

## Assignment 2: Mental Programming in NGOMSL

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**Assess in Natural GOMS Language (NGOMSL) how effective placing a phone call is by using the “Favorite” feature versus dialing a number when using *Apple IOS*.**

1. **Give examples of typical “unit-tasks” for the telephone app and model the top-level in NGOMSL. Remember to include the unit-task level.**

Typical unit-tasks for the telephone app includes:

- Creating a new contact
- Editing an existing contact
- Checking answering machine
- Calling a number
- Calling a contact
- Searching for a contact

2. **Model the goal “call”, which calls a person.**

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Method to accomplish goal of calling a person
Step 1: Recall name of person to call
Step 2: Retrieve-LTM whether person is a favorite contact
Step 3: Decide: If person is a favorite contact Then accomplish the
          goal of calling favorite contact Else accomplish the goal of
          calling a person by dialing
Step 4: Return with goal accomplished
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Method to accomplish goal of calling person by dialing  
Step 1: Retain Dialer as button to press  
Step 2: Accomplish the goal of pressing a button  
Step 3: Accomplish the goal of dialing number  
Step 4: Retain call button as button to press  
Step 5: Accomplish the goal of pressing a button  
Step 6: Return with goal accomplished

Method to accomplish goal of calling favorite contact  
Step 1: Retain Favorite as button to press  
Step 2: Accomplish the goal of pressing a button  
Step 3: Recall name of person to call  
Step 4: Retain name of person to call as button to press  
Step 5: Accomplish the goal of pressing a button  
Step 6: Return with goal accomplished

Method to accomplish goal of dialing number  
Step 1: Recall name of person to call  
Step 2: Retrieve-LTM next chunk of person's phone-number  
Step 3: Decide: If no more chunks, then return with goal accomplished  
Step 4: Decide: If no more digits in chunk, then goto step 2  
Step 5: Retain next digit in chunk as button to press  
Step 6: Accomplish the goal of pressing a button  
Step 7: Goto step 4

Method to accomplish goal of pressing button  
Step 1: Recall button to press  
Step 2: Locate button on screen  
Step 3: Move finger to button area  
Step 4: Press button  
Step 5: Return with goal accomplished

**3. Compute execution time for the two phoning alternatives.**

$CP = 1.2, B = 0.1, H = 0.4, K = 0.2, M = 1.2, P = 1.1$  (in seconds)

It is assumed that the user remembers an 8-digit phone number as chunks of 2 digits each. For both scenarios it is also assumed that the user starts from the "last used contacts" screen – which is the first screen to appear after opening the "Phone" application. Table 1 shows that the total time it takes to call a person through dialing is estimated to be 68.6 seconds; while Table 2 shows that the total time it takes to call a favorite contact is estimated to be 15.5 seconds.

Description	Type	Cost
Step 1: Recall name of person to call	M	$0.1 + 1.2$
Step 2: Retrieve-LTM whether person is a favorite contact	M	$0.1 + 1.2$
Step 3: Decide: If person is a favorite contact Then accomplish the goal of calling favorite contact Else accomplish the goal of calling a person by dialing		$0.1 + 0.1$
Step 1: Retain Dialer as button to press	M	$0.1 + 1.2$
Step 2: Accomplish the goal of pressing a button		$0.1$
Step 1: Recall button to press	M	$0.1 + 1.2$
Step 2: Locate button on screen	CP	$0.1 + 1.2$
Step 3: Move finger to button area	P	$0.1 + 1.1$
Step 4: Press button	BB	$0.1 + 2 \cdot 0.1$
Step 5: Return with goal accomplished		$0.1$
Step 3: Accomplish the goal of dialing number		$0.1$
Step 1: Recall name of person to call	M	$0.1 + 1.2$
Step 2: Retrieve-LTM next chunk of person's phone-number	M	$0.1 + 1.2$
Step 3: Decide: If no more chunks, then return with goal accomplished		$0.1$
Step 4: Decide: If no more digits in chunk, then goto step 2		$0.1$
Step 5: Retain next digit in chunk as button to press	M	$0.1 + 1.2$
Step 6: Accomplish the goal of pressing a button		$4.3$
Step 7: Goto step 4		$0.1$
Repeat step 5-7 twice for each chunk and step 4 three times.		$11.5$
Repeat step 4-7 four times and step 2-3 five times.		$53$
Step 4: Retain call button as button to press	M	$0.1 + 1.2$
Step 5: Accomplish the goal of pressing a button		$4.3$
Step 6: Return with goal accomplished		$0.1$
Step 4: Return with goal accomplished		$0.1$
Total		$68.6$

Table 1: Estimation of cost in seconds of dialing favorite contact

Description	Type	Cost
Step 1: Recall name of person to call	M	$0.1 + 1.2$
Step 2: Retrieve-LTM whether person is a favorite contact	M	$0.1 + 1.2$
Step 3: Decide: If person is a favorite contact Then accomplish the goal of calling favorite contact Else accomplish the goal of calling a person by dialing		$0.1 + 0.1$
Step 1: Retain Favorite as button to press	M	$0.1 + 1.2$
Step 2: Accomplish the goal of pressing a button		4.3
Step 3: Recall name of person to call	M	$0.1 + 1.2$
Step 4: Retain name of person to call as button to press	M	$0.1 + 1.2$
Step 5: Accomplish the goal of pressing a button		4.3
Step 6: Return with goal accomplished		0.1
Step 4: Return with goal accomplished		0.1
	Total	15.5

Table 2: Estimation of cost in seconds of dialing favorite contact