        printf ( "%d\n", j ) ;
    }
    return 0 ;
}
int g ( int x )
{
    static int v = 1 ;
    int b = 3 ;
    v += x ;
    return ( v + x + b ) ;
}
```

Output:

```
6
9
13
18
```

(g)
```
# include <stdio.h>
int main( )
{
    func( ) ;
    func( ) ;
    return 0 ;
}
void func( )
{
    auto int i = 0 ;
    register int j = 0 ;
```

```
    static int k = 0 ;
    i++ ; j++ ; k++ ;
    printf ( "%d %d %d\n", i, j, k ) ;
}
```

Output:

```
1 1 1
1 1 2
```

(h)
```
# include <stdio.h>
int x = 10 ;
int main( )
{
    int x = 20 ;
    {
        int x  = 30 ;
        printf ( "%d\n", x ) ;
    }
    printf ( "%d\n", x ) ;
    return 0 ;
}
```

Output:

```
30
20
```

[B] Point out the errors, if any, in the following programs:

(a)
```
# include <stdio.h>
int main( )
{
    long  num ;
    num = 2 ;
    printf ( "%d\n", num ) ;
    return 0 ;
}
```

No Error

(h) The default value for automatic variable is zero.

Answer: False

(i) The life of static variable is till the control remains with the block in which it is defined.

Answer: False

(j) If a global variable is to be defined, then the exter keyword is necessary in its declaration.

Answer: False

(k) The address of register variable is not accessible.

Answer: True

(l) A variable that is defined outside all functions can also have a static **storage** class.

Answer: True

(m) One variable can have multiple storage classes.

Answer: False