Foundations of Programming

The administrator of a playgroup maintains a database containing the names, ages and heights of children. A Java program is required which will sort the children into ascending order of height.

An early test version of the program begins thus:

```java
public class ChildProg {
    public static void main(String[] args)
    {
        Child[] p = (new Child("George", 4, 1.06f);
            (new Child("Betty", 2, 0.93f));
        sort(p);
    }

    private static void sort(Child[] p)
    {
        while (... p[i-1].compare(p[i]))
    }
}
```

Supply a suitable class `Child`. In addition to appropriate data fields and an appropriate constructor, this class should contain a `compare()` method (for use as implied in the `sort()` method above) and a `toString()` method. There is no need to write any further code for the methods `main()` and `sort()`. [10 marks]

The program is then modified so that the `sort()` method and the `compare()` method are each given a second formal parameter. When the modified `sort()` method is called, the second actual argument specifies whether sorting is to be in alphabetical order of name, ascending order of age or ascending order of height.

The modified program will require a new heading for the `sort()` method and a rewritten `compare()` method in class `Child`. Supply this new heading and the new `compare()` method in full. Supply any other necessary new code too and explain its purpose. There is again no need to write any further code for the methods `main()` and `sort()`. [10 marks]