

# National 5 Computing Homework



## Computational Thinking

### Topic 4 - IF (Making Decisions)

Name -

Grade - / 28

Feedback

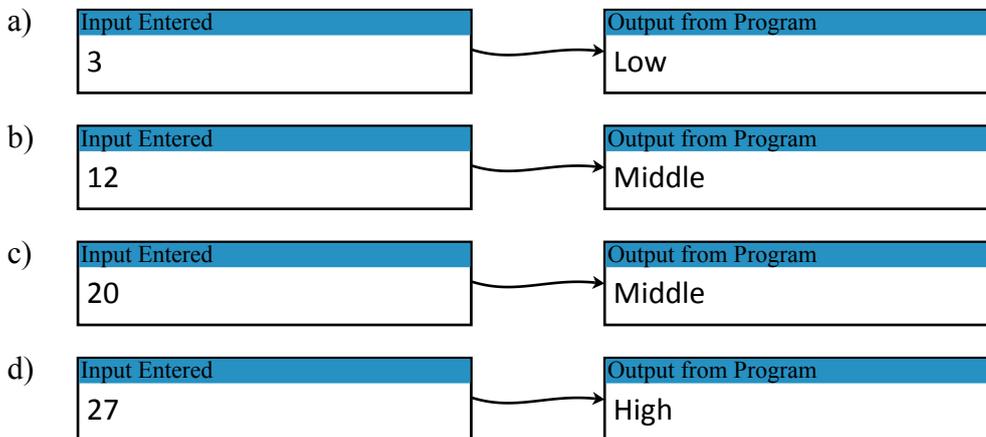
Without the ability to make decisions a computer program would not be able to change how it responds to input. Conditions (for example -  $\text{num} \geq 25$ ) are used to decide how the program will respond.

In the following questions you will be asked to predict what the output from each program will be from a variety of different inputs.

Example program:

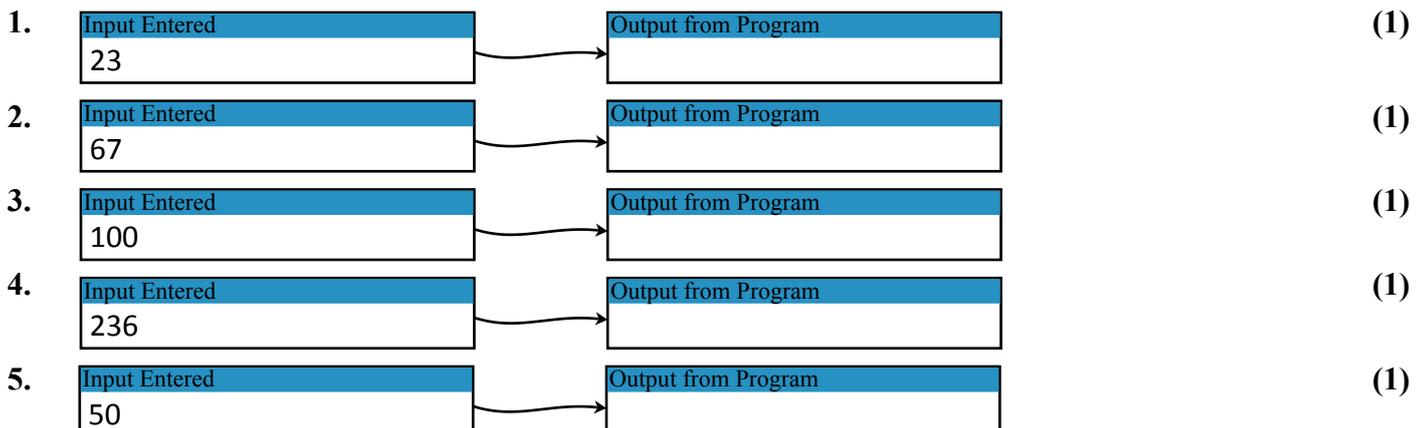
```
number = int(input("Please enter an integer"))
if number < 10:
    print("Low")
if number >= 10 and number <= 20:
    print("Middle")
if number > 20:
    print("High")
```

#indented lines are only if the above condition is true



**Program 1:**

```
number = int(input("Please enter an integer"))
if number <= 50:
    print("Low")
if number > 50 and number < 100:
    print("Middle")
if number >= 100:
    print("High")
```





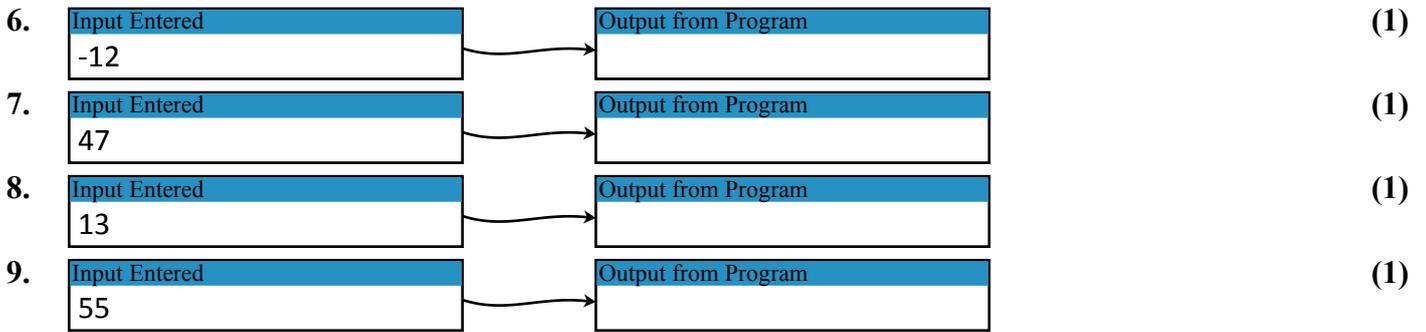
**Program 2:**

```

temp = float(input("Please enter a temperature"))
if temp >= -273 and temp <= 12:
    print("Solid")
elif temp >13 and temp < 47:
    print("Liquid")
elif temp >= 47:
    print("Gas")
else:
    print("Not Found")

```

#elif in Python means 'else if'  
#if none of the conditions above are true, the 'else' is used



10. Which of the above questions (5,6,7 or 8) highlights an error in the logic of the program? (1)

State how would you fix the program? (1)

**Program 3:**

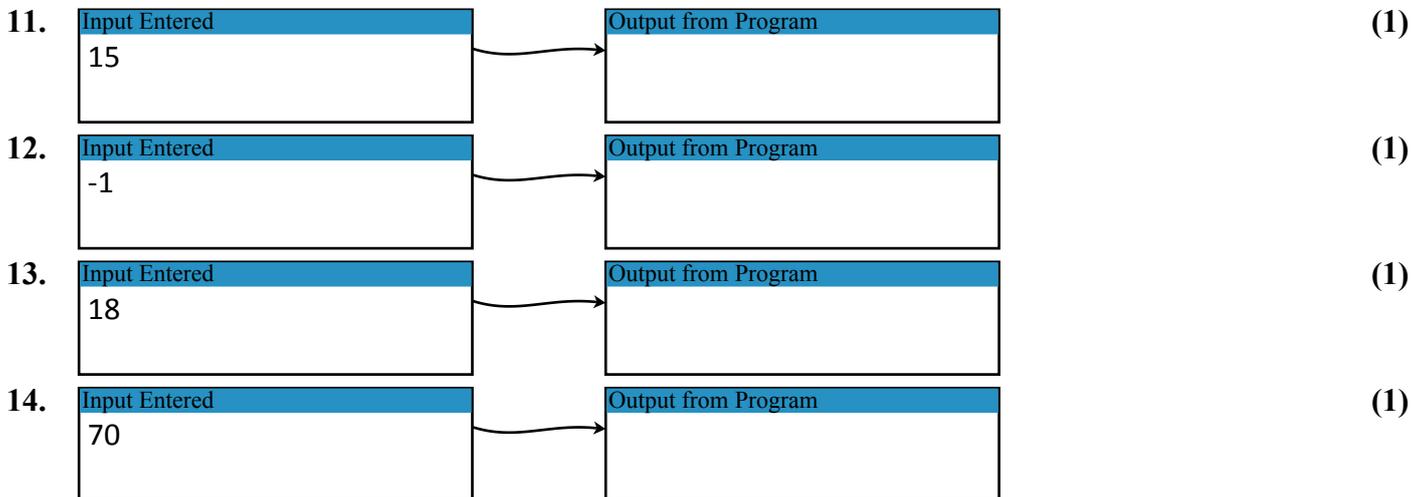
```

age = int(input("Please enter your age"))
if age < 0 or age > 120:
    print("Age not valid")
elif age >= 0 and age <= 18:
    print("School age")
elif age >= 16 and age <= 70:
    print("Working age")
elif age > 65:
    print("Retirement age")
else:
    print("Not Found")

```

#with an 'or' only one condition has to be true

Note - for this program there may sometimes be two outputs generated from the one input.



15. Assuming an integer is entered as input, explain why can the output never be "Not Found"? (1)

\_\_\_\_\_

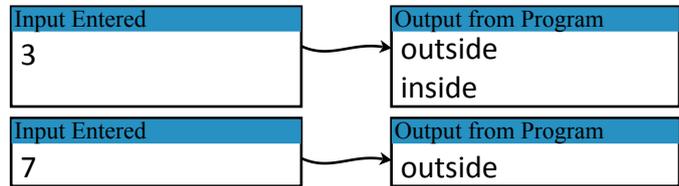


It's possible to put 'if' statements inside each other. In programming, this is called nesting.

```

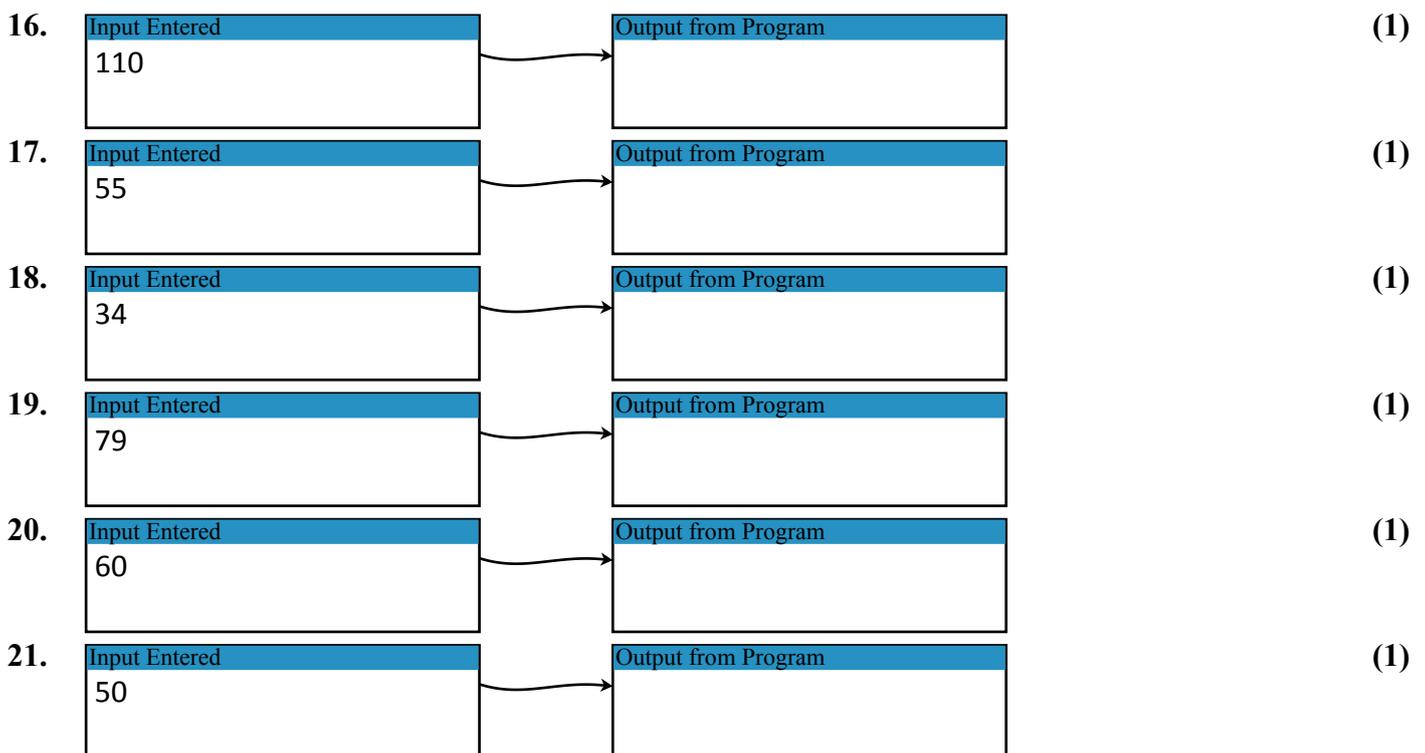
Example program:  test = int(input("Please enter an integer"))
                    if test >= 0 and test <= 12:                #outside if statement
                        print("outside")
                        if test >= 0 and test < 4:              #nested if statement
                            print("inside")                    #two levels of indentation
  
```

The conditions of a nested if are only checked if the outside if conditions are true:



```

Program 4:      percentage = int(input("Please enter a percentage between 0 and 100"))
                    if percentage < 0 or percentage > 100:
                        print("Invalid Input")
                    elif percentage >= 0 and percentage < 100:
                        print("Valid Percentage Entered")
                        if percentage >= 0 and percentage < 50:
                            print("Fail")
                        elif percentage >= 50 and percentage < 60:
                            print("C Pass")
                        elif percentage >= 60 and percentage < 70:
                            print("B Pass")
                        else:
                            print("A Pass")
  
```



**Program 5:**

The following program calculates the postage cost of parcels depending on their value and their weight.

```
value = float(input("Please enter the value of your item"))
weight = float(input("Please enter the weight of your item in kilograms"))
if value <= 0:
    print("Invalid value")
    postage = 0
if weight >= 0 and weight < 2:
    if value > 0 and value < 50:
        postage = 1.50
    if value >= 50 and value < 150:
        postage = 2.75
    if value >= 150:
        postage = 5.50
elif weight >= 2 and weight < 10:
    if value > 0 and value < 50:
        postage = 2.50
    if value >= 50 and value < 150:
        postage = 4.40
    if value >= 150:
        postage = 8.35
elif weight >= 10 and weight < 25:
    if value > 0 and value < 50:
        postage = 7.55
    if value >= 50 and value < 150:
        postage = 12.30
    if value >= 150:
        postage = 15.00
else:
    postage = 25
print(postage)
```

Calculate the postage for each of the inputs entered in the program.

- |     |                              |                 |     |
|-----|------------------------------|-----------------|-----|
| 22. | Value = 62<br>Weight = 1.5   | Postage = _____ | (1) |
| 23. | Value = 0<br>Weight = 2.2    | Postage = _____ | (1) |
| 24. | Value = 172<br>Weight = 19   | Postage = _____ | (1) |
| 25. | Value = 250<br>Weight = 32.5 | Postage = _____ | (1) |
| 26. | Value = 34<br>Weight = 2.5   | Postage = _____ | (1) |
| 27. | Value = 50<br>Weight = 10    | Postage = _____ | (1) |