**EXERCISE 1**

(a)

**XDR struct:**

forecast{

string weekday;

int temperature;

string tags<>;

}

**Encoding:**

weekday:”monday”

00 00 00 06 – 6d 6f 6e 64 – 61 79 00 00

temperature:14

00 00 00 0e

tags:{“sunny”,”dry”}

00 00 00 02 – 00 00 00 05 - 73 75 6e 6e – 79 00 00 00

00 00 00 03– 64 72 79 00

Total Bytes: (32)

00 00 00 06 6d 6f 6e 64 61 79 00 00 00 00 00 0e 00 00 00 02 00 00 00 05 73 75 6e 6e 79 00 00 00 00 00 00 03 64 72 79 00

b)

**define a SET:**

forecast ::= SET

{

weekday IA5String

temperature INTEGER

tags SEQUENCE OF IA5String;

}

**Encoding:**

weekday:monday

16 06 6d 6f 6e 64 61 79

temperature:14

02 01 0e

tags:

30 0c 16 05 73 75 6e 6e 79 16 03 64 72 79

Total Bytes: (27)

31 19 16 06 6d 6f 6e 64 61 79 02 01 0e 30 0c 16 05 73 75 6e 6e 79 16 03 64 72 79

**EXERCISE 2**

(a)

**XML schema:**

<xs:element name=“forecast“>

<xs:complexType>

<xs:sequence>

<xs:element name=”weekday” type=”xs:string”/>

<xs:element name=”temperature” type=”xs:Integer”/>

<xs:element name=”tags”>

<xs:complexType>

<xs:sequence>

<xs:element name=”props” type=”xs:string”

minOccurs=”0” maxOccurs=”unbounded”/>

</xs:sequence>

</xs:complexType>

</xs:element>

</xs:sequence>

</xs:complexType>

</xs:element>

**XML valid document:**

<forecast>

<weekday>monday</weekday>

<temperature>14</temperature>

<tags>

<props>sunny</props>

<props>dry</props>

</tags>

</forecast>

**JSON object:**

{“forecast”:{

“weekday”:”monday”,

“temperature”:14,

“tags”:[”sunny”,”dry”]

}

}}

**EXERCISE 3**

(a)

**.proto file:**

message forecast{

required string weekday =1

required int32 temperature =2

repeated string tags =3

}

**Encoding:**

0a 06 6d 6f 6e 64 61 79

10 0e

1a 05 73 75 6e 6e 79

1a 03 64 72 79

(b)

**.thrift file:**

struct forecast{

1: string weekday

2: i32 temperature

3: list<string> tags

}

**Encoding (Thrift BinaryProtocol):**

08 0001 00 00 00 06 6d 6f 6e 64 61 79

06 0002 00 00 00 00 00 00 00 0e

09 0003 0b 00 00 00 02

00 00 00 05 73 75 6e 6e 79

00 00 00 03 64 72 79 00

**Encoding (Thrift CompactProtocol):**

18 06 6d 6f 6e 64 61 79

25 0e

39 28

05 73 75 6e 6e 79

03 64 72 79 00

**EXERCISE 4**

(a)

**int32 - protobuf protocol:**

11010000 10010001 00110010

* D0 91 32

(b)

**sint32 (signedint) - protobuf protocol:**

positive:

Zahl \* 2 = encoded Zahl

negative:

Zahl \* (-2) -1 = encoded Zahl

(-821456) \* (-2) - 1= 1.642.911

10011111 10100011 01100100

* 9F A3 64