

ASD1 : Solution of the Final exam

2024-2025

Exercise 1: Transportation Cost Calculation

Algorithm CalculateTransportationCost

Variables:

```
distance, weight: real;
isUrgent: Boolean;           //declarations : 1. pt
transportMeans: string;
baseCost, totalCost, surcharge: real;
```

Begin

```
Read(distance, weight, isUrgent, transportMeans); // readings : 1 pt, 0.25 for each one
```

```
If weight < 10 Then
```

```
  If distance < 50 Then
```

```
    baseCost ← distance * 2;
```

```
  Else
```

```
    baseCost ← distance * 1.5;
```

```
  Endif;
```

```
Else If weight <= 50 Then
```

```
  If distance < 50 Then
```

```
    baseCost ← distance * 4;           // Alternative conditional actions : 2 pts
```

```
  Else
```

```
    baseCost ← distance * 3;
```

```
  Endif;
```

```
Else //weight >50
```

```
  If distance < 50 Then
```

```
    baseCost ← distance * 6;
```

```
  Else
```

```
    baseCost ← distance * 5;
```

```
  Endif;
```

```
Endif;
```

```
Endif;
```

```
Surcharge ← 0; // 0.5 pt
```

```
If isUrgent Then
```

```
  surcharge ← baseCost * 0.2; // 0.5 pt
```

```
Endif;
```

```
If transportMeans = "Air" Then
```

```
  surcharge ← surcharge + (baseCost * 0.3);
```

```
Else If transportMeans = "Sea" Then
```

```
  surcharge ← surcharge - (baseCost * 0.1);
```

```
Endif;
```

```
//1 pt
```

```
totalCost ← baseCost + surcharge; // 0.5 pt
```

```
Write("Total Cost = ", totalCost); // 0.5 pt
```

End.

Exercise 2: Binary to Decimal Conversion : (7 pts)

Algorithm BinaryToDecimal

Const n = 16;

Variables :

Bin : array[1..n] of integer; // declarations : 1 pt

decim, weight: integer;

j , i: integer;

Begin

For i= 1 to n do

 Read (bin[i]); // reading : 0.5 pt

EndFor;

decim ← 0; // initialisation : 0.5 pt

For i = n To 1 step = -1 Do // loop i for calculation of the polynomial sum : 1.5 pts

 weight := 1;

 For j = 1 To (n - i) Do

 weight ← weight * 2; // loop j for calculation of the power of 2 : 2 pts

 EndFor;

 decim ← decim + (bin[i] * weight); // sum instruction : 1 pt

EndFor;

Write ("Decimal Equivalent = ", decim); //output : 0.5 pt

End.

Exercise 3: Product Calculation (6 pts)

Algorithm CalculateProduct

Const n = 10;

Variables : //declarations : 1 pt

u[n] , v[n] : array of real;

Product: real;

i: integer;

Begin

For i= 1 to n do

 Read (u [i]); // readings : 1 pt

EndFor;

For i= 1 to n do

 Read (v [i]);

EndFor;

Product := 0; //initialisation : 1 pt

For i := 1 To n Do

 Product ← Product + (u[i] * v[i]); // calculation loop : 2 pts

Endfor;

Write("Dot Product = ", Product); // writings : 1 pt

End.