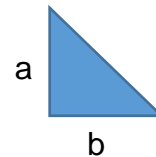


## SEQUENTIAL

1. Draw a flowchart that reads in the name of a dinosaur and the number of years ago that the dinosaur lived and then computes 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>
```

2. Given a right triangle with sides A, sides B. Draw a flowchart that 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>
```

3. Get the radius of a circle. Compute and display the circle's area and circumference.  
Area of circle =  $\text{PI} * \text{radius} * \text{radius}$   
Circumference of a circle =  $2 * \text{PI} * \text{radius}$

```
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>
```

2. 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>
```

3. Write an interactive program that computes the area of rectangle (  $\text{area} = \text{base} * \text{height}$ ) and area of triangle (  $\text{area} = \frac{1}{2} * \text{base} * \text{height}$ ). 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  $\rightarrow$  0, b  $\rightarrow$  0, h  $\rightarrow$  0
  INPUT ans
  IF (ans == 'R' || ans == 'r') THEN
    INPUT b, h
    a  $\rightarrow$  b * h
    OUTPUT a
  ELSE IF (ans == 'T' || ans == 't') THEN
    INPUT b, h
    a  $\rightarrow$  .5 * b * h
    OUTPUT a
  ELSE
    OUTPUT "INVALID!"
  END IF
END <area>
```

4. 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>
```