King Saud University
College of Computer and Information Sciences
Computer Science Department
CSC 340: Programming Language and Compilation
Three Address Code and Code Generating

Q1. Translate each of the following arithmetic expressions into a) Quadruples b) Triples.

1. a + -(b+c)

2. Y * Z + 7 * 6

3. Y + Z * W

Q2. How many labels are needed to be created in converting each of the following code segments to machine code?

1.
```
if ( X >7 )
{ y=1;
printf("...");
}
else
  { y=2;
printf("...");
}
```

2.
```
X=10;
printf(".....");
```

3.
```
While (Y<X)
{
  if ( X >7 )
   {…}

  …..
}
```

4.
```
 while(Y<X)
{…
   while(YY==XX)
              { ….}
  }
```

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Q3.
The following figure is a matrix elements initialization code segment.

a) **Translate the program into *three-address statements* (Triplets). Assume the matrix entries are numbers that require 8 bytes, and that matrices are stored in row-major order.**
b) **Construct the flow graph for your code from (a).**
c) **Identify the loops in your flow graph from (b).**

```
for (i=O; i<n; i++)
   for (j=O; j<n; j++)
      c[i][j] = 0.0;
```