UNIVERSITY OF JOHANNESBURG

# Practical 8 (due 2023-09-22 @ 09:00)

This practical builds upon the `PointCloud2D` class you created in practical 7.

Modify the `PointCloud2D` class as follows:

- Constructors:
  - No changes.
- Accessors for the number for rows and columns:
  - No changes.
- The `PointCloud2D` should have a 1-D array of a generic class `UJRow`.
- Assign an existing `PointCloud2D` object to another existing `PointCloud2D` object:
  - Overload the assignment operator (**=**) so that it performs a deep copy of the right-hand side object.
  - `PointCloud2D` *objOne = objTwo*
- Accessing and mutating values of the underlying array:
  - Overload the indexing ([]) operator.
  - This should enable double indexing on a `PointCloud2D` object.
  - i.e `PointCloud2D` [r][c]
- Supporting output via a stream operator:
  - Overload the stream insertion operator (**<<**) so that the contents of the underlying array can be displayed via *cout*.
  - i.e *cout* << *objPointCloud*

Create a generic class `UJRow,` which must have:

- An underlying array of a size set by the user.
- A constructor with no parameters.
- A constructor with parameters.
- A copy constructor.
- Overload the indexing (**[]**) operator.
- Overload the assignment (**=**) operator.

Create a `main` function which demonstrates the functionality of the `PointCloud2D` generic class.

**Note:** *The tutorial example solution on double indexing is available on eve (Tutorial Week 9 by Mr Sithungu).*

| | Mark sheet | |
|---|---|---|
| | Design | 10 |
| | PointCloud2D class (Templated) | 10 |
| | Constructors | 05 |
| | Destructor | 05 |
| | Overloaded Indexing Operator | 10 |
| | Overloaded Assignment Operator | 10 |
| | Overloaded Insertion Stream Operator | 10 |
| | UJRow class (Templated) | 10 |
| | Constructors | 05 |
| | Destructor | 05 |
| | Overloaded Assignment Operator | 10 |
| | Overloaded Indexing Operator | 10 |
| | main function demonstrates the functionality of the PointCloud2D generic class | 10 |
| | Total | /110 |