

CS111 Introduction to Computers

Programming Sheet 4

(Loops)

1. Trace the following program and show the output when the input $n=10$.

```
scanf("%d", &n);
ev = 0;
while(ev < n)
{
    printf("%3d", ev);
    ev = ev + 2;
}
```

2. Show the output of the following nested loops.

```
for(i = 0; i < 2; i++)
{
    printf("Outer %4d\n", i);
    for(j = 0; j < 3; j++)
        printf("Inner %3d%3d\n", i, j);
    for(k = 2; k > 0; --k)
        printf("Inner %3d%3d\n", i, k)
}
```

3. Rewrite the following program using a for loop.

```
count = 0;
i = 0;
while (i < n)
{
    scanf("%d", &x);
    if(x == 1) ++count;
    ++i;
}
```

4. Write a program that reads in 200 numbers and then print out their sum, average, minimum and maximum.
5. Write a program that displays all numbers divisible by 3 in the range 1 – 100.
6. Write a program that displays all numbers from 1 to y that are divisible by x , where x and y are entered by the user.

Example:

if $x = 3$ and $y = 30$, the output is 3, 6, 9, 12, 15, 18, 21, 24, 27, 30.

7. Write a program that produces the following output for the given input.

| Input | Output |
|-------|--------|
| 0 | 1 |
| 1 | 2 |
| 2 | 4 |
| 3 | 8 |
| 4 | 16 |
| 5 | 32 |
| 6 | 64 |

8. Write a program that calculates the factorial of a given number n .
($n! = n*(n-1)*(n-2)*\dots*2*1$)
