**SEQUENTIAL**

1. Draw a flowchart that reads in the name of a dinosaur and the number of years ago that the dinosaur lived and then computers the number of months, days, and seconds ago that the dinosaur lives. (Use 365.25 days per year.) Test your program with Eric, a triceratops that lived 145 million years ago and Alfred, a brontosaurus that lived 182 million years.

ALGORITHM <conversion>

name, y 🡪 0, m 🡪 0.0, d 🡪 0.0, s 🡪 0.0

INPUT name, y

m 🡪 y \* 12

d 🡪 y \* 365.25

s 🡪 d \* 86400

OUTPUT m, d, s

END <conversion>

1. Given a right triangle with sides A, sides B. Draw a flowchart that

a

b

will input values of side A, side B. Compute the hypotenuse\_C.

ALGORITHM <hypotenuse>

a 🡪 0.0, b 🡪 0.0, c 🡪 0.0

INPUT a, b

c 🡪 sqrt((a\*a) + (b\*b))

OUTPUT c

END <hypotenuse>

1. Get the radius of a circle. Compute and display the circle’s area and circumference.

Area of circle = PI \* radius\* radius

Circumference of a circle = 2\*PI \* radius

ALGORITHM <circle>

r 🡪 0.0, pi 🡪 3.14, a 🡪 0.0, c 🡪 0.0

INPUT r

a 🡪 pi \* r \* r

c 🡪 2 \* pi \* r

OUTPUT a, c

END <circle>

**SELECTION**

1. Draw a flowchart that will input any positive integer and display “DIVISIBLE BY 9” if the given number is divisible by 9 otherwise display “ NONE DIVISIBLE” if not.

ALGORITHM <integer9>

num 🡪 0

INPUT num

IF (num%9 == 0) THEN

OUTPUT "DIVISIBLE BY 9"

ELSE

OUTPUT "NONE DIVISIBLE"

END IF

END <integer9>

1. A certain city classifies a POLLUTION INDEX of less than 35 as “PLEASANT”. If index is from 35 to 60 it is “UNPLEASANT” and index above 60 is “HAZARDOUS”. The city pollution officer wants a program that will accept POLLUTION INDEX and will display appropriate classification.

ALGORITHM <pol\_index>

pol 🡪 0

INPUT pol

IF (pol < 35) THEN

OUTPUT "PLEASANT"

ELSE IF (pol >= 35 && pol <= 65) THEN

OUTPUT "UNPLEASANT"

ELSE

OUTPUT "HAZARDOUS"

END IF

END <pol\_index>

1. Write an interactive program that computes the area of rectangle ( area = base \* height) and area of triangle ( area = ½ \* base \* height). Let the user choose what area to compute by prompting the first character of figure name ( R – Rectangle or T – Triangle) then compute and print the desired result.

ALGORITHM <area>

ans, a 🡪 0, b 🡪 0, h 🡪 0

INPUT ans

IF (ans == 'R' || ans == 'r') THEN

INPUT b, h

a 🡪 b \* h

OUTPUT a

ELSE IF (ans == 'T' || ans == 't') THEN

INPUT b, h

a 🡪 .5 \* b \* h

OUTPUT a

ELSE

OUTPUT "INVALID!"

END IF

END <area>

1. An applicant will be accepted to the Jedi Knight Academy if he is at least 200 cm tall; age is between 21 and 25 inclusive, and a citizen of the Planet Endor. However, if the applicant is recommendee of Jedi Master Obi Wan, he is accepted automatically regardless of his height, age and citizenship. Write a program that would input the applicant’s height, age, citizenship code (1- citizen 0-not citizen) and recommendee’s code (1- recommended 0- not recommended) and then output whether the applicant is accepted or rejected.

ALGORITHM <applicant>

rc 🡪 0, cc 🡪 0, age 🡪 0, h 🡪 0.0

INPUT rc

IF (rc == 1) THEN

OUTPUT "ACCEPTED!"

ELSE

INPUT h, age, cc

IF (h >= 200 && age >= 21 && age <= 25 && cc == 1) THEN

OUTPUT "ACCEPTED!"

ELSE

OUTPUT "DECLINED!"

END IF

END IF

END <applicant>