LAHTP - Assignment 1

Questions and Answers Set

Contents:
Problems to be solved with the knowledge of loops

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Example 1: Half Pyramid of *

```
*
* *
* * *
* * * *
* * * * *
```

C Program

```c
#include <stdio.h>
int main() {
    int i, j, rows;
    printf("Enter the number of rows: ");
    scanf("%d", &rows);
    for (i = 1; i <= rows; ++i) {
        for (j = 1; j <= i; ++j) {
            printf("* ");
        }
        printf("\n");
    }
    return 0;
}
```

Example 2: Half Pyramid of Numbers

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

C Program

```c
#include <stdio.h>
int main() {
    int i, j, rows;
    printf("Enter the number of rows: ");
    scanf("%d", &rows);
    for (i = 1; i <= rows; ++i) {
        for (j = 1; j <= i; ++j) {
            printf("%d ", j);
        }
        printf("\n");
    }
    return 0;
}
```

Example 3: Half Pyramid of Alphabets

```
A
B B
C C C
D D D D
E E E E E
```

C Program

```c
#include <stdio.h>
int main() {
    int i, j;
    char input, alphabet = 'A';
    printf("Enter an uppercase character you want to print
in the last row: ");
    scanf("%c", &input);
    for (i = 1; i <= (input - 'A' + 1); ++i) {
        for (j = 1; j <= i; ++j) {
            printf("%c ", alphabet);
        }
        ++alphabet;
        printf("\n");
    }
    return 0;
}
```

Example 4: Inverted half pyramid of *

```
* * * * *
* * * *
* * *
* *
*
```

C Program

```c
#include <stdio.h>
int main() {
    int i, j, rows;
    printf("Enter the number of rows: ");
    scanf("%d", &rows);
    for (i = rows; i >= 1; --i) {
        for (j = 1; j <= i; ++j) {
            printf("* ");
        }
        printf("\n");
    }
    return 0;
}
```

Example 5: Inverted half pyramid of numbers

```
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

C Program

```c
#include <stdio.h>
int main() {
    int i, j, rows;
    printf("Enter the number of rows: ");
    scanf("%d", &rows);
    for (i = rows; i >= 1; --i) {
        for (j = 1; j <= i; ++j) {
            printf("%d ", j);
        }
        printf("\n");
    }
    return 0;
}
```

Example 6: Full Pyramid of *

```
        *
      * * *
    * * * * *
  * * * * * * *
* * * * * * * * *
```

C Program

```c
#include <stdio.h>
int main() {
    int i, space, rows, k = 0;
    printf("Enter the number of rows: ");
    scanf("%d", &rows);
    for (i = 1; i <= rows; ++i, k = 0) {
        for (space = 1; space <= rows - i; ++space) {
            printf("  ");
        }
        while (k != 2 * i - 1) {
            printf("* ");
            ++k;
        }
        printf("\n");
    }
    return 0;
}
```

Example 7: Full Pyramid of Numbers

```
    1
   2 3 2
  3 4 5 4 3
 4 5 6 7 6 5 4
5 6 7 8 9 8 7 6 5
```

C Program

```c
#include <stdio.h>
int main() {
    int i, space, rows, k = 0, count = 0, count1 = 0;
    printf("Enter the number of rows: ");
    scanf("%d", &rows);
    for (i = 1; i <= rows; ++i) {
        for (space = 1; space <= rows - i; ++space) {
            printf("  ");
            ++count;
        }
        while (k != 2 * i - 1) {
            if (count <= rows - 1) {
                printf("%d ", i + k);
                ++count;
            } else {
                ++count1;
                printf("%d ", (i + k - 2 * count1));
            }
            ++k;
        }
        count1 = count = k = 0;
        printf("\n");
    }
    return 0;
}
```

Example 8: Inverted full pyramid of *

```
* * * * * * * * *
 * * * * * * *
  * * * * *
   * * *
    *
```

C Program

```c
#include <stdio.h>
int main() {
    int rows, i, j, space;
    printf("Enter the number of rows: ");
    scanf("%d", &rows);
    for (i = rows; i >= 1; --i) {
        for (space = 0; space < rows - i; ++space)
            printf("  ");
        for (j = i; j <= 2 * i - 1; ++j)
            printf("* ");
        for (j = 0; j < i - 1; ++j)
            printf("* ");
        printf("\n");
    }
    return 0;
}
```

Example 9: Pascal's Triangle

```
      1
    1  1
   1  2  1
  1  3  3  1
 1 4  6 4  1
1 5  10  10 5  1
```

C Program

```c
#include <stdio.h>
int main() {
    int rows, coef = 1, space, i, j;
    printf("Enter the number of rows: ");
    scanf("%d", &rows);
    for (i = 0; i < rows; i++) {
        for (space = 1; space <= rows - i; space++)
            printf("  ");
        for (j = 0; j <= i; j++) {
            if (j == 0 || i == 0)
                coef = 1;
            else
                coef = coef * (i - j + 1) / j;
            printf("%4d", coef);
        }
        printf("\n");
    }
    return 0;
}
```

Example 10: Floyd's Triangle.

```
1
2 3
4 5 6
7 8 9 10
```

C Program

```c
#include <stdio.h>
int main() {
    int rows, i, j, number = 1;
    printf("Enter the number of rows: ");
    scanf("%d", &rows);
    for (i = 1; i <= rows; i++) {
        for (j = 1; j <= i; ++j) {
            printf("%d ", number);
            ++number;
        }
        printf("\n");
    }
    return 0;
}
```