

Actividad 05 (Clases y Objetos).

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Seminario de Algoritmia I

Lineamientos de evaluación

[X] El reporte está en formato Google Docs o PDF.

- [X] El reporte sigue las pautas del [Formato de Actividades](#) .
- [X] El reporte tiene desarrollada todas las pautas del [Formato de Actividades](#).
- [X] Se muestra la captura de pantalla de los datos antes de usar el método agregar_inicio() y la captura de pantalla del método mostrar() después de haber utilizado el método agregar_inicio().
- [X] Se muestra la captura de pantalla de los datos antes de usar el método agregar_final() y la captura de pantalla del método mostrar() después de haber utilizado el método agregar_final().

Desarrollo

Agregar al inicio.

Para demostrar la función agregar al inicio de la lista, se ingresó una partícula con valor de 0 en todos sus campos.

The screenshot shows a Java Swing window titled "GroupBox". Inside, there is a form with several input fields, each with a value of "0" and a small up/down arrow button. The fields are labeled: "Id:", "Origen X:", "Origen Y:", "Destino X:", "Destino Y:", "Velocidad:", "Rojo:", "Verde:", and "Azul:". At the bottom of the form are two buttons: "Agregar Inicio" and "Agregar Final". To the right of the form, there is a text area displaying the current state of the data: "ID: 0", "Origen X: 0", "Origen Y: 0", "Destino X: 0", "Destino Y: 0", "Velocidad: 0", "Rojo: 0", "Verde: 0", "Azul: 0", and "Distancia: 0.0".

Después ingresamos los una partícula con el ID 99, la siguiente imagen demuestra los parámetro antes de que se ingresen con el método agregar al inicio.

Id:	99		ID: 0
Origen X:	5		Origen X: 0
Origen Y:	5		Origen Y: 0
Destino X:	55		Destino X: 0
Destino Y:	55		Destino Y: 0
Velocidad:	2		Velocidad: 0
R rojo:	130		R rojo: 0
Verde:	255		Verde: 0
Azul:	1		Azul: 0
			Distancia: 0.0
<div>Agregar Inicio</div>			
<div>Agregar Final</div>			
<div>MOSTRAR</div>			

En la siguiente imagen se muestra el resultado al imprimir ahora los resultados de nuestra lista de partículas.

Id:	0		ID: 99
Origen X:	0		Origen X: 5
Origen Y:	0		Origen Y: 5
Destino X:	0		Destino X: 55
Destino Y:	0		Destino Y: 55
Velocidad:	0		Velocidad: 2
R rojo:	0		R rojo: 130
Verde:	0		Verde: 255
Azul:	0		Azul: 1
			Distancia: 70.71067811865476
<div>Agregar Inicio</div>			
<div>Agregar Final</div>			
<div>MOSTRAR</div>			

ID: 0
Origen X: 0
Origen Y: 0
Destino X: 0
Destino Y: 0
Velocidad: 0
R rojo: 0
Verde: 0
Azul: 0
Distancia: 0.0

Agregar al final.

Para demostrar la función agregar al final de la lista, se tienen las partículas ingresadas en los puntos anteriores.

Se ingresará una nueva partícula con el ID 255, en la siguiente imagen se muestran los datos de la partícula.

Id:	255		ID: 99
Origen X:	1		Origen X: 5
Origen Y:	25		Origen Y: 5
Destino X:	500		Destino X: 55
Destino Y:	358		Destino Y: 55
Velocidad:	5		Velocidad: 2
Rojo:	255		Rojo: 130
Verde:	68		Verde: 255
Azul:	255		Azul: 1
			Distancia: 70.71067811865476
Agregar Inicio			
Agregar Final			
MOSTRAR			

ID: 0
Origen X: 0
Origen Y: 0
Destino X: 0
Destino Y: 0
Velocidad: 0
Rojo: 0
Verde: 0
Azul: 0
Distancia: 0.0

En la siguiente imagen se puede apreciar el resultado de ingresar la partícula al final de la lista.

Id:	0		ID: 99
Origen X:	0		Origen X: 5
Origen Y:	0		Origen Y: 5
Destino X:	0		Destino X: 55
Destino Y:	0		Destino Y: 55
Velocidad:	0		Velocidad: 2
Rojo:	0		Rojo: 130
Verde:	0		Verde: 255
Azul:	0		Azul: 1
			Distancia: 70.71067811865476
Agregar Inicio			
Agregar Final			
MOSTRAR			

ID: 0
Origen X: 0
Origen Y: 0
Destino X: 0
Destino Y: 0
Velocidad: 0
Rojo: 0
Verde: 0
Azul: 0
Distancia: 0.0

ID: 255
Origen X: 1
Origen Y: 25
Destino X: 500
Destino Y: 358
Velocidad: 5
Rojo: 255
Verde: 68
Azul: 255
Distancia: 599.9083263299485

Conclusiones

El mayor inconveniente en esta práctica fue que me confundí en la parte de sacar los valores de los spinBox de QT, ya que los estaba obteniendo como **text()** esto me causaba problemas se soluciono al cambiar al parámetro **value()**.

Ejemplo:

Línea mal escrita para este caso.

```
id = self.ui.id_spinBox.text()
```

Línea correcta para este caso:

```
id = self.ui.id_spinBox.value()
```

Referencias

Autor: Michel Dávalos.

PySide2 - Clases y Objetos (Qt for Python)(I)

<https://www.youtube.com/watch?v=T0qJdF1fMqo&feature=youtu.be>

PySide2 - Clases y Objetos (Qt for Python)(II)

<https://www.youtube.com/watch?v=KfQDtrrL2OU>

PySide2 - Clases y Objetos (Qt for Python)(III)

<https://www.youtube.com/watch?v=5TPKrKIAAU0>

Código

app.py

```
from PySide2.QtWidgets import QApplication
from mainWindow import MainWindow
import sys

app = QApplication()
myWindow = MainWindow()
myWindow.show()

sys.exit(app.exec_())
```

algorithms.py

```
import math

def euclidean_distance(x_1, y_1, x_2, y_2)->float:
    euclidean_Distance = math.sqrt(((x_2-x_1)**2) + ((y_2-y_1)**2))
    return euclidean_Distance
```

particle.py

```
from algorithms import euclidean_distance

class Particle:
    def __init__(self, id, ori_X=0, ori_Y=0, dest_X=0, dest_Y=0,
speed=0, R=0, G=0, B=0):
        self.__id = id
        self.__origen_x = ori_X
        self.__origen_y = ori_Y
        self.__destino_x = dest_X
        self.__destino_y = dest_Y
        self.__velocidad = speed
        self.__red = R
        self.__green = G
        self.__blue = B
        self.__distancia = euclidean_distance(ori_X, ori_Y, dest_X,
dest_Y)

    def __str__(self) -> str:
        return(
            '\nID: ' + str(self.__id) +
            '\nOrigen X: ' + str(self.__origen_x) +
            '\nOrigen Y: ' + str(self.__origen_y) +
            '\nDestino X: ' + str(self.__destino_x) +
            '\nDestino Y: ' + str(self.__destino_y) +
            '\nVelocidad: ' + str(self.__velocidad) +
            '\nRojo: ' + str(self.__red) +
            '\nVerde: ' + str(self.__green) +
            '\nAzul: ' + str(self.__blue) +
            '\nDistancia: ' + str(self.__distancia) +
            '\n'
        )
```

particle_list.py

```
from particle import Particle

class Particle_List:
    def __init__(self):
        self.__Particles = []
```

```

def addToEnd(self, part:Particle):
    self.__Particles.append(part)

def addFirst(self, part:Particle):
    self.__Particles.insert(0, part)

def showAll(self):
    for part in self.__Particles:
        print(part)

def __str__(self):
    return "".join(
        str(particle) for particle in self.__Particles
    )

```

mainWindow.py

```

from PySide2.QtWidgets import QMainWindow
from ui_mainWindow import Ui_MainWindow
from particle import Particle
from particle_list import Particle_List

class MainWindow(QMainWindow):
    def __init__(self) -> None:
        super(MainWindow, self).__init__()
        self.particle_list = Particle_List()
        self.ui = Ui_MainWindow()
        self.ui.setupUi(self)

self.ui.addToStart_pushButton.clicked.connect(self.click_addStart)
self.ui.addEnd_pushButton.clicked.connect(self.click_addEnd)

self.ui.showListParticle_pushButton.clicked.connect(self.click_show)

    def click_addStart(self):
        self.particle_list.addFirst(self.make_particle())
        self.reset_spinBoxes()

    def click_addEnd(self):
        self.particle_list.addToEnd(self.make_particle())
        self.reset_spinBoxes()

```

```

def click_show(self):
    self.ui.particle_PlainText.clear()

self.ui.particle_PlainText.insertPlainText(str(self.particle_list))

def make_particle(self)->Particle:
    id = self.ui.id_spinBox.value()
    x1 = self.ui.originX_spinBox.value()
    y1 = self.ui.originY_spinBox.value()
    x2 = self.ui.destX_spinBox.value()
    y2 = self.ui.destY_spinBox.value()
    speed = self.ui.speed_spinBox.value()
    red = self.ui.red_spinBox.value()
    green = self.ui.green_spinBox.value()
    blue = self.ui.blue_spinBox.value()
    myParticle = Particle(id, x1, y1, x2, y2, speed, red, green,
blue)

    return myParticle

def reset_spinBoxs(self):
    self.ui.id_spinBox.setValue(0)
    self.ui.originX_spinBox.setValue(0)
    self.ui.originY_spinBox.setValue(0)
    self.ui.destX_spinBox.setValue(0)
    self.ui.destY_spinBox.setValue(0)
    self.ui.speed_spinBox.setValue(0)
    self.ui.red_spinBox.setValue(0)
    self.ui.green_spinBox.setValue(0)
    self.ui.blue_spinBox.setValue(0)

```

ui_mainWindow.py

```

# -*- coding: utf-8 -*-

#####
#####
## Form generated from reading UI file 'mainWindow.ui'
##
## Created by: Qt User Interface Compiler version 5.15.2
##
## WARNING! All changes made in this file will be lost when recompiling
UI file!

```

```
#####

#####

from PySide2.QtCore import *
from PySide2.QtGui import *
from PySide2.QtWidgets import *

class Ui_MainWindow(object):
    def setupUi(self, MainWindow):
        if not MainWindow.setObjectName():
            MainWindow.setObjectName(u"MainWindow")
        MainWindow.resize(638, 620)
        self.centralwidget = QWidget(MainWindow)
        self.centralwidget.setObjectName(u"centralwidget")
        self.horizontalLayout = QHBoxLayout(self.centralwidget)
        self.horizontalLayout.setObjectName(u"horizontalLayout")
        self.groupBox = QGroupBox(self.centralwidget)
        self.groupBox.setObjectName(u"groupBox")
        self.label = QLabel(self.groupBox)
        self.label.setObjectName(u"label")
        self.label.setGeometry(QRect(40, 120, 47, 13))
        self.label_2 = QLabel(self.groupBox)
        self.label_2.setObjectName(u"label_2")
        self.label_2.setGeometry(QRect(40, 150, 47, 13))
        self.label_3 = QLabel(self.groupBox)
        self.label_3.setObjectName(u"label_3")
        self.label_3.setGeometry(QRect(40, 190, 47, 13))
        self.label_4 = QLabel(self.groupBox)
        self.label_4.setObjectName(u"label_4")
        self.label_4.setGeometry(QRect(60, 230, 31, 16))
        self.label_5 = QLabel(self.groupBox)
        self.label_5.setObjectName(u"label_5")
        self.label_5.setGeometry(QRect(50, 260, 41, 20))
        self.label_6 = QLabel(self.groupBox)
        self.label_6.setObjectName(u"label_6")
        self.label_6.setGeometry(QRect(60, 290, 31, 16))
        self.destX_spinBox = QSpinBox(self.groupBox)
        self.destX_spinBox.setObjectName(u"destX_spinBox")
        self.destX_spinBox.setGeometry(QRect(100, 120, 81, 22))
        self.destX_spinBox.setMaximum(500)
        self.destY_spinBox = QSpinBox(self.groupBox)
        self.destY_spinBox.setObjectName(u"destY_spinBox")
```



```
self.destY_spinBox.setGeometry(QRect(100, 150, 81, 22))
self.destY_spinBox.setMaximum(500)
self.speed_spinBox = QSpinBox(self.groupBox)
self.speed_spinBox.setObjectName(u"speed_spinBox")
self.speed_spinBox.setGeometry(QRect(100, 190, 81, 22))
self.speed_spinBox.setMaximum(99999)
self.red_spinBox = QSpinBox(self.groupBox)
self.red_spinBox.setObjectName(u"red_spinBox")
self.red_spinBox.setGeometry(QRect(100, 230, 81, 22))
self.red_spinBox.setMaximum(255)
self.green_spinBox = QSpinBox(self.groupBox)
self.green_spinBox.setObjectName(u"green_spinBox")
self.green_spinBox.setGeometry(QRect(100, 260, 81, 22))
self.green_spinBox.setMaximum(255)
self.blue_spinBox = QSpinBox(self.groupBox)
self.blue_spinBox.setObjectName(u"blue_spinBox")
self.blue_spinBox.setGeometry(QRect(100, 290, 81, 22))
self.blue_spinBox.setMaximum(255)
self.particle_PlainText = QPlainTextEdit(self.groupBox)
self.particle_PlainText.setObjectName(u"particle_PlainText")
self.particle_PlainText.setGeometry(QRect(260, 0, 321, 531))
self.addToStart_pushButton = QPushButton(self.groupBox)

self.addToStart_pushButton.setObjectName(u"addToStart_pushButton")
self.addToStart_pushButton.setGeometry(QRect(20, 340, 91, 31))
self.addEnd_pushButton = QPushButton(self.groupBox)
self.addEnd_pushButton.setObjectName(u"addEnd_pushButton")
self.addEnd_pushButton.setGeometry(QRect(120, 340, 91, 31))
self.showListParticle_pushButton = QPushButton(self.groupBox)

self.showListParticle_pushButton.setObjectName(u"showListParticle_pushB
utton")
self.showListParticle_pushButton.setGeometry(QRect(50, 380,
131, 31))
self.originX_label = QLabel(self.groupBox)
self.originX_label.setObjectName(u"originX_label")
self.originX_label.setGeometry(QRect(40, 60, 47, 13))
self.originY_label = QLabel(self.groupBox)
self.originY_label.setObjectName(u"originY_label")
self.originY_label.setGeometry(QRect(40, 90, 47, 13))
self.originY_spinBox = QSpinBox(self.groupBox)
self.originY_spinBox.setObjectName(u"originY_spinBox")
self.originY_spinBox.setGeometry(QRect(100, 90, 81, 22))
```

```

        self.originY_spinBox.setMaximum(500)
        self.originX_spinBox = QSpinBox(self.groupBox)
        self.originX_spinBox.setObjectName(u"originX_spinBox")
        self.originX_spinBox.setGeometry(QRect(100, 60, 81, 22))
        self.originX_spinBox.setMaximum(500)
        self.originX_label_2 = QLabel(self.groupBox)
        self.originX_label_2.setObjectName(u"originX_label_2")
        self.originX_label_2.setGeometry(QRect(70, 20, 21, 16))
        self.id_spinBox = QSpinBox(self.groupBox)
        self.id_spinBox.setObjectName(u"id_spinBox")
        self.id_spinBox.setGeometry(QRect(100, 20, 81, 22))
        self.id_spinBox.setMaximum(500)

        self.horizontalLayout.addWidget(self.groupBox)

        MainWindow.setCentralWidget(self.centralwidget)
        self.menubar = QMenuBar(MainWindow)
        self.menubar.setObjectName(u"menubar")
        self.menubar.setGeometry(QRect(0, 0, 638, 21))
        MainWindow.setMenuBar(self.menubar)
        self.statusbar = QStatusBar(MainWindow)
        self.statusbar.setObjectName(u"statusbar")
        MainWindow.setStatusBar(self.statusbar)

        self.retranslateUi(MainWindow)

        QMetaObject.connectSlotsByName(MainWindow)
    # setupUi

    def retranslateUi(self, MainWindow):
        MainWindow.setWindowTitle(QCoreApplication.translate("MainWindow",
u"MainWindow", None))
        self.groupBox.setTitle(QCoreApplication.translate("MainWindow",
u"GroupBox", None))
        self.label.setText(QCoreApplication.translate("MainWindow",
u"Destino X:", None))
        self.label_2.setText(QCoreApplication.translate("MainWindow",
u"Destino Y:", None))
        self.label_3.setText(QCoreApplication.translate("MainWindow",
u"Velocidad:", None))
        self.label_4.setText(QCoreApplication.translate("MainWindow",
u"Rojo:", None))

```

```

        self.label_5.setText(QCoreApplication.translate("MainWindow",
u"Verde:", None))
        self.label_6.setText(QCoreApplication.translate("MainWindow",
u"Azul:", None))

self.addToStart_pushButton.setText(QCoreApplication.translate("MainWind
ow", u"Agregar Inicio", None))

self.addEnd_pushButton.setText(QCoreApplication.translate("MainWindow",
u"Agregar Final", None))

self.showListParticle_pushButton.setText(QCoreApplication.translate("Ma
inWindow", u"MOSTRAR", None))

self.originX_label.setText(QCoreApplication.translate("MainWindow",
u"Origen X:", None))

self.originY_label.setText(QCoreApplication.translate("MainWindow",
u"Origen Y:", None))

self.originX_label_2.setText(QCoreApplication.translate("MainWindow",
u"Id:", None))
        # retranslateUi

```

mainwindow.ui

```

<?xml version="1.0" encoding="UTF-8"?>
<ui version="4.0">
    <class>MainWindow</class>
    <widget class="QMainWindow" name="MainWindow">
        <property name="geometry">
            <rect>
                <x>0</x>
                <y>0</y>
                <width>638</width>
                <height>620</height>
            </rect>
        </property>
        <property name="windowTitle">
            <string>MainWindow</string>

```

```
</property>
<widget class="QWidget" name="centralwidget">
  <layout class="QHBoxLayout" name="horizontalLayout">
    <item>
      <widget class="QGroupBox" name="groupBox">
        <property name="title">
          <string>GroupBox</string>
        </property>
        <widget class="QLabel" name="label">
          <property name="geometry">
            <rect>
              <x>40</x>
              <y>120</y>
              <width>47</width>
              <height>13</height>
            </rect>
          </property>
          <property name="text">
            <string>Destino X:</string>
          </property>
        </widget>
        <widget class="QLabel" name="label_2">
          <property name="geometry">
            <rect>
              <x>40</x>
              <y>150</y>
              <width>47</width>
              <height>13</height>
            </rect>
          </property>
          <property name="text">
            <string>Destino Y:</string>
          </property>
        </widget>
        <widget class="QLabel" name="label_3">
          <property name="geometry">
            <rect>
              <x>40</x>
              <y>190</y>
              <width>47</width>
              <height>13</height>
            </rect>
          </property>
        </widget>
      </widget>
    </item>
  </layout>
</widget>
```

```
<property name="text">
  <string>Velocidad:</string>
</property>
</widget>
<widget class="QLabel" name="label_4">
  <property name="geometry">
    <rect>
      <x>60</x>
      <y>230</y>
      <width>31</width>
      <height>16</height>
    </rect>
  </property>
  <property name="text">
    <string>Rojo:</string>
  </property>
</widget>
<widget class="QLabel" name="label_5">
  <property name="geometry">
    <rect>
      <x>50</x>
      <y>260</y>
      <width>41</width>
      <height>20</height>
    </rect>
  </property>
  <property name="text">
    <string>Verde:</string>
  </property>
</widget>
<widget class="QLabel" name="label_6">
  <property name="geometry">
    <rect>
      <x>60</x>
      <y>290</y>
      <width>31</width>
      <height>16</height>
    </rect>
  </property>
  <property name="text">
    <string>Azul:</string>
  </property>
</widget>
```

```
<widget class="QSpinBox" name="destX_spinBox">
  <property name="geometry">
    <rect>
      <x>100</x>
      <y>120</y>
      <width>81</width>
      <height>22</height>
    </rect>
  </property>
  <property name="maximum">
    <number>500</number>
  </property>
</widget>
<widget class="QSpinBox" name="destY_spinBox">
  <property name="geometry">
    <rect>
      <x>100</x>
      <y>150</y>
      <width>81</width>
      <height>22</height>
    </rect>
  </property>
  <property name="maximum">
    <number>500</number>
  </property>
</widget>
<widget class="QSpinBox" name="speed_spinBox">
  <property name="geometry">
    <rect>
      <x>100</x>
      <y>190</y>
      <width>81</width>
      <height>22</height>
    </rect>
  </property>
  <property name="maximum">
    <number>99999</number>
  </property>
</widget>
<widget class="QSpinBox" name="red_spinBox">
  <property name="geometry">
    <rect>
      <x>100</x>
```

```
<y>230</y>
<width>81</width>
<height>22</height>
</rect>
</property>
<property name="maximum">
  <number>255</number>
</property>
</widget>
<widget class="QSpinBox" name="green_spinBox">
  <property name="geometry">
    <rect>
      <x>100</x>
      <y>260</y>
      <width>81</width>
      <height>22</height>
    </rect>
  </property>
  <property name="maximum">
    <number>255</number>
  </property>
</widget>
<widget class="QSpinBox" name="blue_spinBox">
  <property name="geometry">
    <rect>
      <x>100</x>
      <y>290</y>
      <width>81</width>
      <height>22</height>
    </rect>
  </property>
  <property name="maximum">
    <number>255</number>
  </property>
</widget>
<widget class="QPlainTextEdit" name="particle_PlainText">
  <property name="geometry">
    <rect>
      <x>260</x>
      <y>0</y>
      <width>321</width>
      <height>531</height>
    </rect>
```

```
</property>
</widget>
<widget class="QPushButton" name="addToStart_pushButton">
  <property name="geometry">
    <rect>
      <x>20</x>
      <y>340</y>
      <width>91</width>
      <height>31</height>
    </rect>
  </property>
  <property name="text">
    <string>Agregar Inicio</string>
  </property>
</widget>
<widget class="QPushButton" name="addEnd_pushButton">
  <property name="geometry">
    <rect>
      <x>120</x>
      <y>340</y>
      <width>91</width>
      <height>31</height>
    </rect>
  </property>
  <property name="text">
    <string>Agregar Final</string>
  </property>
</widget>
<widget class="QPushButton" name="showListParticle_pushButton">
  <property name="geometry">
    <rect>
      <x>50</x>
      <y>380</y>
      <width>131</width>
      <height>31</height>
    </rect>
  </property>
  <property name="text">
    <string>MOSTRAR</string>
  </property>
</widget>
<widget class="QLabel" name="originX_label">
  <property name="geometry">
```



```
<rect>
  <x>40</x>
  <y>60</y>
  <width>47</width>
  <height>13</height>
</rect>
</property>
<property name="text">
  <string>Origen X:</string>
</property>
</widget>
<widget class="QLabel" name="originY_label">
  <property name="geometry">
    <rect>
      <x>40</x>
      <y>90</y>
      <width>47</width>
      <height>13</height>
    </rect>
  </property>
  <property name="text">
    <string>Origen Y:</string>
  </property>
</widget>
<widget class="QSpinBox" name="originY_spinBox">
  <property name="geometry">
    <rect>
      <x>100</x>
      <y>90</y>
      <width>81</width>
      <height>22</height>
    </rect>
  </property>
  <property name="maximum">
    <number>500</number>
  </property>
</widget>
<widget class="QSpinBox" name="originX_spinBox">
  <property name="geometry">
    <rect>
      <x>100</x>
      <y>60</y>
      <width>81</width>
```

```
        <height>22</height>
    </rect>
</property>
<property name="maximum">
    <number>500</number>
</property>
</widget>
<widget class="QLabel" name="originX_label_2">
    <property name="geometry">
        <rect>
            <x>70</x>
            <y>20</y>
            <width>21</width>
            <height>16</height>
        </rect>
    </property>
    <property name="text">
        <string>Id:</string>
    </property>
</widget>
<widget class="QSpinBox" name="id_spinBox">
    <property name="geometry">
        <rect>
            <x>100</x>
            <y>20</y>
            <width>81</width>
            <height>22</height>
        </rect>
    </property>
    <property name="maximum">
        <number>500</number>
    </property>
</widget>
</widget>
</item>
</layout>
</widget>
<widget class="QMenuBar" name="menubar">
    <property name="geometry">
        <rect>
            <x>0</x>
            <y>0</y>
            <width>638</width>
```

```
        <height>21</height>
    </rect>
</property>
</widget>
<widget class="QStatusBar" name="statusbar"/>
</widget>
<resources/>
<connections/>
</ui>
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