CONCORDIA UNIVERSITY

SOEN 6011: Software Engineering Processes

ETERNITY:FUNCTION F4
$\Gamma(x)$

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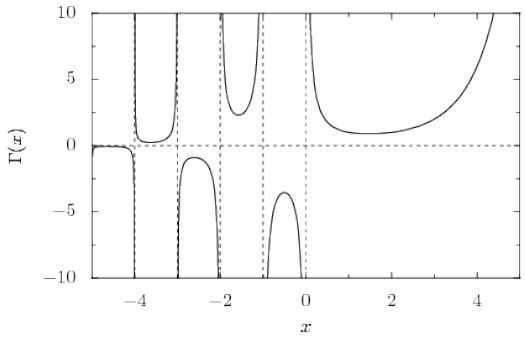

Figure 1: Graph of Gamma Function.[2]

`https://github.com/tavtejS07/SOEN-6011`

Contents

1 Problem 2

1.1 Assumptions

Assumption 1

- **ID =** Gamma_Asump_01
  - Input for the function $\Gamma(x)$ is a real number, where $\mathbb{R} > 0$.

Assumption 2

- **ID =** Gamma_Asump_02
  - At no point is the value of $\Gamma(x) = 0$

Assumption 3

- **ID =** Gamma_Asump_03
  - For the input values which are not within the domain, system throws an error and we get an undefined result.

1.2 Functional Requirements

Requirement 1

- **ID =** Gamma_FR_001
- **Type =** Functional Requirement
- **Version =** 1.0
- **Difficulty =** High
- **Description =** All the inputs should be within the domain. If the value lies outside the domain, error should be thrown by the system.

Requirement 2

- **ID** = Gamma_FR_002
- **Type** = Functional Requirement
- **Version** = 1.0
- **Difficulty** = High
- **Description** = All the inputs which are positive integers should calculate the factorial of that integer. This will be the output of gamma function.
- **Rationale** = As gamma function follows recursive property for $\mathbb{Z} > 0$. $\Gamma(x) = (x-1)\Gamma(x-1)$

Requirement 3

- **ID** = Gamma_FR_003
- **Type** = Functional Requirement
- **Version** = 1.0
- **Difficulty** = Medium
- **Description** = User should provide a single input only.
- **Rationale** = input is either a non-negative integer or a real number greater than 0.

Bibliography

[1] Libretexts. (2022, February 27). *E14.2: Definition and properties of the gamma function.*Mathematics LibreTexts. Retrieved July 25, 2022, from https://math.libretexts.org/Bookshelves/Analysis/Complex_Variables_with_Applications_(Orloff)/14%3A_Analytic_Continuation_and_the_Gamma_Function/14.02%3A_Definition_and_properties_of_the_Gamma_function

[2] Gamma function. (2011, July 25). *Gamma function*- Knowino. (n.d.). Retrieved July 27, 2022, from https://www.tau.ac.il/ tsirel/dump/Static/knowino.org/wiki/Gamma_function.html