Functional Specification Template

Student José Alberto Esquivel Patiño **Program #** 5

Class Name	IOHandler
Parent Class	

Attributes	
Declaration	**Description**
bufIn : BufferedReader	Variable with the input stream reader from keyboard.

Items	
Declaration	**Description**
String readValue(sPrompt : String, sErrorMessage : String, patValidStructure : Pattern)	Reads a String value from standard input and keeps prompting the user for the value until it matches the valid structure received as a parameter.

Class Name	ErrrorMessages
Parent Class	

Attributes	
Declaration	**Description**
sINVALID_REAL_NUMBER : String	Constant with the message to display when the user inputs an invalid real number in the system.

sINVALID_INTEGER : String	Constant with the message to display when the user inputs an invalid integer in the system.
sINVALID_PVALUE : String	Constant with the message to display when the user inputs an invalid value for p.

Items	
Declaration	**Description**

Class Name	AreaUnderTDistribution
Parent Class	ErrorMessages (implemented as interface)

Attributes	
Declaration	**Description**
dX : double	Variable with the x value that delimits the area under the t-distribution curve to calculate or with the x value that corresponds the inputted p value.
iDof: Integer	Variable with the degrees of Freedom of the Distribution to integrate.
dP : double	Variable with the p value calculated or to be calculated of the area under the Distribution T described by the previous variables.

Items	
Declaration	**Description**
void main()	Method that contains the main logic of the program. It reads from input dP and iDof with the help of IOHandler. Then it calculates the associated dX value and outputs the result.
double gamma(dX : double)	Method that calculates the value of gamma for the parameter received and returns it as a double.

double tStudent(dX : double)	Method that calculates the value of the tStudent function based on the parameter dX and the class variable iDof
double simpson(dX : double, dW : double)	Method that calculates one iteration of the simpson function based on the parameters obtained.
void calculateP()	Method that calculates P using Simpson's method with the aid of the tStudent and Gamma functions.
void calculateX()	Method that calculates an X that gives the closest value to P using tStudent, by moving the X and calculating its P value iteratively.
String toString()	Method that returns a String representation of the object.