Achieve Target 1

```c
#include <stdio.h>

void main() {
    if (1)
        printf("One\n");
    if (1)
        printf("Two\n");
    while (1)
        printf("Three\n");
    while (1)
        printf("Four\n");
    getchar();
}
```

Note that the while loop for printing "Four" could be removed without affecting the program. The loop for printing "Three" iterates indefinitely anyway. We call this an infinite loop.

Achieve Target 3

There are many different ways to write this program. The following shows two possible ways.

```c
#include <stdio.h>

void main() {
    int count;

    count = 10;
    while (count) {
        printf("Two\n");
        count = count - 1;
    }

    printf("Finished\n");
    getchar();
}
```
One program counts from 10 down to 0, and the second program counts from –10 up to 0.

### Achieve Target 3 Cont

You can change the range of counter by changing the stopping condition of the while loop. Instead of stopping at 0, the while loop now stops beyond –5. So we have changed the operator to the greater and equal operator so that –5 is included.

For the second program, we observe the pattern and should discover that subsequent numbers differ by two. It gives a hint that we should change the counter update.
printf("Finished\n");
getchar();
}

Achieve Target 4

#include <stdio.h>

void main() {
  int count;
  int sum;

  count = 1;
  sum = 0;
  while (count <= 11) {
    sum = sum + count;
    count = count + 2;
  }

  printf("Sum is %d and Average is %f\n", sum, (float)sum/10);
  getchar();
}

Casting is essential in this case so that the calculation (the division) is correctly performed.

#include <stdio.h>

void main() {
  int count;
  int sum;

  count = 1;
  sum = 0;
  while (count <= 10) {
    sum = sum + count;
    count = count + 1;
  }

  printf("Sum is %d and Average is %d\n", sum, sum/10);
  getchar();
}

To test the program properly, you should remember to change the conversion character from %f to %d. The division is now an integer division and gives an integer result. The result given is now 5, instead of 5.5.
Achieve Target 4 Cont

```c
#include <stdio.h>

void main() {
    int count;
    int fac;

    fac = 1; /* must initialised to 1 for the multiplication to work */
    count = 2; /* so count starts from 2 */
    while (count <= 30) {
        fac = fac * count;
        count = count + 1;
    }
    printf("Factorial of 30 is %d\n", fac);
    getchar();
}
```

Achieve Target 5

```c
#include <stdio.h>

void main() {
    int count;
    int fac;

    fac = 1;
    count = 2;
    for ( ; count <= 30; ) {
        fac = fac * count;
        count = count + 1;
    }
    printf("Factorial of 30 is %d\n", fac);
    getchar();
}
```

Achieve Target 5 Cont

Note that the updating of count must be the last item in the update part.

```c
#include <stdio.h>

void main() {
    int count;
    int fac;

    for (fac = 1, count = 2; count <= 10; fac = fac * count, count = count + 1) {
    }
```
printf("Factorial of 10 is %d\n", fac);
getchar();
}

Achieve Target 6 Cont

#include <stdio.h>

void main()
{
    float data = 0;
    float sum = 0;
    int count;

    printf("Enter 4 numbers below\n");
    for (count = 0; count < 4; count++)
    {
        scanf("%f", &data);
        sum = sum + data;
    }
    printf("Average is %f", sum/4);
    getchar();
}