

Microprocessors and Interfacing

(CSE - 3002)

LAB EXPERIMENT-2

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Teacher: Mr. Konguvel E.

1. Write and execute ALP to perform nCr and nPr calculations. Assume n and r to be non-negative integers.

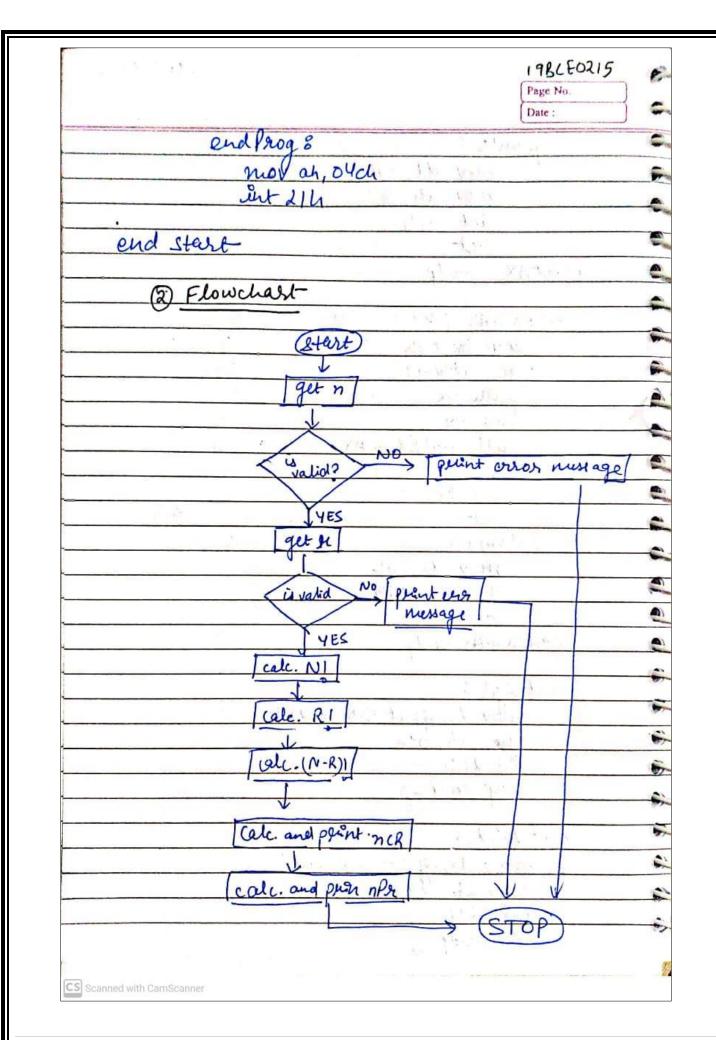
| Page No. Date: OI) Write and execute ALP to perform nor and nor valuations. Assume n and n to be non-nightive integers. Alway: nucled small stack by data entern db 'Enter the value of n: \$' entern db 'Enter the " " n: \$' outning db Dah, Dah, Odh, 'nor: \$' outning db Dah, Dah, Odh, 'nore: \$' errenting db Oah, Odh, 'nore: \$' rented db Oah, Odh, 'Crossid light \$' then dw 10 n db ? n feet dw? nfact dw? nfact dw? nfact dw? nor dw? | | 19BCE0215 |
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| OI) write and execute ALP to perform nor and nor calculations. Alsume n and n to be non-nighter integers. Awal) Alp: nucle small . stack by . data entern db 'Enter the value of n: \$' entern db 'Enter the "" " n: g' outner db Oah, Dah, adh, 'nor: \$' erenostaget db Oah, Odh, 'coret: \$' erenostaget db Oah, Odh, 'coretid input \$' ten dw 10 n db ? nrest dw? nre | | |
| non-nighter integers. Awal) . Malf: . model small . stack by . data . entern db 'Enter the value of n: \$' entern db 'Enter the " " n: \$' outnips db Dah, Dah, Odh, 'npr: \$' outnich db Oah, Dah, Odh, 'nre: \$' errnatigit db Dah, Odh, 'nre: \$' errnatigit db Dah, Odh, 'Cuvalid inpert \$' then dw 10 n db ? n feet dw ? nfact dw ? nfact dw ? nor da, @deta | 1 01 | |
| Pron-nightre Integers. AWI) I Malp: I model small I stack by I data Pentern db 'Enter the value of n: \$' Pentern db 'Enter the " " n: \$' OutNPR db Dah, Dah, Odh, 'nPr: \$' OutNPR db Dah, Dah, Odh, 'nPr: \$' Perentalizat db Dah, Odh, 'chroalid agent \$' I then dw 10 n db? n feet dw? nfeet dw? nfeet dw? nfeet dw? nfeet dw? ncr dw? nor dx, @data mov dx, afset entern mov dh, Oth | The state of the s | The state of the s |
| Awal) I model small . stack 64 . data entern db 'Enter the value of n: \$' entern db 'Enter the " " n: \$' outNPR db Dah, Dah, Odh, 'nPr: \$' outNCR db Oah, Dah, Odh, 'nPr: \$' erenot Digit db Oah, Odh, 'chroalid agent \$' then dw 10 n db? n feet dw? nfeet dw? nfeet dw? nfeet dw? nor dw? . code then dw? nor dw? | m. The state of th | 100 % 10 0E |
| nwoll smell italk 64 data entern db 'Enter the value of n: \$' entern db 'Enter the "" " n: \$' outNPR db Dah, Dah, Odh, 'nPr: \$' outNCR db Dah, Dah, Odh, 'nCr: \$' erenot Digit db Dah, Odh, 'Cerval d'expert \$' ten dw 10 n db? nrest dw? nrest dw? nrest dw? nrest dw? nrest dw? nor dw? | Tron-regerve surgers. | 6.11 |
| nwoll smell itack by data entern db 'Enter the value of n: \$' entern db 'Enter the "" " n: \$' outNPR db Dah, Dah, Odh, 'nPr: \$' outNCR db Dah, Dah, Odh, 'nCh: \$' erenot Digit db Dah, Odh, 'Cervalid inper \$' ten dw 10 n db? nrest dw? nrest dw? nrest dw? nrest dw? nrest dw? nor dw? | Aug) |)1 1 |
| . steek by . data . entern db 'Enter the value of n:\$' entern db 'Enter the "" on:\$' outNPR db Dah, Dah, Odh, 'nPr:\$' outNCR db Dah, Dah, Odh, 'nCh:\$' erenot Digit db Dah, Odh, 'Cervalid lepert \$' the dw 10 n db? or db? n Feet dw? n Feet dw? nhreat dw? nhreat dw? nor dw? | | |
| . steek by . data . entern db 'Enter the value of n:\$' entern db 'Enter the "" on:\$' outNPR db Dah, Dah, Odh, 'nPr:\$' outNCR db Dah, Dah, Odh, 'nCh:\$' erenvot Digit db Dah, Odh, 'Cervalid ligher \$' the dw 10 n db? n feet dw? nfeet dw? nharat dw? nharat dw? ncr dw? ncr dw? . code } Steert on ax, @data now ds, ex now ds, offset entern now ah, Oth | | 7-1 |
| entern db Enter the value of n:\$' entern db Enter the "" n:\$' outnPR db Dah, Dah, Odh, "nPr:\$' outnCR db Dah, Dah, Odh, "nCh:\$' enrNotDigit db Dah, Odh, "Christid Eight \$' then dw 10 n db? n db? n Feet dw? n feet dw? n Mrfact dw? nPr dw? nCr dw? now ax, @data nwo ds, ex | · model smell | VO -1 |
| entern db 'Enter the value of n:\$' entern db 'Enter the " " n: \$' outNPR db Dah, Dah, Odh, 'nPr: \$' outNCR db Dah, Dah, Odh, 'nCh: \$' errNotDigit db Dah, Odh, 'Cuvalid input \$' ten dw 10 n db? n feet dw? nFeet dw? nMrFact dw? nCr dw? nCr dw? ncr dw? ncr dw? nwv ax, @deta mov ds, ex | | |
| enter db 'Enter the " " " " " " " " " " " " " " " " " " " | | 1.49 |
| outNPR db Dah, Dah, Odh, 'nPr: \$', outNCR db Dah, Ddh, 'nCh: \$' evenNotDigit db Dah, Odh, 'Christid input \$', ten dw 10 n db? or db? nFeet dw? nFeet dw? nPract dw? nPract dw? nCr dw? ncr dw? ncr dw? ncr dw? nww ds, 2x nww ds, 2x nww ds, 2x | | 1n:\$' |
| out NCR db Oah, Odh, "nch: \$3 err Not Digit db Oah, Odh, "Curvalid input \$3 ten dw 10 n db? or db? n Feet dw? nfact dw? nMnfact dw? nCr dw? ncr dw? nwv ax, Odeta nwv dx, afset enter N mov ah, Ah | | |
| ever Not Digit db Oah, Odh, "Chivalid input \$? ten dw 10 n db? or db? n Feet dw? nfeet dw? nMr fact dw? nPa dw? nCr dw? code nwv ax, Odeta nwv ds, ax | outNPR db Dah, Dah, Odh, | cnpr; \$" |
| ten dw 10 n olb? or olb? n Feet dw? n feet dw? n feet dw? n Manfact dw? n fee dw? n cr dw? . code n wo ax, Odeta mov dx, afset entern mov ah, ah | | n: s |
| n db? or db? n Feet dw? nfact dw? nMrfact dw? nCr dw? . code nwv ax, Odeta nwv ds, ex nwv dx, ext entern nwv ah, orh | evi Not Digit db Oah, Odh, | avalid arpet \$ 3 |
| n Fact dw? n Fact dw? n fact dw? n Mar Fact dw? n Mar dw? n Cr dw? n code n wov ax, @ data n wo dx, afact entern n wov ah, ah | | 70.0 |
| n Feet dw? n feet dw? n Mafaet dw? n Ma dw? n Cr dw? . code steart? mov ax, @deta mov ds, ex nov dx, offset entern nov ah, Oh | | 11.1 |
| nfact dw? nMrFact dw? nPr dw? ncr dw? . ude stert 6 mov ax, @deta mov ds, ex nwo dx, afset entern mov ah, Orh | - | |
| nMarfact dev? nfor dw? ncr dw? . code steart 6 new ax, @deta new ds, ex new ds, ex new dx, affect entern new ah, Orh | | LC ALC |
| nfa dw? ncr dw? . code 2 stert 3 nwv ax, @deta nwv ds, ex nwv dx, affect entern nwv ah, Orh | | 1 184 |
| ncr dw? . code . code . stert 3 . mov ax, @deta . mov ds, ex . mov dx, expect entern . mov ah, Oah | nfa dw? | |
| Start 3 Mov ax, Odsta mov ds, ax mov dx, affect entern mov ah, an | nce du? | s. = t _{ep} |
|) Start 3 mov ax, @deta mov ds, ax) mov dx, affect entern mov ah, an | | 1 1 7 (3) |
| mov ax, @deta nov ds, ax nov dx, affect entern nov ah, ah | | 10 20 |
| mov ds, ax nov dx, affect entern nov dx, affect entern | | N. A. M. M. |
|) now dx, offset entern mov ah, oah | nov ax, Odeta | |
| mor ah, Ogh | mor ds, ex | 1 100-7 |
| mor ah, Ogh | | V V8 - |
| gut 21 h | nov dx, offset entern | . 1 S |
| 3 INT XIN | mov al, ogh | To Walls |
| | int LIh | |

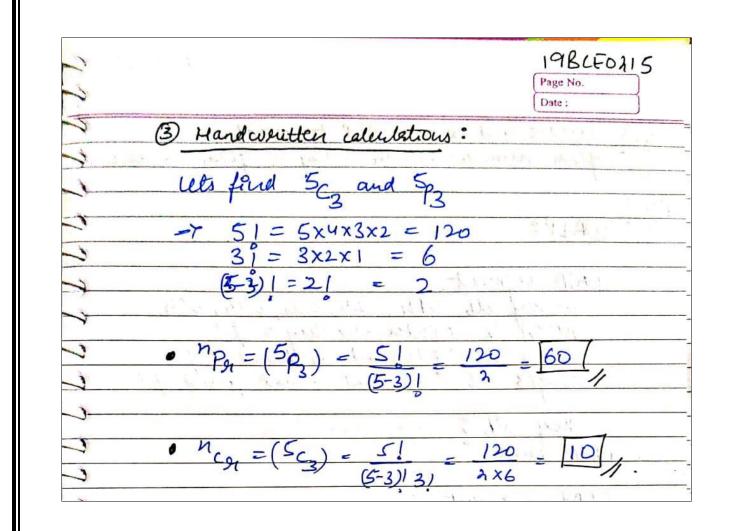
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| mov ah, 1 | 0 h 1 2 m 1 f 6 |
| int 214 | Animala Pin |
| Experience 1 | C reality to part to |
| mov ah, 084 | |
| call is AL Digitless Thear | - Equel AH |
| V | a 11/4 (1) |
| 2 wb al, 304 | - |
| mov n, al | Jane - allen |
| | L. Maria |
| mov dx, afset enter | |
| mor ah, 094 | dr. William |
| ent 214 | AL ALLA |
| mor al, 1 | Al fertina |
| Ent 214 | 40 40 200 |
| 200 2/01 | 11/11/11 |
| mor ah, n | 11 11 |
| call is ALDigitless Than E | qualati |
| 0 | Cot a ing |
| sub al, 304 | or things |
| mor I, al | A despetting C |
| 10 | the will |
| nov bl, n | 124 167 |
| mor 64,004 | 1/1/21 |
| cau fait &X in AX | |
| nov nfact, ax | * * * * * * * * * * * * * * * * * * * |
| mor bl, e | No. |
| mor 64,004 | 6 |
| call fact bx in AX | A State |
| nov defact, ax | No Val |
| | 1.5 1 |

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| 1 | Date: |
| 3 | nov bl.n |
| 1 | nov bl, n |
| 1 | mor bh,ooh |
| ,4 | call factBX&AX |
| 1 | nuv nMAFact, ax |
| 3 | |
| 5 | mov ax, nfact |
| 4 | mov bx, nMrFact |
| 7 | nov dx, ooh |
| 3 | div bx |
| • | nov nPr, ax |
| 1 | hold and the |
| • | nur dx, afset outRPR |
| 3 | nov at, ogh |
| <u>.</u> | Ent 214 |
|) | 5-1 1 3-A b. 1 1 |
| | nov ax, nor |
| · - | nw dx, 004 |
| , | call Bourt AX |
| <u> </u> | 1851 N'S |
|) | mov ax, npr |
| 7 | nov bx, «Fact |
| > | mov dx, 004 |
| 7 | div bx |
| 577 | mor ncg, ax |
|) | M 21 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
| 1 | mor ah, agu |
|) | 2ht 211 |
|) | int 21h |
| | mor ax, no |
| 4 | mor dx only |
| 13 | mor dx, ools |

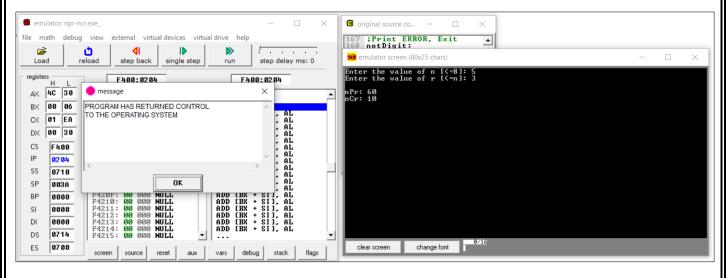
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| jup endforg. | - |
| V | |
| 3 uses defined functions: | |
| Shark and a second | |
| is AL Digit Less Than Equal AH proce | 1 |
| emp al, 20h | |
| jb not rigit | |
| cup al, 39h | |
| jg notskigit | |
| add ah, 364 | |
| imp al, ah | |
| ja notvard | |
| net the state xx vivi | |
| isAlligitlessthentqualAH endp | |
| paint AX paioc | e |
| paint Ax paioc | |
| comp ax, ooh | |
| je return mov dx,00h | |
| div ten | |
| add dl, 304 | |
| MAY dx | |
| call puintAX | 6 |
| Bon dx | 6 |
| pop dx mov ah, 2 | |
| Pat 211 | 6 |
| gut | |
| gulurn: | |
| como olx.004 | 69 |
| gut gut guturn: Comp dx,00h je prento get | |
| get you the voor | |
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| | | Date: |
| And the last of th | pounto: | |
| - | mov dl, 304 | 1 4 2 4 |
| | mov ah, 2 | |
| | int 214 | |
| | out | *** 1 1 1 |
| pen | ITAX endp | |
| | | 100000 |
| fa | itbxinax proc | A control of the cont |
| | crip bx,00h | Tage |
| | je returni | |
| | push bx | K. |
| | dec bx | d. |
| | call fact BX in DX | |
| | | dr. A. C. |
| 1 | mul bx | |
| | Jut 1 | |
| | gretury 1: | (1) |
| | mor dx, ooh | 3. |
| | Control of the contro | |
| | Cartex & Ax endp | 7 |
| _ | CartBX & AX andp | |
| | | 1 2/4 |
| 7 | rotligit: | 1 |
| | mov dx, spret evrno | tligit |
| | mor en, orn | |
| - | int 21 h | Vi a district |
| | jup endfrog | |
| 1 | notValid ? | Landa Van |
| 7 | mov dx, offset ersin | solid |
| | mov ax, offer with | · · · · · · · · · · · · · · · · · · · |
| | nw ah, beh | |
| | Sup andfrog | |
| canned with CamSca | | |





Screenshot of Output:



```
## emulator screen (80x25 chars)

Enter the value of n [<=8]: 5
Enter the value of r [<=n]: 3

nPr: 60
nCr: 10

clear screen | change font | e>16
```

Screenshot of ALP:

```
### citic Cubern/Wibha/Ome/Ome-utazin/Destopy/all Semeste 21-22/Micro-Eth/LAB-2/mp-ncazam

### citic Cubern/Wibha/Ome/Ome-utazin/Destopy/all Semeste 21-22/Micro-Eth/LAB-2/mp-ncazam

### citic Cubern/Wibha/Ome/Ome-utazin/Destopy/all Semeste 21-22/Micro-Eth/LAB-2/mp-ncazam

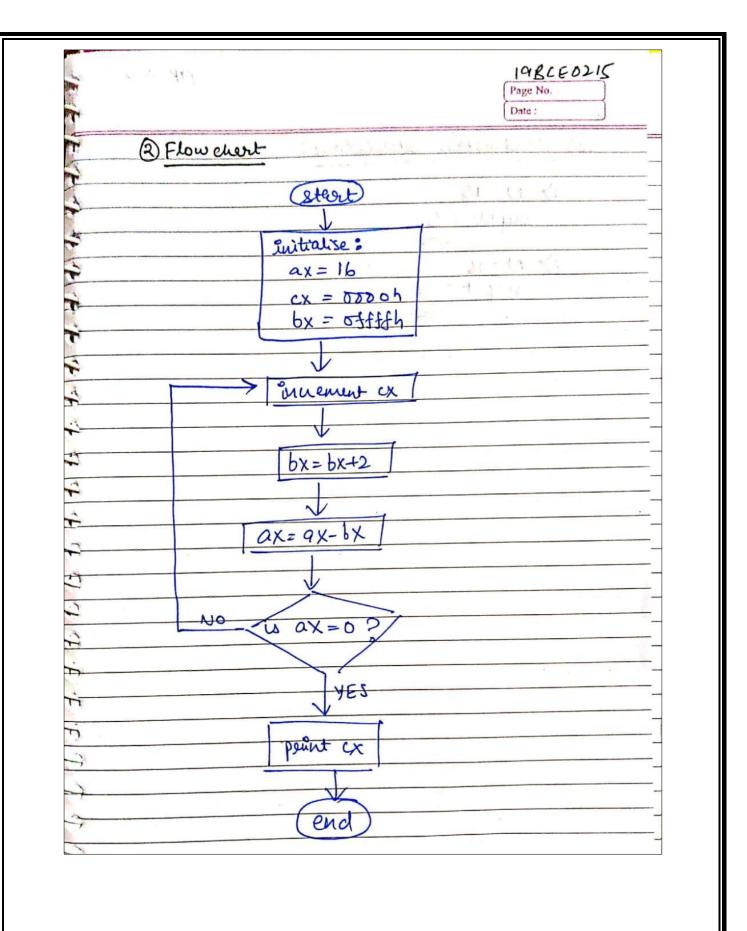
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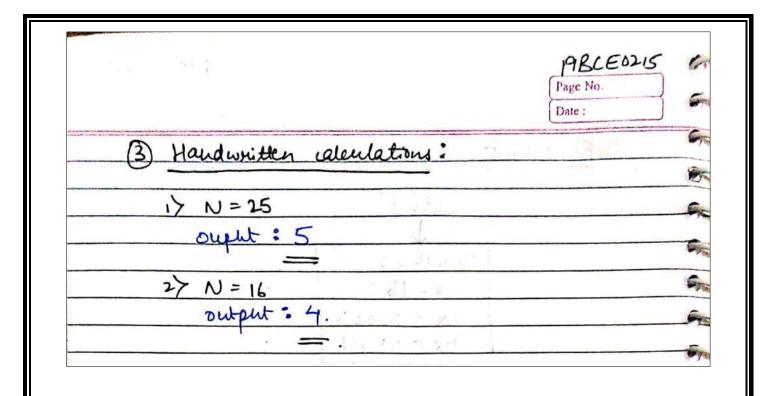
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| Iterainate Program | jnp endProgram |
```

```
151 : RECURSIUE Factorial of BX stored in 8X
152 factBX:NBX were
153 cap bx. Web
154 je return!
155 push bx
157 call factBX:nBX
158 pop bx
159 not bx
159 not bx
150 not cap bx
151 not cap bx
152 not cap bx
153 not cap bx
154 je return!
155 factBX:nBX endp
166 factBX:nBX endp
166 isor : Print ERROR, Exit
167 not cap bx
170 not cap bx
171 jn pendProg
172 int 21h
173 jn endProg
173 int 21h
174 int 21h
175 not cap bx
175 not cap bx
176 not cap bx
177 not cap bx
178 jn endProg
179 int 21h
179 jn endProg
181 iEXII
182 endProg:
183 endProg:
184 int 21h
185 endProg:
185 not cap bx
186 int 21h
187 int 21h
188 endProg:
188 endProg:
189 not cap bx
180 int 21h
180 endProg:
180 int 21h
181 int 21h
182 endProg:
180 not cap bx
180 int 21h
181 int 21h
182 endProg:
180 not cap bx
180 int 21h
181 int 21h
182 endProg:
180 not cap bx
180 int 21h
180 endProg:
180 int 21h
180 int 21h
180 endProg:
180 int 21h
180 endProg:
180 end
```

2. Write and execute ALP to perform find square root of a two digit number. Assume that the number is a perfect square.

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| grout of a two de | git number. Assume that the expuse. | - |
| numbly is a perfec | et equare. | - |
| Aus2) | Ke / - / 4524 | |
| (i) ALP | | Sing |
| 1 -1 -1 | Level A. Level | • |
| mor ax, 16d | 1 | - |
| nov (x, 0000 | HACKS STONEY | |
| mor bx, Offfh | | - |
| LIO | ay and the state of the state o | - |
| add bx, 02 | | |
| Ene cx | | |
| sub ax, bx | | |
| jnz Ll | | - |
| | | 0 |
| mor ah, 024 | | - |
| mov dl, d | | - |
| add dl, de cos | | |
| int 214 | | 0 |
| hlt | | 0 |
| | | - |





Screenshot of ALP:



Screenshot of Output:

