Name:…… Q4

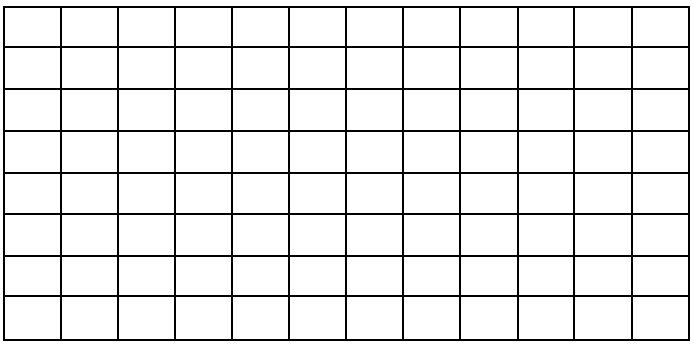
CS 1713 Intro to Programming II

1. (5pt) Trace the following C program: Show the output and how the values of each variable change in memory:

```
#include <stdio.h>

int main(void)
{
   /* Declare variables. */
   int i, j;

   for(i=1; i<=6; i++) {
      if (i%2==0) continue;
      j = i;
      while(j <= 6) {
         if (j%2 != 0)
            printf("+ ");
         else
            printf("o ");
         j++;
      }
      for(j=1; j<=i; j++) {
          printf("* ");
      }
      printf("\n");
   }

   /*  Exit program.  */
   return 0;
}
```

MEMORY

Values of i	Values of j



Suppose this is the screen.

2. (5pt) Write a C program that asks user to enter a value for *n* from the keyboard. For example, suppose user enters 5 for n. Then your program should produce the following triangle.

```
    *
   ++
  ***
 ++++
*****
```

```
#include <stdio.h>
#include <math.h>

int main(void)
{
   /*  Declare variables */
   int n,  i;
```

3. (5pt) Complete the following C program that asks user to enter *n* from the keyboard and then approximately computes the value of π for the given value of *n* based on the following definition of π

$$\pi = 4 \times \left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \cdots + (-1)^n \frac{1}{2n+1} \right)$$

```
#include <stdio.h>
#include <math.h>

int main(void)
{
   /*  Declare variables */
   int n,  i;
   double pi;

   printf("Enter the value of n : ");
   scanf("%d",&n);

   /* Write a loop to compute pi using the above formula */
```

```
   printf("Approximate value of pi is %lf when n=%d\n",pi, n);
   return 0;
}
```

4. (5pt) Write a C program that gets the values of x (double) and n (integer) then computes the sin x based on the following formula.

$$\sin x = \frac{x}{1!} - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \cdots + (-1)^n \frac{x^{2n+1}}{(2n+1)!}$$