**PSD Team Project Specification**

**Bike Share System**

**Objective**

Your task is to create a software system to support a bike share programme (like NextBike in Glasgow, or Santander Cycles in London). You need to create a functioning end-to-end prototype and demonstrate it with appropriate data. Your product is meant to provide an interface for customers to reserve and return bikes and to pay their bills; for operators to assess the state of the system and make changes if necessary; and for managers to view usage reports.

You can use **Python** or **Java** for your implementation, as you prefer (or any other language, but the tutors will not be able to help you!). Your system must include a **database** to store the details of the bicycles, city locations, customers, and any other data as needed by your implementation.

The detailed functionality of the system is up to you, but it should include at least the following capabilities:

* Customers should be able to:
  + **Rent** a bike at any location in the city, as long as there is a working bike available at that location.
  + **Return** a bike to any location. When a customer returns a bike, their account is **charged** an amount depending on how long the bike rental was.
  + **Report a bike** as defective.
  + **Pay** any charges on their account.
* Operators should be able to:
  + **Track** the location of all bikes in the city.
  + **Repair** a defective bike.
  + **Move bikes** to different locations around the city as needed.
* Managers should be able to:
  + **Generate reports** showing all bike activities over a defined time period, using appropriate **data visualisation** techniques.

You can implement the above functionality using command-line scripts, a graphical user interface, or a combination – the details are up to you as a team.

**What to submit**

Each group must submit the following (through Moodle):

* A **report** describing the functionality that was implemented, explaining any design decisions that were made. The report should also include a summary of how each team member contributed to the design and implementation, as well as to the report. Templates will be provided on Moodle.
* All of the **source code** involved in the system, along with any other resources required to run it. You should also include a README file describing **exactly** how to run your software.