

CO225 – SOFTWARE CONSTRUCTION

Mid Quiz

Time: 50 Minutes.

E11/

Every function you write must have a comment describing the parameters used.

1. The exponential function can be defined on the complex plane as

$$e^z = \sum_{n=0}^{\infty} \frac{z^n}{n!}$$

where z is a complex number.

Write a function to compute e^z by expanding the above series to a specified number of terms. You should represent complex numbers as tuples.

Hint: The n th term t_n of the series above is

$$t_n = \frac{z}{n} t_{n-1}, \text{ for } n > 0$$

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2. Macro cars makes several different models of cars. The need to store the following details about a model's features.

Feature	Attributes
Engine	type (petrol, diesel), capacity (in litres)
Options	A/C, GPS, Stereo

Note that the “Option” feature can have more than one value. For example a model can have A/C and GPS and a stereo.

- (a) Write the required type definitions to store a model's features described above. The type containing all features should be called `model`.

Hint: You should NOT use string as the type of any attribute!

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- (b) Write a function `full_option` that takes a list of `models` and counts how many of the models have all 3 options.

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