- Solve at least one of the problems povided.
- Feel free to use standard libraries, STL or common 3rd party libraries like BOOST as required.
- For assessment, the solutions will be compiled and executed on Ubuntu 17.04 with gcc version 6.3.0. Please provide specifications of the system you've implemented your solution on along with version numbers of any external libraries that you may have used.
- Please reply to the mail sent to you with your solution along with any test files and documentation.
- Please e-mail your solution(s) as a single zip/tar/rar archive.
- Assessment criteria will be as follows:
    - understanding of problem statement.
    - correctness of solution.
    - error handling.
    - quality of implementation.
    - documentation and test code coverage

1. Int vector implementation

C arrays have size determined at compile time. Implement a C++ class that provides you with objects that behave like arrays of int except that their size is determined at run time. Explain the reasons for your design decisions.

2. Producer-Consumer

Design a producer class, a consumer class and a buffer class. Producer reads from a file and writes into a buffer and consumer reads from the buffer and writes into a file. Make the classes thread safe.

Using multiple producers merge different files into a single output file. Ask the user for input files. After 3 files, start dumping the combined content into a single put file. Continue to take input files from the user and keep adding them to the process. Ensure that no single producer reading from an infinite source (e.g. /dev/urandom) causes output application to ignore data from the other sources.