Session 6 Solution
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Achieve Target 1

```c
#include <stdio.h>

void main() {
    int  col;

    for (col = 0; col < 10; col++) {
        printf("*");
    }
}
```

Achieve Target 1 Cont

```c
#include <stdio.h>

void main() {
    int  col;

    for (col = 0; col < 6; col++) {
        if (col % 2)
            printf("*");
        else
            printf("##");
    }
}
```

An alternative solution using switch statement.

```c
#include <stdio.h>

void main() {
    int  col;

    for (col = 0; col < 9; col++) {
        switch (col % 3) {
            case 0:
                printf("**"); break;
            case 1:
                printf("#"); break;
            case 2:
                printf("#"); break;
        }
    }
```
Achieve Target 2

Pattern 1

```c
#include <stdio.h>

void main() {
    int row, col;

    for (row = 0; row < 3; row++) {
        printf("B");
        for (col = 0; col < 5; col++)  {
            printf("*");
        }
        printf("A");
    }
}
```

Pattern 2

```c
#include <stdio.h>

void main() {
    int row, col;

    for (row = 0; row < 3; row++) {
        printf("B");
        for (col = 0; col < 5; col++)  {
            printf("*#");
        }
        printf("A");
    }
    printf("C");
}
```

Achieve Target 2 Cont

```c
#include <stdio.h>

void main() {
    int row, col;
```
row = 0;
while (row < 3) {
    col = 0;
    while (col < 5) {
        printf("*");
        col++;
    }
    printf("\n");
    row++;
}
}

#include <stdio.h>

void main() {
    int row, col;

    for (row = 0; row < 4; row++) {
        for (col = 0; col < 3; col++)  {
            printf("+");
        }
        printf("\n");
    }
}

Achieve Target 3

#include <stdio.h>

void main() {
    int row, col;

    for (row = 0; row < 6; row++) {
        for (col = 0; col < 5; col++)  {
            if (row % 2)
                printf("O");
            else
                printf(" ");
        }
        printf("\n");
    }
}
void main() {
    int row, col;
    for (row = 0; row < 8; row++) {
        for (col = 0; col < 8; col++) {
            if ((row + col) % 2)
                printf("*");
            else
                printf(" ");
        }
    }
}

#include <stdio.h>

void main() {
    int row, col;
    int repeat;
    for (row = 0; row < 8; row++) {
        for (repeat = 0; repeat < 4; repeat++) {
            if (repeat % 2 == 0) {
                for (col = 0; col < 8; col++) {
                    printf("*");
                }
            } else {
                for (col = 0; col < 8; col++) {
                    printf(" ");
                }
            }
        }
    }
}

Achieve Target 4

For the first case.

a = 26  b = 10

For the other cases.

a = 26  b = 11
a = 26  b = 11
a = 26  b = 10
Achieve Target 5

```c
#include <stdio.h>
void main() {
    int count;
    float sum; /* we use float here because assignment scores have 0.5
    increments */
    float score;
    float highest;
    float lowest;
    count = 1;
    sum = 0;
    highest = 0;
    lowest = 100;
    while (count <= 4) {
        printf("Enter score for assignment %d: ", count);
        scanf("%f", &score);
        sum = sum + score;
        if (score > highest)
            highest = score;
        if (score < lowest)
            lowest = score;
        count = count + 1;
    }

    printf("Average score is %f, the highest is %f and the lowest is %f\n",
            sum/4, highest, lowest);
    getchar();
}
```

```c
#include <stdio.h>
#include <float.h>
void main() {
    float data = 0;
    float sum = 0;
    int count = 0;
    int holidaycount = 0;
    float highest = -1; /* HSI should never be -1 */
    float lowest = FLT_MAX;

    printf("Closing HSI Average for One Week (Enter -1 if holiday)\n");
    while (count < 5) {
        switch (count) {
            case 0: printf("Enter Monday HSI: "); break;
```
case 1: printf("Enter Tuesday HSI: "); break;
            case 2: printf("Enter Wednesday HSI: "); break;
            case 3: printf("Enter Thursday HSI: "); break;
            case 4: printf("Enter Friday HSI: "); break;
        }
        scanf("%f", &data);

        if (data == -1) {
            holidaycount++;
            count++;
            continue;
        }
        if (data < lowest)
            lowest = data;
        else if (data > highest)
            highest = data;
        sum = sum + data;
        count++;
    }
    if (count - holidaycount > 0) {
        printf("Average is %f\n", sum/(count - holidaycount));
        printf("Lowest is %f and Highest is %f\n", lowest, highest);
    }
    getchar();
}

The variable lowest is initialized to \texttt{FLT\_MAX}, which is actually a value representing the largest possible floating point number in C. To add \texttt{FLT\_MAX} in the program, the following line must be added at the beginning.

\begin{verbatim}
#include <float.h>
\end{verbatim}

This line tells the compiler that we now want to import code from a library. The library is called \texttt{float.h} and the thing we require is \texttt{FLT\_MAX}, which is the largest floating point number in C.

For proper comparison to take place, the variable highest must be initialized to the lowest possible number. For this program, -1 is sufficiently low because HSI cannot be negative. Similarly, the variable lowest should take the largest number possible at the beginning. We must rely on the system’s largest number which is defined as \texttt{FLT\_MAX}.

\section*{Achieve Target 6}

\begin{verbatim}
#include <stdio.h>

void main() {

    int ch;

    int count = 0;
    int countA = 0;

\end{verbatim}
printf("I will say what you say\n");
ch = getchar();
while (ch != \'\n\') {
    printf("%c", ch);
    count++;
    if (ch == \'a\' || ch == \'A\')
        countA++;
    ch = getchar();
}
printf("\n");
printf("Characters entered = %d\n", count);
printf("Number of 'A' and 'a' = %d\n", countA);
fflush(stdin);
getchar();
}

Achieve Target 6 Cont

#include <stdio.h>

void main() {

    int ch;
    int count = 0;

    printf("I will say what you say\n");

    while ((ch = getchar()) != \'\n\') {
        if (count % 2 == 0)
            printf("%c", ch);
        count++;
    }
    printf("\n");

    printf("Characters entered = %d\n", count);
    fflush(stdin);
    getchar();
}