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**COS 731 – Assignment 1**

**Bellissimo Complexity Report**

\*\*Support modules for routing and service discovery not included here

\*Gateway module handles routing using Netflix OSS Zuul's, does not make any calls directly in the code to modules but routes requests from other modules to the correct ones so will count as a calling module in the following calculations

Metric		Comment
<b>Structural Complexity</b>	$S(i) = f_{out}^2(i)$	
Products	0	Does not invoke any other modules
Users	0	Does not invoke any other modules
Catalogue	4	A composite service that invokes all other services so it can present holistic information
<b>Data Complexity</b>	$D(i) = \frac{v(i)}{f_{out}(i)+1}$	
Products	11	Uses a lot of variables because product info is the main business of the application
Users	7	Uses some variables to store user information
Catalogue	14/3	Does not use a lot of variables instead just presents data from other modules as it is a composite service
<b>System Complexity</b>	$C(i) = S(i) + D(i)$	

Products	11	This module deals with a fair amount of data and is not reliant on other modules
Users	7	Small module that deals with little data and is not reliant on other modules
Catalogue	26/3	Fairly complex because of its composite nature in that it relies on other modules
<b>Coupling</b>	$C = 1/m$ where: $m = i1 + (q_6 \times i2) + u1 + (q_7 \times u2) + g1 + (q_8 \times g2) + w + r$	
Products	1/18	Loosely coupled because not dependent on any other modules
Users	1/12	Loosely coupled because not dependent on any other modules
Catalogue	1/25	Loosely coupled module, despite using a lot of variables, it is not dependent on too many modules thanks to the use of a Gateway service in microservices
<b>Cyclomatic Complexity</b>	$V(G) = P + 1$	
Products	4	Logic is used in fetching product information based on input so there a number of functions with control flow
Users	3	Logic is used in fetching user information and checking user status and password based on input so there a number of functions with control flow
Catalogue	1	Small cyclomatic complexity because it is a composite service that doesn't implement a lot of business logic but displays combined data from other services