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import random
from manim import *

print(random.randint(1,9))
class AnimationThing(Scene):
    def construct(self):
        title = Tex("Bubble Sort")
        BLUE1 = "#006aff"
        BLUE2 = "#3b8cff"
        BLUE3 = "#0054cc"
        bubble1 = Circle(radius=2.0,fill_color=BLUE1, color=BLUE1,fill_opacity=1).to_edge(UP+RIGHT)
        bubble2 = Circle(radius=1.0,fill_color=BLUE2, color=BLUE2,fill_opacity=1).to_edge(DOWN)
        bubble3 = Circle(radius=0.7,fill_color=BLUE3, color=BLUE3,fill_opacity=1).to_edge(LEFT)
        self.play(Write(title),run_time=2)
        self.play(title.animate.scale(4).set_color(BLUE1), run_time=2)
        self.play(
          FadeIn(bubble1),
          bubble1.animate.scale(5),
          FadeIn(bubble2),
          bubble2.animate.scale(3),
          FadeIn(bubble3),
          bubble3.animate.scale(9),
          run_time=2,
        )
        self.wait(1)
        project = Tex("ICS4-AP Sorting Project", color=BLACK)
        sehan = Tex("Sehan Munir", color=BLACK).shift(5*RIGHT).shift(2*UP)
        daniel = Tex("Daniel Iravani", color=BLACK).shift(5*RIGHT).shift(UP)
        yogi = Tex("Yogi Shah", color=BLACK).shift(5*RIGHT)
        date = Tex("2024-04-01", color=BLACK).to_edge(DOWN+RIGHT)

        animation1 = project.animate
        self.play(Write(project),animation1.to_edge(UP),animation1.scale(2),run_time=1.5)
        self.play(Write(sehan),sehan.animate.shift(10*LEFT),
                  Write(daniel),daniel.animate.shift(10*LEFT),
                  Write(yogi),yogi.animate.shift(10*LEFT),
                  Write(date),
                  run_time=2
                 )
        self.wait(1)
        circleTransition = Circle(radius=3.0,fill_color=BLACK,
color=BLACK,fill_opacity=1).to_edge(DOWN)
        self.play(Create(circleTransition),circleTransition.animate.scale(5.0),run_time=2)
        self.wait(1)
        blueblue = "#00f2ff"
        toptext = Text("Given an array of N elements:",color=blueblue).scale(0.8)
        bottomtext = Text("Bubble Sort It",color=blueblue).scale(0.8)
        self.play(Write(toptext),toptext.animate.to_edge(UP),run_time=1.5)
        table = Table([["5","3","4","7","5"]], include_outer_lines = True,h_buff=1.0,v_buff=1.0,
color=blueblue)
        sq = Square(side_length=2.0)
        self.play(FadeIn(sq))
        self.play(Transform(sq, table))
        self.play(Write(bottomtext),bottomtext.animate.to_edge(DOWN))
        coverrect = Rectangle(width=12.0, height=4.0,fill_color=BLACK,
color=BLACK,fill_opacity=1).to_edge(RIGHT)
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        self.add(coverrect)
        self.play(table.animate.shift(RIGHT * 3))
        sq1 = Square(side_length=1.4).shift(RIGHT*3)
        sq2 = Square(side_length=1.4).next_to(sq1, RIGHT, buff=0)
        sq3 = Square(side_length=1.4).next_to(sq2, RIGHT, buff=0)
        sq4 = Square(side_length=1.4).next_to(sq1, LEFT, buff=0)
        sq5 = Square(side_length=1.4).next_to(sq4, LEFT, buff=0)
        txt1 = Text("4", color=WHITE).move_to(sq1.get_center())
        txt2 = Text("7", color=WHITE).move_to(sq2.get_center())
        txt3 = Text("5", color=WHITE).move_to(sq3.get_center())
        txt4 = Text("3", color=WHITE).move_to(sq4.get_center())
        txt5 = Text("5", color=WHITE).move_to(sq5.get_center())
        self.add(coverrect)
        self.add(sq1,sq2,sq3,sq4,sq5,txt1,txt2,txt3,txt4,txt5)
        self.wait(2)
        t1 = Text("Bubble Sort works like this:",color=BLUE).scale(0.7).to_edge(LEFT).shift(UP*2)
        t2 = Text(" - PASS through the array (Index 1 through
max)",color=BLUE).scale(0.40).to_edge(LEFT).shift(UP*1.3)
        t3 = Text(" -    COMPARE every ADJACENT
element",color=BLUE).scale(0.40).to_edge(LEFT).shift(UP*0.9)
        t4 = Text(" -        If they are out of
ORDER",color=BLUE).scale(0.40).to_edge(LEFT).shift(UP*0.5)
        t5 = Text(" -             SWAP",color=BLUE).scale(0.40).to_edge(LEFT).shift(UP*0.1)
        self.play(Write(t1),Write(t2),Write(t3),Write(t4),Write(t5))
        self.play(t1.animate.set_color(GREEN))
        self.play(t1.animate.set_color(BLUE))
        self.play(t2.animate.set_color(GREEN))
        ar = Arrow(start=UP*0.3, end=DOWN, color=WHITE)
        self.play(Create(ar),ar.animate.move_to(sq4.get_center()).shift(UP*1.6))
        self.play(ar.animate.move_to(sq1.get_center()).shift(UP*1.6))
        self.play(ar.animate.move_to(sq2.get_center()).shift(UP*1.6))
        self.play(ar.animate.move_to(sq3.get_center()).shift(UP*1.6))
        self.play(ar.animate.move_to(sq4.get_center()).shift(UP*1.6))
        ar2 = Arrow(start=UP*0.3, end=DOWN, color=WHITE).move_to(ar.get_center())
        self.play(Create(ar2), ar2.animate.move_to(sq5.get_center()).shift(UP*1.6))
        self.play(t3.animate.set_color(GREEN))
        inquestion = "#00e5ff"
        good = "#00ff6a"
        bad = "#ff0000"
        self.play(sq5.animate.set_stroke(color=inquestion),sq4.animate.set_stroke(color=inquestion),
                txt5.animate.set_color(color=inquestion),txt4.animate.set_color(color=inquestion))
        self.play(ar.animate.move_to(sq1.get_center()).shift(UP*1.6),
ar2.animate.move_to(sq4.get_center()).shift(UP*1.6),
                    sq5.animate.set_stroke(color=WHITE),sq1.animate.set_stroke(color=inquestion),
                txt5.animate.set_color(color=WHITE),txt1.animate.set_color(color=inquestion))
        self.play(ar.animate.move_to(sq2.get_center()).shift(UP*1.6),
ar2.animate.move_to(sq1.get_center()).shift(UP*1.6),
                    sq4.animate.set_stroke(color=WHITE),sq2.animate.set_stroke(color=inquestion),
                txt4.animate.set_color(color=WHITE),txt2.animate.set_color(color=inquestion))
        self.play(ar.animate.move_to(sq3.get_center()).shift(UP*1.6),
ar2.animate.move_to(sq2.get_center()).shift(UP*1.6),
                    sq1.animate.set_stroke(color=WHITE),sq3.animate.set_stroke(color=inquestion),
                txt1.animate.set_color(color=WHITE),txt3.animate.set_color(color=inquestion))
        self.play(ar.animate.move_to(sq4.get_center()).shift(UP*1.6),
ar2.animate.move_to(sq5.get_center()).shift(UP*1.6),
                    sq3.animate.set_stroke(color=WHITE),sq2.animate.set_stroke(color=WHITE),
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                txt3.animate.set_color(color=WHITE),txt2.animate.set_color(color=WHITE))
        self.play(sq5.animate.set_stroke(color=inquestion),sq4.animate.set_stroke(color=inquestion),
                txt5.animate.set_color(color=inquestion),txt4.animate.set_color(color=inquestion))
        self.play(t3.animate.set_color(GREEN))
        self.play(sq5.animate.set_stroke(color=bad),sq4.animate.set_stroke(color=bad),
                txt5.animate.set_color(color=bad),txt4.animate.set_color(color=bad))
        self.play(t3.animate.set_color(bad))
        self.play(t4.animate.set_color(bad))
        self.play(t5.animate.set_color(bad))
        self.play(Swap(sq5,sq4),Swap(txt5,txt4),run_time=2)
        self.play(sq5.animate.set_stroke(color=WHITE),sq4.animate.set_stroke(color=WHITE),
                txt5.animate.set_color(color=WHITE),txt4.animate.set_color(color=WHITE))
        self.play(t3.animate.set_color(GREEN),t4.animate.set_color(BLUE),t5.animate.set_color(BLUE))
        self.play(ar.animate.move_to(sq1.get_center()).shift(UP*1.6),
ar2.animate.move_to(sq5.get_center()).shift(UP*1.6)
                ,sq5.animate.set_stroke(color=inquestion),sq1.animate.set_stroke(color=inquestion),
                txt5.animate.set_color(color=inquestion),txt1.animate.set_color(color=inquestion))
        self.play(sq5.animate.set_stroke(color=bad),sq1.animate.set_stroke(color=bad),
                txt5.animate.set_color(color=bad),txt1.animate.set_color(color=bad))
        self.play(t3.animate.set_color(bad))
        self.play(t4.animate.set_color(bad))
        self.play(t5.animate.set_color(bad))
        self.play(Swap(sq5,sq1),Swap(txt5,txt1),run_time=2)
        self.play(sq5.animate.set_stroke(color=WHITE),sq1.animate.set_stroke(color=WHITE),
                txt5.animate.set_color(color=WHITE),txt1.animate.set_color(color=WHITE))
        self.play(t3.animate.set_color(GREEN),t4.animate.set_color(BLUE),t5.animate.set_color(BLUE))
        self.play(ar.animate.move_to(sq2.get_center()).shift(UP*1.6),
ar2.animate.move_to(sq5.get_center()).shift(UP*1.6)
                ,sq2.animate.set_stroke(color=inquestion),sq5.animate.set_stroke(color=inquestion),
                txt2.animate.set_color(color=inquestion),txt5.animate.set_color(color=inquestion))
        self.play(t3.animate.set_color(bad))
        self.play(sq5.animate.set_stroke(color=good),sq2.animate.set_stroke(color=good),
                txt5.animate.set_color(color=good),txt2.animate.set_color(color=good))
        self.play(t3.animate.set_color(GREEN))
        self.play(sq5.animate.set_stroke(color=WHITE),sq2.animate.set_stroke(color=WHITE),
                txt5.animate.set_color(color=WHITE),txt2.animate.set_color(color=WHITE))
        self.play(ar.animate.move_to(sq3.get_center()).shift(UP*1.6),
ar2.animate.move_to(sq2.get_center()).shift(UP*1.6)
                ,sq3.animate.set_stroke(color=inquestion),sq2.animate.set_stroke(color=inquestion),
                txt3.animate.set_color(color=inquestion),txt2.animate.set_color(color=inquestion))
        self.play(sq3.animate.set_stroke(color=bad),sq2.animate.set_stroke(color=bad),
                txt3.animate.set_color(color=bad),txt2.animate.set_color(color=bad),
                t3.animate.set_color(bad))
        self.play(t4.animate.set_color(bad))
        self.play(t5.animate.set_color(bad))
        self.play(Swap(sq3,sq2,txt3,txt2))
        self.play(sq3.animate.set_stroke(color=WHITE),sq2.animate.set_stroke(color=WHITE),
                txt3.animate.set_color(color=WHITE),txt2.animate.set_color(color=WHITE))
        self.play(t3.animate.set_color(GREEN),t4.animate.set_color(BLUE),t5.animate.set_color(BLUE))
        questionCircle = Circle(radius=12.0, fill_color=BLACK, color=BLACK, fill_opacity=1)
        questionText = Text("We know that the array will be sorted after certain PASSES", color=WHITE,
font_size=28).shift(UP)
        questionText2 = Text("But how can the program?", color=WHITE, font_size=28)
        self.play(FadeIn(questionCircle), questionCircle.animate.scale(4), Write(questionText),
Write(questionText2))
        self.wait(2)
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        self.play(FadeOut(questionCircle), FadeOut(questionText), FadeOut(questionText2))
        t22 = Text(" - While Array is UNSORTED",color=BLUE).scale(0.40).to_edge(LEFT).shift(UP*1.3)
        t32 = Text(" -      Assume array is SORTED (unless proven
otherwise)",color=BLUE).scale(0.40).to_edge(LEFT).shift(UP*0.9)
        t42 = Text(" -      PASS through array",color=BLUE).scale(0.40).to_edge(LEFT).shift(UP*0.5)
        t52 = Text(" -           COMPARE every ADJACENT
element",color=BLUE).scale(0.40).to_edge(LEFT).shift(UP*0.1)
        t62 = Text(" -           If they are out of
ORDER",color=BLUE).scale(0.40).to_edge(LEFT).shift(DOWN*0.3)
        t72 = Text(" -               SWAP",color=BLUE).scale(0.40).to_edge(LEFT).shift(DOWN*0.7)
        t82 = Text(" -               Assume Array is
UNSORTED",color=BLUE).scale(0.40).to_edge(LEFT).shift(DOWN*1.1)
        self.play(Transform(t2,t22),Transform(t3,t32),Transform(t4,t42)
                ,Transform(t5,t52),Write(t62),Write(t72),Write(t82))
        questionText = Text("Before every array PASS, lets assume it is SORTED", color=WHITE,
font_size=28).shift(UP)
        questionText2 = Text("if a SWAP is ever required, lets assume it is NOT SORTED", color=WHITE,
font_size=28)
        self.play(FadeIn(questionCircle), Write(questionText), Write(questionText2))
        self.wait(4)
        questionText21 = Text("This way, we can ensure that after (?) PASSES", color=WHITE,
font_size=28).shift(UP)
        questionText22 = Text("the Array is fully sorted!", color=WHITE, font_size=28)
        self.wait(4)
        self.play(FadeOut(questionText2),FadeOut(questionText), FadeIn(questionText21),
FadeIn(questionText22))
        self.play(FadeOut(questionText21), FadeOut(questionText22),FadeOut(questionCircle))
        self.play(t22.animate.set_color(GREEN))
        self.play(t32.animate.set_color(GREEN))
        self.wait()

self.play(ar.animate.move_to(sq1.get_center()).shift(UP*1.6),ar2.animate.move_to(sq4.get_center()).shif
t(UP*1.6),
                  sq1.animate.set_stroke(color=good),sq4.animate.set_stroke(color=good),
                txt1.animate.set_color(color=good),txt4.animate.set_color(color=good),
                t42.animate.set_color(color=good), t52.animate.set_color(color=good))



self.play(ar.animate.move_to(sq5.get_center()).shift(UP*1.6),ar2.animate.move_to(sq1.get_center()).shif
t(UP*1.6),
                  sq1.animate.set_stroke(color=WHITE),sq4.animate.set_stroke(color=WHITE),
                txt1.animate.set_color(color=WHITE),txt4.animate.set_color(color=WHITE),
                  sq5.animate.set_stroke(color=good),sq1.animate.set_stroke(color=good),
                txt5.animate.set_color(color=good),txt1.animate.set_color(color=good))


self.play(ar.animate.move_to(sq3.get_center()).shift(UP*1.6),ar2.animate.move_to(sq5.get_center()).shif
t(UP*1.6),
                  sq5.animate.set_stroke(color=WHITE),sq1.animate.set_stroke(color=WHITE),
                txt5.animate.set_color(color=WHITE),txt1.animate.set_color(color=WHITE),
                  sq3.animate.set_stroke(color=good),sq5.animate.set_stroke(color=good),
                txt3.animate.set_color(color=good),txt5.animate.set_color(color=good))
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self.play(ar.animate.move_to(sq2.get_center()).shift(UP*1.6),ar2.animate.move_to(sq3.get_center()).shif
t(UP*1.6),
                  sq3.animate.set_stroke(color=WHITE),sq5.animate.set_stroke(color=WHITE),
                txt3.animate.set_color(color=WHITE),txt5.animate.set_color(color=WHITE),
                  sq2.animate.set_stroke(color=good),sq3.animate.set_stroke(color=good),
                txt2.animate.set_color(color=good),txt3.animate.set_color(color=good))
        self.play(sq2.animate.set_stroke(color=WHITE),sq3.animate.set_stroke(color=WHITE),
                txt2.animate.set_color(color=WHITE),txt3.animate.set_color(color=WHITE))
        self.wait()
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