Formálne metódy tvorby softvéru
Domáca úloha 3

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1.)

a) Nil a $\tau.\tau.$Nil -> Áno

b) τ.a.Nil + τ.b.Nil a a.Nil + b.Nil -> Nie

c) µX.τ.X a µX.(τ.X + τ.Nil) -> Áno

d) µX.τ.X a Nil -> Áno

Status	Time	Property	Verify	Edit	Delete	Options
✓	50 ms	X ≈ Y	▶	✎	🗑	☰
✗	25 ms	XX ≈ YY	▶	✎	🗑	☰
✓	26 ms	XXX ≈ YYY	▶	✎	🗑	☰
✓	25 ms	XXXX ≈ YYYY	▶	✎	🗑	☰

Obr. 1: Výsledky bisimulácii

2.)

Po boji... Funkčný kód, sender posiela správy kým nedostane potvrdenie a mediumy ich vedia zahadzovať, kontrola slabej bisimulácia vyšla správne. Receiver vždy vráti potvrdenie ale output iba ak potvrdenie korešponduje s jeho vnútorným stavom. (obrázky na ďalšej strane)

Protokol_send_receive

Parse | CCS | TCCS | 16

```
1  ProtokolSpecifikacia = in1.'out1.ProtokolSpecifikacia +
2  in2.'out2.ProtokolSpecifikacia + in3.'out3.ProtokolSpecifikacia;
3
4  Protokol = (Sender | Medium1 | Medium2 | Receiver)\{sm01, sm11, sm02, sm12, sm03, sm13, mr01, mr11, mr02, mr12, mr03, mr13, rm0,
       rm1, ms0, ms1};
5
6  Medium1 = (sm01.('mr01.Medium1 + Medium1)) + (sm11.('mr11.Medium1 + Medium1)) +
7  (sm02.('mr02.Medium1 + Medium1)) + (sm12.('mr12.Medium1 + Medium1)) +
8  (sm03.('mr03.Medium1 + Medium1)) + (sm13.('mr13.Medium1 + Medium1));
9
10 Medium2 = (rm0.('ms0.Medium2 + Medium2)) + (rm1.('ms1.Medium2 + Medium2));
11
12 Sender = Sender0;
13
14 Sender0 = in1.SenderRep01 + in2.SenderRep02 + in3.SenderRep03;
15
16 Sender1 = in1.SenderRep11 + in2.SenderRep12 + in3.SenderRep13;
17
18 SenderRep01 = 'sm01.(ms0.Sender1 + SenderRep01);
19 SenderRep02 = 'sm02.(ms0.Sender1 + SenderRep02);
20 SenderRep03 = 'sm03.(ms0.Sender1 + SenderRep03);
21 SenderRep11 = 'sm11.(ms1.Sender0 + SenderRep11);
22 SenderRep12 = 'sm12.(ms1.Sender0 + SenderRep12);
23 SenderRep13 = 'sm13.(ms1.Sender0 + SenderRep13);
24
25 Receiver = Receiver0;
26
27 Receiver0 = mr01.'out1.'rm0.Receiver1 + mr02.'out2.'rm0.Receiver1 + mr03.'out3.'rm0.Receiver1 +
28 mr11.'rm1.Receiver0 + mr12.'rm1.Receiver0 + mr13.'rm1.Receiver0;
29
30 Receiver1 = mr11.'out1.'rm1.Receiver0 + mr12.'out2.'rm1.Receiver0 + mr13.'out3.'rm1.Receiver0 +
31 mr01.'rm0.Receiver1 + mr02.'rm0.Receiver1 + mr03.'rm0.Receiver1;
32
```

Obr. 2: Finálny výsledok

Status	Time	Property	Verify	Edit	Delete	Options
✓	101 ms	ProtokolSpecifikacia ≈ Protokol	▶	✎	🗑	≡

Obr. 3: Výsledky bisimulácii