1 Syntax

1.1 Task

Create a program to find all the factors of any positive integer.

Example

```
Input: 12
Output: 1, 2, 3, 4, 6, 12

Input: 7
Output: 1, 7

Input: 16
Output: 1, 2, 4, 8, 16
```

1.2 Task

Expand the program to calculate the highest common factor between two numbers

Example

```
Input: 12, 16
Output: 4

Input: 7, 15
Output: 1
```

1.3 Notes

This session focused on becoming comfortable with syntax. You should be comfortable with the correct syntax for classes, methods, fields, and other members.

Creating a class

```
1 public class MyClass {
2     ...
3 }
```

Creating properties

```
1 public class MyClass {
2     public int MyProperty { get; set; }
3 }
```

Creating fields

```
public class MyClass {
    private int MyField;
}
```

You should also be comfortable calling methods and refering to variables and properties in the code, as well as declaring variables.

Declaring variables

```
public class MyClass {
  public static int AddNumbers(int first, int second) {
    var result = first + second;
    return result;
  }
}
```

We also looked at creating Lists and looping through lists.

Creating a list and adding items to it

```
public class MyClass {
  public static List<int> GetNumbersFrom1To5() {
    // Make list
    var numbers = new List<int>();

    // populate list with values
    numbers.Add(1);
    numbers.Add(2);
    numbers.Add(3);
    numbers.Add(4);
    numbers.Add(5);

    // return list to the caller of this method
    return numbers;
  }
}
```

Looping over a list

```
public class MyClass {
  public static void PrintAllInList() {
    var numbers = GetNumbersFrom1To5(); // method from above
    foreach(var number in numbers) {
      Console.WriteLine(number);
    }
  }
}
```

2 Object oriented programming

2.1 Task

Create a program to store detals about school courses, and list them all, when requested.

Example

```
Input: 1

Output:
1. List all courses
2. Search for student

All Courses:
    Core:
        Astronomy
        Charms
        Defence Against the Dark Arts
        Flying
        Herbology
        History of Magic
        Potions
        Transfiguration

    Optional:
        Alchemy
        Apparition
        Arithmancy
        Care of Magical Creatures
        Divination
        Study of Ancient Runes

    Extra Curricular:
        Advanced Arithmancy Studies
        Ancient Studies
        Magical Theory
        Orchestra
```

2.2 Notes

In this session we wrote a program to print a list of courses. Each course was an instance of a Course class and a CourseType class had a List of courses. We then had the CourseType class print the name, and for each course of that type, print that course name. This would be done for each course type.

In the next session we will complete the first task and have the courses print out in full from methods belonging to the classes. We can then move on to the student functionality to print the courses a student is enrolled on.