# Medical Screening Tests: ScreeningTest.py: Documentation

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# About This Document

- This document accompanies the Medical Screening Tests App.

- This document is hosted at GutHub.

- This document must be saved as a .PDF file to be readable at Github.

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# ScreeningTest

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# Course: CCSU Stat 476. Spring 2022.

# Author: Tim Brockway. Student ID: 30259316 Email: BrockwayTim@My.CCSU.edu

# Professor: Roger L. Bilisoly

# bilisolyr@ccsu.edu https://www2.ccsu.edu/faculty/bilisolyr

# Program: screeningtest.py

# Purpose: To demonstrate the effect of disease prevalence on the

# reliability of medical screening tests.

#

# How to run this program:

# - Copy & paste the following link into a webbrowser and enter.

# https://share.streamlit.io/profbrockway/screeningtest/main/screeningtestv7.py

# - The web page will explain how to run the program and its plots.

# Medical screening tests vaunting very high "general accuracy" can give

# staggering levels of false results when the prevalence of a disease is low.

# This program explores the effect the prevalence of an infection in a

# population on the usefullness of screening tests. The goal is to

# demonstrate that screening tests are complex and less reliable

# than commonly supposed.

#

# Inputs:

# A GUI invites the user to enter the following medical test statistics.

# Population:

# Test Sensitivity:

# Test Specificity:

# Start of Prevalence Range.

# End of Prevalence Range:

# Prevalence of Interest:

# CheckBoxes allowing the plotting of different statitics.

#

# Outputs:

# (1) A plot with:

# x axis. A range of disease prevalances.

# y axis:

# Positivie Predictive Value.

# Negative Predictive Value.

# False Positives (NPV)

# False Negatives (NPV)

# General Accuracy (A somewhat misleading item !)

# Prevalence of Interest (Vertical line).

# (2) A Matplotlib menu permitting saving the plot, zooming etc.

# (3) A CSV file with the plot data.(Optional)

# (4) A print of the plot data. (Optional)

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# PROGRAM SUMMARY. TEXT FOR INCLUSION IN CODE

r"""

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# "Accuracy" Of Medical Screening Tests

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# Professor: Roger L. Bilisoly

# bilisolyr@ccsu.edu https://www2.ccsu.edu/faculty/bilisolyr

#

# ScreeningTest: PROGRAM PURPOSE.

#

# Medical screening tests vaunting a very high "general accuracy" can give

# staggering levels of false results when the prevalence of a disease is low.

# This program explores the effect the prevalence of an infection in a

# population on the usefullness of screening tests. The goal is to

# demonstrate that the Epidemiology of screening tests is complex and

# they are usually less reliable than commonly supposed.

#

# Inputs:

# A GUI asks the user to enter the following medical test statistics.

# Population:

# Test Sensitivity:

# Test Specificity:

# Start of Prevalence Range.

# End of Prevalence Range:

# Prevalence of Interest:

# CheckBoxes allowing the plotting of different statitics.

#

# Outputs:

# (1) A plot with:

# x axis. A range of disease prevalances.

# y axis:

# Positivie Predictive Value. (PPV)

# Negative Predictive Value. (NPV)

# False Positives (FP)

# False Negatives (FN)

# General Accuracy (ACC) (A somewhat misleading item !)

# Prevalence of Interest (PREVINT ) (A Vertical line).)

# (2) A table of the generated data used to create the plots.

# (3) A video tour of the app and its features

#

# Features:

# All outputs can be saved to the users local computer, viewed full

# screen or browsed from the GUI

# This is true of the entire projects code.

#

# Result Verification:

# Our graphs seems correct. See a similar one at:

# https://epitools.ausvet.com.au/predictivevalues

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