

Class 10

Nested Loops, Library Functions

Example 1

- Print a 5 x 5 table with a border of * and X everywhere else:

```
*****  
*XXX*  
*XXX*  
*XXX*  
*****
```

Questions to ask:

1. How many rows?
2. How many columns?
3. After labeling the rows and columns, what condition(s) using the row and column labels can be used to tell the computer when a particular character needs to be placed?

Example 2

- Print a 6 x 6 checkerboard pattern:

XOXOXO

OXOXOX

XOXOXO

OXOXOX

XOXOXO

OXOXOX

Questions to ask:

1. How many rows?
2. How many columns?
3. After labeling the rows and columns, what condition(s) using the row and column labels can be used to tell the computer when a particular character needs to be placed?

Example 3

- Print a 6 x 6 multiplication table:

```
1 2 3 4 5 6
2 4 6 8 10 12
3 6 9 12 15 18
4 8 12 16 20 24
5 10 15 20 25 30
6 12 18 24 30 36
```

Questions to ask:

1. How many rows?
2. How many columns?
3. What action is repeated frequently?
4. What action is repeated less frequently?

Example 4

- Output seven days for each week of three weeks.

Week: 1

Day: 1

Day: 2

...

Week: 2

Day: 1

Day: 2

...

Questions to ask:

1. How many rows?
2. How many columns?
3. What action is repeated frequently?
4. What action is repeated less frequently?

Library Functions

- `rand()` generates a random integer
- Use in conjunction with `srand()` to generate a distinct random number every time the code executes

Example 5 – Single For Loop

- Goal: Generate ten random numbers

Example 6

- Generate ten random numbers each between 1 and 10

For Fun

- Number guessing game
 - Generate a random number between 1 and 100
 - Ask the user to guess the number
 - In a while loop:
 - If the user's guess is too low, print "Too low" to the monitor
 - If the user's guess is too high, print "Too high" to the monitor
 - Prompt the user for a new guess
 - Once the user guesses the correct number, print "You guessed the number!"
 - If you like, keep track of how many tries it took the user to guess the number