# Northeastern University

ETC2103 – Homework 2

1. For following example, use a sequence of diagrams like those in the text

(Section 7.4) to trace the action of the run-time stack.

#include <iostream>

void fl(int );

int f2(int p);

int f3(int n);

int main()

{

int a = 5;

f1(a);

cout << endl; *//* A: Return here after f1 finishes

}

//--- Function fl

void fl(int x)

{

cout << f2(x + 1); // B: Return here after f2 finishes

}

//--- Function f2

int f2(int p)

{

int q = f3(p/3); // C: Return here after f3 finishes

return 3\*q + 1;

}

/--- Function f3

int f3(int n)

{

return n\*n + 1;

}

Parameters Function Value Local Variables Return Address

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Activation Record |  |  | a 5 | A |

Function call f1(a)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AR for f1() | x 5 |  |  | A |
| AR for main() |  |  | a 5 | OS |

Function call for f2(x+1)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AR for f2() | p 6 |  | q 5 | B |
| AR for f1() | x 5 |  |  | A |
| AR for main() |  |  | a 5 | OS |

Function call f3(p/3)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AR for f3() | n 2 |  |  | C |
| AR for f2() | p 6 |  | q 5 | B |
| AR for f3() | x 5 |  |  | A |
| AR for main() |  |  | a 5 | OS |

Return from f(3)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **POP** AR for f3() | n 2 | **5** |  | C |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AR for f2() | p 6 |  | q 5 | B |
| AR for f1() | x 5 |  |  | A |
| AR for main() |  |  | a 5 | OS |

Return from f2()

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **POP** AR for f2() | p 6 | **16** | q**5** | B |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AR for f1() | x 5 |  |  | A |
| AR for main() |  |  | a 5 | OS |

Return from f1()

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **POP** AR for f1() | x 5 |  |  | A |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AR for main() |  |  | a 5 | OS |

Return from main()

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **POP** AR form main() |  |  | a 5 | OS |

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Hi, my name is Antonio. I am an international student currently studying at UMass Boston.I was diagnosed with nymprhotic syndrome, a kidney disorder, when I was 17 and ever since I have been under treatment, without success until now. Due to a visit to the emergency tj